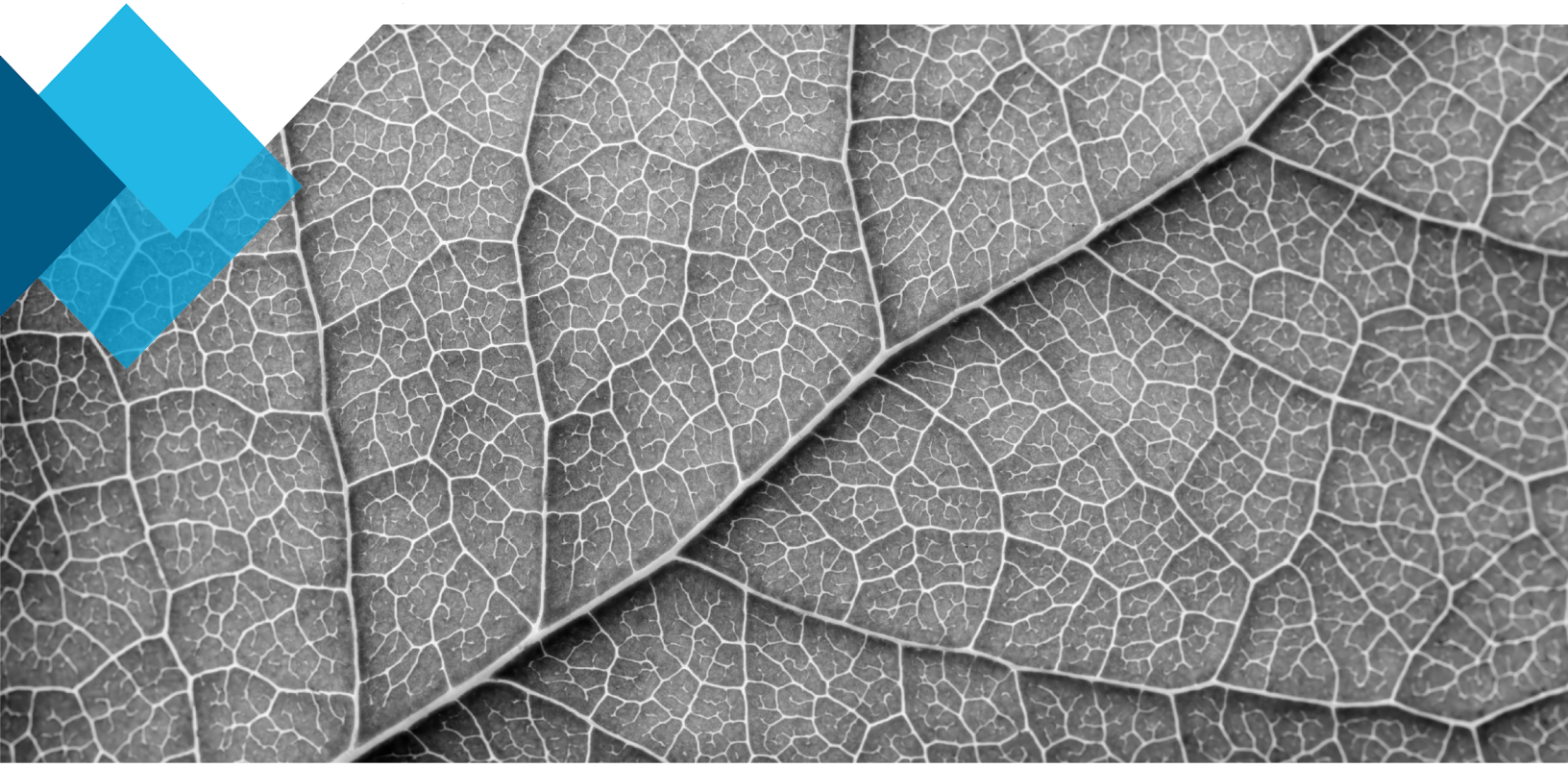
SNC·LAVALIN

Meliadine Interim Closure and Reclamation Plan 2019

Final Report

Agnico Eagle Mines Limited - Meliadine Division



Mining & Metallurgy

12 | 12 | 2019
Report > Rev. 00
Internal ref. 668523-4000-4EER-0001

SNC-LAVALIN INC.
5400 des Galeries Blvd., Suite 450
Quebec (Qc)
Canada G2K 2B4
Tel: (418) 621-5500
Fax: (418) 621-8887

Quebec, December 12th 2019

Mrs. Jessica Huza
Environment Superintendent - Meliadine
Agnico Eagle Mines Limited
Meliadine Division
Nunavut, Canada

Subject: Meliadine Interim Closure and Reclamation Plan 2019
Finale Report
Our file: 668523-4000-4EER-0001_00

Dear Mrs. Huza,

We are pleased to submit the finale 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.

Erika Voyer, Eng., M. Sc.
#OIQ: 146740
Project Manager
Mining and Metallurgy

EV/bsp

List of Revisions

Revision					Revised pages	Remarks
#	Prep.	Rev.	App.	Date		
PA	MHP/JL/ EV	EV/SP	SP	2019-11-26	All	Issued for internal revision
PB	EV/JL	EV/SP	SP	2019-11-28	All	Issued for client's review
00	MHP	EV	SP	2019-12-12	All	Issued for use

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 September 16th 2019 (the "Agreement") between SNC-Lavalin and Agnico Eagle Mines 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.

To the extent permitted by law, SNC-Lavalin disclaims any liability to the Client and to third parties in respect of the publication, reference, quoting, or distribution of this report or any of its contents to and reliance thereon by any third party

Table of Content

Page

1.0 Plain Language Summary 1
1.1 Statutory Context 1
1.2 Description of the Project 1
1.2.1 Site Geology and Mining Methods 4
1.2.2 Project Mine Plan and Facilities 4
1.3 Closure and Reclamation Activities 6
1.3.1 Rankin Inlet Site Facilities 6
1.3.2 Transportation Roads and Quarries 7
1.3.3 Underground 8
1.3.4 Open Pits 8
1.3.5 Waste Rock Storage Facilities 10
1.3.6 Tailings Storage Facilities 11
1.3.7 Water Management Structures 12
1.3.8 Site Buildings and Equipment 13
1.3.9 Waste Management Facilities 14
1.4 Cost Estimate 15
2.0 Introduction 16
2.1 Purpose and Scope of the Interim Closure and Reclamation Plan 16
2.1.1 General description of the Project 16
2.1.2 Purpose of the ICRP 19
2.1.3 Description of the proponent 19
2.2 Goal of the Closure and Reclamation Plan 20
2.3 Closure and Reclamation Planning Team 21
2.4 Engagement 21
2.5 Regulatory Instruments for Closure and Reclamation 22
2.5.1 Applicable regulatory guidelines 22

2.5.2 Concordance between the Water Licence Requirements and the ICRP 23
3.0 Project Environment 25
3.1 Atmospheric Environment 26
3.1.1 Climatic Conditions 26
3.1.2 Climate Change 28
3.1.3 Air Quality 29
3.1.4 Noise 30
3.2 Physical and Terrestrial Environment 31
3.2.1 Topography and drainage basin 31
3.2.2 Surficial Geology 31
3.2.3 Bedrock Geology 32
3.2.4 Geological Hazards and Seismicity 32
3.2.5 Permafrost 32
3.2.6 Hydrogeology 33
3.2.7 Surface Water Hydrology 33
3.3 Chemical Environment 34
3.3.1 Soil Chemistry 34
3.3.2 Sediment Quality 35
3.3.3 Surface Water Quality 35
3.3.4 Groundwater Quality 37
3.3.5 Geochemical Characterization 38
3.4 Biological Environment 41
3.4.1 Vegetation Habitat 42
3.4.2 Aquatic Biota and Habitat 43
3.4.3 Wildlife 44
3.5 Social Environment 46
3.5.1 Traditional Activities 46
3.5.2 Inuit Qaujimajatuqangit (IQ) 47
3.5.3 Cultural, Archaeological and Paleontological Resources 47
4.0 Project Description 47

4.1 Location and Access 47
4.2 Site History 48
4.2.1 Project Alternatives 51
4.3 Site Geology and mining methods 52
4.4 Project Summary 55
4.4.1 Project Mine Plan 55
4.4.2 Project Facilities 58
5.0 Permanent Closure and Reclamation 62
5.1 Definition of Permanent Closure and Reclamation 62
5.2 Permanent Closure and Reclamation Requirements 62
5.2.1 Rankin Inlet Facilities 63
5.2.2 Transportation Roads and Quarries 66
5.2.3 Underground 73
5.2.4 Open Pits 78
5.2.5 Waste Rock Storage Facilities 83
5.2.6 Tailings Storage Facilities 89
5.2.7 Water Management Structures 96
5.2.8 Site Buildings and Equipment 106
5.2.9 Waste Management Facilities 112
6.0 Progressive Reclamation 122
6.1 Definition of Progressive Reclamation 122
6.2 Opportunities for Progressive Reclamation 122
6.2.1 Rankin Inlet Site Facilities 122
6.2.2 Transportation Routes and Quarries 123
6.2.3 Underground 123
6.2.4 Open Pits 123
6.2.5 Waste Rock Storage Facilities 123
6.2.6 Tailings Storage Facilities 123
6.2.7 Water Management Facilities 123
6.2.8 Site Buildings and Equipment 124

6.2.9 Waste Management Facilities 124
7.0 Temporary Closure 124
7.1 Temporary Closure Goal and Closure Objectives 124
7.2 Temporary Closure Activities 125
7.2.1 Short-term Temporary Closure 125
7.2.2 Long-term temporary closure 126
7.3 Temporary Closure Monitoring, Maintenance, and Reporting 128
7.4 Temporary Closure Contingency Program 128
7.5 Temporary Closure Schedule 128
8.0 Integrated Schedule of Activities 129
9.0 Post-Closure Site Assessment 130
9.1 Operational Monitoring Strategies 131
9.2 Closure and Post-Closure Monitoring Strategies 131
9.3 Reporting 132
10.0 Financial Security 132
11.0 Personnel 134
12.0 References 135

List of Tables

Table 2-1 : NWB Water Licence and NIRB Project Certificate for Meliadine 23
Table 2-2 : Concordance between the Water Licence Requirements and the ICRP Sections 24
Table 3-1 : Estimated Mine Site Monthly Climate Characteristics 27
Table 3-2 : Estimated Mine Site Extreme 24-hour Rainfall Events 27
Table 3-3 : Summary of Average Projected Climate Trend Deviations from Observed Historic Values 29
Table 3-4 : Summary of Average Projected Climate Trend Deviations from Observed Historic Values 38
Table 4-1 : Summary of 1987 to 2013 Exploration Works on Meliadine Propoerty 50
Table 4-2: Summary of the Mine Production Schedule 56
Table 4-3 : Summary of the Mine Waste Production Schedule 57
Table 5-1: Closure Objectives and Criteria – Rankin Inlet Facilities 64

Table 5-2: Closure Objectives and Criteria – Transportation Roads 70
Table 5-3: Closure Objectives and Criteria – Open Pits 75
Table 5-4: Closure Objectives and Criteria – Open Pits 80
Table 5-5 : Pit and Underground Flooding 82
Table 5-6 : Design Parameters for Waste Rock Storage Facilities 85
Table 5-7: Closure Objectives and Criteria – Rock Storage Facilities 86
Table 5-8 : Design Parameters for the Tailings Storage Facilities Operations 90
Table 5-9 : Schedule, Quantities and Distribution of Tailings per Year 91
Table 5-10: Closure Objectives and Criteria – Tailings Storage Facilities 92
Table 5-11 : Location of Containment Pond and Required Operation Periods 97
Table 5-12 : Design Parameters for CP1, CP5 and CP6 97
Table 5-13 : Design Parameters for CP3 and CP4 97
Table 5-14 : As-Built Capacity for P-Area Ponds 98
Table 5-15 : As-Built and Design Parameters for Channels 100
Table 5-16: Closure Objectives and Criteria – Water Management Structures 102
Table 5-17: Closure Objectives and Criteria – Site Buildings and Equipment 108
Table 5-18 : Estimated Waste in Landfill 115
Table 5-19 : Estimated Volume of Petroleum Hydrocarbon Contaminated Soil and Ice/Snow to be Managed 117
Table 5-20: Closure Objectives and Criteria – Waste Management Facilities 119
Table 7-1 : Short-term Temporary Closure Activities 126
Table 7-2 : Long-term Temporary Closure Activities 127
Table 8-1 : Meliadine - Closure and Post-Closure Main Phases 130

List of Figures

Figure 1-1 : Meliadine Mine Site Location 3
Figure 2-1 : Meliadine Mine Site Location (AEM, 2015) 17
Figure 2-2 : Meliadine Mine Site Location 18
Figure 4-1 : Meliadine project claims, leases and concessions as of December 31, 2014 53

Figure 4-2 : Tiriganiaq open pit looking North 54
Figure 4-3 : Tiriganiaq underground mine looking South 55
Figure 4-4 : Meliadine Infrastructure General Map 60
Figure 4-5 : Rankin Inlet Infrastructure General Map 61
Figure 5-1 : All Weather Access Road (AWAR) General Map 68
Figure 5-2 : Bypass Road General Location 69
Figure 5-3 : P-Area plan view and general location 99
Figure 5-4 : Meliadine mineral processing flowsheet 106
Figure 5-5 : Operation Landfill (Stage 1) Location 113
Figure 5-6 : Landfarm Location 116

List of Appendices

Appendix A: Glossary of Terms and Definitions
Appendix B: List of Acronyms, Abbreviations, Units and Symbols
Appendix C: Record of Engagement
Appendix D: Lessons Learned from Other Projects
Appendix E: Reclamation Research Plans
Appendix F: Meliadine Site Photos
Appendix G: Meliadine Site Monitoring Water Quality Stations
Appendix H: Regulatory Instruments
Appendix I: Permafrost Map
Appendix J: Meliadine Geology, Seismic Zone, Groundwater Flow and Bathymetry
Appendix K: Water Balance
Appendix L: Ecological Land
Appendix M: Water Quality Results
Appendix N: Post Closure General Site Layout
Appendix O: Closure Integrated Schedule
Appendix P: Financial Security Cost Estimate Assumptions and RECLAIM 7.0 Spreadsheets
Appendix Q: Infrastructures As-Built and Design

1.0 Plain Language Summary

1.1 Statutory Context

This document presents the first Interim Closure and Reclamation Plan (ICRP) for the development phase of the Meliadine Gold Project. The general purpose of this ICRP is to update the preliminary closure and reclamation plan produced for the development phase of the Project (AEM, 2015a). This ICRP, based on the current life of mine, provides increasing levels of detail on the closure and reclamation of individual project components and details for components which are to be progressively reclaimed earlier in the mine life.

Agnico Eagle was granted a Type A Water Licence 2AM-MEL1631 in April 2016 (NWB, 2015). This licence authorizes Agnico Eagle to use water and dispose of waste associated with the mining and milling undertakings at the Meliadine mine site. The Licence sets out several conditions with respect to Agnico Eagle's right to alter divert or otherwise use water for the purpose of mining. The development of a closure and reclamation plan is also a requirement of the NIRB Project Certificate 006.

The closure goal, as described in the Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories issued by the Mackenzie Valley Land and Water Board (MVLWB) and Aboriginal Affairs and Northern Development Canada (AANDC) (AANDC/MVLWB, 2013), is to return the mine site and affected areas to viable and, wherever practicable, self- sustaining ecosystems that are compatible with a healthy environment and with human activities. Planning for mine closure and reclamation is an iterative process where ICRPs are prepared and updated on a regular basis, when there is a significant change to the mine plan, or according to key milestones in the mine life (AANDC/MVLWB, 2013).

1.2 Description of the Project

The Meliadine Mine site (Meliadine or the Project) is located in the Kivalliq region, Nunavut, approximately 30 km south of Rankin Inlet, and 80 km southwest of Chesterfield, as shown on Figure 1-1. The Project is located within the Meliadine Lake watershed of the Wilson Water Management Area (Nunavut Water Regulations Schedule 4) (AEM, 2015a). Located in the peninsula between the east, south, and west basins of Meliadine Lake (63°1'23.8'' N, 92°13'6.42"W), on Inuit Owned Lands, the mine site is accessible by plane via the Rankin Inlet Aerodrome.

As presented in the Preliminary Closure and Reclamation Plan (AEM, 2015a), the Meliadine property is divided as Meliadine West property and Meliadine East property. These areas were divided geographically by the Meliadine Lake at 547500 E. Meliadine West contained Tiriganiaq, Wesmeg, Pump, F Zone, and Wolf deposits, whereas Meliadine East contained the Discovery deposits and other regional gold showings.

The Meliadine Mine (the Project) is 100% owned by Agnico Eagle following acquisition of Comaplex Mines Corporation (Comaplex) on July 6th, 2010. Presently, there are no properties adjacent to the Project that has any influence on the Project (AEM, 2015a).

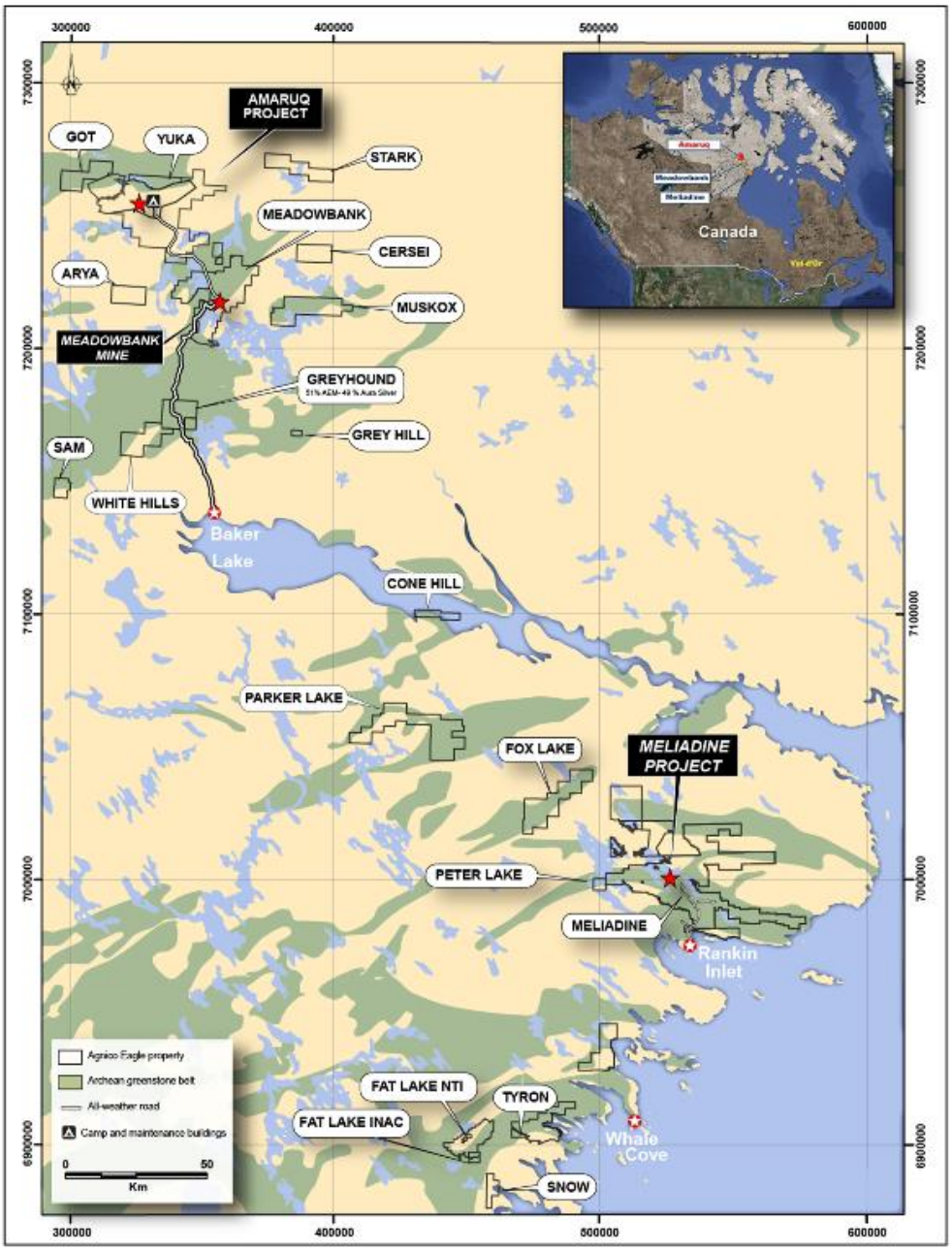
The Project ore zone exploitation will start by extracting the richer ore zones using underground mining techniques (Tiriganiaq Underground), while the open pit ore extraction (Tiriganiaq Pit 1 and Tiriganiaq Pit 2)

will start in Year 4 (2023). Both of extraction will continue until end of the mine life. Approximately 8.1 Mt of ore will be mined from the underground mining and 3.5 Mt from the open pits. The produced ore from the underground will be milled at a rate of 2500 to 3,000 tpd on average. The Meliadine Mine will also generate approximately 31.4 Mt of waste rock, 7.1 Mt of overburden waste, and 14.9 Mt of tailings.

The area that will be disturbed during construction and operation for the Project is approximately 453 ha, including the Rankin Inlet facilities. At closure, 418 ha will be reclaimed, including off-site facilities. The 35 ha that will not be reclaimed are associated to residual disturbances derived from the flooded open pits.

Mining facilities for the Project include an industrial pad, a mill and services buildings, accommodation buildings, ore stockpiles, a temporary overburden stockpile, a tailings storage facility (TSF), three waste rock storage facilities (WRSFs), and a water management system that includes collection ponds, water diversion channels, retention dikes/berms, a reverse osmosis system, a saline water treatment plant, an effluent water treatment plant and a water treatment plan.

Figure 1-1 : Meliadine Mine Site Location



Source : https://www.agnicoeagle.com/English/operations-and-development-projects/operations/meliadine/maps-and-surveys/default.aspx

1.2.1 Site Geology and Mining Methods

The Meliadine mine is located near the western shore of Hudson Bay in the Kivalliq District of Nunavut and includes seven gold deposits, six of which are part of the current mine plan. The 111,358-hectare property covers an 80-kilometre-long greenstone belt. The current mineral reserves are mainly in the Tiriganiaq deposit at underground and open pit depths, and consist of 3.8 million ounces of gold in proven and probable reserves (16.7 million tonnes at 6.97 g/t) as of December 31, 2018 (AEM website).

Commercial production began at Meliadine in mid-May 2019. The mine is expected to produce 230,000 ounces gold in 2019 (including pre-commercial production), and 385,000 ounces of gold production in 2020, its first full year of production. There are numerous opportunities to create additional value at Meliadine, both at the mine and on the large regional land package (AEM website).

Archean volcanic and sedimentary rocks of the Rankin Inlet greenstone belt underlie the property. The Pyke Fault and associated secondary structures (i.e., the Lower Fault) appear to control gold mineralization on the property.The deposits are all within 5 km of Tiriganiaq except for Discovery, which is 17 km east-southeast of Tiriganiaq. Each of these deposits has mineralization within 120 m of surface, making them potentially mineable by open pit methods. They also have deeper mineralization that could potentially be mined with underground methods, which are currently being considered in various studies (AEM website).

The current plan is to mine the Tiriganiaq deposit from two open pits and an underground mine. At the end of operations, the Tiriganiaq Pit 1 will be approximately 150 m deep with a footprint area of 26.6 ha, and Tiriganiaq Pit 2 will be approximately 100 m deep with a footprint area of 8.3 ha.

1.2.2 Project Mine Plan and Facilities

The Meliadine gold mine has begun the operation phase of the project by mining the underground Tiriganiaq deposit in May 14th, 2019. In 2018, the Meliadine Gold Project was still in the construction phase, developing the underground in preparation to operate the Tiriganiaq underground mine. A total of 688,069 tonnes of waste was Meliadine excavated, 3,134 tonnes was used as underground rockfill and the rest was used for construction purposes. A total of 39,216 tonnes of marginal and 60,846 tonnes of ore was excavated and stored at the surface ore pad (AEM, 2019a).

As presented in the Mine Waste Management Plan (AEM, 2019b), operation started after commissioning was completed at the end of Q2 2019 and will span approximately 8.5 years (Q2 2019 to 2027). Mining activities are expected to end in Year 7 (2026) and ore processing is expected to end in Year 8 (2027). Closure will occur within three years (Year 9 to Year 11) (2028 to 2030) after the completion of mining and will mainly include the removal of non-essential site infrastructure and equipment. Flooding of the mined-out open pits with water pumped from Meliadine Lake and flooding of the underground mine will occur with natural groundwater seepage which will start in Year 8 (2027) as progressive reclamation. The post-closure phase will commence as active closure is completed in Year 11 (2030) and will continue until Year 18 (2037) or until it is shown that the site and water quality meet all the regulatory closure objectives (AEM, 2019b).

Tiriganiaq gold deposit will be developed using traditional open-pit and underground mining methods. Two open pits (Tiriganiaq Pit 1 and Tiriganiaq Pit 2) and an underground mine (Tiriganiaq Underground) will be developed as shown in Figure 1.2. Approximately 31.4 Mt of waste rock, 7.1 Mt of overburden material, and

about 14.9 Mt of tailings will be produced throughout the mine life (AEM, 2019b). The following mining development sequence is planned:

- Tiriganiaq underground mine will be developed and operated from Year -5 (2015) to Year 7 (2026);
- Tiriganiaq Pit 1 will be mined from Year 2 (2021) to Year 7 (2026); and
- Tiriganiaq Pit 2 will be mined from Year 4 (2023) to Year 7 (2026).

The Project includes several facilities required for operation. The infrastructures of the Project located directly at the Meliadine site are listed below:

- An underground mine (Tiriganiaq Underground), including an underground total suspended solids (TSS) removal plant;
- Two open pits (Tiriganiaq Pit 1 and Tiriganiaq Pit 2);
- A mineral processing facility, which includes a crusher plant, process plant, and paste backfill plant;
- Sewage treatment plant (STP);
- Water treatment systems;
- Supporting infrastructure, including gated access, emulsion plant and storage facility, potable water treatment plant, exploration and permanent camp, maintenance and on-site storage areas, power plant, fuel storage, incinerator, landfill, landfarm, water management system, water intake and diffuser, a temporary overburden stockpile and ore stockpile facilities;
- Three waste rock storage facilities (WRSFs);
- A tailings storage facility (TSF);
- Transportation routes on site including internal access and haul roads;
- Quarries and borrow pits.

The Rankin Inlet Site Facilities are located about 30 km north of the mine site. The Rankin Inlet facilities act as a transfer point and temporary storage for all dry freight and fuel materials arriving by barge prior to overland shipment to the mine site via the AWAR. The infrastructures present in Rankin Inlet that belong to the Meliadine Mine are:

- fuel storage facility;
- laydown and material storage area;
- barge structure;
- saline effluent pipeline diffuser;
- bypass road around the hamlet of Rankin Inlet, and AWAR.

1.3 Closure and Reclamation Activities

1.3.1 Rankin Inlet Site Facilities

Rankin Inlet facilities are located in mainly Itivia area. This is the transfer point and temporary storage for all dry shipment and fuel materials arriving by barge prior to overland shipment to the mine site via the AWAR. Rankin Inlet Facilities are listed below:

- Floating Dock;
- Dry Freight Storage Facility;
- Bulk Fuel Storage Facilities;
- Water and Power Management;
- Saline Water Tank and diffuser.

At closure, it is planned to offer the infrastructures located in Rankin Inlet to local interests. If there is no local interest or agreement, the facilities and equipment will be decommissioned, dismantled and removed appropriately.

Agnico Eagle will return, if possible, the Rankin Inlet area where the facilities are located to pre-development conditions. The site may also be left in a semi-industrial condition if consistent with a different end land use agreed upon with regulators, the community of Rankin Inlet, and other local interest.

All remaining bulk fuel located at Itivia will first be cleaned and then removed and offered to local interests. Infrastructure, including floating dock and portable equipment will be emptied, and also offered for local use and/or relocation. In the case that there is no local interest for the tanks or remaining infrastructure and equipment, the infrastructure will be dismantled, decontaminate and demolition waste will be either transported to the mine site landfill disposal or barged out of Rankin Inlet to a southern waste disposal, recycling facility or sale for scrap metal.

At closure, scarification of all disturbed areas, including storage pads and roads, is planned to loosen the compacted material to promote surface drainage. Areas will be profiled, and water management structures will be removed from the roadways to re-establish natural drainage patterns.

The saline water tank and diffuser will be decommissioned, dismantled and removed as appropriate. The pump, piping, tanks and other components will be either transported to the mine site landfill disposal or barged out of Rankin Inlet.

It is important to note that any contaminated soils from the facilities will be removed and placed in sealed drums. These will then be transported to the mine site landfarm for treatment or barged out of to a southern destination for treatment and disposal.

No significant residual effects have been identified for after closure of the supporting facilities in Rankin Inlet, but changes to terrain caused by the construction and subsequent reclamation of the facilities could result in some alteration of the natural terrain. The main uncertainty is related to the local interest for the Rankin Inlet facilities or equipment.

1.3.2 Transportation Roads and Quarries

Transportation Routes considered for the Project are listed below:

- Access Road (AWAR) connecting Rankin Inlet to the Mine site;
- By-Pass Road built around the south of the airstrip to Itivia;
- Internal Access and Haul Roads;
- Quarries and Granular Borrow Sites along the AWAR and on site.

Agnico Eagle is committed to manage the road as a private road with limited public access during the mine life and to fully decommission the road after post-closure. The transportation roads should be one of the last mining components to be reclaimed in post-closure to preserve access for monitoring.

As mentioned in the Roads Management Plan (AEM, 2019d), it is the responsibility of Agnico Eagle of decommissioning and reclaiming all roads once construction, operations, closure, and post-closure activities are complete. For a third party to take over the road(s), that third party would have to complete its own arrangements with the landowners (the KIA and the Rankin Inlet Hamlet) and then complete its own environmental assessment and permitting process covering future use. Agnico Eagle does not own the land on which the roads are constructed and, thus, cannot transfer future ownership or use privileges to any third party. Agnico Eagle must complete its obligation to decommission and reclaim all roads unless directed otherwise by a combination of the landowners and other regulatory agencies who issued permits/authorizations for the roads. In the case that Agnico Eagle stays the owner of the AWAR and the bypass road, natural drainage courses and terrain will be restored by removing culverts and bridges, regrading road fill material and removing in-stream works down to the original channel bed.

The decommissioning details of the 18 quarries are provided also in the Road Management Plan (AEM, 2019d). The quarries and borrow pits have gently sloping walls and are designed for positive drainage wherever possible. Reclamation and closure of quarries and borrow pits will depend on the individual site conditions. All quarry sites and borrow sources developed during the construction of the roads have been selected to generate only non-acid generating/low metal leaching materials

No significant residual effects have been identified for after closure of the transportation roads and quarries but changes to terrain caused by the construction and subsequent reclamation of the facilities could result in some alteration of the terrain and or loss of plant populations and plant communities. There are also some uncertainties regarding the transfer of ownership of the road to the local community or a third party. For a third party to take over the road(s), that third party would have to complete its own arrangements with the landowners (the KIA and the Hamlet) and then complete its own environmental assessment and permitting process covering future use.

1.3.3 Underground

Tiriganiaq gold deposit will be developed using traditional open-pit and underground mining methods. Approximately 5.4 Mt of waste rock and 8.5 Mt of overburden material will be mined from underground (AEM, 2019b). Tiriganiaq underground mine will be developed and operated from Year -5 (2015) to Year 7 (2026).

The ore is first being sourced entirely from underground with access by decline, using long-hole mining methods. The first three stopes were blasted and mucked out in late 2018. Each stope is backfilled, with cemented pastefill used in primary stopes and dry rockfill for the secondary stopes. Starting in 2021, the ore will be sourced from both the underground and open pits.

A conveyor belt has been built in the underground access ramp to deliver the ore from the underground to the surface ore stockpile dome. A crusher is located underground to reduce the ore to a size that can be accommodated on the conveyor belt. Underground waste rock is transported through the same system that transports the ore but at different times.

At closure, all surface openings will be sealed; the decline ramps and the portals will be capped to eliminate access to the underground mine workings. The sealed surface opening areas will be contoured to prevent natural surface flows to the underground, and disturbed surface areas will be re-contoured to establish positive natural drainage patterns and blend in with the surrounding topography to the extent possible. The raises will be capped with concrete. Any equipment or infrastructure left underground will be cleaned, drained of fluids, inspected, and remediated as appropriate to eliminate the risk of contaminant leakage. All hazardous materials from underground shops, equipment, and magazines (fuels, oils, glycol, batteries, explosives, etc.) will be removed and disposed off-site at an approved disposal facility. Contamination associated with vehicle and equipment operations at work areas will be identified and remediated (AEM, 2015a).

Every stope will be backfilled, with cemented pastefill used in primary stopes, and dry rockfill for the secondary stopes. The paste backfill will be made by mixing pressed filtered tailings, cement and water in a facility (AEM, 2015b). Backfill will be done during the operation and will be completed in closure.

Passive flooding of the Tiriganiaq Underground Mine will occur following the completion of mining. The estimated total flooding volume of the underground workings is 1,372,000 m^3. Seepage water into the underground mine will be the main water source for flooding. At the predicted seepage rate, it is estimated to take 6 years to flood the underground mine (AEM, 2019c).

No significant long-term effects are expected for the underground mine workings. After closure, the only surface expression of the underground workings will be the sealed vent raises and portals and the area graded and levelled to avoid erosion and water accumulation

1.3.4 Open Pits

Two open pits (Tiriganiaq Pit 1 and Tiriganiaq Pit 2) will be developed as shown in Figure 4-4. Approximately 20.6 Mt of waste rock, 6.6 Mt of overburden material and 3.1 Mt of ore will be mined from Tiriganiaq Pit 1. Approximately 5.4 Mt of waste rock, 488,000 t of overburden material and 454,000 t of ore will be mined from Tiriganiaq Pit 2 (AEM, 2019b). The following mining development sequence is planned:

- Tiriganiaq Pit 1 will be mined from Year 2 (2021) to Year 7 (2026); and

- Tiriganiaq Pit 2 will be mined from Year 4 (2023) to Year 7 (2026).

A conventional truck/shovel operation is anticipated for the open pits.

The Project lies within an area of continuous permafrost where two (2) groundwater flow regimes can be observed: a shallow (active layer) and a deep (beneath permafrost) groundwater flow regimes. No hydraulic connection is anticipated between the systems because of the presence of the permafrost.

Rock material will be transported by haul truck to either the primary crusher dump area for ore material or the designated WRSFs for waste rock. Temporary ore stockpiling pads will be sited near the primary crusher.

No physical surface constraints have been considered in defining the ultimate pit limits within the Tiriganiaq deposit. The presence of different watercourses located within or near the pit footprints will require some water management including dewatering, drainage and water retention dykes. The ultimate pit limits have been controlled by the presence of the underground mine, which limits the deepening of the pits. Potential future Tiriganiaq pit expansion could interact with and/or be constrained by the development of surface infrastructure such as vent houses and raises that will be installed in the vicinity of the current/final pit walls.

Any water reporting to the open pits will be collected in sumps and ultimately directed to the main attenuation pond CP1. Dust will be managed for environmental and safety reasons on pit haul ramps by spraying water whenever needed during the non-freezing periods.

The description of the closure flooding activities for the open pits as presented herein is taken from the Water Management Plan (AEM, 2019c). When flooding the open pits for closure, the maximum pumping rate from Meliadine Lake shall not exceed 4,000,000 m^3/year during closure of the Mine, as stated in Part E, Item 2 of the Water Licence 2AM-MEL1631. The planned pumping period will occur during the open water season from mid-June to end of September for each year. Table 5-5 summarizes the pit volume and expected water elevations at the completion of flooding activities. It will take approximately three years to fill the pits with an assumed pumping rate of 0.44 m^3/s (38,300 m^3/day). The assumed pumping rate of 0.44 m3/s from Meliadine Lake during closure will have negligible effect to Meliadine Lake when compared to the average outflow rate at the outlet of Meliadine Lake. The pumping rate will be evaluated further to validate that any possible negative effects to Meliadine Lake do not occur (AEM, 2019c).

The water quality model results indicated that water quality in the flooded pits will meet the discharge criteria and post closure treatment will not be required. The water quality within the pits will be monitored during flooding to verify the prediction of the water quality model. The information will be used to develop a strategy to minimize contamination of the regional surface water system (AEM, 2019c).

The open pit may be hazardous to wildlife species as wildlife may be injured by inadvertent access into the open pit. Wildlife management and protection practices will be implemented to limit wildlife injury and morbidity during closure and post-closure. A rock berm will be constructed around the open pits to limit or prevent access by people and to discourage access by wildlife. Proper signage will also be placed around the flooded pits to mark access points (AEM, 2019c).

The open pits are designed to have stable slopes during the mine life and post-closure. The slopes are monitored as part of mine operations and will be progressively modified as required to maintain stability during closure and post-closure (AEM, 2019c).

The following uncertainties have been identified with respect to closure planning of the open pits; long-term stability, surficial water quality within the flooded open pits and flooding rate for filling the open pits at closure.

Water quality monitoring will continue during operations to expand the available water quality database. Water quality forecast for pit lake water will continue to be performed to predict the water quality at closure. The water balance and water management will also be reviewed in operation and in closure to estimate the lake water transfer volume required for flooding, as well as the natural inflows, to ensure adequate water levels are maintained into the pits.

The water treatment facilities are included as a contingency measure should water on site not be suitable for release to the environment. Water quality monitoring will occur during mine operation to include in the site water quality and to provide additional information for future closure water quality prediction and planning modifications if required. Prior to flooding of the pits, the quality of surface water and any groundwater seepage reporting from the pit walls will be sampled to assess potential for contamination of the pit water during re-filling. Water quality monitoring will continue in closure and post-closure.

If the results of water quality monitoring indicate that water in the flooded open pits is not suitable for direct discharge, in-pit treatment and active treatment prior to discharge into the receiving environment will be considered as contingencies for the treatment of the flooded pit water (AEM, 2015a).

1.3.5 Waste Rock Storage Facilities

As described in the Waste Rock Management Plan (AEM, 2019b), the overall objective of the site selection for the Waste Rock Storage Facilities (WRSFs) was to minimize the footprint of the areas occupied by the waste rock and overburden, and where possible, avoid environmentally and socially sensitive areas. Approximately 31.4 Mt of waste rock will be mined from the open pits and underground mine operations. Most of the waste rock produced (about 25.3 Mt) will be placed and stored within the designated WRSFs. The remaining 6.1 Mt of waste rock will be used for other purposes, including approximately 2.0 Mt will be backfilled to the underground mine, 1.65 Mt of waste rock will be used for construction activities, and 2.50 Mt of waste rock will be used as TSF closure cover material. Approximately 7.1 Mt of overburden will be produced with about 7.0 Mt of overburden being co-disposed within the WRSFs. The remaining, approximately 0.1 Mt, will be stored in a temporary overburden stockpile that will be used as cover material for progressive closure and reclamation of the TSF area.

Three areas were identified for the combined storage of waste rock and overburden material. Originally, four main areas were proposed as the waste rock storage areas in the baseline study for the project during the FEIS to store the waste rock and overburden generated. Comparatively, the three WRSFs for Tiriganiaq have less impact on existing waterbodies, smaller footprints, shorter haul distances, and it will be easier to manage the surface runoff and seepage from the facilities

Seepage and runoff water from the WRSFs and the temporary overburden stockpile will be managed by a series of water diversion channels, water retention dikes/berms, and water collection ponds. If the water quality does not meet the discharge criteria, the collected contact water will be treated by the appropriate water treatment system prior to discharge to the outside environment. The contact water quality and the water management structures for the WRSFs will be monitored and assessed according to the Type A Water Licence 2AM-MEL1631 during each stage of the mine life, including construction, operations, closure, and post-closure (AEM, 2019b).

Reclamation of the WRSFs will use currently accepted management practices and appropriate mine closure techniques that will comply with accepted protocols and standards. Geochemical testing indicates that the waste rock and overburden from the Project is non-potentially acid generating (NPAG) and non-metal

leaching (NML). Kinetic tests completed on all waste rock type and at various scales show that drainage water quality is expected to meet MDMER monthly mean effluent limits, including results for arsenic. Therefore, a closure cover system is not proposed for the WRSFs (AEM, 2019b).

The WRSFs were designed for long-term stability and no additional re-grading will be required at closure. Reprofiling could be required if waste rock material is excavated for reclamation work such as TSF cover or rock berms around the open pits.

The contact water management system for the WRSFs will remain in place until mine closure activities are completed and that monitoring results demonstrate that water quality conditions from the WRSFs are acceptable for discharge to the environment with no further treatment required. Once water quality meets the discharge criteria, diversion channels/berms/dikes will be decommissioned to allow the surface runoff and seepage water from the WRSFs to naturally flow to the outside environment.

Dust from the WRSFs is anticipated to be a minor issue during closure. It is also anticipated that the native lichen community will naturally re-vegetate the surface of the WRSFs over time (AEM, 2019b).

1.3.6 Tailings Storage Facilities

The tailings storage facility at Meliadine consist in a dry stack tailings pile. Dry stack tailings produced in the mill at Meliadine will be dewatered to a solids content of approximately 85% and will be trucked to the TSF with haul trucks. The tailings will then be spread out and compacted into thin lifts using a dozer and vibratory compactor.

The TSF is designed to accommodate approximately 10.9 Mt of tailings. The two cells system (Cell 1 and Cell 2) is designed to limit dust generation, control tailings surface erosion, and to facilitate the progressive reclamation and closure of the TSF. As the tailings reach final elevation, the tailings will be progressively encapsulated with either waste rock or a layered combination of waste rock and overburden (AEM, 2019b).

Commissioning of the process plant started near the end 2018. The production schedule, quantities, and distribution of tailings by year are presented in Table 5-9. Approximately 14.9 Mt of tailings will be produced over an 8.5-year period. Approximately 10.9 Mt or 73% of the tailings will be deposited within the TSF and the remaining 4.0 Mt or 27% will be used as underground cemented paste backfill. Based on a tailings dry density of 1.65 t/m^3, the TSF will have a storage volume of 6.61 Mm^3 (AEM, 2019b).

Based on the tailings production schedule, Cell 1 will reach its design capacity by Year 5 (2024) at an average height of 33 m above the original ground. Cell 2 will start operation from Year 4 (2023) and will reach design capacity in Year 8 (2027) (AEM, 2019b).

Site contact water from the TSF is collected by the perimeter water management system located to the northwest and south of the TSF. The contact water quality and the water management structures for the TSF will be monitored and assessed according to the Type A Water License 2AM-MEL1631 during operation, closure and post-closure periods.

Mine closure and reclamation of the TSF will utilize currently accepted management practices and appropriate mine closure techniques that will comply with accepted protocols and standards. Results of geochemical characterization indicates that the tailings produced at the Project are NPAG and ML is not predicted to be an issue as there will be limited seepage from the tailings porewater at closure (AEM, 2019b).

The closure plan for the TSF is to progressively place an engineered cover over the tailings surface as the tailings deposit reaches the ultimate elevation. The proposed closure cover includes:

- A minimum thickness of 4.5 m waste rock cover over the lower toe of the final tailings side slopes and a minimum thicknesses of 4.0 m waste rock cover over the upper side slopes, placed during operation along with tailings deposition;
- A minimum thickness of 2.5 m waste rock cover over 0.5 m thick select overburden till fill over the top surface of final tailings. The top closure cover material will be placed when each cell reaches its operational capacity and sloped 4% to discourage ponding and surface infiltration.

The contact water management system for the TSF will remain in place until mine closure activities are completed and monitoring results demonstrate that water quality conditions from the TSF are acceptable for the discharge of all contact water to the environment with no further treatment required. Once the water quality meets the discharge criteria established through the water licensing process, the TSF water management infrastructure will be decommissioned to allow the water to naturally flow to the outside environment (AEM, 2019b).

An adaptive closure strategy has been adopted for the Project. The preliminary closure cover design adopted for the TSF at this stage will be further evaluated and updated based on the TSF performance monitoring, water quality monitoring and evaluation, and the overall mine closure plan. The final closure cover design for the TSF will be developed before mine closure (AEM, 2019b).

The placement of the engineered cover will also help prevent dust production. It is anticipated that the native lichen community will naturally re-vegetate the TSF cover over time (AEM, 2015a).

The main uncertainties for the closure planning of the TSF are related to the cover design, the water quality from the TSF, the permafrost development and the re-vegetation.

1.3.7 Water Management Structures

As presented in the Water Management Plan (AEM, 2019c), a network of berms, dikes, containment ponds, channels, culverts and sumps are in place and maintained to facilitate water management. The major components are listed below.

- Water containments ponds and associated dikes or berms: Five water containment ponds (CP1, CP3, CP4, CP5, and CP6) and their associated dikes or thermal berms (D-CP1, Berm-CP3, Berm-CP4, D-CP5, and D-CP6) are included in the water management system to manage contact water.
- P-Area: The P-area includes three P-Area containment ponds (P1, P2, and P3,) four containment berms (DP1-A, DP1-B, DP2-A, and DP3-A) and five evaporators. It is part of the surface water management system dedicated to saline water.
- Saline ponds: The Saline Pond (SP1) was constructed in Q3 2016 to accommodate excess saline water from underground.
- Water diversion channels and berms: Eight (8) water diversion channels (Channel 1 to Channel 8) are part of the water management system.

- Water Treatment Plants: Contact water will be treated (if necessary) to meet Water Licence requirements prior to being discharged to the environment. Water for potable use is also treated.
- A freshwater intake: Freshwater usage includes potable uses, fire suppression, make-up water for the mill, and other operational requirements, such as drilling water, dust suppression, batch plant use, and use at the wash bay.
- An effluent diffuser located in Meliadine Lake.
- Sixteen water passage culverts to convey water (Culverts 1 to 8, 10, 11, 13, 14 to 16, 18, 19).
- A network of surface pumps and pipelines.

During mine closure, the water management infrastructure on site will remain in place until mine closure activities are completed, and monitoring demonstrates that the water quality is acceptable for environmental discharge without treatment. Once water quality meets the discharge criteria, the water management systems will be decommissioned to allow the water to naturally flow to the environment.

The open pits will be flooded at closure and passive flooding of the Tiriganiaq Underground Mine will also occur. The containment ponds, dikes and berms will remain in place to collect the surface runoff water and seepage from the mine until the water quality meets discharge criteria. Once the water quality meets discharge criteria, dikes/berms will be breached to allow runoff to follow natural (topographically induced) flow paths.

Culverts will be maintained as required in closure until site water quality monitoring results indicate that water can be released to the environment without further management and without erosion.

Once monitoring results have indicated that contact water conveyed in channels and sumps meets acceptable water quality, the infrastructure will be graded and/or surface treated according to site specific conditions to minimize wind-blown dust and erosion from surface runoff, if required.

Water treatment facilities will remain on site until water quality is suitable for direct discharge to the environment. The water treatment and Meliadine Lake effluent diffuser will be maintained for three (3) water treatment seasons as a contingency before being dismantled and disposed of in an appropriate landfill.

Uncertainties are related to water quality during closure and post-closure. However, water quality modelling will continue during operation.

1.3.8 Site Buildings and Equipment

During the life of mine, surface infrastructures are required at different periods for mining, processing, accommodation, fuel storage and electricity. Most of the infrastructures are located within the industrial site of Meliadine.

- Mill;
- Ore Pad;
- Accommodation and Service Building;
- Laboratory and Core Shack;

- Maintenance Shop;
- Emulsion Plant;
- Fuel Storage;
- Power Plants.

The equipment fleet include mobile surface equipment and underground mining equipment.

At closure, all buildings and structures will be decontaminated, decommissioned and dismantled. Demolition waste that cannot be reused, recycled or provided to local interests will be disposed of in the on-site landfill. Salvageable material will be removed off site and metals will be separated and shipped off-site as scrap if economical to do so.

Any above grade concrete structures or foundation will be demolished, and the rubble will be disposed of in the landfill. Remaining bulk fuel and empty portable fuel storage tanks will be offered to community interests. The tanks will be emptied, cleaned, and dismantled for disposal in the site landfill or shipped south. Fuel not required during the closure and reclamation activities will be sold, returned to suppliers, disposed by a licensed handler, or incinerated.

All hazardous wastes will be removed for disposal by a licensed handler during the dismantling of buildings and infrastructure. An assessment will be carried out to identify areas where soils may be contaminated by hydrocarbons. Any contaminated soil will be excavated and taken to the landfarm for treatment.

Most of the mobile equipment will be removed once the closure stage is complete. Equipment used for closure activities and long-term maintenance will be removed from the site once they are no longer required. A small subset of equipment will be retained on-site for a portion of the post-closure stage.

1.3.9 Waste Management Facilities

The waste management facilities include the landfill, landfarm and incinerator. Hazardous waste management is also part of the global waste management. At the Project site, wastes are safely managed from the time they are produced to their final disposal. All waste is segregated at the mine site and will predominately be landfilled, incinerated, or recycled. Used oil burning will be maximized as much as possible using the secondary chamber of the incinerator. Remaining wastes on site, including hazardous waste, will be packaged for shipment to a certified waste management facility for treatment, recycling, and/or disposal.

The location of the landfill in the WRSF1 serves to minimize the area of surface disturbance, stabilize disturbed land surfaces against erosion, and return the land to a post-mining use that is chemically and physically stable, and consistent with past traditional pursuits and wildlife habitat. While waste rock will be disposed on land and in a manner that encourages total freezing. The design, operation, and/or closure of the WRSFs and landfill do not rely on total freezing. Any unacceptable leachate that is generated following closure of these facilities will be contained, collected, and/or treated, if necessary. Upon closure, it is estimated that the landfill will have a volume of approximately 63,000 m^3 of waste. The landfill will be covered with a minimum of 3.7 m of waste rock and should thereafter be stable (AEM, 2019i).

Contact water from the landfill at its closure will continue to be managed using best management practices as in operation. The leachate from the landfill is anticipated to be of very low ionic strength (dilute) due to

controls on materials to be placed in the landfill. Moreover, drainage from the landfill is largely expected to freeze within WRSF1, with little to none reporting to the water collection infrastructure (FEIS, 2014).

After removal of all remediated soil and prior to closure and reclamation of the landfarm, the berm and base will be sampled on a 10 m grid, to determine if these soils are free from PHC contamination. Results of this analysis will be compared to GN criteria. No excavation will be necessary if agricultural/wildlife criteria are met. If industrial criteria are used, the landfarm will be covered with 2 m of waste rock or other material used for reclamation. The surrounding berm will be breached to avoid water accumulation on the landfarm (AEM, 2019j).

Approved waste will be burned in the incinerator during operation and closure. At the end of the active closure phase, the incinerator will be emptied and offered for local use and/or relocation. If there is no local interest, the infrastructure will be demolished and taken to the on-site landfill for disposal or barged out to a southern waste disposal facility.

The hazardous materials will be managed in operations such that minimal quantities remain on site at closure. Any remaining hazardous materials that cannot be used during closure activities will be transported to licensed disposal facilities in the south, as per operation procedures, in accordance with the Hazardous Material Management Plan (AEM, 2018).

1.4 Cost Estimate

A permanent closure and reclamation financial security cost estimate has been prepared with the present Project layout and infrastructure. The cost estimate covers the closure and reclamation of all Project facilities as described in this report and was prepared using RECLAIM Version 7.0 for permanent closure of the Meliadine Mine.

Agnico Eagle is required to submit a detailed financial security cost estimate for the Meliadine ICRP 2019 to Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) and to the Kivallik Inuit Association (KIA) to support land use and water licensing requirements. RECLAIM Version 7.0 workbook has been used for this estimate, as per the Guidelines for Closure and Reclamation Cost Estimates for Mines, issued by Indigenous and Northern Affairs Canada, Mackenzie Valley Land and Water Board and the Government of the Northwest Territories (INAC, MVLWB, GNWT, 2017).

This cost estimate provides for the closure measures described in detail in the Meliadine ICRP 2019. Most closure activities will occur within the active closure period, from 2028 to 2030 inclusively.

The 2019 estimated closure and reclamation costs for the Meliadine Mine represent a total of $ 59,514,717. This total includes $ 34,462,041 of direct costs and $ 25,052,677 of indirect costs.

2.0 Introduction

2.1 Purpose and Scope of the Interim Closure and Reclamation Plan

2.1.1 General description of the Project

The Meliadine Mine site (Meliadine or the Project) is located in the Kivalliq region, Nunavut, approximately 30 km south of Rankin Inlet, and 80 km southwest of Chesterfield, as shown on Figure 2-1. The Project is located within the Meliadine Lake watershed of the Wilson Water Management Area (Nunavut Water Regulations Schedule 4) (AEM, 2015a). Located in the peninsula between the east, south, and west basins of Meliadine Lake (63°1'23.8'' N, 92°13'6.42"W), on Inuit Owned Lands, the mine site is accessible by plane via the Rankin Inlet Aerodrome.

Figure 2-2 presents the location of Meliadine in relation with the other Agnico Eagle Nunavut Projects.

As presented in the Preliminary Closure and Reclamation Plan (AEM, 2015a), the Meliadine property is divided as Meliadine West property and Meliadine East property. These areas were divided geographically by the Meliadine Lake at 547500 E. Meliadine West contained Tiriganiaq, Wesmeg, Pump, F Zone, and Wolf deposits, whereas Meliadine East contained the Discovery deposits and other regional gold showings.

The Meliadine Mine (the Project) is 100% owned by Agnico Eagle following acquisition of Comaplex Mines Corporation (Comaplex) on July 6th, 2010. Presently, there are no properties adjacent to the Project that has any influence on the Project (AEM, 2015a).

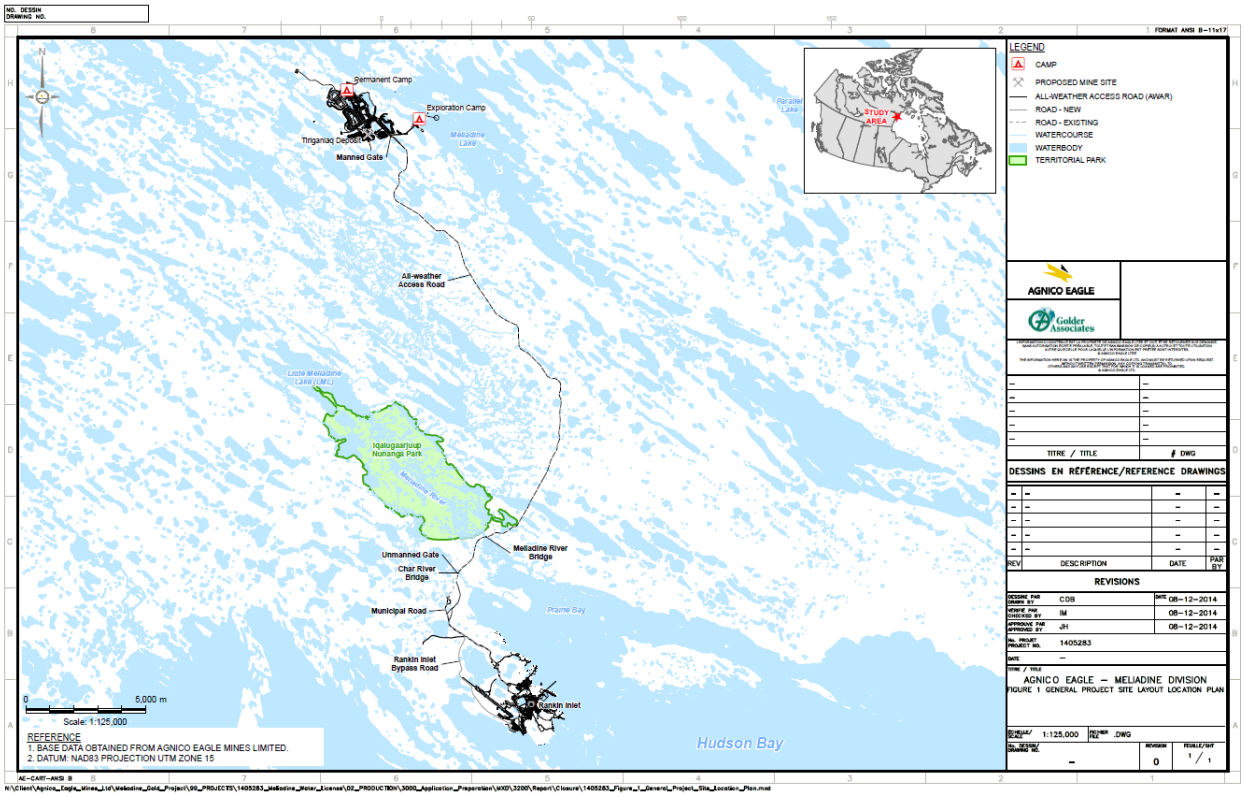
The Project ore zone exploitation will start by extracting the richer ore zones using underground mining techniques (Tiriganiaq Underground), while the open pit ore extraction (Tiriganiaq Pit 1 and Tiriganiaq Pit 2) will start in Year 4 (2023). Both of extraction will continue until end of the mine life. Approximately 8.1 Mt of ore will be mined from the underground mining and 3.5 Mt from the open pits. The produced ore from the underground will be milled at a rate of 2500 to 3,000 tpd on average. The Project will also generate approximately 31.4 Mt of waste rock, 7.1 Mt of overburden waste, and 14.9 Mt of tailings.

The area that will be disturbed during construction and operation for the Project is approximately 453 ha, including the Rankin Inlet facilities. At closure, 418 ha will be reclaimed, including off-site facilities. The 35 ha that will not be reclaimed are associated to residual disturbances derived from the flooded open pits.

Mining facilities for the Project include an industrial pad, a mill and services buildings, accommodation buildings, ore stockpiles, a temporary overburden stockpile, a tailings storage facility (TSF), three waste rock storage facilities (WRSFs), and a water management system that includes collection ponds, water diversion channels, retention dikes/berms, a reverse osmosis system, a saline water treatment plant, an effluent water treatment plant and a water treatment plan.

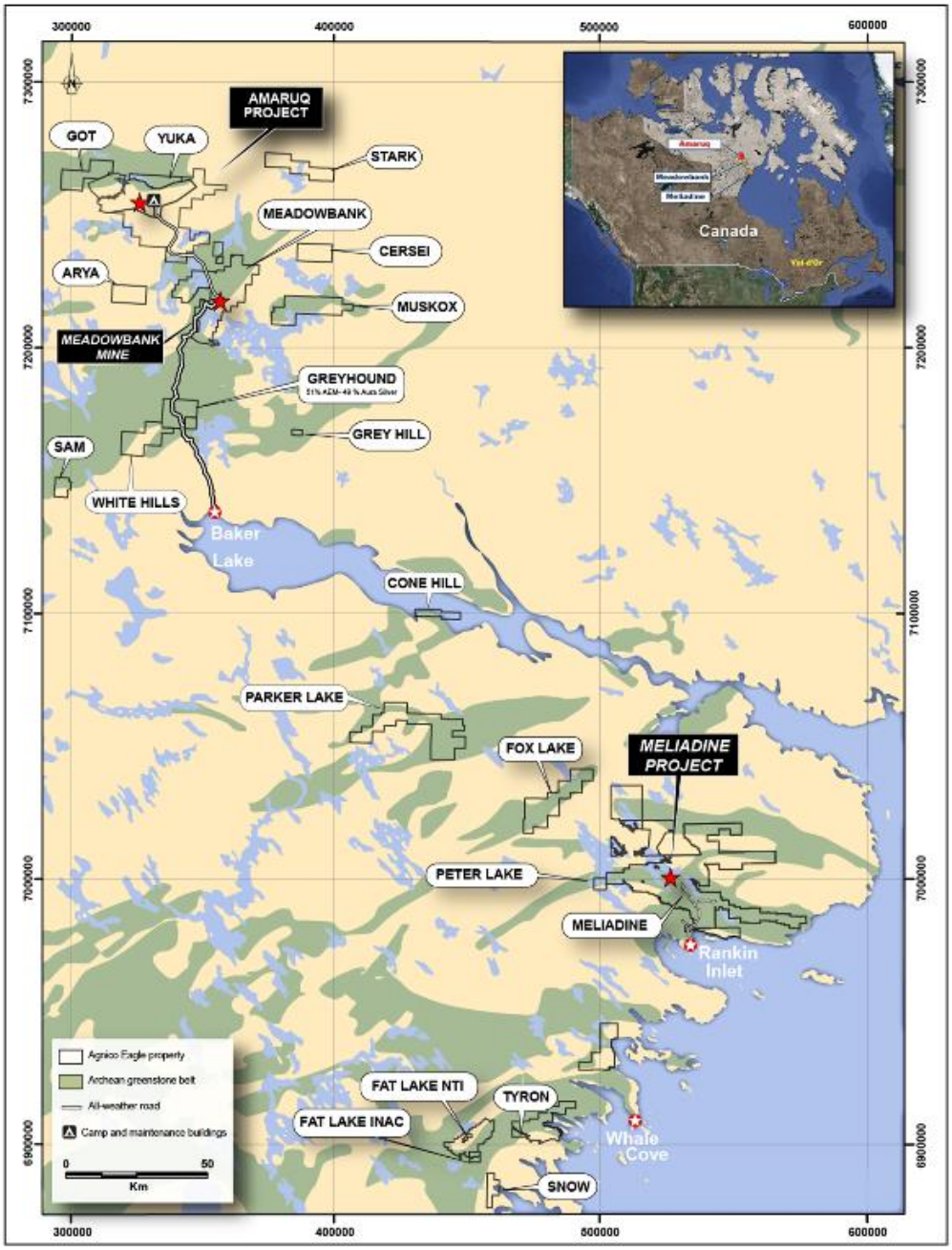
The present Meliadine Interim Closure and Reclamation Plan (ICRP) is based on the current Life of Mine (LOM) of Meliadine, as presented in Section 4.4.1.

Figure 2-1 : Meliadine Mine Site Location (AEM, 2015)



Source : AEM, 2015a

Figure 2-2 : Meliadine Mine Site Location



Source : https://www.agnicoeagle.com/English/operations-and-development-projects/operations/meliadine/maps-and-surveys/default.aspx

2.1.2 Purpose of the ICRP

This document presents the first Interim Closure and Reclamation Plan (ICRP) for the development phase of the Meliadine Gold Project. The general purpose of this ICRP is to update the preliminary closure and reclamation plan produced for the development phase of the Project (AEM, 2015a). This ICRP, based on the current life of mine, provides increasing levels of detail on the closure and reclamation of individual project components and details for components which are to be progressively reclaimed earlier in the mine life.

The ICRP document is the main reference to be used throughout the closure engineering process for the development of the Final Closure and Reclamation Plan. This document does not include detailed engineering closure designs, or specific post-closure monitoring programs as these will be developed in the future. However, a view of the current closure concepts for each area of the mine site and the plans to advance these designs are provided.

The focus of this ICRP for the Project is to:

- Provide closure objectives for the Project components;
- Describe closure options for temporary and permanent closure;
- Identify uncertainties related to the proposed closure objectives, options, or criteria;
- Identify post-closure monitoring requirements and responsibilities for the selected closure activities;
- Predict the likelihood of potential post-reclamation risks to the environment and human and wildlife health; and
- Estimate the closure and reclamation costs.

2.1.3 Description of the proponent

The proponent of the Project is:	Agnico Eagle Mines Limited (Agnico Eagle)
The address for the proponent is:	Meliadine Gold Project – Agnico Eagle 145 King Street East, Suite 400 Toronto, Ontario M5C 2Y7, Canada
The Project site is located at:	latitude 63°1'23.8"N, longitude 92°13'6.42"W (UTM 6988500N, 540250E, NAD83, Zone 15) Territory of Nunavut, Canada
Acting on behalf of the proponent:	SNC-Lavalin Inc. (SLI) Mines et métallurgie 5400 des Galeries Blvd., Suite 450 Québec (Qc) Canada G2K 2B4

The contact person for the Project is:

Jessica Huza, Meliadine Environment Superintendent
Agnico Eagle Mines Limited
Meliadine Division
Nunavut, Canada
Email: Jessica.huza@agnicoeagle.com

2.2 Goal of the Closure and Reclamation Plan

Permanent closure is defined as the final closure of the mine site after mining has ceased. Permanent closure is typically a planned event, the timing of which is dependent on the life of mine of the project. The closure approach for the project, as well as specific closure activities at each project facility, is guided by the intended end land use of the area. Based on stakeholder and local community consultation to date, the intended end land use for project-affected areas is a return to the “natural” state. As such, closure activities are focused on decommissioning mine components so that they blend into the existing landscape to the extent possible.

Agnico Eagle is committed to responsible mining practices for the protection of human, wildlife and aquatic life health, and for minimizing impacts on the environment. Agnico Eagle intends to leave behind a positive community and environmental legacy. The closure goal as described in the Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest (AANDC/MVLWB, 2013), is to return the mine site and affected areas to viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment and with human activities. The four closure principles of physical stability, chemical stability, no long-term active care requirements, and future use (including aesthetics and values) support the closure goal:

- Physical stability: The components of the reclaimed site should be built or modified at closure so that they do not erode, subside or move under extreme design events, and therefore do not pose a threat to humans, wildlife, or environmental health and safety;
- Chemical stability: The components of the reclaimed site should be chemically stable so as to prevent adverse soil, water and air quality effects that might pose a risk to humans, wildlife or environmental health and safety; and
- Future use and aesthetics: The reclaimed site should be compatible with the surrounding lands at the completion of the reclamation activities.

These broad objectives were used to support the identification of closure objectives that are specific to the Project. These specific objectives are:

- Physically and chemically stable lands and waters at the reclaimed Meliadine site that are safe for human, wildlife and aquatic life;
- Lands and waters at the reclaimed Meliadine site that allow for traditional uses;
- Final landscape guided by pre-development conditions and traditional knowledge;
- Post closure conditions that, where appropriate, do not require a continuous presence of Project staff until a walk-away condition is achieved.

2.3 Closure and Reclamation Planning Team

The strategy used by Agnico Eagle is an integrated approach consisting of a consortium between the Meliadine departments, the corporate office and Engineering consultant firms. This multidisciplinary team will form the Reclamation Planning Team, which will be responsible for coordinating activities and projects related to closure. The Reclamation Planning Team will oversee the review of the ICRP, developing the Final Closure and Reclamation Plan and communicate its content to all departments of the Project. The communication effort is intended to provide a sufficient level of awareness among operations staff as to the importance of closure and reclamation activities on Project development. The team members are comprised of Environment Department staff members for now. External support for the development of the plan is currently provided by SNC Lavalin Inc. (SLI) for the development of the Meliadine ICRP 2019, although other consultants and contractors may be involved in the preparation of the subsequent ICRP and/or the final plan.

The Reclamation Planning Team will ensure to:

- Take leadership of the Closure Project and develop a work environment characterized by open communication, commitment, dedication to safety and continuous improvement;
- Liaise with departments and manage inter-company relationships;
- Take responsibility for the staffing and organization of the studies required for the interim and final closure and reclamation plans;
- Respect the schedule and permitting requirements;
- Identify closure risks and opportunities;
- Manage documentation; and
- Provide services in an ethical manner that is consistent with the Agnico Eagle corporate policies and its professional reputation.

Furthermore, Agnico Eagle has developed a Responsible Mining Management System (RMMS) Standard. The RMMS supports the application of Agnico Eagle's Sustainable Development policy. All Agnico Eagle Divisions must implement the RMMS outlined in the current standard at all their sites. Sites include operations, exploration, projects, offices, and closed sites. The application of RMMS does not take precedence over site-specific statutory and permitting requirements. The primary focus of this system is to provide an integrated framework for the management of health, safety, environmental and social acceptability performance. This standard applies to all phases of mining projects including closure and post-closure phases.

2.4 Engagement

Agnico Eagle is committed to engaging all stakeholders through public engagement and consultation during the development, construction, operation and closure of the Project. Consultations under various owners and operators of the Project have been recorded from 1995 to the present and have included information sessions, consultation, informed participation, and negotiation (AEM, 2014, Volume 1). In its public engagement and consultation, Agnico Eagle focused on those communities in close proximity to the Project; Rankin Inlet, located some 25 km south of the Project, and secondarily Chesterfield Inlet, some 70 km to the

northeast. Stakeholders were identified and consulted amongst general public, local, and regional communities and Inuit organizations, federal and territorial government departments, and government institutes having a mandate relevant to the Project. The participation of community members, including Elders and community organizations, in all forms of consultation ensured that local knowledge and Inuit Qaujimajatuqangit (IQ) were an input to the Project's design (AEM, 2014, Volume 1).

Agnico Eagle has initiated ongoing discussions and consultations with the Government of Nunavut (GN), the Kivalliq Inuit Association (KIA), local Hunters' and Trappers' Organizations (HTO), and the Municipality of Rankin Inlet, to ensure that all parties are kept aware of the development plans for the Project. Agnico Eagle has also engaged in meetings with the Community Lands and Resources Committee. This will continue throughout the mine life and closure phase (AEM, 2014, Volume 1).

Common to all communities were concerns related to caribou preservation, jobs, and training. An additional concern raised in 2012 was employee relations, particularly as it relates to the accommodation of different cultures working together. Key community findings and the Agnico Eagle's response to address them are outlined in the Meliadine Final Environmental Impact Statement (FEIS) (AEM, 2014, Volume 1) and in the Public Engagement and Consultation Baseline Report, which has been updated to include consultation following the release of the FEIS and later submitted in support of the Type A Water Licence Application.

Agnico Eagle continues to actively conduct public consultation/participation with local organizations and residents of the nearby communities. Activities include community meetings held in Rankin Inlet and Chesterfield Inlet, meetings with the Rankin HTO, meetings with the Meliadine Community Liaison Committee in Rankin Inlet, interviews conducted with Elders in Kivalliq communities on a variety of topics and site tours for Rankin Inlet residents.

2.5 Regulatory Instruments for Closure and Reclamation

2.5.1 Applicable regulatory guidelines

The ICRP follows applicable regulatory guidelines, the principles of which are described in:

- Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories (AANDC/ MVLWB, 2013);
- Mine Site Reclamation Guidelines for the Northwest Territories (AANDC, 2007);
- Abandonment and Reclamation Policy for Inuit Owned Lands;
- Mine Site Reclamation Policy for Nunavut (AANDC, 2002);
- Environment Canada, Environmental Code of Practice for Metal Mines (Environment Canada, 2009).

The Project is located within the Nunavut Territory and is thus subject to the regulatory processes established under the applicable laws and regulations of Canada and of Nunavut. The Project is subject to the Federal and Territorial Acts and Regulations listed below:

- Arctic Waters Pollution Prevention Act and Regulations;
- Canadian Environmental Act and Regulations;

- Fisheries Act and Regulations;
- Navigable Waters Protection Act and Regulations;
- Nunavut Land Claims Agreement and Regulations;
- Nunavut Waters and Nunavut Surface Rights Tribunal Act and Regulations;
- Territorial Lands Act and Regulations;
- Nunavut Environmental Protection Act and Regulations;
- Nunavut Transportation of Dangerous Goods Act and Regulations; and
- Nunavut Mine Health and Safety Act and Regulations.

The Nunavut Water Board (NWB) Water Licence and the Nunavut Impact Review Board (NIRB) Project Certificate for Meliadine details are found in Table 2-1. A list of the known Federal and Territorial Acts and Regulations applicable to the ICRP and a list of all Authorizations for the Project are found in **Appendix H**.

Table 2-1 : NWB Water Licence and NIRB Project Certificate for Meliadine

Authorization	Issuing Authority	Note
Type A Water Licence (2AM-MEL1631), issued April 1, 2016, expires March 31, 2031	Nunavut Water Board (NWB)	
Project Certificate NIRB-006 Amendment 1, issued February 26, 2019	Nunavut Impact Review Board (NIRB)	Amendments and additions to Terms and Conditions of Project Certificate to reflect significant modifications to the Meliadine Gold Mine Project as proposed in the Saline Effluent Discharge to the Marine Environment proposal and amendments to reflect implementation of project monitoring and reporting requirements

2.5.2 Concordance between the Water Licence Requirements and the ICRP

Agnico Eagle was granted a Type A Water Licence 2AM-MEL1631 in April 2016 (NWB, 2015). This licence authorizes Agnico Eagle to use water and dispose of waste associated with the mining and milling undertakings at the Project mine site. The Licence sets out several conditions with respect to Agnico Eagle's right to alter divert or otherwise use water for the purpose of mining. Specifically, in Part J, the Licence stipulates the conditions applying to abandonment, reclamation and closure. A summary of the specific requirements listed within the Water Licence applicable for the ICRP are provided in Table 2-2. The development of a closure and reclamation plan is also a requirement of the NIRB Project Certificate 006.

Table 2-2 : Concordance between the Water Licence Requirements and the ICRP Sections

Part/Condition	Water Licence Requirements	Corresponding Sections in the ICRP
Part J-1	The Board has approved the document entitled Preliminary Mine Closure and Reclamation Plan, dated April 2015, under Part B, Item 12. The Licensee shall submit to the Board for approval, within six (6) months of Commercial Operation, an Interim Closure and Reclamation Plan prepared in accordance with the Mine Site Reclamation Guidelines for the Northwest Territories, 2007 and consistent with the INAC Mine Site Reclamation Policy for Nunavut, 2002.	All sections of the ICRP
	The Plan shall include the following:	
	a. Detailed description, including maps and other visual representations, of the pre-Construction conditions for each site, accompanied by a detailed description of the proposed final landscape, with emphasis on the reclamation of surface drainage over the restored area;	Sections 3.0 Section 5.0
	b. A description of how progressive reclamation will be employed and monitored throughout the life of the mine, plus reclamation scheduling and coordination of activities with the overall sequence of the project; details of reclamation scheduling and procedures for coordinating reclamation activities within the overall mining sequence and materials balance;	Section 5.0 Section 6.0 Section 8.0
	c. Implications of water quality model re-calibration results on discharge strategy and any adaptive management measures that may be required;	Section 5.2.4, 5.2.5, 5.2.6, 5.2.7
	d. An evaluation of closure and reclamation measures for each mine component, including the goals, objectives, closure criteria and the rationale for selection of the preferred measures;	Section 5.0
	e. A comprehensive assessment of materials suitability, including geochemical and physical characterization, and schedule of availability for reclamation needs, with attention to cover materials, including maps where appropriate, showing sources and stockpile locations of all reclamation construction materials and any Water related mitigation required during implementation;	Section 3.3.5 Section 4.4.1 Section 5.0
	f. An assessment and description of any required post-closure treatment for drainage Water that is not acceptable for discharge from any of the reclaimed mine components;	Sections 5.2.4, 5.2.5, 5.2.6, 5.2.7
	g. Contingency measures for all reclamation components including action thresholds that are linked to the monitoring programs;	Section 5.0
	h. Monitoring programs to assess reclamation performance and environmental conditions including monitoring locations for	Section 9.0

Part/Condition	Water Licence Requirements	Corresponding Sections in the ICRP
	surface Water and groundwater, parameters, schedules and overall timeframes; i. QA/QC procedures for managing all waste disposal areas; j. A list of non-salvageable materials and disposal locations; k. Rock storage facility closure design plans and sections including the types of material placed and volumes; l. Underground mine plans and sections, including the areas of backfill, the type of material placed and volumes; m. Protocol for the disposal of any contaminated soil at closure; n. An assessment of the long-term physical stability of project components; o. A detailed criteria for the final breaching of the Dam(s); p. A revised closure and reclamation cost estimate; and q. A detailed implementation schedule for completion of reclamation work.	Section 5.2.5, 5.2.6, 5.2.9 Section 5.2.9 Section 5.2.5 Sections 4.4.1, 5.2.3 Section 5.2.9 Section 5.0 Section 5.2.7 Section 10.0 Section 8.0
Part J-8	The Licensee shall implement progressive reclamation, including progressive covering of the tailings, and re-vegetation if practically possible.	Section 6.0 Section 8.0
Part J-9	The Licensee shall notify the Board in writing, at least sixty (60) days prior to any intent to achieve Recognized Closed Mine status.	Section 4.4.1 Section 8.0
Schedule I	Monitoring programs according to Table 2	Section 9.0

3.0 Project Environment

This section provides a detailed description of the pre-disturbance conditions and the current development status of the Project. The Project Environment details presented herein were extracted from the main documents listed below:

- Final Environmental Impact Statement (FEIS), Volume 1 to 10 (AEM, 2014), including;
  - Permafrost Baseline Studies (SD 6-1) (AEM, 2014);
  - Terrestrial Synthesis Baseline (SD 6-2) (AEM, 2014);
  - Geochemistry Baseline (SD 6-3) (AEM, 2014);
- Meliadine Preliminary Closure and Reclamation Plan (AEM, 2015a);
- Updated Technical Report on the Meliadine Gold Project (AEM, 2015b);
- Type A Water Licence Main Application Document (AEM, 2015c);
- Meliadine Annual Report 2018 (AEM, 2019a);

- Meliadine Mine Waste Management Plan (AEM, 2019b);
- Meliadine Water Management Plan (AEM, 2019c);
- Meliadine Roads Management Plan (AEM, 2019d);
- Water Quality and Flow Monitoring Plan (AEM, 2019e);
- Groundwater Management Plan (AEM, 2019f);
- Metal Leaching and Acid Rock Drainage Monitoring Report (AEM, 2019g);
- Wildlife protection and response plan (AEM, 2019h).

3.1 Atmospheric Environment

3.1.1 Climatic Conditions

Climate data were extracted from the Closure and Reclamation plan 2015 (AEM, 2015a) and the Mine Waste Management Plan 2019 (AEM, 2019b). A single monitoring station is installed at the mine site and installed to meet international meteorological installation standards. The station tower records monthly data the following parameters:

- wind speed and direction;
- temperature;
- solar radiation; and
- total precipitation.

The Meliadine site is in the Kivalliq Region of Nunavut, near the northern border of the southern Arctic terrestrial ecozone, and within the Arctic tundra climate region. This ecoregion is classified as a polar desert and is characterized by long cold winters and short cool summers. Winds are predominately from north and-northwest with an average of 23 km/hr.

The mean annual air temperature at the Project site is approximately -10.4 degrees Celsius (°C). The monthly average temperature ranges from -31.0°C in January to +12°C in July, with above-freezing averages for only four months of the year i.e., June to September.

Total annual precipitation averaging is estimated to be 411.7 millimeters (mm) per year, with 51% of precipitation falling as rain, and 49% falling as snow. This mean annual precipitation is based on the hydrological year from October 1st to September 30th. Average annual evaporation for small waterbodies in the Project area is estimated to be 323 mm between June and September. The average annual loss of snowpack to sublimation and snow redistribution is estimated to vary between 46% and 52% of the total precipitation for the winter period and occurs between October and May.

Table 3-1 summarizes estimated monthly climate characteristics at the Project site.

Table 3-1 : Estimated Mine Site Monthly Climate Characteristics

Month[a]	Max. Air Temp. (°C)	Min. Air Temp. (°C)	Rainfall[b] (mm)	Snowfall[c] (mm)	Total Precip.[d] (mm)	Lake Evap. (mm)
January	-19.8	-37.2	0.0	12.9	11.1	0
February	-24	-35.3	0.0	13.1	11.1	0
March	-18.8	-30.8	0.0	18.6	16.1	0
April	-10.4	-20.2	1.4	28.8	26.4	0
May	-1.2	-10.8	7.7	19.2	25.2	0
June	6.7	0.1	26.4	7.1	37.0	60.4
July	14.9	6.9	43.7	0.2	51.2	124.4
August	11.2	7.7	63.7	0.3	74.6	95.6
September	6.8	1.3	45.2	5.7	57.8	42.7
October	1.7	-9.9	15.5	36.9	50.0	0
November	-10.2	-23.6	0.3	33.3	28.5	0
December	-19.4	-33.3	0.0	18.9	15.8	0
Annual	**14.9**	**-37.2**	**203.9**	**195.0**	**404.8**	**323.1**

[a] Climate characteristics obtained from the 2009 Aquatics Synthesis Baseline (FEIS SD 7-1; Agnico Eagle 2014).
[b] Rainfall was adjusted to account for undercatch by 13%.
[c] Snowfall was adjusted to account for undercatch by 50%.
[d] Total precipitation was adjusted to account for undercatch by 32%.
Source: Preliminary Closure and Reclamation Plan (AEM, 2015a).

Short-duration rainfall values, representative of the Project are presented in Table 3-2, based on Intensity duration-frequency (IDF) curves available from the Baker Lake A meteorological station (1987-2006) operated by Environment Canada.

Table 3-2 : Estimated Mine Site Extreme 24-hour Rainfall Events

Return Period (years)	Precipitation (mm)
2	33
5	44
10	50
25	57
50	61
100	65

Notes:
Precipitation extreme obtained from the 2009 Aquatics Synthesis Baseline (FEIS SD 7-1; Agnico Eagle 2014).
No adjustments were made for undercatch since undercatch is generally not significant for extreme rainfall events on a daily time scale.
Source: Preliminary Closure and Reclamation Plan (AEM, 2015a).

3.1.2 Climate Change

The baseline environment for climate change has analyzed the historic climate trends at Rankin Inlet and Baker Lake using data from the climate data archives. At Rankin Inlet, average annual, spring and winter temperatures have shown a statistically significant warming trend. There was also a statistically significant increase in winter precipitation. None of the other temperature or precipitation trends were shown to be statistically significant (AEM, 2014, Volume 1).

The results of the Rankin Inlet trend analysis show that the average annual, spring, and winter temperatures have been experiencing a statistically significant increase (i.e., warming). An increase in winter precipitation was also significant, but this trend was not confirmed in other seasons. At Baker Lake, the annual average and winter temperatures showed a statistically significant warming trend. None of the other temperature and none of the precipitation trends were shown to be statistically significant (AEM, 2014, Volume 5).

Long-term climate trends were assessed as part of the Project (AEM, 2014, Volume 5), and included estimating changes in air temperature and precipitation from observed historical values for three typical time horizons: 2011 to 2040 (the 2020s), 2041 to 2070 (the 2050s), and 2071 to 2100 (the 2080s). The average projected climate trend deviations from the observed historical values are provided in Table 3-3 below. Conclusions on trend deviation for air temperature and precipitation are as follows:

- The climate in the Project region is projected to be warmer for the 2020s, 2050s, and 2080s time horizons when compared to the observed historical values.
- Precipitation shows a larger percent increase compared to historical values; however, most projections are within the annual recorded precipitation values.
- Conclusions from Final Environmental Impact Statement (FEIS) (AEM, 2014, Volume 5) also indicate that a warming climate can increase the thickness of the permafrost active layer. Overall, warming could cause thawing of ice-rich permafrost, potentially resulting in permafrost degradation including thaw lakes and subsidence of the land surface.

Table 3-3 : Summary of Average Projected Climate Trend Deviations from Observed Historic Values

Station and Period			Air temperature (°C)	Precipitation (mm equiv.)
Baker Lake	2020s	Annual	+ 1.5 to 2.0	+ 20 to 40
		Spring	+ 2.0 to 2.5	+ 5 to 10
		Summer	+ 1.0 to 1.5	+ 10 to 15
		Fall	+ 2.0 to 2.5	+ 10 to 15
		Winter	+ 2.0 to 2.5	+ 5 to 10
	2050s	Annual	+3.0 to 3.5	+30 to 50
		Spring	+3.0 to 3.5	+5 to 10
		Summer	+2.0 to 2.5	+10 to 15
		Fall	+3.0 to 3.5	+15 to 20
		Winter	+4.5 to 5.0	0 to +5
	2080s	Annual	+4.5 to 5.0	+35 to 55
		Spring	+4.0 to 4.5	+5 to 10
		Summer	+2.0 to 2.5	+10 to 15
		Fall	+5.0 to 5.5	+15 to 20
		Winter	+ 7.0 to 7.5	+ 5 to 10

Source: Preliminary Closure and Reclamation Plan (AEM, 2015a)

3.1.3 Air Quality

The existing air quality in the general Project area was characterized using background air concentrations from available literature and monitoring data sources. Field studies were not undertaken to characterize the existing air quality in Rankin Inlet because adequate data were available. Specifically, data are available from both the Environment Canada National Air Pollution Surveillance Network, and the Government of Northwest Territories air monitoring network. Although the communities selected for comparaison are located at substantial distances from Rankin Inlet, they are considered to be indicative of Rankin Inlet background air quality as they are also northern communities, have similar sources of electrical power, are similar in size, and are expected to have similar anthropogenic activities (AEM, 2014, Volume 1 and 5).

Much of the Regional Study Area (RSA) could be considered pristine and free of anthropogenic air emissions. For this reason, it is likely that background air concentrations along the AWAR and around the mine site would be very low and lower than the existing air quality data. The only available monitoring data at remote locations within NWT/Nunavut were collected for the Fortune Minerals NICO Project (Fortune Minerals 2011). This monitoring, which quantified the levels of nitrogen dioxide (NO2) and sulphur dioxide (SO2), confirms that the existing air quality in remote areas have lower levels than in the communities (AEM 2014, Volume 5).

The assessment of potential air quality effects from Project activities focused on the operational phase when emissions and activities will be at their highest. Effects from all compounds except for 24-hour total suspended particulate (TSP) and particles nominally smaller than 10 µm in diameter (PM10), are predicted to be of negligible to moderate magnitude at the mine site and of negligible magnitude along the AWAR.

Effects of TSP and PM10 are predicted to be of high magnitude for the mine and of moderate to high magnitude for the AWAR within the SSA and LSAs. However, all residual effects are assessed to be of a negative direction, medium-term duration, and fully reversible once Project emissions cease. Therefore, the potential residual air quality effects from Project activities were determined to be not significant. No potential cumulative effects on air quality were identified (AEM, 2014, Volume 5).

3.1.3.1 Air Quality Monitoring Program

The air quality monitoring plan measures the concentration of airborne particulate surrounding the major areas of activity and the deposition of those particles over time. The program uses a combination of active and passive sampling methods.

The dustfall rates measured at the dustfall stations are analyzed for indications of increasing trends or measured concentrations above the applicable air quality guideline, as well as spatial and temporal trends. The conclusions of this analysis are presented each year in the annual report (AEM, 2015d).

The indicator compounds fall into the following two general categories:

- Particulate matter: total suspended particulate (TSP), particles nominally smaller than 10 µm in diameter (PM_{10}), and particles nominally smaller than 2.5 µm in diameter ($PM_{2.5}$); and
- Combustion gases: nitrogen dioxide (NO_2), sulphur dioxide (SO_2), and carbon monoxide (CO).

Air quality monitoring focuses on measuring airborne particulates, dustfall and the gaseous compounds NO_2 and SO_2 during operations phase. The components of the air quality monitoring programs during operations are (AEM, 2015d):

- To verify that the TPS, PM_{10} and $PM_{2.5}$ emission rates used in the impact assessment were reasonable;
- To verify the predicted concentrations of TSF, PM_{10} and $PM_{2.5}$; and
- To verify that the mitigation measures considered integral to the Project are being incorporated as planned and are effective.

Air quality monitoring includes analysis of dustfall in seven locations, as well as NO_2 and SO_2 in two locations, over one month averaging periods throughout the year. Active sampling of total suspended particulates (TSP), $PM_{2.5}$, and PM_{10} began in December 2018. Available results for all parameters are compared to regulatory guidelines and Final Environmental Impact Statement (FEIS) predictions, and spatial and temporal trends are assessed. In 2018, monitoring results were within applicable air quality criteria and FEIS predictions (AEM, 2019a).

The air quality monitoring plan for closure will be developed in the future, based on the operation monitoring plan and results.

3.1.4 Noise

The baseline noise environment was characterized through a combination of literature review and field work (AEM, 2014, Volume 5). The baseline average hourly noise level at the proposed Project site is expected to be 35 decibels “A weighted” (weighted to account for the frequency response of the human ear in decibels; dBA). Near Rankin Inlet, the field study indicated average night time noise levels between 45 and 52 dBA.

3.1.4.1 Noise monitoring

The objective of the noise monitoring program at Meliadine is to measure noise levels at four previously determined monitoring locations over at least two 24 h periods. All noise monitoring stations are in close proximity to seasonally occupied cabins, which were identified as being the most sensitive receptors in the noise impact assessment (AEM 2014, Volume 5). In 2018 Agnico Eagle conducted two successful rounds of monitoring for stations NPOR006 and NPOR017, and one successful round of monitoring for NPOR008 and NPOR014. However, high winds (both measured and audible) and frequent bird calls near the noise meter substantially reduced the quality of the data for comparison to FEIS predictions (AEM, 2019a).

3.2 Physical and Terrestrial Environment

3.2.1 Topography and drainage basin

As presented in the Preliminary Closure and Reclamation Plan (AEM,2015a), topography and lake bathymetry characteristics for the Project presented herein are from the Permafrost Thermal Regime Baseline Report (AEM, 2014, Volume 6, SD 6-1). The dominant terrain in the Project area comprises glacial landforms, such as drumlins (glacial till), eskers (gravel and sand), and lakes. A series of low relief ridges composed of glacial deposits oriented northwest-southeast control the regional surface drainage patterns. The Tiriganiaq deposit is located on a large peninsula separating the east and west basins of Meliadine Lake.

The Project property is located about 60 m above sea level (masl) in low-lying topography with numerous waterbodies. The surveyed lake surface elevations in the Project area range from about 51 masl at Meliadine Lake to about 74 masl for local small perched lakes. Kettle lakes, and other lakes formed by glacio-fluvial processes or glacial processes, are common throughout the Project area. The development of the Project infrastructure including the open pits, process plant and associated facilities, WRSFs and TSF affected some small lakes and ponds.

Late-winter ice thickness on freshwater lakes in the Project area ranges between 1.0 and 2.3 m with an average thickness of 1.7 m. Therefore, lake ice freezes to the lake bottom at depths shallower than approximately 1.0 to 2.3 m. Ice covers usually appear by the end of October and are completely formed in early November. The spring ice melt typically begins in mid-June and is complete by early July.

3.2.2 Surficial Geology

As explained in the Preliminary Closure and Reclamation Plan (AEM, 2015a), terrain and soil characteristics for the Project presented herein were extracted from the FEIS (AEM, 2014, Volume 6). In general, the local overburden stratigraphy in the Project area consists of a thin layer of topsoil overlying a layer of silty gravelly sand. Cobbles and boulders are present throughout the entire site and at various depths. The bedrock surface at site is encountered between about 2 and 18 m below ground surface.

Terrain and soil mapping have been completed. The mapping describes and characterizes the terrain and soil resources, their distribution across the landscape, and their quality and sensitivities within the Local Study Area (LSA). Seven soil map units were identified, and fifteen terrain units have been defined and mapped for the LSA. Soil sensitivities to wind and water erosion range from low to moderate.

Soil samples were collected for total metal analysis to measure background metal concentrations. The results for the Tiriganiaq deposit indicated areas where naturally occurring arsenic and chromium concentrations are high (i.e., above Canadian Soil Quality Guidelines (CCME, Canadian Council of Ministers of the Environment, 2006).

3.2.3 Bedrock Geology

As summarized in the FEIS (AEM, 2014, Volume 1), the Project is in the northern portion of the Archean Rankin Inlet Greenstone Belt, defined by the regional Pyke Fault. This Archean is situated in the Northwest Hearne Sub-domain of the Churchill Structural Province that forms part of the northern Canadian Shield. The Meliadine trend is defined by the regional Pyke Fault, a prominent high-strain fault zone which is northwest trending within the stratigraphy of the Archean Rankin Inlet Group. The Rankin Inlet Group was subjected to lower to middle greenschist facies metamorphism and multiple periods of deformation, including two identified periods of Archean and Proterozoic age. The Meliadine ore deposits are low-sulphide, gold-quartz vein deposits as per the geo-environmental classifications (provided in Plumlee et al., 1999). All the rocks in the deposit areas are lower to middle greenschist metamorphic grade. The main lithological units likely to be mined include the following:

- Turbiditic sedimentary rocks of the hanging wall, comprising greywacke, siltstone, and argillite (Sam Formation) with gabbro dykes;
- Volcanic-hosted and sediment-hosted iron formation, including greywacke, siltstone, and argillite (Upper Iron Formation) with abundant magnetite and chert layers;
- Sericite altered siltstones and graphitic argillite near the Lower Fault zone contact (Tiriganiaq Formation); and
- Schistose and carbonate-altered mafic volcanic rocks in the footwall (Wesmeg Formation).

3.2.4 Geological Hazards and Seismicity

The mine site is in an area of relatively low seismic risk. The peak ground acceleration for the area was estimated using seismic hazard calculator from the 2010 National Building Code of Canada-Natural Resources Canada (NRC) website (NRC, 2015). The estimated PGA is 0.022 g for a 5% in 50-year probability of exceedance (0.001 per annum or 1 in 1,000 year return) and 0.037 g for a 2% in 50-year probability of exceedance (0.000404 per annum or 1 in 2,475 year return) for the area (see **Appendix J** for the seismic zoning map and the seismic hazard calculation).

3.2.5 Permafrost

As presented in the FEIS (AEM, 2014, Volume 1 and 6), the Project site is located within a region of continuous permafrost within the Southern Arctic terrestrial ecozone; one of the coldest and driest regions of Canada (see **Appendix I**). Permafrost is defined as ground that remains at or below 0°C for at least two years. Permafrost does not necessarily contain ice; rather, its definition is based solely on the temperature of the mineral or organic parent material. Permafrost in the Project area is considered to be an irregular surface, and so the actual depth of permafrost is variable. In this region, the layer of permanently frozen subsoil and rock is generally deep and overlain by an active layer that thaws during summer. The ground temperature data indicates that the active layer is 1.0 to 3.0 m in areas of shallow soil and away from the

influence of lakes. It is anticipated that the active layer adjacent to lakes or below a body of moving water, such as a stream, will be deeper. Permafrost depths are estimated to be between 360 and 495 m, depending on proximity to lakes, slope, aspect, and other site-specific conditions.

Late-winter ice thickness on freshwater lakes is approximately 1.7 m. Ice covers usually appear by the end of October and are completely formed in early November. The spring ice melt typically begins in mid-June and is complete by early July, depending on site specific conditions of water depth and exposure. Based on bathymetry data, maximum lake depth varies from 2.5 to 5.0 m. Where water depth is greater than about 1.0 to 2.3 m, taliks are expected. A talik is a zone of unfrozen ground year-round that lies in permafrost areas. Formation of open taliks that penetrate through the permafrost may also be expected for relatively deeper and larger lakes in the project area. Round lakes that do not freeze to the bottom in winter and have a minimum radius of approximately 290 to 330 m, or elongated lakes that do not freeze to the bottom and have a minimum half width of approximately 160 to 195 m, are expected to have a talik underneath that extends through permafrost.

The ground ice content of permafrost soil and rock in the Meliadine area is expected to be between 0% and 10% (dry permafrost) based on regional scale compilation data. Locally on land, ice lenses and ice wedges are present, as indicated by ground conductivity, and by permafrost features such as frost mounds. These areas of local ground ice are generally associated with low-lying areas of poor drainage.

Rock and soil-related terrain instability is a minor concern in the Meliadine project area. Although permafrost will degrade in certain areas, for the most part the permafrost is “dry” and has low ground ice content. The exception is the wetlands occupying lowlands adjacent to lakes and ponds where excess ground ice is present and thaw instability is foreseeable. These impacts can be mitigated using currently accepted permafrost engineering practices as part of construction and closure.

3.2.6 Hydrogeology

As presented in the FEIS (AEM, 2014, Volume 1 and 7), in areas of continuous permafrost, there are two groundwater flow regimes: a deep regime beneath the permafrost and a shallow regime in the active layer near the ground surface and above permafrost (see **Appendix J**). From late spring to late summer when temperatures are above 0°C, the active layer becomes thawed. Within the active layer, the water table is expected to be a subdued replica of the topographic surface. The deep groundwater regime is connected to taliks located beneath large lakes. The water level elevations in lakes that have these deep taliks provide the driving force, or hydraulic head, for the deep groundwater flow. Groundwater in the active layer flows to local depressions and ponds that drain to larger waterbodies. The talik beneath large waterbodies will be open. The open talik will connect to the deep groundwater flow regime beneath the permafrost.

Elongated waterbodies with terraces and a width of 340 to 460 m or greater are expected to have open taliks extending to the deep groundwater flow regime at the Mine. Meliadine Lake and Lake B7 are likely to have open taliks connected to the deep groundwater flow regime. No impact is expected to Lake B7 by mine activities (AEM, 2019b).

3.2.7 Surface Water Hydrology

As presented in the FEIS (AEM, 2014, Volume 1 and 7), hydrology in the Project area is highly influenced by geographic location, the headwater nature of the Project watersheds, and by the seasons. The mine site

is in the northeast part of the Meliadine Lake watershed, which covers 586 km², on a peninsula extending into Meliadine Lake. The surface area of Meliadine Lake is 107 km², with a highly convoluted shoreline of 465 km, and 243 islands. Meliadine Lake has outflows that drain into Hudson Bay through two separate river systems: the Meliadine River, which carries about 80% of the flow, and an outlet to Peter Lake on the Diana River (a stream distance of 70 km) which takes the rest.

Based on bathymetric surveys, the lakes on the peninsula of Meliadine Lake range from 1.3 ha to 90.5 ha in surface area and are shallow (mean depths range from 0.7 m to 1.6 m). Only four lakes have maximum depths of 4.0 m or greater. The surveyed ponds on the peninsula ranged from 0.1 to 18.8 ha in surface area. They are shallow, with maximum depths of less than 1.0 m in 62% of the surveyed ponds.

As explained on the preliminary closure and reclamation plan (AEM, 2015a), watersheds within the local study area comprise an extensive network of waterbodies and interconnecting streams. Channels are only slightly entrenched with banks typically consisting of mats of vegetation, below which are found organics and fine soils within a matrix of cobble and boulders similar to the bed materials. After the spring runoff and before the late summer rains, the streams are usually dry. During spring snowmelt peak discharges, erosion of channel banks is likely enhanced by frozen conditions. However, during conditions above freezing after spring runoff, these banks may be sensitive to changes in flow regime.

Local watersheds have lake surface fractions (i.e., the ratio of lake area to land area) of up to 51%, and the hydrology of these watersheds is dominated by lake storage and evaporation. Regional and local watershed boundary details are presented in **Appendix J**.

Summer evaporation is roughly equivalent to summer precipitation, with little if any net input from summer rain. The net input to the annual water balance of the watershed comes from spring run-off that recharges the lakes and ponds. Snowmelt runoff in the region begins in the period from late May to mid-June, and the snowmelt peak is often the peak flow for the year. Flows typically decline through the late summer and fall, with freeze-up occurring towards the end of October (except for Meliadine Lake, which has been observed to flow over the winter). All channels are anticipated to freeze to the bottom with zero flows over the winter period.

3.3 Chemical Environment

3.3.1 Soil Chemistry

Geochemical characterization results indicated that the overburden produced will be NPAG, and that leachate concentrations are generally lower than waste rock and is predicted to meet the Metal Mining Effluent Regulations (MMER[1]) effluent monthly mean limits. Waste rock and overburden have compatible geochemical characteristics such that these materials can be managed together in the same disposal facilities (AEM, 2015a).

[1] The FEIS was issued in 2014 and refer to the Metal Mining Effluent Regulations (MMER 2012, Consolidated Regulations)

3.3.2 Sediment Quality

Sediment can be an important source or sink for contaminants such as metals. Contaminants entering aquatic systems (via tributary streams or directly from local sources) are usually associated with suspended particulate material in the water column that eventually settle in depositional areas as sediment, especially in deeper areas of lakes. Sediment provides a long-term, temporal record of deposition, integrating concentrations over time.

Lakebed substrate in the project area is a key habitat attribute that dictates the species composition and abundance of benthic invertebrates and its importance as feeding habitat by fish. Water depth is the strongest determinant of physical features of the lake substrate, especially grain size. Substrate consists of coarse materials consisting of a boulder/cobble mix along the shallow areas close to shore. Transition areas, consisting of fine organic materials interspersed among cobbles, are common throughout most of the lake. Substrates within the deep sections of the lake are composed primarily of fine organic material and silt (AEM, 2015a).

Sediments were analysed for particle size, nutrients (carbon, phosphorus, and nitrogen), total and dissolved metals, and selected organic compounds. Sediment quality data were compared to quality guidelines (*Interim Sediment Quality Guidelines* (ISQG) and *Probable Effect Level* (PEL) guidelines for the protection of aquatic life). The ISQG were derived solely from the threshold effects level (CCME 2001). The threshold effects level represents the concentration below which adverse biological effects are expected to rarely occur.

Concentrations of arsenic, chromium, and copper in sediments were above guidelines in many samples. The mean concentrations of arsenic from Meliadine Lake and the regional waterbodies were above the ISQG, but the mean concentration of arsenic from the Peninsula waterbodies was above the PEL guideline. In addition, the 90th percentile concentration of arsenic from Meliadine Lake was above the PEL guideline. Mean concentrations of chromium were below the ISQG in Meliadine Lake, Peninsula waterbodies, and regional waterbodies, but the 90th percentile and maximum concentrations from these three groups of waterbodies were above the ISQG. Concentrations of chromium were never above the PEL guideline. Copper concentrations (mean and 90th percentile) from these three groups of waterbodies were above the ISQG, but were never above the PEL guideline (AEM, 2015a).

3.3.3 Surface Water Quality

Due to the site's northern latitude and climate, lakes naturally experience long periods of cold temperatures and low light levels during the winter months. Ice covers the lakes for extended periods of time each year and low water temperature exists year-round. As a result of the ice cover, gas exchange with the atmosphere is limited most of the year. However, oxygen concentrations remain high under the ice because of the low rates of biological activity and decomposition of organic material.

Water quality studies conducted from 1994 to 2011 and in 2013 were summarized by waterbody type, as follows: Meliadine Lake; waterbodies on the peninsula of Meliadine Lake plus near the Discovery area; larger, regional lakes including the reference lake, Peter Lake, and Little Meliadine Lake; watercourses (streams) on the peninsula of Meliadine Lake, near the Discovery area, and along the AWAR; and watercourses (rivers) including Meliadine River and Char River. A total of 263 water quality samples have been collected between 1994 and 2013 with greatest sampling effort in the peninsula lakes and streams.

Sediment quality sampling effort has been greatest in Meliadine Lake and the peninsula lakes with a total of 66 and 56 samples, respectively, and 143 samples overall collected between 1994 and 2013 (AEM, 2014, Volume 1 and 7).

Water quality data were collected and analysed for general parameters (field and laboratory), major ions, nutrients (carbon, phosphorus, and nitrogen), total and dissolved metals, and selected organic compounds, and were compared to quality guidelines (CCME *Canadian Water Quality Guidelines for the Protection of Aquatic Life* and Health Canada's *Guidelines for Canadian Drinking Water Quality*).

Metal concentrations are generally very low in surface waterbodies in the Project area, and in most cases, concentrations are less than guidelines. Measured organic compounds are generally below detection limits. Small and shallow ponds are the predominant waterbody types in the region and have low habitat value for year-round use by fish (FEIS, Volume 1, and AEM, 2015a).

3.3.3.1 Surface Water Quality Monitoring

There are many monitoring programs conducted to evaluate water quality at Meliadine. These are mainly a requirement of the Meliadine Water License 2AM-MEL1631 Schedule I. They are designed to provide immediate feedback such that mitigation or adaptive management can be implemented. The site map with the different surface water sampling locations is presented in **Appendix G**.

As presented in the Water Quality and Flow Monitoring Plan (AEM, 2019e), the surface water monitoring is divided into two levels of monitoring to characterize the range of impacts between the sources of contact water in the individual mine facilities and the point of discharge or release to the receiving environment. The two levels of monitoring include the compliance monitoring, as described in the Water License and the event monitoring.

As presented in the Water Management Plan (AEM, 2019c) water quality forecast model is also completed for the surface water quality at the Meliadine site. Long-term, post-closure water quality in the containment ponds (CP1, CP3, CP4, CP5, and CP6) and in the flooded open pit lakes are anticipated to meet MDMER limits and CCME-WQG for the protection of aquatic life or the Site-specific Water Quality Objectives (SSWQO) developed for the Mine for aluminum, fluoride, and iron. Arsenic concentrations in CP3 could slightly exceed the SSWQO post-closure, a criterion that is conservatively protective of the receiving aquatic environment (Golder, 2013a). Concentrations that exceed predictions are minor, much less than the mixing capacity in the receiving environment. These arsenic concentrations are within the tolerance levels that have been deemed nondeleterious by Environment Canada for the Mine (Golder, 2013a).

The Aquatic Effects Monitoring Plan (AEMP) is implemented, which considers the range of Project activities and potential Project-environment interactions identified as being of concern for the aquatic ecosystem. The purpose of the AEMP is to provide information on the health of the aquatic receiving environment and will include routine monitoring of water quality in lakes and streams, and the health of fish and other aquatic life and their habitat in the freshwater environment. The AEMP functions as an integrated monitoring program, which considers a variety of pathways identified as pertinent to potential effects of the Project on the aquatic environment. The AEMP is designed to address predicted impacts to the aquatic environment related to changes in surface water quantity and quality, sediment quality, aquatic life, fish habitat and fish health due to physical alterations of the watersheds, and water and air emissions during construction, operations and closure. The AEMP has been developed in consultation with Inuit communities, stakeholders, and regulatory authorities (AEM, 2014, Volume 7. Golder, 2019a).

3.3.4 Groundwater Quality

The Project lies within the Canadian Shield in an area of continuous permafrost. In areas of continuous permafrost, there are generally 2 groundwater flow regimes: a shallow groundwater flow regime located in the active (seasonally thawed) layer near the ground surface, and a deep groundwater flow regime beneath permafrost.

The following details are from the FEIS for Meliadine (AEM, 2014, Volume 7). In the Canadian Shield, primarily in response to upward diffusion of deep-seated brines, concentrations of Total Dissolved Solids (TDS) in groundwater increase with depth. Chloride and calcium, with sodium to a lesser degree, are the chemicals that contribute to TDS in shield brines. By comparison, sea water is mostly composed of chloride and sodium. Three groundwater samples were collected in 2011:

- Groundwater sample from about 100 m bgs with a TDS of about 4,700 milligrams per litre (mg/L);
- Groundwater sample from about 450 m bgs with a TDS of about 60,900 mg/L; and
- Groundwater sample from about 600 m bgs with a TDS of about 61,000 mg/L.

As reported in the preliminary closure and reclamation plan (AEM, 2015a), these values are greater than values observed at other sites in the Canadian Shield at corresponding depths. This difference, together with the relatively high proportion of sodium relative to calcium in groundwater samples likely indicates the presence of relic sea water in bedrock. It is known that this area was largely overlain by seawater during the last period of glaciation. Such occurrences have been observed at other areas where land was submerged by oceans in the past.

A TDS profile with depth was prepared for Meliadine mine site based on the three samples identified above and, compared to TDS profiles from sites in the Canadian Shield, as well as the Diavik and Meadowbank sites. It is assumed that the TDS attributed to the sodium chloride of the recent incursion of seawater will decrease with depth down to the calcium chloride profile established for Meadowbank (AEM, 2015a).

An additional groundwater sampling round was undertaken in the summer of 2013. The TDS of the three groundwater samples collected in 2013 are as follows:

- groundwater sample from about 455 m bgs with a TDS of about 54,290 mg/L;
- groundwater sample from about 510 m bgs with a TDS of about 57,700 mg/L; and
- groundwater sample from about 580 m bgs with a TDS of about 58,420 mg/L.

It is expected that the following key salinity parameters will vary with depth: chloride, sulphate, calcium, magnesium, potassium, sodium, and strontium. In all water samples, the concentration of dissolved trace metals in the groundwater is low, including arsenic which has a concentration below the analytical method detection limit in all samples. All parameters not associated with salinity are expected to be constant with depth.

As outlined in the Groundwater Management Plan (AEM, 2019f), groundwater investigations suggested that total dissolved solids (TDS) concentrations are relatively consistent below the permafrost at approximately 64,000 mg/L. Groundwater quality data from samples taken underground 2017 through 2018 from diamond drillholes indicate mostly stable concentrations for several parameters and indicate that TDS concentrations are less than predicted at an average concentration of 56,000 mg/L. The discrepancy between expected and

observed TDS levels is potentially due to the difference of sampling depth between predevelopment testing and samples collected during development. Pre-development samples were collected below permafrost (>450 m below ground surface), whereas the bulk of samples collected to-date have been collected in the basal cryopeg (280 m to 450 m below ground surface). Samples and trends will continue to be assessed as development progresses below the cryopeg. It should also be noted that mining operations include drill-and-blast excavation for the development of the underground mine, which results in certain parameters in groundwater to be influenced by explosives (particularly ammonia and nitrate due to emulsion explosives).

3.3.4.1 Groundwater Monitoring Program

Table 3-4 presents a summary of the underground monitoring plan presented in the Groundwater Management Plan (AEM, 2019f). Additional sampling at the surface will be conducted, including pre- and post salt water treatment plan sampling as outlined in the WMP and the Water Quality and Flow Monitoring Plan (AEM, 2019e).

Table 3-4 : Summary of Average Projected Climate Trend Deviations from Observed Historic Values

Monitoring Type	Monitoring Location	Purpose	Frequency
Verification	Portal Water Stope L75	Quantity - Monitor underground water quantity pumped to surface.	Totalized Flow Tabulated Monthly
Verification	Underground Seeps	Quantity - Seepage survey to verify underground flow estimates.	Monthly
Verification	Sump 125	Quality - Monitor underground water quality prior to recirculation for underground use.	Monthly
Verification	Underground seeps/DDHs	Quality - Verify quality of groundwater flowing into underground.	Quarterly
Verification	SWTP Inlet and Outlet	Quality - Verify quality of groundwater being treated and monitor final treated effluent prior to continued transfer to CP1	Weekly

Source: (AEM, 2019f)

3.3.5 Geochemical Characterization

As presented in FEIS for Meliadine (AEM, 2014, Volume 1 and 6), a baseline mine waste geochemical characterization program characterized the geo-environmental properties of waste rock, ore, tailings, and overburden from the Tiriganiaq, Pump, Wesmeg, Wolf, F Zone, and Discovery deposits. The objectives of the program were to identify chemicals of environmental interest in the framework of mine water and waste management and probable future mine water quality. This was accomplished through static testing and kinetic testing at various scales, including standard laboratory humidity cells, large leaching columns and larger field scale leaching tests.

The waste rock and ore samples' selection was completed to obtain a data set that is compositionally and spatially representative of the material to be removed by mining at each deposit. All waste rock, tailings, and overburden samples were subjected to a variety of static testing to evaluate chemical and mineralogical composition, the potential to generate acid rock drainage (ARD), as well as short- and long-term metal leach potential. Acid rock drainage potential was assessed following Guidelines for Acid Rock Drainage Prediction in the North (AANDC 1992) for waste rock and tailings. All leach test water quality results were screened against Metal Mining Effluent Regulations (MMER) for effluent quality (DFO, 2006).

The summary of the results presented below are presented in the FEIS (AEM, 2014, Volume 6) and summarized in the Meliadine Preliminary Closure and Restauration Plan (AEM, 2015a)

3.3.5.1 Mine waste rock

Static and kinetic testing methods were used to assess the chemical composition of the mine waste, its potential to generate ARD, and its potential to leach metals to the receiving environment upon exposure to ambient conditions.

The key findings from the geochemical properties of the waste rock are summarized as follows (AEM, 2015a):

- ARD generation test results (ABA; static testing) indicated that the waste rock from the Tiriganiaq deposit has no potential for acid-generation (NPAG), stemming from their low sulfur content and the presence of a sufficient readily-available buffering capacity.
- The final pH values of the leachates from the short-term leaching tests (SFE tests) are circum-neutral to alkaline with values ranging from 6.1 to 9.5, corroborating the available buffering capacity.
- Leachate quality from the SFE tests meet mine effluent criteria (DFO, 2006) for almost all parameters except for arsenic. Arsenic was leached in concentrations marginally higher than the MMER effluent limit (maximum monthly mean of 0.5 mg/L) in one Tiriganiaq greywacke/siltstone sample. However, the average arsenic concentration from all samples was well below the MMER limit.
- Kinetic test leachate quality results from humidity cells, large columns and field cell tests on waste rock also yielded circum-neutral to alkaline pH values ranging from 6.5 to 9.3. This confirms the NPAG classification of Tiriganiaq waste rock groups that was defined through the static test methods.
- For all kinetic leaching test types, leachate concentrations were below mine effluent criteria (DFO, 2006).
- Large column and field cell tests, conducted at low water-to-rock ratios that are more appropriate to site conditions, generated leachate concentrations well below MMER criteria.

Based on the waste rock geochemical testing findings, the waste rock from the Tiriganiaq deposit area is considered to be NPAG and has a low potential for metal leaching (ML) in view of proposed waste rock management for the Project. Kinetic tests at various scales indicate that drainage water quality will meet MMER monthly mean effluent limits.

3.3.5.2 Tailings

The key findings from the geochemical characterization programs for tailings are summarized as follows (AEM, 2015a):

- Test results from acid-base accounting (ABA) indicated that the tailings sourced from the Tiriganiaq deposit are expected to be non-potentially acid generating (NPAG) according to Indian and Northern Affairs Canada (AANDC, 1992) guidance.
- Humidity cell test results on the whole ore tailings samples indicated that the tailings samples maintained neutral pH (>6.5), and stable to decreasing parameter concentrations through testing to date indicating that Acid Rock Drainage (ARD) conditions have not yet developed in any sample.
- Most leachates from the shake flask extraction (SFE) tests had constituent concentrations below MMER except for arsenic in the Tiriganiaq whole ore tailings. The SFE Metal Leaching potential test results indicated that the arsenic concentration from the Tiriganiaq whole ore tailings samples was 1.2 mg/L for the Tiriganiaq open-pit ore and 0.55 mg/L for the Tiriganiaq underground ore. These values exceed the maximum monthly mean criterion for arsenic of 0.5 mg/L (DFO, 2006).
- Arsenic concentrations reported decreasing trends in all whole ore tailings samples in the humidity cell tests, with initial concentrations ranging from 0.05 to 0.9 mg/L (Cycle 0), and the final test cycle to date ranging from 0.003 to 0.05 mg/L. This is substantially lower than reported from the static leach tests.

Tailings acid generation and long-term metal leaching should not be an issue at the Project. However, the test results do indicate that tailings pore water (i.e., process water) would contain residual arsenic and cyanide. While the tailings may have a potential to leach arsenic, especially during initial flushing or wet weather, long-term arsenic leaching from tailings is predicted to be low and below MMER based on the humidity cell test results.

3.3.5.3 Overburden

The key findings from the geochemical characterization programs for the overburden material are summarized as follows (AEM, 2015a):

- Overburden samples reported very low sulphur content and the presence of available buffering capacity; all samples were NPAG.
- For all overburden samples, the concentrations of all leachate parameters met mine effluent criteria (DFO, 2006) except for one Tiriganiaq surface overburden sample that exceeded the MMER maximum monthly mean limit (0.5 mg/L) for zinc. However, the average zinc concentration for all the Tiriganiaq overburden samples (0.09 mg/L) was an order of magnitude below the MMER limit.
- Arsenic content in the overburden samples exceeded the CCME *Industrial Soil Guidelines* (12 mg/kg). These results are consistent with a previous study that documented the natural occurrence of higher arsenic concentrations in the soil and surface water samples collected in the area of the Meliadine deposits.

The geochemical characterization results indicated that the overburden produced will be NPAG, and that leachate concentrations are generally lower than waste rock and will meet MMER monthly mean limits.

Waste rock and overburden have compatible geochemical characteristics such that these materials can be managed together in the same disposal facilities.

3.3.5.4 Geochemical Monitoring

In accordance with the Meliadine Project Certificate No.006 and Water License 2AM-MEL1631 conditions, Agnico Eagle has developed a waste rock and quarry monitoring plan to characterize the metal leaching and acid rock drainage (ML/ARD) potential of excavated materials on-site. The yearly results are presented in the Metal Leaching and Acid Rock Drainage Monitoring Report (AEM, 2019g).

The waste rock and tailings storage facilities were designed and will be operated to minimize the impact on the environment and to consider geochemical stability. Geochemical monitoring is or will be completed on the waste rock, tailings and quarry material. The collected samples will be sent to an accredited commercial laboratory. Analyses included (AEM, 2019g):

- Acid-base accounting;
- Paste pH;
- Total sulphur (LECO);
- Sulphate sulphur (HCl leach);
- Total carbon (LECO);
- Total inorganic carbon (TIC);
- Neutralization potential (modified Sobek);
- Element scan by aqua regia digestion and a 31 element ICP-MS finish.

In 2018, Agnico Eagle conducted geochemical testing on waste rock material from underground development and surface material from approved quarries and eskers. Based on geochemical characterization results obtained in 2018 for the waste rock and quarry samples, there is low risk for ARD or metal leaching from the materials. Results are within project prediction studies for the project (AEM, 2019g). Sampling will continue during operations and closure.

3.4 Biological Environment

As presented in the FEIS (AEM, 2014, Volume 6), baseline studies on vegetation, and terrestrial wildlife in and around the Project area were conducted for three study areas:

- A regional study area (RSA) to capture any effects that may extend beyond the immediate Project area on vegetation and wildlife in the broader regional context;
- A local study areas (LSA) to assess the immediate direct and indirect effects of the Project on vegetation and wildlife;
- The AWAR LSA to assess limit of direct and indirect effects from the road on the surrounding vegetation and is delineated by a 1 km buffer on either side of the anticipated right-of way surrounding the proposed road alignment.

A map illustrating the RSA study area is provided in **Appendix L**.

The regional study area was defined as a 52 km radius from the proposed Project and covers an area of approximately 850 000 ha. The LSA for the mine boundary was defined by the expected spatial extent of the immediate direct (e.g., Project footprint) and indirect effects (e.g., dust deposition) from the Project on the surrounding vegetation. The LSA is based on the 2009 Project footprint and includes the Meliadine main site, F Zone area, and the Discovery area.

3.4.1 Vegetation Habitat

Baseline vegetation surveys were conducted at the Project in 1998, 2008 and 2009. The objectives of the vegetation baseline study were to:

- Collect quantitative vegetation and plant community data;
- Define and map plant communities using these collected data;
- Identify and report on valued components;
- Describe and map the occurrence of rare plants or unusual plant associations within the LSA; and
- Develop a regional ecological land classification system.

In general, the community types identified within, or in the vicinity of the Project and AWAR areas include:

- Upland terrestrial vegetation classes: predominantly heath vegetation defined as land where the soils are not saturated for extended periods of the year. Presence of low growing evergreen shrubs, such as Labrador tea, bearberry, and black crowberry. Heath vegetation in the area also consists of heath tundra or heath boulder and bedrock associations;
- Wetland classes: areas that are saturated for most, or all of the growing season. Wetlands or riparian vegetation in the area consists of wet sedge meadows or tussock-hummock areas and low shrubby riparian vegetation along the margins of lakes and rivers; and,
- Un-vegetated classes: areas disturbed by pre-mining activities or bare ground and water.

The vegetation baseline details for the Project are provided in the 2009 Terrestrial Synthesis Baseline Report (AEM, 2014, Volume 6, SD 6-2). Heath vegetation represents the dominant vegetation cover at 445 926 ha (52%) of the RSA boundary, whereas wetlands and riparian areas are distributed over 122 575 ha (14%) of the RSA boundary. The remaining 280 983 ha (33%) of the RSA boundary are classified as water (predominantly lakes and the tidal basin of Hudson's Bay) and a small percentage of bare ground and rock outcrops.

A total of six rare plant species were observed within the Project area. An additional 13 species of rare plants may have the potential to occur in the Project area. These species are all listed as "Sensitive" in Nunavut (CESCC, 2011) with one exception (autumn bluegrass), which has been ranked as "Undetermined" due to insufficient data. None of these species are federally listed (COSEWIC, 2012; SARA 2012).

In order to provide a basis for evaluating potential effects of dust borne contaminants containing metals originating from the Project site and AWAR, an assessments of baseline metal concentrations in plant tissue and soil in the Project area was undertaken. Surrounding the mine site and along the road, a total of 29 permanent sample sites were established; plant tissue samples from at least two different plant species and

a soil sample were collected from each site. Most of the soil metal concentrations were within acceptable guidelines, except for arsenic, which exceeded CCME (2007) guidelines for agricultural use on 12 plots; all but three of which were found in the immediate vicinity of the proposed Project site or along the AWAR near the mine site. Metal concentrations in tissue from selected plant species were also analyzed to provide an understanding of baseline levels of various metals that may be concentrated in plant tissue. The results of the plant tissue metals analyses indicated a wide variability in the range of metal concentrations, with highest levels of arsenic found in alpine manzanita *(Arctostaphylos alpine)* and water sedge (*Carex aquatilis)* on two plots located near the proposed mine site (AEM, 2015a).

3.4.1.1 Vegetation monitoring

In 2018, Agnico Eagle Mines and the University of Saskatchewan were successful in receiving a Natural Sciences and Engineering Research Council (NSERC) Collaborative Research and Development grant. The grant entitled “Tundra Restoration: Niche construction in early successional plant-soil systems” will support on-site and laboratory research from June 2018 to June 2022. The primary objective of this research is to address Term and Condition no. 41 of the Project Certificate for the Meliadine site. The specific objective is the characterization of initial and realized niches of biological soil crusts and tundra vascular plants across a chronosequence of naturally recolonized drilling waste dumps. This work was completed during the 2018 summer (AEM, 2019a).

Following the examination of drilling waste sites, it was found that natural revegetation of drilling wastes is occurring at the Meliadine site. The community composition between drilling wastes and the paired undisturbed tundra was similar 20-25 years post disturbance and species richness recovered within 6 years. Due to the different life history characteristics of tundra plants, individual species responses to disturbance were observed. While sedges and mosses may recover more rapidly on these drilling wastes, dwarf shrubs and lichens may require longer to recover. These trends in natural recovery are important for guiding future restoration efforts and techniques. Specifically, targeting sedge and moss species for transplanting and/or seeding of disturbed substrates may be a highly effective strategy for initiating the development of early successional tundra communities (AEM, 2019a).

Vegetation monitoring is also completed as part of the Terrestrial Ecosystem Monitoring and Management Plan (TEMMP) and is discussed in section 3.4.3.

3.4.2 Aquatic Biota and Habitat

Studies targeting the ecological characteristics of the aquatic environment in the LSA and RSA were conducted from 1997 to 2012. Investigations included ground and aerial surveys to assess habitat quality of streams, bathymetric surveys of selected lakes, continuous recordings of water temperature in streams and lakes, collection of in-situ water quality data, and measurements of vertical distribution of temperature and dissolved oxygen in lakes (AEM, 2015a).

As presented in the FEIS (AEM, 2014, Volume 7), habitat for fish was dominated by shallow runs; other habitat types encountered included riffles, pools and riffle/boulder garden combinations. High quality habitats occurred in pools and deeper run habitats that were present mainly in larger streams connecting the primary chains of lakes in each Peninsula basin. Coarse substrates and abundant instream cover in these larger streams provided suitable habitat for Arctic grayling spawning and rearing. The valued ecosystem components occupying top trophic positions in the Meliadine Lake ecosystem were Arctic char, lake trout, and Arctic grayling

Mainly shallow, ponds were also investigated in the area of the proposed mine site (i.e., the Peninsula) and contained poor to moderate fish habitat. The surveys showed that pond habitat was suitable mainly for rearing and spawning by forage species, particularly ninespine stickleback. The lack of suitable coarse substrates limits the spawning potential for Arctic grayling. Freezing to bottom during winter, overwintering by fish in the Peninsula ponds is not possible. Spring freshet and/or important precipitation events allows movement between ponds, they offer seasonal habitat (when accessible) and there is no potential to support fish on an annual basis.

In order to characterize the lower trophic communities within the LSA and RSA, numerous investigations at streams, ponds, and lakes where completed in 1997, 1998 and 2001. At the base of the ecosystem, phytoplankton in lake water and periphyton on shoreline rocks use nutrients and carbon sources for growth and provide food to benthic invertebrates and zooplankton. Zooplankton feed directly on phytoplankton, while benthic invertebrates feed on periphyton and decaying organic material that settle on the bottom of waterbodies. Fish feed on zooplankton and benthic invertebrates, and predatory fish feed on smaller fish (AEM, 2015a).

3.4.2.1 Aquatic Ecosystem Monitoring

Upon the discharge of dewatering effluent to Meliadine Lake, the Mine became subject to the Metal and Diamond Mining Effluent Regulations (MDMER). Under the MDMER, the Mine is required to conduct Environmental Effects Monitoring (EEM) studies, the results of which are used by Environment and Climate Change Canada (ECCC) to assess the effectiveness of the effluent regulations by evaluating effects on fish, fish habitat, and use of fisheries resources by humans (Golder, 2019a).

The Aquatic Effects Monitoring Program (AEMP) is a requirement of the Type A Water Licence 2AM-MEL-1631. The AEMP is intended to function as an integrated monitoring program, which considers pathways to potential effects of the Mine on the aquatic environment, including changes in surface water quality, sediment quality, lower trophic communities, fish habitat, and fish health due to release of mine water, physical alteration of watersheds, and air emissions during construction, operations, and closure. The AEMP was also designed to incorporate EEM requirements of the MDMER throughout the life of the Mine, with supplemental components included to fulfill the additional conditions and requirements of the Water Licence (Golder, 2019a).

3.4.3 Wildlife

Wildlife represents an important ecosystem component, and some species are protected by legislation and/or are important to Inuit. The baseline details for the terrestrial baseline data are presented in the FEIS (AEM, 2014, Volume 6). Wildlife baseline studies were completed for the Project between 1998 and 2009 in support of the environmental assessment. Aerial surveys documented the abundance and distribution of caribou in the RSA. Wildlife baseline is complemented by observations recorded in the Meliadine Wildlife Observation Log and will include additional information from the annual Hunter Harvest Survey which is expected to collect data as of 2019..

Due to the extreme northern climate and low structural heterogeneity, relatively few terrestrial vertebrates are found in the Project area. Baseline data were collected over 5 years (1998, 1999, 2000, 2008, and 2009). During the baseline wildlife surveys, the following species or species group were identified: barren-ground caribou (Rangifer tarandus), arctic fox (Alopex lagopus), raptors, upland birds, shorebirds, waterfowl, Tundra Swan (Cygnus columbianus) and loons. Wolves (Canis lupus), muskox (Ovibos moschatus) and polar bears

(Ursus maritimus) are infrequently observed on the Project area. Grizzly bears (Ursus arctos horribilis) and wolverines (Gulo gulo) are not seen in the Meliadine area. Relevant existing traditional and scientific knowledge on key wildlife species was documented and supplemented with wildlife surveys during the terrestrial baseline study (AEM, 2014, Volume 6, SD-6).

Barren-ground caribou is a key mammal as Inuit population heavily depends on it for food, fuel (from caribou fat), and materials for clothing, tools, and traditional crafts. Caribou are listed as secure in Nunavut and as a species of Special Concern federally (COSEWIC, 2010). Seasonal and yearly differences of the various population parameters are difficult to determine as little scientific information is available on local caribou population parameters, distribution, abundance, and migration corridors. The region includes the major summer range and calving grounds for some of Canada's largest caribou herds.

Bird studies have been undertaken for the Project since the mid-1990s and include baseline studies completed from 1998 to 2000, 2008 to 2009, and 2011. These studies have used a variety of species-specific methods to quantify bird populations with a focus on loons and other waterfowl, upland birds, raptors, and on bird species at risk within the RSA. Surveys recorded the presence and abundance of upland breeding birds, shorebirds, and water birds in the RSA. Ground and aerial surveys were used to locate swan and loon breeding areas and raptor nests in the RSA. The region is a major breeding and nesting ground for a variety of migratory birds. The peregrine falcon population near Rankin Inlet has the highest known breeding density in the Arctic (AEM, 2015a, AEM, 2014, Volume 6).

Barren-ground caribou of the Qamanirjuaq herd are regular but transient visitors during their spring migration and calving periods. The region is a major breeding and nesting ground for a variety of migratory birds. The peregrine falcon population near Rankin Inlet has the highest known breeding density in the Arctic.

3.4.3.1 Wildlife monitoring

Wildlife protection at Meliadine is ensured by various protocols implemented during operations and presented in the Terrestrial Effects Monitoring and Mitigation Program (TEMMP, a component of the FEIS) (Golder, 2019b) and the Wildlife protection and response plan (AEM, 2019h).

The purpose of the TEMMP is to collect date from wildlife and vegetation monitoring programs, and to describe natural variation and potential mine-related changes in wildlife populations within and adjacent to the Mine. The scope of the TEMMP annual report is to report on monitoring of the Project during construction, operation, maintenance, reclamation, and closure. The TEMMP is a requirement of the Meliadine Project Certificate no.006.

Wildlife monitoring is an essential tool in protecting and maintaining wildlife in the vicinity of the Project. A comprehensive monitoring strategy has been implemented and, as required, is adapted to meet the objectives of the management strategy and methods set out in the TEMMP (Golder, 2015). Monitoring programs evaluate the effectiveness of mitigation measures and assess Project-related impact predictions. For all wildlife monitoring programs there is a certain level of uncertainty or unpredictability; therefore, residual effects identified during monitoring may require implementation of adaptive management strategies (Golder, 2019b).

Agnico Eagle has established several wildlife monitoring programs that involve collaborations with regional initiatives and community members and contribute to monitoring cumulative effects. These include caribou collar program, regional muskoxen surveys, hunter harvest program, raptor monitoring program, waterfowl and shorebird monitoring and wildlife surveys.

As presented in the Wildlife protection and response plan (AEM, 2019h), mitigation measures and monitoring initiatives to lessen the likelihood that wildlife will become habituated to the Meliadine site and its infrastructures. Measures are defined to deter wildlife from obtaining camp food waste, finding shelter around the site, gaining access to harmful substances present on the project site, being injured as a result of vehicle collisions, and damaging mine property. Despite these mitigation measures, personnel may occasionally come in contact with wildlife that inhabits the Meliadine area. Incidents must be managed to keep both humans and wildlife safe while using only humane control methods (AEM, 2019h).

As explained in the annual report (AEM, 2019a), all observations, problematic interactions, wildlife surveys conducted weekly along the AWAR, caribou migration, operation shut downs related to caribou migration, aerial observations when helicopters are active, onsite audits (i.e for wildlife attractants) conducted by third parties, and mitigation actions taken following problematic issues are reported in the monthly report and to the Government of Nunavut, the Kangiqliniq Hunters and Trappers Organization and Kivalliq Inuit Association.

3.5 Social Environment

The Kivalliq region is sparsely populated. It is part of the Inuit homeland and Inuit form over 80% of the population. Recently, Rankin Inlet and Baker Lake have been experiencing population growth. Rankin Inlet has a lower percentage of Inuit residents, and higher incomes. Much of the economy in the Kivalliq region is based on subsistence hunting, trapping and fishing. Mineral exploration and mining activities as well as construction, tourism and government services are the other principal activities (AEM, 2014, Volume 1).

3.5.1 Traditional Activities

The maintenance of traditional culture is an important component of Inuit wellbeing. Traditional culture gives people identity and protects more vulnerable people by providing food and other assistance. Traditional celebrations demonstrate recognition and emotional support for people's achievements. Family and community ties are maintained through the sharing of country food. The benefits of country foods were attributed to nutritional health and physical fitness, teaching younger generations traditional skills, and local concepts of responsibilities. Activity on the land, such as hunting and fishing, keeps skills alive and reinforces Inuit values, for example, environmental protection, cooperation, resourcefulness, and providing for others.

Caribou are an important part of Inuit life, providing food, fuel (from caribou fat), and materials for clothing, tools and traditional crafts. Other animals important to the communities of Rankin Inlet, Chesterfield Inlet, and Whale Cove include fur bearing species such as foxes, wolves, wolverines and polar bears and marine mammals, such as seals and beluga whales. Birds and bird eggs are also important. In times when caribou were unavailable, these species provided important sources of food and materials to the Inuit. Polar bears and marine mammals provide sources of food and materials supplementary to caribou. Meliadine Lake is an important lake for fishing for residents of Rankin Inlet. Traditional plants, such as berries, are collected throughout the RSA for food and medicine.

It has been difficult for people to adjust to southern cultural influences in light of differing cultural values. Some people may feel that their social obligations interfere with their goals for advancement in the new economic environment. People also speak about the misunderstanding between generations that has come with the introduction of southern people values and material goods. Some elders feel that traditional culture is losing strength in the young. Most of the young say that they are close to their families, respect their elders,

and respect their culture. Traditional life also meant people had clear gender roles. However, men find it hard now to provide for their families if they don't have work or money to go on the land. It may be easier for women whom are typically the primary caregivers to children.

Although Inuit no longer live entirely off the land and their culture has changed, people have maintained their language over the last decade. Studies show that there is strong commitment to Inuktitut and most people feel they speak it well. People say, however, that many children are using English more now than they did in the past. Managing cultural influences, particularly from the south, will continue to be important for the retention of traditional Inuit culture (AEM, 2014, Volume 1).

3.5.2 Inuit Qaujimajatuqangit (IQ)

Traditional knowledge of the existing conditions is included in baseline reports or environmental setting portions of the FEIS. The Inuit Qaujimajatuqangit (IQ) collected on the Project included knowledge on the existing condition, Project impact concerns, and recommendations for the Project. Knowledge of the existing conditions is included in baseline reports or environmental setting portions of the Final Environmental Impact Statement. Concerns on the various Project impacts are included as part of the effects assessments and recommendations are considered when developing mitigation and monitoring plans.

3.5.3 Cultural, Archaeological and Paleontological Resources

Archaeological sites within the Project area span approximately 3,500 years of occupation of the Barrenlands. The oldest sites are associated with the early Arctic Small Tool tradition or Pre-Dorset. Predominately the sites within the local Project area are associated with Thule or Caribou Inuit. Most of the sites contain tent rings, caches, and hunting blinds and are associated with summer and autumn activities.

There are 52 sites within the proposed mine infrastructure, 43 within the Phase 2 AWAR, and 3 associated with the bypass road. In total, 34 sites are within the immediate Project footprint and will be impacted. Thirty-one of these sites have been mitigated and Agnico Eagle is committed to mitigating the remaining 3. All sites impacted by the Project have been mitigated using standard archaeological methods to document the sites. The level of documentation is appropriate for the site significance. The documentation of the site preserved the information and therefore the residual impact to the archaeological record is considered minor (AEM, 2014, Volume 1).

4.0 Project Description

4.1 Location and Access

The mine site of the Project is in the Kivalliq region, Nunavut, approximately 30 km south of Rankin Inlet (coordinates 62°48'35''N; 092°05'58''W) and 80 km southwest of Chesterfield, as shown in Figure 2-1. Rankin Inlet is the regional centre and the largest community of the Kivalliq region, and the second-most populated community in Nunavut behind the capital of Iqaluit. The mine is located on Inuit Owned Lands and, as such, land and environmental management are generally governed by the provisions of the Nunavut Land Claims Agreement.

The Project involves pre-development, construction, operation, and closure, including decommissioning and the rehabilitation of a conventional gold mine.

The Tiriganiaq deposit is located at 63°01'3"N, 92°12'3"W (National Topographic Survey sheets 55/J, N, and O). Mineral tenure covers 80,223 hectares of which 76,793 ha are held under the Canada Mining Regulations and administered by CIRNAC (Crown-Indigenous Relations and Northern Affairs Canada, formerly AANDC) and are referred to as Crown Land. The Crown Land is made up of mining claims covering 25,507 ha and mineral leases covering 51,286 ha. There are also 3,430 ha of subsurface Nunavut Tunngavik Inc. concessions administered by a division of the Nunavut territorial government (AEM, 2015a).

The mine site access is by plane via the Rankin Inlet airport. Meliadine Mine relies on marine transportation to the harbor at Itivia in Rankin Inlet via Hudson Bay for most of its supplies including fuel, construction and operation equipment, materials and consumables, including dangerous goods, food, household goods and other non-perishable supplies. The AWAR provides year-round access between Rankin Inlet and the Project site.

4.2 Site History

Multiple companies were involved in the exploration of Meliadine resources in the early 1970's. Historically, the Meliadine property was divided as Meliadine West property and Meliadine East property. These areas were divided geographically by the Meliadine Lake at 547500 E. Meliadine West contained Tiriganiaq, Wesmeg, Pump, F Zone, and Wolf deposits, whereas Meliadine East contained the Discovery deposits and other regional gold showings (AEM, 2015a, 2015c). Exploration activities (mostly Meliadine West) by operators are summarized in Table 4-1.

The Project moved from an exploration project to an advanced exploration project starting in 2007 when an underground exploration and bulk sample program was advanced for the first time. In late 2010, Agnico Eagle announced that it planned to accelerate the pace of advanced exploration at the Meliadine West property given the encouraging drilling results. Agnico Eagle subsequently reopened the underground decline and advanced a second bulk sample from underground in 2011, increased the number of operating diamond drills, and modified and expanded the exploration camp and associated facilities (sewage treatment, potable water treatment, power generation, etc.) to allow exploration to continue year-round. Exploration continued during the environmental assessment. Diamond-drilling was required to better define existing mineral resources and to find new resources on the minerals claims. In 2011, condemnation drilling was required to confirm that the mine buildings and other infrastructure were not planned on top of potential new ore zones (AEM, 2015c).

The Project is 100% owned by Agnico Eagle following acquisition of Comaplex Mines Corporation (Comaplex) on July 6th, 2010. Presently, there are no properties adjacent to the Project that has any influence on the Project.

The construction phase started in the last quarter of 2015 and has taken about 3.5 years, ending in 2019. The mine construction period focused primarily on-site preparation and the construction of infrastructure, with some mining activities (advancement of the mine ramp) occurring at the Tiriganiaq underground mine. Operation started after commissioning was completed at the end of Q2 2019. The operation phase will span approximately 8.5 years (Q2 2019 to 2027) (AEM, 2019b).

The Nunavut Impact Review Board issued a Project Certificate no.006 in February 2015 (amended in February 2019), setting out the terms on which the Meliadine project could proceed. In March 2017, Agnico Eagle and the Kivalliq Inuit Association (KIA) signed the Inuit Impact Benefit Agreement (IIBA) for the Meliadine Mine. Through the agreement, both Agnico Eagle and the KIA are intent on ensuring that business opportunities, employment and training opportunities arising from this mine will benefit the Inuit of the Kivalliq Region. Agnico Eagle was granted a Type A Water Licence 2AM-MEL1631 in April 2016.

Table 4-1 : Summary of 1987 to 2013 Exploration Works on Meliadine Propoerty

Year	Operator	Exploration Activities and Highlights
1987	Asamera	Investigation of gold occurrence at Tonic Lake Sample of quartz vein with arsenopyrite of 5 g/t Au
1989	Asamera/Comaplex (50%-50% JV)	Follow-up on the 5 g/t sample along strike of the iron formation Discovery deposit identified with chip sample grades of up to 4.4 g/t Au over 4 m
1990	Asamera/Comaplex (50%-50% JV)	Total of 112 m of channel sampling and 15 diamond drill holes on Discovery deposit Airborne geophysical surveys on Meliadine East
1991	Rio Algom Inc. (60 % JV on Meliadine West)	Drilling on Meliadine West Airborne survey and boulder sampling on Meliadine West where 75 boulders assayed greater than 34 g/t Au
1992	Asamera/Comaplex (50%-50% JV)	Drilling on Meliadine West (Pump and Wolf deposits)
1993 to 1994	Comaplex/Cumberland (50%-50% JV)	Drilling on Meliadine West Discovery of the Tiriganiaq deposit (11.3 g/t Au over 2.2 m), F Zone and Pump deposits
1995	Western Mining Corporation (WMC)	Drilling
1996	WMC	Drilling
1997	WMC	Mapping, geochemical and geophysical exploration Drilling at Pump, F Zone, Tiriganiaq, Wolf and regional targets Ground magnetic and IP surveys
1998	WMC	Drilling at Pump, F Zone, Wolf and Tiriganiaq Ground magnetic survey
1999	WMC	Drilling at Tiriganiaq, F Zone and Discovery
2000	WMC	Drilling at Tiriganiaq and exploration targets within the Meliadine West property
2001 to 2002	WMC	Aeromagnetic surveys
2003	WMC	Drilling exclusively on Tiriganiaq
2004	Comaplex Minerals Corp.	Drilling on Meliadine West Best assay results were as high as 153.5 g/t Au over 20.2 m (uncut) on Tiriganiaq
2010	Agnico Eagle	Acquisition of Meliadine Project
2011	Agnico Eagle	Bulk sampling program of Meliadine East and West
2012	Agnico Eagle	Drilling Tiriganiaq, Discovery, F Zone, Pump, and Wesmeg
2013	Agnico Eagle	Tiriganiaq drilling: 14,608 m in 44 exploration and conversion holes were completed. A total of 72,322 m in 339 drill holes was drilled on the entire Meliadine property during the 2013 campaign

Source: AEM, 2015a

4.2.1 Project Alternatives

During the study phase, alternatives to Project components and activities were assessed by Agnico Eagle. The Project alternative description presented below is extracted from the Main Application Document for the Type A Water Licence (AEM, 2015c). The alternatives were defined using the following criteria: technical feasibility, economic viability, environmental acceptability, community preference, social acceptability, and reclamation and closure. Select mine components can be constructed in different locations or operated differently, and activities can be completed or achieved in different ways; therefore, alternatives were evaluated and rated using the above referenced criteria.

The alternative assessment approach employed by Agnico Eagle recognizes that community preferences are important, and that positive and negative effects on valued components of the ecosystemic and socio-economic environments must be carefully weighed in selecting the preferred alternative. The process gave due consideration to the vulnerability of the Arctic ecosystem, the potential for extension of the mine life, reclamation and closure, and potential for cumulative effects.

Agnico Eagle completed an explicit analysis of all the reasonable identified means of carrying out the Project components or activities, including the “no-go” alternative. The alternatives analysis is summarized here but was presented in more detail in the FEIS (AEM, 2014). Project alternatives analyzed included the following:

- the marine shipping route for fuel and dry cargo;
- access road alternatives – community bypass road alignment;
- AWAR – restricted or unrestricted use by public;
- use of the Rankin Inlet airport or build airstrip on-site;
- use of Itivia or a private port;
- production rate and mining methods – open pit versus underground mining;
- location of mill complex and associated infrastructure;
- alternatives to on-site processing of ore;
- alternate road access to deposits;
- location of main fuel storage tank farm;
- power generation – power plant location, fuel transportation, choice of generating
- equipment, fuel choice, wind energy, solar, thermal energy, and hydroelectric;
- location and transport technology type for TSF;
- form of mill tailings generated – slurry, thickened, or filtered;
- alternatives to using cyanide in the mill process;
- waste rock/overburden storage alternatives;
- waste management and disposal alternatives;

- site water treatment alternatives;
- salt water management for underground water (including concentrated brine disposal options);
- mine dewatering alternatives;
- closure and reclamation alternatives;
- hiring point for work force; and
- “no-go” alternative.

4.3 Site Geology and mining methods

The information as presented below is extracted from the Agnico Eagle website (https://www.agnicoeagle.com/English/operations-and-development-projects/operations/meliadine/default.aspx) and from the Meliadine Project Technical Report (AEM, 2015b).

The Meliadine mine is located near the western shore of Hudson Bay in the Kivalliq District of Nunavut and includes seven gold deposits, six of which are part of the current mine plan. The 111,358-hectare property covers an 80-kilometre-long greenstone belt. The Figure 4-1 presents the area of the project including the claims, leases and subsurface Nunavut Tunngavik Incorporated (“NTI”) concessions. The current mineral reserves are mainly in the Tiriganiaq deposit at underground and open pit depths, and consist of 3.8 million ounces of gold in proven and probable reserves (16.7 million tonnes at 6.97 g/t) as of December 31, 2018 (AEM website).

Commercial production began at Meliadine in mid-May 2019. The mine is expected to produce 230,000 ounces gold in 2019 (including pre-commercial production), and 385,000 ounces of gold production in 2020, its first full year of production. There are numerous opportunities to create additional value at Meliadine, both at the mine and on the large regional land package (AEM website).

Archean volcanic and sedimentary rocks of the Rankin Inlet greenstone belt underlie the property. The rock layers have been folded, sheared and metamorphosed. They trend west-northwest, dip steeply to the north, and have been overturned. The rock units are truncated by the Pyke Fault, a regional structure that extends the entire 80-km length of the property (AEM website).

The Pyke Fault and associated secondary structures (i.e., the Lower Fault) appear to control gold mineralization on the property. Along the fault is a series of oxide iron formations that host six of the seven Meliadine mine deposits currently known. The deposits consist of multiple lodes of mesothermal quartz-vein stockwork, laminated veins and sulphidized iron formation mineralization. The northern, magnetite-rich Upper Oxide iron formation hosts the Tiriganiaq zone, the largest deposit to date with a strike length of approximately 3.0 km at surface and a known depth of 800 m, as well as the Wolf North and Discovery zones. The southern, weakly magnetic Lower Lean iron formations contain the F Zone, Pump, Wolf Main and Wesmeg deposits. Normeg is hosted by mafic volcanics and is located between the Wesmeg and Tiriganiaq zones (AEM website).

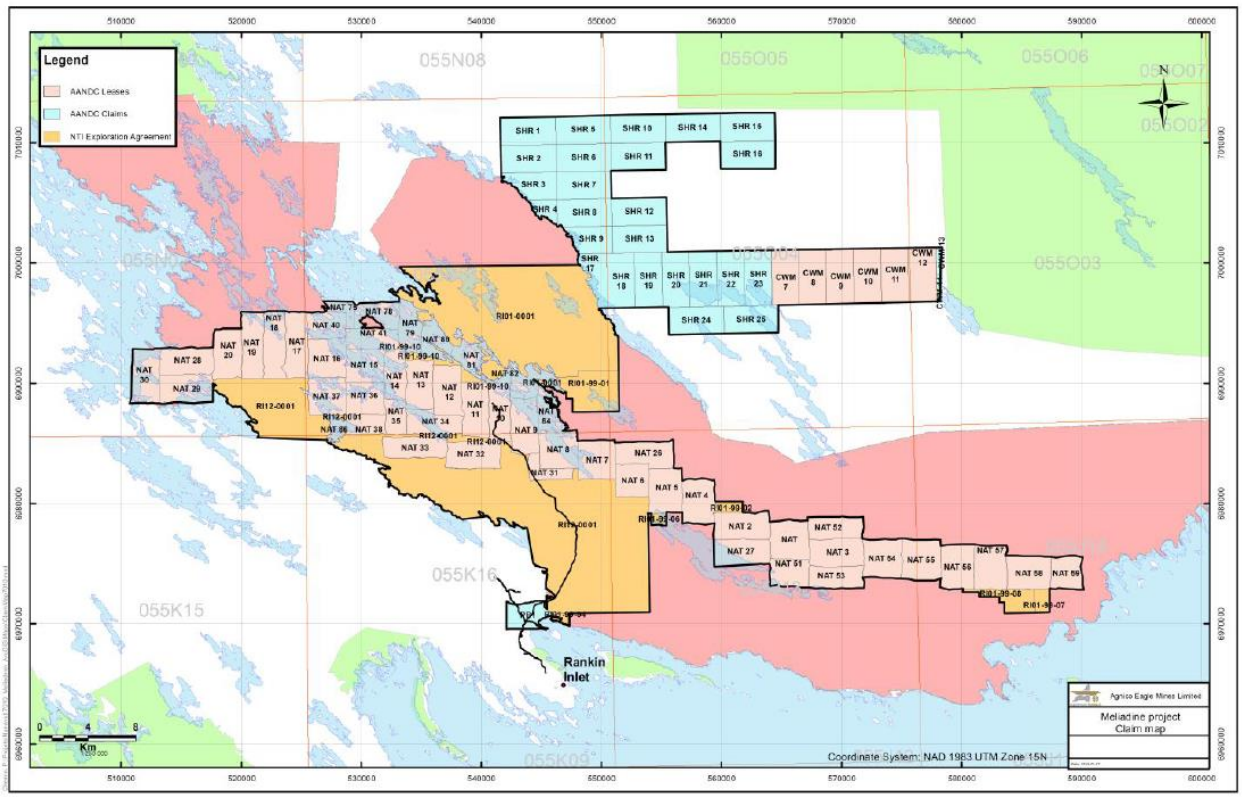
The deposits are all within 5 km of Tiriganiaq except for Discovery, which is 17 km east-southeast of Tiriganiaq. Each of these deposits has mineralization within 120 m of surface, making them potentially mineable by open pit methods. They also have deeper mineralization that could potentially be mined with underground methods, which are currently being considered in various studies (AEM website).

The **Appendix J** presents the regional and local geology maps for Meliadine. The Tiriganiaq-Westmeg-Nortmeg schematic geological cross-section and the Tiriganiaq composite longitudinal section are also presented.

The current plan is to mine the Tiriganiaq deposit, including the Wesmeg 650, lode from two open pits and an underground mine (AEM, 2015b). At the end of operations, the Tiriganiaq Pit 1 will be approximately 150 m deep with a footprint area of 26.6 ha, and Tiriganiaq Pit 2 will be approximately 100 m deep with a footprint area of 8.3 ha. Figure 4-2 presents the Tiriganiaq open pit looking north.

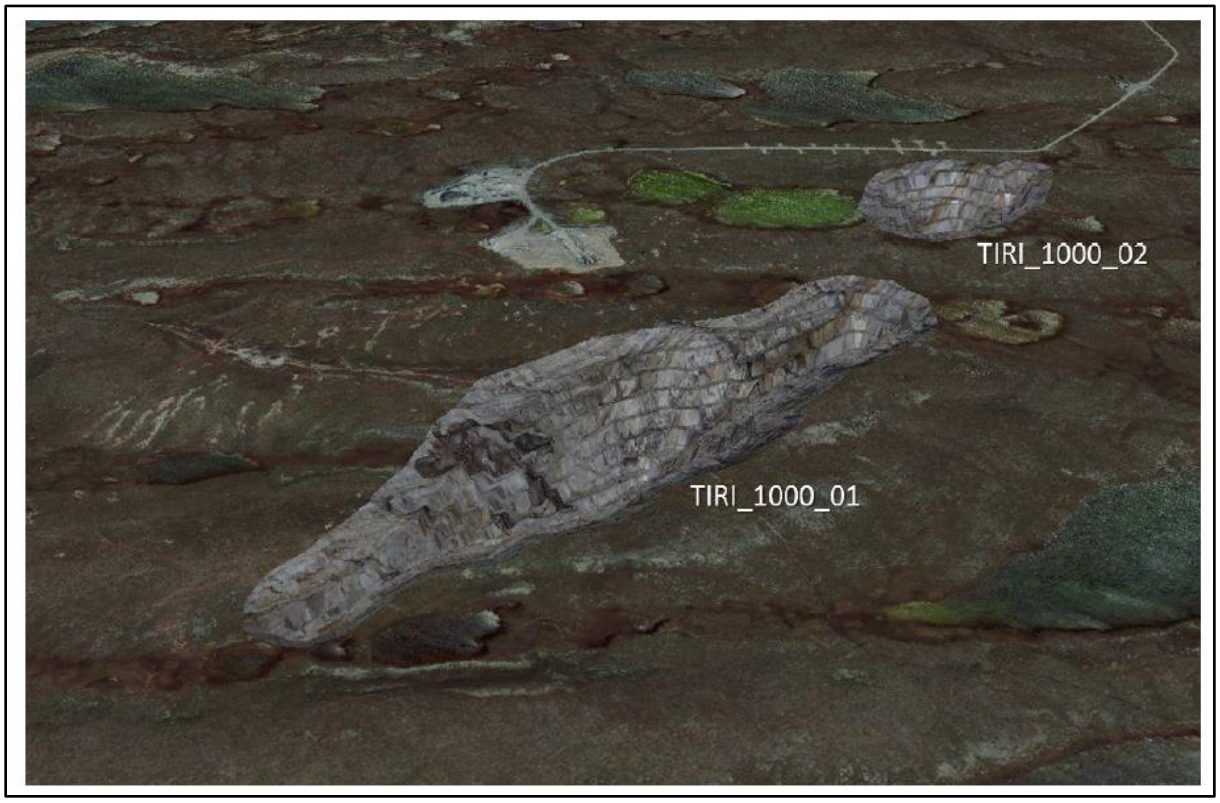
As presented in the Meliadine Project Technical Report (AEM, 2015b), the current Tiriganiaq underground reserves lie between 100 m and 650 m below surface. The main underground mine plan consists of 23 levels (level 100 through level 650) set at 25-m intervals. Figure 4-3 presents the Tiriganiaq underground mine looking south.

Figure 4-1 : Meliadine project claims, leases and concessions as of December 31, 2014



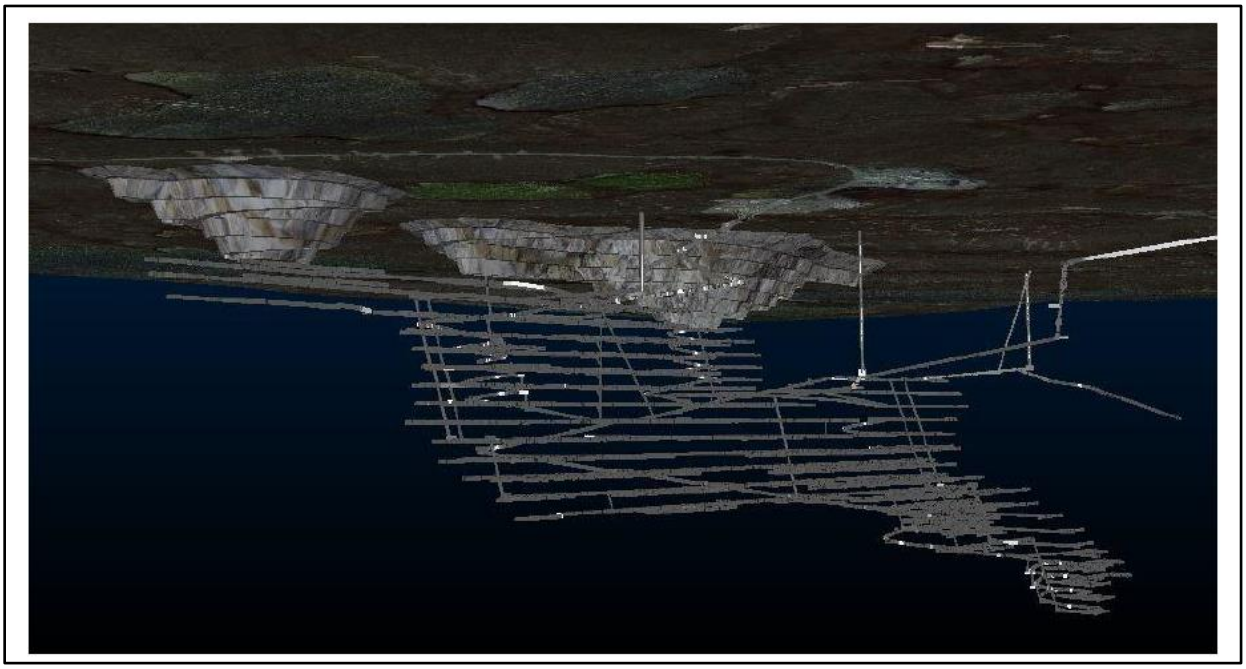
Source: (AEM, 2015b)

Figure 4-2 : Tiriganiaq open pit looking North



Source: (AEM, 2015b)

Figure 4-3 : Tiriganiaq underground mine looking South



Source: (AEM, 2015b)

4.4 Project Summary

The Project is composed of five known gold deposits: Tiriganiaq, F Zone, Pump, Wesmeg, and Discovery. Agnico Eagle will develop these deposits in a phased approach to allow production to commence while ongoing exploration continues to increase the known ore reserve. The initial phase of development focuses on the ore is being sourced entirely from underground. In the second phase, the ore will be sourced from both the underground and open pits. The Project mine plan includes the operation of underground and open pits over a period of approximately 8.5 years.

The area that will be disturbed during construction and operation for the proposed Project is approximately 453 ha including off-site facilities in Rankin Inlet. At closure, 418 ha will be reclaimed, including off-site facilities, while approximately 35 ha will not be reclaimed. Non-reclaimed land is associated with residual disturbances derived from the flooded open pits (AEM, 2015a).

4.4.1 Project Mine Plan

The Meliadine gold mine has begun the operation phase of the project by mining the underground Tiriganiaq deposit in May 14th, 2019. In 2018, the Meliadine Gold Project was still in the construction phase, developing the underground in preparation to operate the Tiriganiaq underground mine. A total of 688,069 tonnes of waste was Meliadine excavated, 3,134 tonnes was used as underground rockfill and the rest was used for construction purposes. A total of 39,216 tonnes of marginal and 60,846 tonnes of ore was excavated and stored at the surface ore pad (AEM, 2019a).

As presented in the Mine Waste Management Plan (AEM, 2019b), operation started after commissioning was completed at the end of Q2 2019 and will span approximately 8.5 years (Q2 2019 to 2027). Mining activities are expected to end in Year 7 (2026) and ore processing is expected to end in Year 8 (2027). Closure will occur within three years (Year 9 to Year 11) (2028 to 2030) after the completion of mining and will mainly include the removal of non-essential site infrastructure and equipment. Flooding of the mined-out open pits with water pumped from Meliadine Lake and flooding of the underground mine will occur with natural groundwater seepage which will start in Year 8 (2027) as progressive reclamation. The post-closure phase will commence as active closure is completed in Year 11 (2030) and will continue until Year 18 (2037) or until it is shown that the site and water quality meet all the regulatory closure objectives (AEM, 2019b).

Tiriganiaq gold deposit will be developed using traditional open-pit and underground mining methods. Two open pits (Tiriganiaq Pit 1 and Tiriganiaq Pit 2) and an underground mine (Tiriganiaq Underground) will be developed as shown in Figure 1.2. Approximately 31.4 Mt of waste rock, 7.1 Mt of overburden material, and about 14.9 Mt of tailings will be produced throughout the mine life (AEM, 2019b). The following mining development sequence is planned:

- Tiriganiaq underground mine will be developed and operated from Year -5 (2015) to Year 7 (2026);
- Tiriganiaq Pit 1 will be mined from Year 2 (2021) to Year 7 (2026); and
- Tiriganiaq Pit 2 will be mined from Year 4 (2023) to Year 7 (2026).

Table 4-2 summarizes the schedule and quantities to be mined from the open pit and underground mining operations. The projected mill throughput with the expected quantities and the origin of waste rock, overburden and ore to be generated from Year -5 (2015) to Year 8 (2027). The usage or destination of the three mine waste materials (waste rock, tailings and overburden) is presented in Table 4-2.

Table 4-2: Summary of the Mine Production Schedule

Year	Mine Waste and Ore from Tiriganiaq Underground (t)		Tiriganiaq Pit 1			Tiriganiaq Pit 2		
	Waste Rock	Ore	Overburden	Waste Rock	Ore	Overburden	Waste Rock	Ore
Year -5 (2015)	290,705*	36,911**						
Year -4 (2016)	355,200	7,646						
Year -3 (2017)	583,679	5,725						
Year -2 (2018)	691,529	120,865						
Year -1 (2019)	764,683	602,440						
Year 1 (2020)	959,950	1,185,403						
Year 2 (2021)	789,614	1,051,472	2,038,237	68,930				

Year	Mine Waste and Ore from Tiriganiaq Underground (t)		Tiriganiaq Pit 1			Tiriganiaq Pit 2		
	Waste Rock	Ore	Overburden	Waste Rock	Ore	Overburden	Waste Rock	Ore
Year 3 (2022)	608,626	1,254,293	4,328,239	4,205,799				
Year 4 (2023)	336,059	1,237,507	236,246	5,774,071	905,004	391,137	287,727	6,509
Year 5 (2024)	31,567	1,154,294	0	5,004,160	742,892	97,830	1,667,353	70,586
Year 6 (2025)	0	967,430	0	3,703,548	781,391	0	2,468,635	123,008
Year 7 (2026)	0	888,008	0	1,830,060	710,953	0	973,358	254,040
Year 8 (2027)	0	0	0	0	0	0	0	0
TOTAL	**5,411,612**	**8,511,994**	**6,602,722**	**20,586,568**	**3,140,240**	**488,967**	**5,397,073**	**454,143**

*The amount include approximately 112,775 tonnes of waste rock produced during development of ramp to underground mine before construction phase starting in Year-5
**Volume from 2008-2015 of ore produced during development of ramp to underground mine before construction phase starting in Year-5
*** Source: adapted from Waste Management Plan 2019 (AEM, 2019b)

Table 4-3 : Summary of the Mine Waste Production Schedule

Mine Waste Stream	Estimated Quantities		Waste Destination
Overburden	7.1 Mt		Temporary storage in the Overburden Stockpile ~ 0.1 Mt for reclamation of TSF
			Closure and site reclamation for the TSF
			Co-disposed with waste rock within WRSFs
Waste Rock	31.4 Mt		Infrastructure construction
			WRSFs
			Closure and site reclamation for the TSF
Tailings	14.9 Mt	10.9 Mt	As dry stack tailings placed in the TSF
		4.0 Mt	Used in underground mine as cemented paste backfill

Source: (AEM, 2019b)

4.4.2 Project Facilities

This section presents list of all facilities require to support the mining operation at the Meliadine site and in Rankin Inlet. The detail description of the facilities is presented in section 5.0. The Figure 4-4 shows the main infrastructures at the Meliadine site. The Figure 4-5 presents the infrastructures in Rankin Inlet.

Existing infrastructure has been developed from previous bulk sampling programs, which were completed in the 2008 by Comaplex and 2011 by Agnico Eagle. The pre-existing site infrastructure is regulated by the NWB under the Water Licence 2BE-MEP1318 (Meliadine East Project) (expires 2018-10-31) and the Water Licence 2BW-MEL1215 (expires 2015-05-31). The existing facilities at the Project site, which are also covered in this ICRP, include:

- An exploration camp, located on the shore of Meliadine Lake, approximately 2.3 km north-east of the Tiriganiaq deposit;
- An underground portal; and
- A core shack and storage building remaining from a previous exploration camp (Meliadine East; the decommissioning of the Meliadine East camp on Atulik Lake began during the summer of 2010 and was completed by spring 2011).

The infrastructures of the Project located directly at the Meliadine site are listed below:

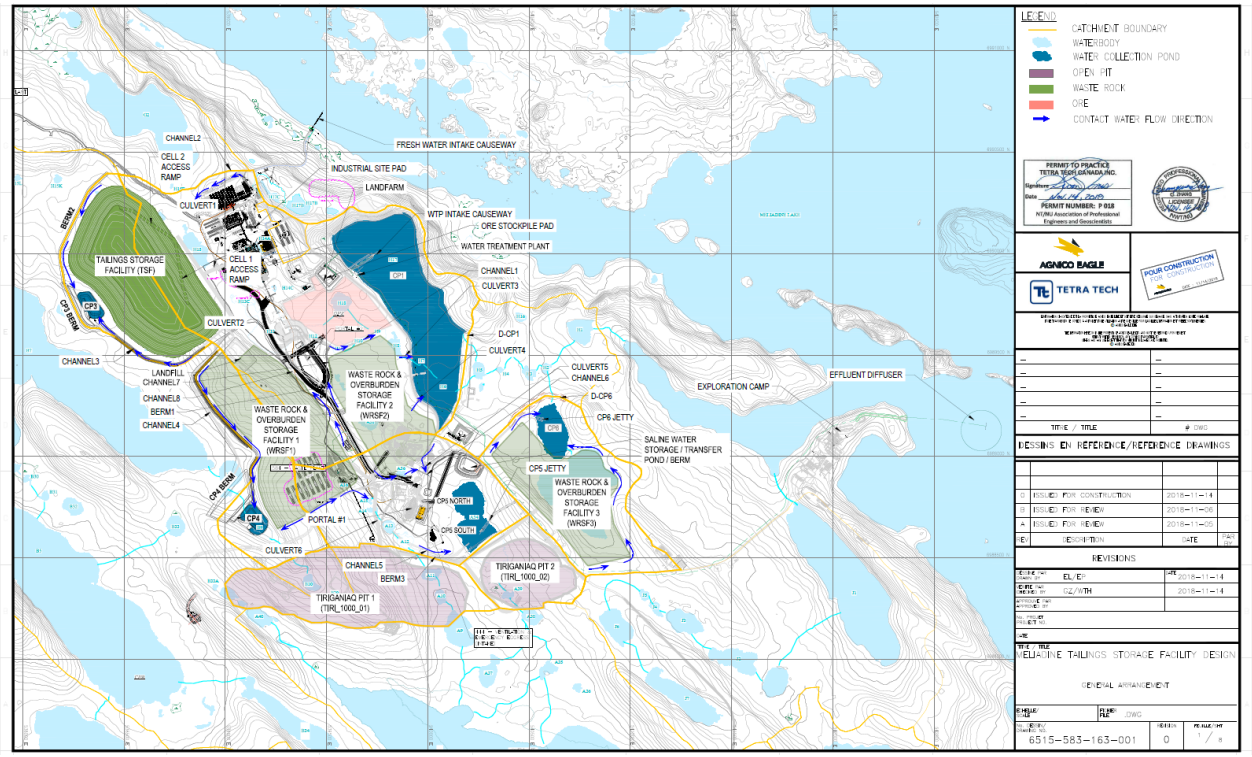
- An underground mine (Tiriganiaq Underground), including an underground total suspended solids (TSS) removal plant;
- Two open pits (Tiriganiaq Pit 1 and Tiriganiaq Pit 2);
- A mineral processing facility, which includes a crusher plant, process plant, and paste backfill plant;
- Sewage treatment plant (STP);
- water treatment systems;
- Supporting infrastructure, including gated access, emulsion plant and storage facility, potable water treatment plant, exploration and permanent camp, maintenance and on-site storage areas, power plant, fuel storage, incinerator, landfill, landfarm, water management system, water intake and diffuser, a temporary overburden stockpile and ore stockpile facilities;
- Three waste rock storage facilities (WRSFs);
- A tailings storage facility (TSF);
- Transportation routes on site including internal access and haul roads;
- Quarries and borrow pits.

The Rankin Inlet Site Facilities are located about 30 km south of the mine site. The Rankin Inlet facilities act as a transfer point and temporary storage for all dry freight and fuel materials arriving by barge prior to overland shipment to the mine site via the AWAR. The infrastructures present in Rankin Inlet that belong to the Meliadine Mine are:

- fuel storage facility;

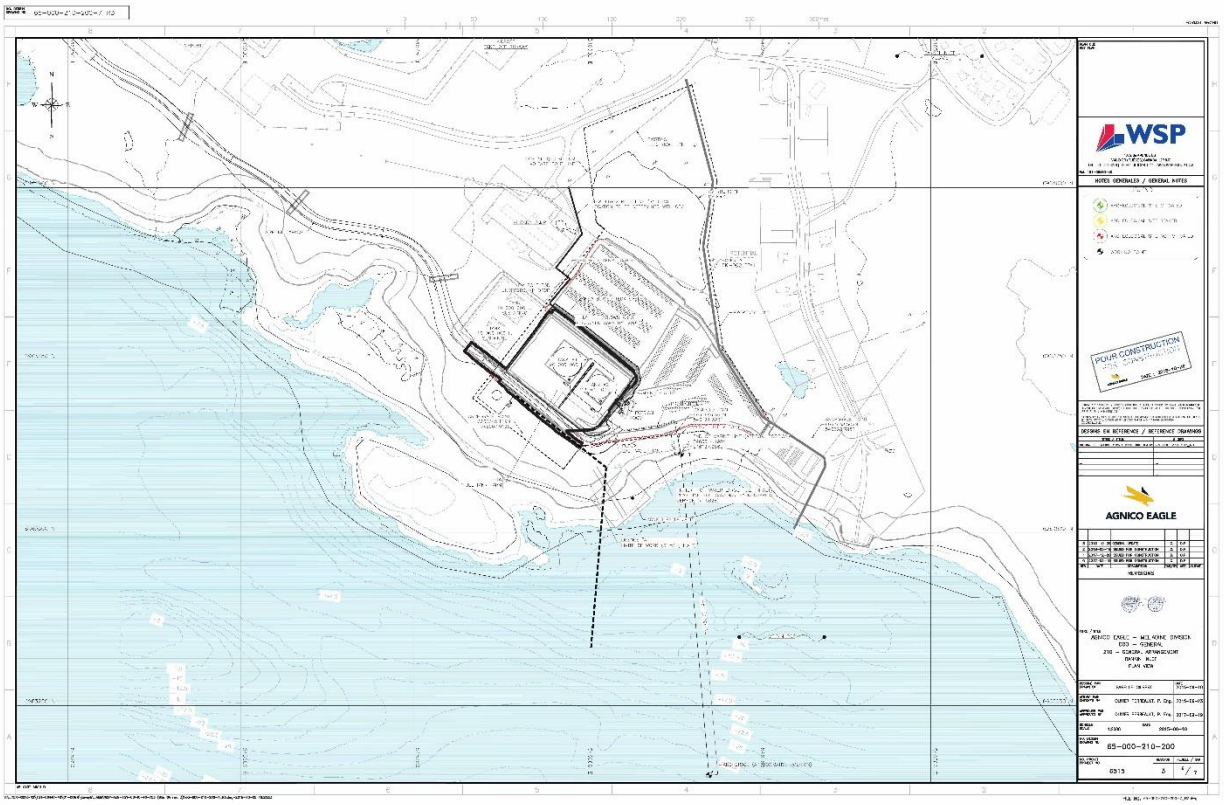
- laydown and material storage area;
- barge structure;
- saline effluent pipeline and diffuser;
- bypass road around the hamlet of Rankin Inlet, and AWAR.

Figure 4-4 : Meliadine Infrastructure General Map



Source: Meliadine Infrastructure Map_17 Sept 2019, provided by AEM

Figure 4-5 : Rankin Inlet Infrastructure General Map



5.0 Permanent Closure and Reclamation

5.1 Definition of Permanent Closure and Reclamation

Permanent closure is defined as the final closure of a mine site with no foreseeable intent by the existing proponent to return to either active exploration or mining. Permanent closure indicates that the proponent intends to have no further activity on the site aside from post-closure monitoring and potential contingency actions. Permanent closure does not, however, preclude the proponent or another party from pursuing opportunities at the existing site or in the area at a time beyond the foreseeable future (AANDC/ MVLWB, 2013).

5.2 Permanent Closure and Reclamation Requirements

This section provides the permanent closure and reclamation requirements for each individual component of the Project. The components are categorized in sub-sections for clarity. The specified closure objectives may be revised with subsequent updates to the Interim Closure and Reclamation Plan but are considered reasonable at this time to guide the advancement of closure planning.

The details presented herein for each mine component were extracted from the main documents listed below:

- Final Environmental Impact Statement, Volume 1 to 10 (AEM, 2014);
- Meliadine Preliminary Closure and Reclamation Plan (AEM, 2015a);
- Updated Technical Report on the Meliadine Gold Project (AEM, 2015b);
- Type A Water Licence Main Application Document (AEM, 2015c);
- Air Quality Monitoring Plan (AEM, 2015d);
- Meliadine Incinerator Design Report and Drawings (AEM, 2017);
- Hazardous Materials Management Plan (AEM, 2018);
- Meliadine Annual Report 2018 (AEM, 2019a);
- Meliadine Mine Waste Management Plan (AEM, 2019b);
- Meliadine Water Management Plan (AEM, 2019c);
- Meliadine Roads Management Plan (AEM, 2019d);
- Water Quality and Flow Monitoring Plan (AEM, 2019e);
- Groundwater Management Plan (AEM, 2019f);
- Metal Leaching and Acid Rock Drainage Monitoring Report (AEM, 2019g);
- Wildlife protection and response plan (AEM, 2019h);
- Landfill and Waste Management Plan AEM (2019i);

- Landfarm Management Plan (AEM, 2019j);
- Design report for Itivia laydown area culvert (Tetra Tech, 2017a);
- Design Report for Operation Landfill (Stage 1), Meliadine Gold Project (Tetra Tech, 2017b);
- Construction summary (as-built) report for landfarm (Tetra Tech, 2018);
- Construction summary report for Rankin Inlet bypass road and culverts (Tetra Tech, 2019).

5.2.1 Rankin Inlet Facilities

5.2.1.1 Description of the components

Rankin Inlet facilities are located in mainly Itivia area as presented on Figure 4-5. This is the transfer point and temporary storage for all dry shipment and fuel materials arriving by barge prior to overland shipment to the mine site via the AWAR. Rankin Inlet Facilities are listed below:

- Floating Dock: A floating dock facility (spud barge) dedicated to the Project located at Itivia. This floating dock consists of a barge that is connected by cables to the shore, while the other end is anchored in place by two “spuds” onto the seabed, which allow the barge to rise and fall with the tides. The barge is connected to the shore using a ramp or removable bridge section. A portable crane (capacity of about 200 t) is set up on the floating dock and used to lift the sea cans and other containers and equipment directly off the delivery barges and place them onto trucks. The gateway to link the barge to the beach is approximately about 6.5 m wide by 21 m long. The ship(s) will be located offshore in deep water (approximately 3 km from Itivia) where they will be offloaded onto barges for the transport of materials to the Itivia laydown area. Sea cans, large equipment, machinery, and vehicles are placed onto the barges for transport through the access passage using tugs before being docked alongside the floating dock located at Itivia.
- Dry Freight Storage Facility: A fenced-in laydown area is located near the offloading barge to store the material being received during the barge season. An area of approximately 6.68 ha is established to act as a laydown yard for the incoming freight. The 6.68 ha laydown is backfilled with crushed rock with a total excavation of approximately 42,000 m^3 (AEM, 2014, Volume 1). The culvert under Itivia laydown area road are a group of 2 pipes, length of 30 m each and diameter of 900 mm (Tetra Tech, 2017a).
- Bulk Fuel Storage Facilities: The Itivia oil handling facility including the fuel tank farm is located fairly close to the barge landing and within an area of about 114,200 m^2. The tank farm includes two (2) diesel fuel storage tanks of 20 ML and 13.5 ML and one 4 ML tank, for a total capacity of up to 37.5 ML of diesel fuel. Fuel is pumped from the barges to the storage tanks (AEM, 2014, Volume 1).
- Water and Power Management: Water accumulation within the berms lined with geomembrane surrounding the Bulk Fuel Storage Facilities has to be managed as it is release to the environment. Power for facilities is supplied by portable generators and yard lighting is provided by portable diesel-powered light towers.
- Saline Water Tank and diffuser: The effluent discharge system consists of a truck discharge pump, a back-up discharge truck pump, a 100 000-litre storage tank, as well as suction and discharge pipelines. Storage tank will only be used to contain the treated effluent until the next day, if the 800

m^3/d discharge limit is attained upon a truck's arrival. The storage tank is installed on a containment area, built on a geomembrane with underlying and overlying granular materials and surrounded by berms. A pumping station including two pumps is installed on the containment area. The truck discharge pump is used to transfer the effluent from the trucks directly into the sea (or to storage tank). A by-pass pipeline is installed parallel to the main discharge pipe in case the discharge truck pump malfunctions or if maintenance is required. The back-up truck discharge pump is used to pump the effluent into the by-pass pipe, through the 6-inch discharge HDPE pipe and out the diffuser, if necessary (AEM, 2019f).

5.2.1.2 Pre-Disturbance, Existing, and Final Site Conditions

Pre-disturbance conditions are based on baseline data collection programs presented in the Meliadine FEIS (AEM, 2014). The pre-disturbance site conditions are summarized in Section 3.0 of this plan.

The Meliadine facilities are currently in use and will be during the period of operation, until closure or post-closure.

The facilities will be dismantled and reclaimed following best practices put in place during operation and in order to minimize long term disturbance and impact on the community. The facilities could also be transferred to the local community upon interest.

5.2.1.3 Closure Objectives and Criteria

The closure relevant objectives and closure criteria for the Rankin Inlet Site facilities are listed in Table 5-1, along with the specific actions and monitoring associated (modified from AANDC/ MVLWB 2013 and AEM, 2015a).

Table 5-1: Closure Objectives and Criteria – Rankin Inlet Facilities

Closure Objectives	Closure Criteria	Action / Measurements
Return area to its original state or to a condition compatible with the end land-use targets	Remove all facilities and restore natural/compatible terrain as much as possible	Dismantle and reclaim all infrastructure, fuel reservoirs, chemicals and industrial wastes
Infrastructure, equipment and storage area will not be a source of contamination to the environment or a safety hazard to humans and wildlife	Limit access during closure Remove all facilities and restore natural/compatible terrain as much as possible Remove all hazardous material	Place signs to limit access Dismantle and reclaim all infrastructure, fuel reservoirs and hazardous wastes Remaining areas will be scarified and remaining concrete foundations and slabs will be cut in the pieces and buried Soil and water monitoring Physical inspection
Restore natural drainage patterns where surface infrastructure has been removed	Restore natural/compatible terrain as much as possible	Surface will be regraded to promote natural drainage

Closure Objectives	Closure Criteria	Action / Measurements
Restore the area for natural use by wildlife or traditional use by the community	Restore natural/compatible terrain as much as possible	Surface will be regraded to promote the use for wildlife and safe access for traditional activities
Consider community land use expectations and traditional knowledge	Community engagement and traditional knowledge will continue to be implemented in closure planning	Community engagement during closure planning

5.2.1.4 Consideration of Closure Options and Selection of Closure Activities

Considerations for Rankin Inlet facilities closure are provided by the AANDC/ MVLWB (AANDC/ MVLWB, 2013). Closure activities were selected in consideration of the closure aspects listed below, related to mine design stage, closure and post-closure periods.

- Recycling or reusing building materials and equipment where possible to reduce waste;
- Dismantle all buildings that are not necessary to achieve the future land use target;
- Cover foundations with materials conducive to vegetation growth;
- Where approved, break or perforate concrete floor slabs and walls to create a free draining condition in order that vegetation can be established;
- Bury materials in the unsaturated zone or below the active layer;
- Cut, shred, crush, or break demolition debris to minimize the void volume during disposal;
- Decontaminate equipment (free of any batteries, fuels, oils, or other deleterious substances) and reuse or sell it to local community interests;
- Remove all hazardous materials and chemicals prior to demolition to national approved hazardous material treatment facilities, or recycle, reuse, or dispose of in an appropriate manner upon approval from the regulatory authorities.

All the options listed above will be required to address closure and reclamation of the Rankin Inlet facilities belonging to the Project. Details on the implementation of those considerations are provided as applicable in the following section.

5.2.1.5 Engineering Work Associated with Selected Closure Activity

At closure, it is planned to offer the infrastructures located in Rankin Inlet to local interests. If there is no local interest or agreement, the facilities and equipment will be decommissioned, dismantled and removed appropriately.

Agnico Eagle will return, if possible, the Rankin Inlet area where the facilities are located to pre-development conditions. The site may also be left in a semi-industrial condition if consistent with a different end land use agreed upon with regulators, the community of Rankin Inlet, and other local interest.

All remaining bulk fuel located at Itivia will first be cleaned and then removed and offered to local interests. Infrastructure, including floating dock and portable equipment will be emptied, and also offered for local use

and/or relocation. In the case that there is no local interest for the tanks or remaining infrastructure and equipment, the infrastructure will be dismantled, decontaminated and demolition waste will be either transported to the mine site landfill disposal or barged out of Rankin Inlet to a southern waste disposal, recycling facility or sale for scrap metal.

At closure, scarification of all disturbed areas, including storage pads and roads, is planned to loosen the compacted material to promote surface drainage. Areas will be profiled, and water management structures will be removed from the roadways to re-establish natural drainage patterns.

The saline water tank and diffuser will be decommissioned, dismantled and removed as appropriate. The pump, piping, tanks and other components will be either transported to the mine site landfill disposal or barged out of Rankin Inlet.

It is important to note that any contaminated soils from the facilities will be removed and placed in sealed drums. These will then be transported to the mine site landfarm for treatment or barged out of to a southern destination for treatment and disposal.

5.2.1.6 Predicted Residual Effects

No significant residual effects have been identified for after closure of the supporting facilities in Rankin Inlet, but changes to terrain caused by the construction and subsequent reclamation of the facilities could result in some alteration of the natural terrain.

5.2.1.7 Uncertainties

The main uncertainty is related to the local interest for the Rankin Inlet facilities or equipment.

5.2.1.8 Post-Closure Monitoring, Maintenance, and Reporting

The overall post-closure monitoring and maintenance program for the Meliadine Mine are discussed in Section 9.0 along with the general reporting requirements. The following presents the relevant post-closure monitoring following the closure of the Rankin Inlet facilities and maintenance strategies as presented by AANDC/ MVLWB (2013):

- Periodic inspections will be performed to visually assess the reclaimed areas; and
- All buildings and equipment left on-site during closure will be maintained until no longer required, at which time they will be removed from the site or demolished and disposed to the mine site landfill disposal or barged out to a southern waste disposal or recycling facility or for sale or sold as scrap metal.

5.2.1.9 Contingencies

There are no activities proposed as contingencies for the closure of the facilities in Rankin Inlet.

5.2.2 Transportation Roads and Quarries

5.2.2.1 Description of the components

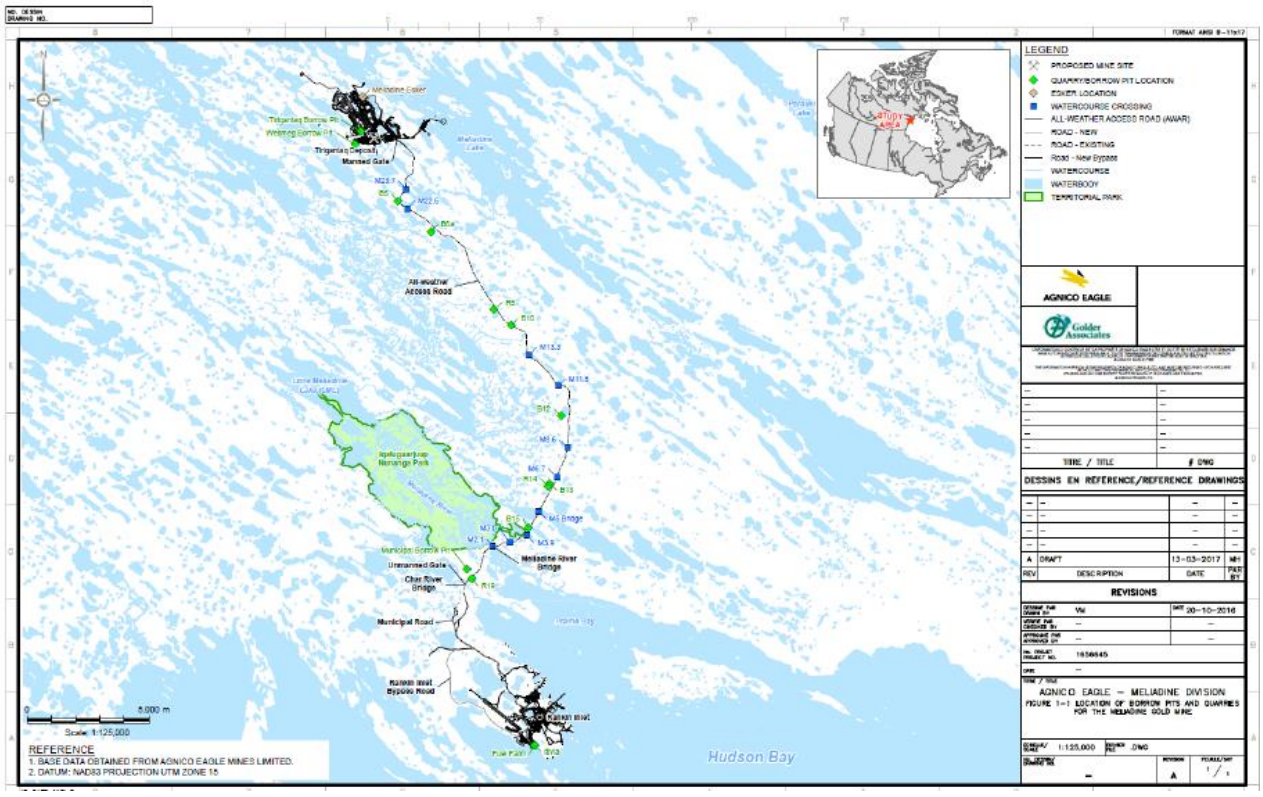
Transportation Routes considered for the Project are listed below:

- Access Road (AWAR): The AWAR connects Rankin Inlet to the Mine site. The AWAR is a 23.8 km private road built with a 6.5 m running surface between the Char River bridge turn-off and the Mine

site and has passing turnouts approximately every 400 ± 50 m (9.5 m total road width at passing turnouts). The first 2.3 km of the AWAR between Rankin Inlet and the Meliadine mine site are located on municipal land; the first 2 bridges on the AWAR (over the Char and Meliadine rivers) are also located on municipal land. There are eight (8) culverts along the AWAR, and two (2) bridges under the responsibility of the Meliadine Mine. A total of eight (8) quarries and borrow pits are located along the AWAR. The road alignment is presented on Figure 5-1 (AEM, 2019d).

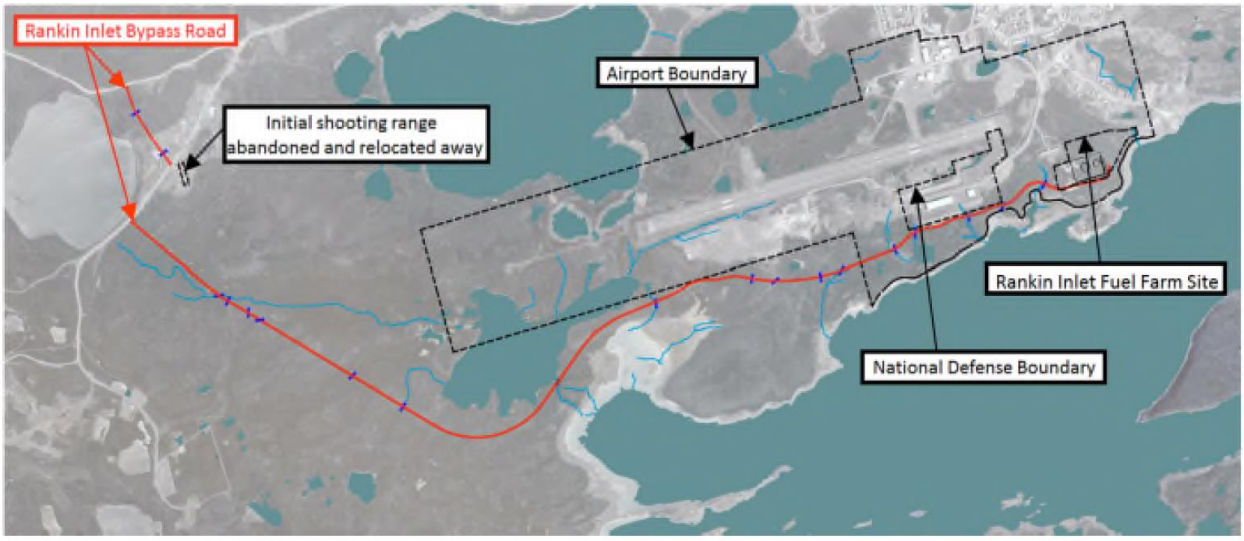
- By-Pass Road: A bypass road is built around the south of the airstrip to Itivia as shown on Figure 5-2. The length of the bypass road is approximately 6.17 km long and allows traffic from Itivia to bypass the hamlet. Its design and width are similar to the AWAR (6.5 m, 8.0 m from chainage 0+222 to 1+492). There are 19 groups of culverts along the bypass road (Tetra Tech, 2019).
- Internal Access and Haul Roads: A network of roads (service roads and haul roads) of approximately 15 km on the mine site connects the various mining areas and to access the various Project facilities.
- Quarries and Granular Borrow Sites: required for AWAR, by-pass, internal access and haul roads construction. There are 15 quarries located along the AWAR. There are also 3 quarries located directly on site.

Figure 5-1 : All Weather Access Road (AWAR) General Map



Source: (AEM, 2019d)

Figure 5-2 : Bypass Road General Location



Source: (Tetra Tech, 2019)

5.2.2.2 Pre-Disturbance, Existing, and Final Site Conditions

Pre-disturbance conditions are based on baseline data collection programs presented in the Meliadine FEIS (AEM, 2014). The pre-disturbance site conditions are also summarized in Section 3.0 of this plan.

The transportation roads are currently in use and will be until post-closure, at least for the AWAR to access the site. The quarries will be maintained until material is no longer required.

At post-closure, the AWAR and by-pass road embankment will be reclaimed, and the natural drainage and terrain will be restored as much as possible. The culverts and the bridges all along the AWAR and the bypass road will be dismantled. Upon local interest and regulatory approval, the AWAR and the bypass road could be transferred to the local community.

The internal access and haul roads on site will be reclaimed and the natural drainage and terrain will be restored as much as possible during closure.

The quarries and granular borrow sites no longer required for operations will be progressively reclaimed during operation, as equipment and resources are available.

5.2.2.3 Closure Objectives and Criteria

The closure relevant objectives and closure criteria for the transportation routes are listed in Table 5-2, along with the specific actions and monitoring associated (modified from AANDC/ MVLWB 2013 and AEM, 2015a).

Table 5-2: Closure Objectives and Criteria – Transportation Roads

Closure Objectives	Closure Criteria	Action / Measurements
Maintain access to site during post-closure for monitoring	Preserve the main access road to the site in a sufficient condition to allow post-closure access for monitoring, inspection and maintenance activities	Reclaim the AWAR and the by-pass once post-closure monitoring and site maintenance can be completed with helicopter access
At closure and post-closure, reclaim road to its original state or to a condition compatible with the end land-use targets	Restore natural/compatible terrain as much as possible and promote revegetation	Remove bridges, culverts and pipes; restoring natural stream flow and drainage patterns; stabilizing stream banks by using rip-rap Road embankment will be regraded and surface scarified Remove other infrastructures along the road, including communication towers
Restore natural drainage patterns	Restore natural/compatible terrain as much as possible	Road embankment will be regraded to promote natural drainage Remove bridges, culverts and pipes; restoring natural stream flow and drainage patterns Visual inspection
Reclaim quarries and borrow area by providing safe long-term conditions	Promote natural drainage and ensure wall stability	Quarry walls will be drilled and blasted to ensure long term stability and safety of the quarry walls for wildlife Quarry area will be regraded to promote natural drainage Visual inspection
Control dust generation from reclamation activities	Best management practices for controlling dust, fugitive and exhaust emissions during active reclamation	Implement best management practices Routine air quality monitoring
Ensure the remaining surface areas are safe for wildlife use and access	Restore natural/compatible terrain as much as possible	Scarified surfaces will be re-graded Visual inspection and wildlife survey
Ensure reclaimed areas are safe for the community and support continuation of human land use activities	Restore natural/compatible terrain as much as possible Human land use of the reclaimed area at post-closure will not compromise people's health and safety Reclaimed area will be compatible with land use	Routine monitoring and physical inspection
Consider community land use expectations and traditional knowledge	Community engagement and traditional knowledge will continue to be implemented in closure planning	Community engagement during closure planning

Other recommendations are presented in the Code of Practice for Metal Mines as follows (adapted from EC, 2009):

- The main access road to the site and other on-site roads, as required, should be preserved in a sufficient condition to allow post-closure access for monitoring, inspection and maintenance activities. (from R518);
- Roads that will not be preserved for post-closure use should be reclaimed. Bridges, culverts and pipes should be removed, natural stream flow should be restored, and stream banks should be stabilized by re-vegetating or by using rip-rap. Surfaces, shoulders, escarpments, steep slopes, regular and irregular benches, etc., should be rehabilitated to prevent erosion. Surfaces and shoulders should be scarified, blended into natural contours, and re-vegetated. (from R519).

5.2.2.4 Consideration of Closure Options and Selection of Closure Activities

Considerations for the transportation roads closure are provided by the MVLWB/AANDC (MVLWB/AANDC, 2013). Closure activities were selected in consideration of the closure aspects listed below, related to mine design stage, closure and post-closure periods.

- Remove structures including bridges and culverts (not the culverts or bridges belonging to the Hamlet of Rankin Inlet);
- Reclaim areas to the original topography and drainage or to a new topography or drainage compatible with end land use targets;
- Scarify road surfaces to promote re-vegetation of indigenous species;
- Allow gradual slope failure of quarries involving rock masses or slope pit walls;
- Block quarry access routes with boulder fences, berms and/or inukshuks (guidance from local communities and elders would be sought); and
- Flatten berms and slopes at the side of roads to facilitate wildlife passage.

As mentioned in the preliminary closure plan (AEM, 2015a), migrating caribou protection is an important aspect of the AWAR closure. Agnico Eagle will work, during the operations and closure stages, with the KIA and HTO to monitor areas where the road may be impeding caribou migration. Heavy traffic on the AWAR and on-site roads will cease at closure. Traffic associated with reclamation will continue at a reduced level for the first years of closure. After that, there will be very little vehicle traffic.

All the options listed above will be required to address closure and reclamation of the transportation roads for the Meliadine Mine. Details on the implementation of those considerations are provided as applicable in the following section.

5.2.2.5 Engineering Work Associated with Selected Closure Activity

Agnico Eagle is committed to manage the road as a private road with limited public access during the mine life and to fully decommission the road after post-closure. The transportation roads should be one of the last mining components to be reclaimed in post-closure to preserve access for monitoring.

As mentioned in the Roads Management Plan (AEM, 2019d), it is the responsibility of Agnico Eagle of decommissioning and reclaiming all roads once construction, operations, closure, and post-closure activities

are complete. For a third party to take over the road(s), that third party would have to complete its own arrangements with the landowners (the KIA and the Rankin Inlet Hamlet) and then complete its own environmental assessment and permitting process covering future use. Agnico Eagle does not own the land on which the roads are constructed and, thus, cannot transfer future ownership or use privileges to any third party. Agnico Eagle must complete its obligation to decommission and reclaim all roads unless directed otherwise by a combination of the landowners and other regulatory agencies who issued permits/authorizations for the roads. In the case that Agnico Eagle stays the owner of the AWAR and the bypass road, natural drainage courses and terrain will be restored by removing culverts and bridges, regrading road fill material and removing in-stream works down to the original channel bed.

The reclamation work presented in detail in the Roads Management Plan (AEM, 2019d) is summarized herein. The loosening of compacted surfaces will be accomplished by ripping of the road bed using a dozer with a “ripper” attachment on the back. Successive passes with the dozer longitudinally along the road bed will eliminate the level road surface and make travel difficult. It is anticipated that, in this way, the abandoned roads will not be useable by wheeled vehicles (i.e., cars, trucks, and pick-up trucks). The road bed would still be useable by ATV or snowmobile and, thus, even after final reclamation, the reclaimed roadbed would offer similar passage to the existing set of trails that currently exist and are used by the residents of Rankin Inlet for traditional use purposes.

The road deactivation works will be carried out as necessary to stabilize any slopes where potential for slope erosion may exist. Stabilization measures may require pulling back of side-cast fills on locally steep slopes or buttressing and/or re-contouring of steepened out slopes using non-acid generating material. These measures would also be applicable to borrow pits/quarries that remained open following construction and are located adjacent to the roadway. As much as practical, deactivated surfaces will be graded to blend with the existing topography (AEM, 2019d).

To the extent practical, the reclamation would also restore the natural pre-road hydrology. Natural drainage courses would be restored primarily through the removal of all culverts and bridges (excluding the Char River bridge, which will belong to the Hamlet of Rankin Inlet), and through rehabilitation of channels and banks at the crossing sites. Cross-drain structures (cross-ditches) will also be installed where necessary between culvert sites. Where armouring rock (rip-rap) is required, this rock will be non ARD/ML for the protection of aquatic life. Where affected watercourses are fish bearing, the timing of work will have to be restricted to within the designated DFO fisheries work window (July 16th to April 30th). For these sites, appropriate fish exclusion measures will be undertaken prior to the in-stream works. All in-stream works will be carried out using best management practices for erosion and sediment control (AEM, 2019d).

Decommissioning of the roads will start from the Mine site and progress south towards Rankin Inlet and will include reclamation of the bypass road. Stream crossings will be rehabilitated as they are encountered during the progression of the work. The culverts and bridges, as previously mentioned, will be removed from the crossings using a backhoe and crane, and then removed materials (i.e., culvert steel, bridge decks, abutment steel, etc.) will be transported to Rankin Inlet using a semi-tractor and a low-boy trailer, for disposal and salvage (AEM, 2019d).

The decommissioning details of the 18 quarries are provided also in the Road Management Plan (AEM, 2019d). The quarries and borrow pits have gently sloping walls and are designed for positive drainage wherever possible. Reclamation and closure of quarries and borrow pits will depend on the individual site conditions. With a conservative initial design, the quarries should require little reclamation following

completion of the roads. Loose rock will be pulled to the floor of the quarry and the entrance blocked with large boulders. Reclamation should lead to natural re-vegetation establishing on disturbed areas (AEM, 2019d). Similar process will be completed for the reclamation of the quarries on site.

All quarry sites and borrow sources developed during the construction of the roads have been selected to generate only non-acid generating/low metal leaching materials. During reclamation of the roads, should acid-generating bedrock be exposed along the roadway or in borrow pit/quarries, these areas will be covered with a minimum 2 m thick layer of non-acid generating soil or rock to direct water away from the surface (AEM, 2019d).

5.2.2.6 Predicted Residual Effects

No significant residual effects have been identified for after closure of the transportation roads and quarries but changes to terrain caused by the construction and subsequent reclamation of the facilities could result in some alteration of the terrain and or loss of plant populations and plant communities. The reclaimed roadbed would offer similar passage to the existing set of trails that currently exist and are used by the residents of Rankin Inlet for traditional use purposes.

5.2.2.7 Uncertainties

The pre-disturbance terrain is covered by discontinuous vegetation interspersed with few bedrock outcroppings. The reclamation plan will be designed to encourage a natural succession of indigenous plant species within disturbed site areas. Grading and contouring would be done, where appropriate, to control soil erosion and to promote re-vegetation by natural colonization. Re-vegetation studies will be completed to assess the potential for vegetation to establish in disturbed areas or on rockfill covers.

There are also some uncertainties regarding the transfer of ownership of the road to the local community or a third party. For a third party to take over the road(s), that third party would have to complete its own arrangements with the landowners (the KIA and the Hamlet) and then complete its own environmental assessment and permitting process covering future use.

5.2.2.8 Post-Closure Monitoring, Maintenance, and Reporting

The overall post-closure monitoring and maintenance program for the Meliadine Mine are discussed in Section 9.0 along with the general reporting requirements. The following presents the relevant post-closure monitoring following the closure of the roads and quarries and maintenance strategies as presented by AANDC/ MVLWB (2013):

- Periodic inspections will be performed to visually assess the reclaimed areas; and
- All roads to be used during closure will be maintained until they are no longer required.

5.2.2.9 Contingencies

There are no activities proposed as contingencies for the closure of the transportation roads.

5.2.3 Underground

5.2.3.1 Description of the components

Tiriganiaq gold deposit will be developed using traditional open-pit and underground mining methods. Two open pits (Tiriganiaq Pit 1 and Tiriganiaq Pit 2) and an underground mine (Tiriganiaq Underground) will be

developed as shown in Figure 4-4. Approximately 5.4 Mt of waste rock and 8.5 Mt of overburden material will be mined from underground (AEM, 2019b). Tiriganiaq underground mine will be developed and operated from Year -5 (2015) to Year 7 (2026).

The ore is first being sourced entirely from underground with access by decline, using long-hole mining methods. The first three stopes were blasted and mucked out in late 2018. Each stope is backfilled, with cemented pastefill used in primary stopes and dry rockfill for the secondary stopes. Starting in 2021, the ore will be sourced from both the underground and open pits.

The description presented below for the underground mine is extracted from the Meliadine Mine Updated Technical Report (AEM, 2015b) and the Final Environmental Impact Statement (AEM, 2014, Volume 1).

Currently, underground mining is considered for the Tiriganiaq deposit. The selected mining rate from underground is set at 2500 to 3000 tpd on average. Geotechnical information was incorporated in designing the underground mine. This included the distribution of intact rock strength, distribution of rock mass classification values, and detailed structural geology information.

A numerical hydrogeological model was developed to estimate the quantity and quality of potential inflows to Tiriganiaq underground. The underground mine at Tiriganiaq is anticipated to extend below the permafrost zone. The deep groundwater flow system will be encountered in the deeper portion of the mine.

Ground support for underground will primarily be provided by bolting and screening, as well as cable bolting. Cable bolting requirements for intersections and stopes were estimated using typical cable bolting patterns. Mined-out workings will also be backfilled for reasons of ground stability, using coarse rock waste, cemented waste rock, paste tailings, or some combination of these.

The current Tiriganiaq underground reserves lie between 100 m and 650 m below surface. The main underground mine plan consists of 23 levels (level 100 through level 650) set at 25-m intervals. Access to all underground workings will be via one of two decline ramps, which can be seen in Figure 4-3. The portal 1 is used as the initial mine access for pre-development, from which the existing ramp (decline 1) will be extended to the 300 level. A second decline developed in the hanging wall of the Tiriganiaq deposit from a second surface portal (portal 2) is used as the trucking ramp and the main access for the Meliadine mine. Decline 1 will remain as a secondary egress point and provide direct access to the upper parts of the mine. A third decline (decline 3) will be developed allowing access and mining of the Wesmeg 650 lode

Long-hole mining method was selected to mine the Tiriganiaq deposit due to the shape, thickness and orientation of the orebody. The stope height was set at 25 m to minimize drill deviation and waste rock dilution, and to maximize mine recoveries.

A conveyor belt has been built in the underground access ramp to deliver the ore from the underground to the surface ore stockpile dome. A crusher is located underground to reduce the ore to a size that can be accommodated on the conveyor belt. Underground waste rock is transported through the same system that transports the ore but at different times.

The maximum underground mine ventilation requirements were calculated at 544 m³/sec (1,153,000 ft3/minute (cfm)). Two 576-kcfm fan systems are required to ventilate the mine, one for the eastern part of the mine and another one for the western part. One 800-kcfm fan system is required in the return air raise. The mine-air-heating infrastructure for the Tiriganiaq underground mine consists of multiple indirect oil-fired air heaters and heat exchangers for each raise. The heat comes from both the heat recovery system at the

power house and from the fuel heaters. The underground mine equipment fleet required during the peak period considering the development and production was selected in consideration of the quantities of material to be mined and moved, the geometry of the orebody and from the expertise Agnico Eagle gained at its other mines in operation. Trucks (60 tonnes) are used to haul waste and ore at surface or rockfill into stopes. Scooptrams are used for mucking development headings or production stopes.

5.2.3.2 Pre-Disturbance, Existing, and Final Site Conditions

Pre-disturbance conditions are based on baseline data collection programs presented in the Meliadine FEIS (AEM, 2014). The pre-disturbance site conditions are also summarized in Section 3.0 of this plan.

The mining of the underground has started in 2015 and will continue until 2026. In 2018, the Meliadine Gold Project was still in the construction phase, developing the underground in preparation to operate the Tiriganiaq underground mine. A total of 688,069 tonnes of waste was excavated, 3,134 tonnes was used as underground rockfill and the rest was used for construction purposes. A total of 39,216 tonnes of marginal and 60,846 tonnes of ore was excavated and stored at the surface ore pad (AEM, 2019a).

The ultimate depth of the Tiriganiaq Underground at the end of operations is expected to be approximately 650 m below ground surface (bgs).

5.2.3.3 Closure Objectives and Criteria

The closure relevant objectives and closure criteria for the underground mine are listed in Table 5-3, along with the specific actions and monitoring associated (modified from AANDC/ MVLWB 2013 and AEM, 2015a).

Table 5-3: Closure Objectives and Criteria – Open Pits

Closure Objective	Closure Criteria	Actions/Monitoring
Access to underground workings from surface openings has been limited, for the safety of humans and wildlife	The decline ramps and the portals will be capped to eliminate the access to the underground mine workings	Place signage Maintain or construct waste rock berm Inspection of berms
Uncontrolled surface water infiltration into underground workings has been minimized	The decline ramps and the portals will be capped, and area will be levelled to avoid water accumulation	Ramp will be dismantled and blocked Concrete structures will cap the raises Physical inspection and monitoring
Underground workings have been stabilized so that there is no surface expression of underground failure Controls that prevent collapse, stress transfer, and flooding of adjacent mines are in place	The underground will be designed and mined to be physically stable; stopes will be backfilled as needed during operation and closure	Proper backfilling procedure Meet appropriate design levels, physical inspection by a qualified engineer and monitoring
Contaminated mine water from underground workings is not and will not become a source of contamination to the surface environment, nearby taliks, surface water, or groundwater	Underground mine to flood with natural groundwater seepage	Water treatment systems in place until surface water meets discharge criteria to the environment Initial physical monitoring to check inflow, but limited once ventilation is turned off

Closure Objective	Closure Criteria	Actions/Monitoring
Areas surrounding mine openings are suitable for future use targets	Ramp facilities at the surface will be removed Area will be levelled to avoid water accumulation	Ramp will be dismantled and blocked Concrete structures will cap the raises Physical inspection and monitoring
No hazardous material from underground will become a source of contamination	Remove hazardous materials from the underground mine	Fuels, oils, chemicals and all hazardous material will be removed for disposal by a licensed handler prior to flooding Physical inspection and monitoring
Consider community land use expectations and traditional knowledge in the closure planning	Community engagement and traditional knowledge will continue to be implemented in closure planning	Community engagement during closure planning

Other recommendations are presented in the Code of Practice for Metal Mines as follows (adapted from EC, 2009):

- If it is technically and economically feasible to do so, infrastructure (e.g., crushers, metal structures and air pipes) and equipment (e.g., pumps) should be removed from the site. Any equipment to be left in the pit should be inspected and remediated as appropriate to ensure that there is no risk of leakage of any contaminants (R506);
- During the decommissioning of underground and open pit mines, any contamination associated with vehicle and equipment operations and maintenance should be identified and remediated, as appropriate (R507);
- Underground mine workings should be secured, and signs should be posted warning the public of potential dangers associated with the facility (R508);
- The risk of subsidence in underground mines should be assessed. Appropriate measures should be taken to prevent subsidence in cases where the risk of subsidence is determined to be significant. The primary measure used to prevent subsidence is the backfilling of underground voids (R509);
- The potential for mine water discharges should be assessed. For underground mines, this should be done using a hydrogeological assessment (R511);
- Where there is the potential of mine water discharge after mine closure, the quality of the discharge should be predicted. Mine water quality should be assessed once closure has been completed to verify the accuracy of the predictions (R512);
- Where there is the potential of mine water discharge of poor quality, measures should be implemented to prevent or control that discharge and to collect the mine water for treatment. Prevention methods may include capping of mine openings to prevent mine water discharge (R513).

5.2.3.4 Consideration of Closure Options and Selection of Closure Activities

Considerations for open pit closure are provided by the AANDC/MVLWB (AANDC/MVLWB, 2013). Closure activities for the pit were selected in consideration of the closure aspects listed below, related to mine design stage, closure and post-closure periods.

- Minimize the number of mine openings to the surface;
- Include long-term geotechnical and geothermal stability in the design of mine openings and crown pillars;
- Develop a ground stability monitoring plan.

Capping the top of the decline ramps and portals are considered to be the only viable option for eliminating access to the underground mine workings.

Geotechnical monitoring, thermal monitoring and underground water quality monitoring is part of the underground operations and will be used for the closure planning of the underground mine.

5.2.3.5 Engineering Work Associated with Selected Closure Activity

All surface openings will be sealed; the decline ramps and the portals will be capped to eliminate access to the underground mine workings. The sealed surface opening areas will be contoured to prevent natural surface flows to the underground, and disturbed surface areas will be re-contoured to establish positive natural drainage patterns and blend in with the surrounding topography to the extent possible. The raises will be capped with concrete. Any equipment or infrastructure left underground will be cleaned, drained of fluids, inspected, and remediated as appropriate to eliminate the risk of contaminant leakage. All hazardous materials from underground shops, equipment, and magazines (fuels, oils, glycol, batteries, explosives, etc.) will be removed and disposed off-site at an approved disposal facility. Contamination associated with vehicle and equipment operations at work areas will be identified and remediated (AEM, 2015a).

Every stope will be backfilled, with cemented pastefill used in primary stopes, and dry rockfill for the secondary stopes. The paste backfill will be made by mixing pressed filtered tailings, cement and water in a facility (AEM, 2015b). Backfill will be done during the operation and will be completed in closure.

Passive flooding of the Tiriganiaq Underground Mine will occur following the completion of mining. The estimated total flooding volume of the underground workings is 1,372,000 m^3. Seepage water into the underground mine will be the main water source for flooding. At the predicted seepage rate, it is estimated to take 6 years to flood the underground mine (AEM, 2019c).

5.2.3.6 Predicted Residual Effects

No significant long-term effects are expected for the underground mine workings. After closure, the only surface expression of the underground workings will be the sealed vent raises and portals and the area graded and levelled to avoid erosion and water accumulation.

5.2.3.7 Uncertainties

There are no currently identified uncertainties associated with the closing of the surface openings to the underground or flooding the underground works.

5.2.3.8 Post-Closure Monitoring, Maintenance, and Reporting

The overall post-closure monitoring and maintenance program for the Meliadine Mine are discussed in Section 9.0 along with the general reporting requirements. The following presents the relevant post-closure monitoring following the closure of the underground mine, and maintenance strategies as presented by AANDC/ MVLWB (2013):

- Visually inspect reclaimed openings for signs of physical deterioration or settlement;
- Vary the frequency of inspections, with increased frequency following construction and decreased frequency upon establishment of stable conditions;
- Check for surface expression (subsidence) of underground failure;
- Test underground mine water quality and monitor volume from controlled discharge points of workings to ensure water quality is as predicted;
- Identify unanticipated mine-related drainage discharge points (volume and quality);
- Install thermistors where appropriate to monitor the ground thermal regime in permafrost areas;
- Establish special monitoring provisions for mines that have become flooded and are retaining water under pressure by means of plugs. These provisions can include visual inspection, piezometers, seepage measurement weirs, and sampling to check water quality parameters;
- Inspect areas surrounding mine openings to ensure they are suitable for future use targets;
- Inspect passive water treatment systems for maintenance requirements.

5.2.3.9 Contingencies

Backfilling of certain underground areas will be completed during operation. This will ensure ground stability that potential ground collapse into these tunnels does not progress to surface, creating a subsidence or sinkhole.

5.2.4 Open Pits

5.2.4.1 Description of the components

Two open pits (Tiriganiaq Pit 1 and Tiriganiaq Pit 2) will be developed as shown in Figure 4-4. Approximately 20.6 Mt of waste rock, 6.6 Mt of overburden material and 3.1 Mt of ore will be mined from Tiriganiaq Pit 1. Approximately 5.4 Mt of waste rock, 488,000 t of overburden material and 454,000 t of ore will be mined from Tiriganiaq Pit 2 (AEM, 2019b). The following mining development sequence is planned:

- Tiriganiaq Pit 1 will be mined from Year 2 (2021) to Year 7 (2026); and
- Tiriganiaq Pit 2 will be mined from Year 4 (2023) to Year 7 (2026).

A conventional truck/shovel operation is anticipated for the open pits.

The description presented below for the open pits is summarized from the Meliadine Mine Updated Technical Report (AEM, 2015b) and the Final Environmental Impact Statement (AEM, 2014, Volume 1).

The Project lies within an area of continuous permafrost where two (2) groundwater flow regimes can be observed: a shallow (active layer) and a deep (beneath permafrost) groundwater flow regimes. No hydraulic connection is anticipated between the systems because of the presence of the permafrost. Depth of permafrost in the Mine site is estimated to be about 360 to 495 m. In the deepest open pit design all of the pits are expected to remain in the permafrost layer. The bench height for Tiriganiaq open pits will typically be 20 m (two 10 m benches) and the face angle will vary from 64 to 70 degree depending on the pit wall. The catch bench width in the rock varies from 8 m to 10 m resulting in inter-ramp angles of 48 to 49 degree. Ultimate pit shells were used to make detailed pit plans, production schedules, equipment and labor requirements, operating cost estimates, and equipment capital cost estimates. Resources located close to surface are to be mined by open pit methods.

A conventional truck/shovel operation for both pits is planned with different mining approaches for ore and waste. The mining method must be suited to Arctic conditions and provide a good daily production in waste zones. To maximize the recovery of economic material and minimize dilution in the ore zones, the method must be very selective.

The drill and blast activity will take place using 10 m bench heights, with 165-mm (6.5-inch) diameter holes. The emulsion will be prepared on site by an explosives supplier who will also be responsible for delivering explosives to the bore holes. Once blasted, the rock material will be loaded in rigid trucks by hydraulic excavators.

Rock material will be transported by haul truck to either the primary crusher dump area for ore material or the designated WRSFs for waste rock. Temporary ore stockpiling pads will be sited near the primary crusher.

No physical surface constraints have been considered in defining the ultimate pit limits within the Tiriganiaq deposit. The presence of different watercourses located within or near the pit footprints will require some water management including dewatering, drainage and water retention dykes. However, the ultimate pit limits have been controlled by the presence of the underground mine, which limits the deepening of the pits. Potential future Tiriganiaq pit expansion could interact with and/or be constrained by the development of surface infrastructure such as vent houses and raises that will be installed in the vicinity of the current/final pit walls.

Any water reporting to the open pits will be collected in sumps and ultimately directed to the main attenuation pond CP1. Dust will be managed for environmental and safety reasons on pits haul ramps by spraying water whenever needed during the non-freezing periods.

5.2.4.2 Pre-Disturbance, Existing, and Final Site Conditions

Pre-disturbance conditions are based on baseline data collection programs presented in the Meliadine FEIS (AEM, 2014). The pre-disturbance site conditions are also summarized in Section 3.0 of this plan.

The mining of the open pits has not been initiated yet and is planned to start in Year 2 (2021) to Year 7 (2026).

The open pits are designed to have stable slopes during the mine life and post-closure. At the end of active mining operations, the pits will be flooded and rock berms will be placed around exposed perimeters of the pits to restrict access and minimize hazards to people and wildlife.

5.2.4.3 Closure Objectives and Criteria

The closure relevant objectives and closure criteria for the Meliadine open pits are listed in Table 5-4, along with the specific actions and monitoring associated (modified from AANDC/ MVLWB 2013 and AEM, 2015a).

Table 5-4: Closure Objectives and Criteria – Open Pits

Closure Objective	Closure Criteria	Actions/Monitoring
Access to the pits are limited, for the safety of humans and wildlife	Install physical barriers to limit access	Maintain or construct waste rock berm until pit area is flooded Inspection of berms during flooding period
Allow emergency access and exit during flooding stage	Safe access and route will be established during flooding for inspection and emergency	A plan will be developed to allow for reasonable exit should inadvertent access occur Proper signage will be installed
The open pit mine walls, slopes and pit shorelines are physically and geotechnically stable or minimize access to unstable areas	Ensure walls and slopes are stable prior to flooding Install physical barriers to limit access	Inspection of berms, walls, slopes and shorelines before and during flooding period Maintain or construct waste rock berm until pit area is flooded
Meet water quality objectives for any discharge from pits Water quality in flooded pits is safe for humans, aquatic life, and wildlife	The water quality will meet the Water Licence requirements	Water treatment will remain on site until water quality criteria are met Routine monitoring as per the Water Licence requirements
Migration and discharge of contaminated drainage has been minimized and controlled Controlled flooding rate of the open pits	The water quality will meet the Water Licence requirements Ensure safe water level during flooding to avoid uncontrolled discharge Minimize erosion during flooding	Water treatment will remain on site until water quality criteria are met Integrate water management plan and water balance to control flooding rate and water level Routine monitoring as per the Water Licence requirements
Dust levels are safe for people, vegetation, aquatic life, and wildlife Meet Canadian Ambient Air Quality standards	Control dust emissions during active reclamation period Best management practices for controlling fugitive and exhaust emissions during active reclamation	Implement best practices and conduct air quality monitoring during active reclamation period
Consider community land use expectations and traditional knowledge in the closure planning	Community engagement and traditional knowledge will continue to be implemented in closure planning	Community engagement during closure planning

Other recommendations are presented in the Code of Practice for Metal Mines as follows (adapted from EC, 2009):

- During decommissioning, any contamination associated with vehicle and equipment operations and maintenance should be identified and remediated, as appropriate (R507);
- Open pits should be backfilled or flooded to the extent practicable to prevent unauthorized access and to protect public safety. In cases where backfilling or flooding is not practically feasible, fencing should be installed to protect the public. In all cases, signs should be posted warning the public of potential dangers associated with the site (R510);
- The potential for mine water discharges should be assessed. For open pit mines, this may be done using water balance calculations and, in some cases, hydrogeological assessment. Where mine water discharge is predicted, the flow rate should be estimated (R511);
- Where there is the potential of mine water discharge after mine closure, the quality of the discharge should be predicted. Mine water quality should be assessed once closure has been completed to verify the accuracy of the predictions (R512);
- Where there is the potential of mine water discharge of poor quality, measures should be implemented to prevent or control that discharge and to collect the mine water for treatment. Prevention methods may include capping of mine openings to prevent mine water discharge (R513).

5.2.4.4 Consideration of Closure Options and Selection of Closure Activities

Considerations for open pit closure are provided by the AANDC/MVLWB (AANDC/MVLWB, 2013). Closure activities for the pit were selected in consideration of the closure aspects listed below, related to mine design stage, closure and post-closure periods.

- Excavate rock and soil slopes will remain stable during closure and post-closure;
- Flood the pit, with natural and pumped inflows;
- Block open pit access routes and control access.

All the options listed above will be required to address closure and reclamation of the open pits. Details on the implementation of those considerations are provided as applicable in the following section.

5.2.4.5 Engineering Work Associated with Selected Closure Activity

The description of the closure flooding activities for the open pits as presented herein is taken from the Water Management Plan (AEM, 2019c). When flooding the open pits for closure, the maximum pumping rate from Meliadine Lake shall not exceed 4,000,000 m^3/year during closure of the Mine, as stated in Part E, Item 2 of the Water Licence 2AM-MEL1631. The planned pumping period will occur during the open water season from mid-June to end of September for each year. Table 5-5 summarizes the pit volume and expected water elevations at the completion of flooding activities. It will take approximately three years to fill the pits with an assumed pumping rate of 0.44 m^3/s (38,300 m^3/day). The assumed pumping rate of 0.44 m3/s from Meliadine Lake during closure will have negligible effect to Meliadine Lake when compared to the average

outflow rate at the outlet of Meliadine Lake. The pumping rate will be evaluated further to validate that any possible negative effects to Meliadine Lake do not occur.

Table 5-5 : Pit and Underground Flooding

Pit	Volume (Mm^3)	Final Water Elevation (masl)	Water Source
Tiriganiaq Pit 1	9.20	64.14	Freshwater from Meliadine Lake
Tiriganiaq Pit 2	2.25	64.38	Freshwater from Meliadine Lake
Tiriganiaq Underground	1.40	Groundwater level	Groundwater Seepage

Source: AEM, 2019c

The water quality model results indicated that water quality in the flooded pits will meet the discharge criteria and post closure treatment will not be required. The water quality within the pits will be monitored during flooding to verify the prediction of the water quality model. The information will be used to develop a strategy to minimize contamination of the regional surface water system (AEM, 2019c).

The open pit may be hazardous to wildlife species as wildlife may be injured by inadvertent access into the open pit. Wildlife management and protection practices will be implemented to limit wildlife injury and morbidity during closure and post-closure. A rock berm will be constructed around the open pits to limit or prevent access by people and to discourage access by wildlife. Proper signage will also be placed around the flooded pits to mark access points (AEM, 2019c).

The open pits are designed to have stable slopes during the mine life and post-closure. The slopes are monitored as part of mine operations and will be progressively modified as required to maintain stability during closure and post-closure (AEM, 2019c).

5.2.4.6 Predicted Residual Effects

As presented in the Preliminary Closure Plan (AEM, 2015a), the following residual effects are predicted for the open pits after reclamation:

- The extent of the effect on terrain and soil quantity will consist of a total of approximately 35 ha of non-reclaimed land (i.e., residual ground disturbance). This non-reclaimed land is associated with the flooded open pits;
- The flooded open pits will be a permanent feature on the landscape. The impacted vegetation communities that formerly occupied the open pit footprints will be permanently lost;
- Although wildlife species will be discouraged from using the flooded open pits, some may still do so and they could potentially ingest metals dissolved in the surficial water.

5.2.4.7 Uncertainties

The following uncertainties have been identified with respect to closure planning of the open pits:

- The open pit slopes are designed to be stable under operating conditions, but the walls of the open pits will have been exposed for several years during mine operations, therefore the long-term stability of the open pit walls represents an uncertainty in closure planning design;

- While surficial water quality within the flooded open pits is predicted to meet requirements for direct discharge to the environment (Meliadine Lake), actual water quality conditions will not be known with certainty until flooding is complete;
- Flooding rate for filling the open pits at closure, including natural inflows and lake water transfers, will have to be evaluated to determine the length of time to achieve target water levels.

Water quality monitoring will continue during operations to expand the available water quality database. Water quality forecast for pit lake water will continue to be performed to predict the water quality at closure. The water balance and water management will also be reviewed in operation and in closure to estimate the lake water transfer volume required for flooding, as well as the natural inflows, to ensure adequate water levels are maintained into the pits.

5.2.4.8 Post-Closure Monitoring, Maintenance, and Reporting

The overall post-closure monitoring and maintenance program for the Meliadine Mine are discussed in Section 9.0 along with the general reporting requirements. The following presents the relevant post-closure monitoring following flooding of the open pits as presented by AANDC/MVLWB (2013):

- Monitor water level in pit to confirm closure objectives are being achieved;
- Sample water quality and quantity at controlled pit lake discharge points;
- Inspect aquatic habitat in flooded pits where applicable.

5.2.4.9 Contingencies

The water treatment facilities are included as a contingency measure should water on site not be suitable for release to the environment. Water quality monitoring will occur during mine operation to include in the site water quality and to provide additional information for future closure water quality prediction and planning modifications if required. Prior to flooding of the pits, the quality of surface water and any groundwater seepage reporting from the pit walls will be sampled to assess potential for contamination of the pit water during re-filling. Water quality monitoring will continue in closure and post-closure.

If the results of water quality monitoring indicate that water in the flooded open pits is not suitable for direct discharge, in-pit treatment and active treatment prior to discharge into the receiving environment will be considered as contingencies for the treatment of the flooded pit water (AEM, 2015a).

5.2.5 Waste Rock Storage Facilities

5.2.5.1 Description of the components

As described in the Waste Rock Management Plan (AEM, 2019b), the overall objective of the site selection for the Waste Rock Storage Facilities (WRSFs) was to minimize the footprint of the areas occupied by the waste rock and overburden, and where possible, avoid environmentally and socially sensitive areas. Approximately 31.4 Mt of waste rock will be mined from the open pits and underground mine operations. Most of the waste rock produced (about 25.3 Mt) will be placed and stored within the designated WRSFs. The remaining 6.1 Mt of waste rock will be used for other purposes, including approximately 2.0 Mt will be backfilled to the underground mine, 1.65 Mt of waste rock will be used for construction activities, and 2.50 Mt of waste rock will be used as TSF closure cover material. Approximately 7.1 Mt of overburden will be

produced with about 7.0 Mt of overburden being co-disposed within the WRSFs. The remaining, approximately 0.1 Mt, will be stored in a temporary overburden stockpile that will be used as cover material for progressive closure and reclamation of the TSF area.

Three areas were identified for the combined storage of waste rock and overburden material as shown in Figure 4-4. Originally, four main areas were proposed as the waste rock storage areas in the baseline study for the project during the FEIS to store the waste rock and overburden generated. Comparatively, the three WRSFs for Tiriganiaq have less impact on existing waterbodies, smaller footprints, shorter haul distances, and it will be easier to manage the surface runoff and seepage from the facilities

The description presented below is extracted from the Waste Rock Management Plan (AEM, 2019b).

- WRSF1: The facility is located north of Tiriganiaq Pit 1 with an approximate footprint of 41.4 ha and will be located to the north of Tiriganiaq Pit 1. One small shallow pond (Pond A17) is located within the footprint of WRSF1 and will be covered by the facility. WRSF1 will accommodate waste rock produced from Tiriganiaq underground mining and Tiriganiaq Pit 1 and the overburden produced from Tiriganiaq Pit 1. It is anticipated that approximately 10.2 Mt of waste rock and 6.5 Mt of overburden will be placed in WRSF1. From Year -2 (2018) to Year 4 (2023), most of the waste rock produced will be placed at WRSF1, with a portion of waste rock being used for underground backfill and TSF progressive closure cover. All overburden material produced from pre-stripping of Tiriganiaq Pit 1 will be placed at WRSF1. To manage the slope stability of the placed overburden, the overburden will be placed within areas that will be surrounded by waste rock. The WRSF1 is expected to reach its design capacity at the end of Year 4 (2023).
- WRSF2: The facility is located south of Pond H17 (CP1) with an approximate footprint of 20.2 ha. Five small ponds (Ponds A58, H8, H9, H10, and H11) are located within the footprint of WRSF2. Pond A58 will be fully covered and the other four ponds will be partially covered by waste rock. WRSF2 will accommodate most of the waste rock produced from Tiriganiaq Pit 1 from Year 5 (2024) to Year 7 (2026). The WRSF2 is expected to reach its design capacity by the end of Year 7 (2026).
- WRSF3: The facility is located north of Tiriganiaq Pit 2, covering H20 pond basin with an approximate footprint of 22.7 ha. The runoff water from WRSF3 will be collected within Pond H19. WRSF3 will accommodate overburden from pre-stripping of Tiriganiaq Pit 2 and all waste rock produced from Tiriganiaq Pit 2 with some portions of waste rock from Tiriganiaq Pit 1 in Year 4 (2023) and Year 5 (2024). The WRSF3 is expected to reach its design capacity by end of Year 7 (2026).

The design location of the WRSFs took into consideration the environmental, social, economic, and technical aspects of waste rock management which included the following:

- maintain a minimum distance of 100 m between the toe of the WRSFs and the open pits;
- maintain a minimum distance of 20 m from the toe of the WRSFs to haul and access roads;
- maintain a distance between the toe of the WRSFs and adjacent lakes that will ensure stability of the facilities and ensure no effects to lakes not disturbed by mine activities.

Table 5-6 summarizes some of the key physical parameters used for the design of the WRSFs.

Table 5-6 : Design Parameters for Waste Rock Storage Facilities

Design Parameters	WRSF 1	WRSF 2	WRSF 3
Height of the first lift above original ground surface (m)	5		
Side slope of each lift of waste rock	1.3H:1V		
Width of the horizontal offset between the first and second lift (m)	15		
Width of the horizontal offset between two adjacent lifts above the second lift (m)	30	20	20
Maximum crest elevation above the sea level (m)	115	102	100
Average overall side slopes of each WRSFs (from bottom toe of first lift to top crest of final lift)	2.5H:1V to 3.4H:1V	2.2H:1V to 2.4H:1V	2.3H:1V to 2.5H:1V
Side slope for each lift of overburden	1.6H:1V		
Internal overburden setback distance from toe of WRSF for the first lift (m)	120	80	88
Assumed waste rock in place bulk density (t/m^3)	1.88		
Assumed overburden in place bulk density (t/m^3)	1.62		

Source: (AEM, 2019b)

Seepage and runoff water from the WRSFs and the temporary overburden stockpile will be managed by a series of water diversion channels, water retention dikes/berms, and water collection ponds. If the water quality does not meet the discharge criteria, the collected contact water will be treated by the appropriate water treatment system prior to discharge to the outside environment. The contact water quality and the water management structures for the WRSFs will be monitored and assessed according to the Type A Water Licence 2AM-MEL1631 during each stage of the mine life, including construction, operations, closure, and post-closure (AEM, 2019b).

The waste rock will be managed as one mixed pile; the management plan for waste rock considers the overall leachability of the mixed pile and aims to limit arsenic leaching during operation and post closure. Predictive water quality modelling also considered the overall leachability of waste rock and results show that the mine effluent will meet MDMER during operation, and CCME-WQG, Canadian Council of Ministers of the Environment water quality guidelines, or site-specific water quality objectives post-closure. No arsenic treatment is anticipated to be needed (AEM, 2019b).

The WRSFs were designed to minimize the impact on the environment and consider both the physical and geochemical stability of the stored waste rock and overburden. Slope stability analyses for the WRSFs were carried out during the feasibility study. The results of the stability analysis indicate that the calculated minimum factors of safety for the WRSFs meet or exceed the acceptable factors of safety. Thermal analyses were conducted to estimate the thermal regime of the WRSFs and foundations during mine operations and after closure. The results indicate that material placed in the winter period will likely stay in a frozen condition while the material placed in the summer period will take two to ten years to freeze back. All three WRSFs were designed in consideration of both frozen and unfrozen foundation conditions. Thus, the stability of the facilities do not rely on the presence of permafrost foundations even though permafrost foundation conditions

are expected to be present over long term based on the geothermal analyses that consider long-term climate change, waste rock placement schedule, and annual thaw of the active layer. The permafrost development within the WRSFs will provide additional benefits (i.e., more physical stable and less seepage water) during operation and closure of WRSFs (AEM, 2019b).

5.2.5.2 Pre-Disturbance, Existing, and Final Site Conditions

Pre-disturbance conditions are based on baseline data collection programs presented in the Meliadine FEIS (AEM, 2014). The pre-disturbance site conditions are also summarized in Section 3.0 of this plan.

The WRSF 1 is currently in operation. From Year -2 (2018) to Year 4 (2023), most of the waste rock produced will be placed at WRSF1. WRSF2 will accommodate most of the waste rock produced from Tiriganiaq Pit 1 from Year 5 (2024) to Year 7 (2026). WRSF3 will accommodate overburden from pre-stripping of Tiriganiaq Pit 2 and all waste rock produced from Tiriganiaq Pit 2 with some portions of waste rock from Tiriganiaq Pit 1 in Year 4 (2023) and Year 5 (2024).

Geochemical testing indicates that the waste rock and overburden from the Meliadine Mine is non-potentially acid generating (NPAG) and non-metal leaching (NML). No cover is planned for the WRSFs.

5.2.5.3 Closure Objectives and Criteria

The closure relevant objectives and closure criteria for the Meliadine waste rock storage facilities are listed in Table 5-7, along with the specific actions and monitoring associated (modified from AANDC/ MVLWB 2013 and AEM, 2015a).

Table 5-7: Closure Objectives and Criteria – Rock Storage Facilities

Closure Objectives	Closure Criteria	Action / Measurements
The pile is physically and geotechnically stable for human and wildlife safety in the long-term: minimize erosion, thaw settlement, slope failure, collapse, or the release of contaminants or sediments	The WRSFs are designed for closure and will account for seismic and permafrost conditions	Ensure proper design and stable slopes Physical and geotechnical inspection by a qualified engineer Thermal monitoring
Build to blend in with current topography, be compatible with wildlife use, and/or meet future land use targets	Limit WRSFs elevation to blend into local topography WRSFs at post-closure will not compromise wildlife safety and safe land use	Ensure proper design and stable slopes Physical and geotechnical inspection by a qualified engineer
Generation of poor water quality has been minimized, including ARD/ML Confirm runoff and seepage from the WRSFs meet water licence criteria Surface runoff and seepage water quality is safe for humans and wildlife	The runoff and seepage from the WRSFs will continue to be collected in the designated collection ponds and pumped to CP1 for treatment in the WTP, as per operational practices, until monitoring results demonstrate that water quality conditions from the WRSFs are acceptable for direct discharge	The runoff and seepage from the WRSFs will continue to be collected and monitored as needed and transferred to CP1 for treatment Routine water quality monitoring and sampling Physical inspection, thermal monitoring

Closure Objectives	Closure Criteria	Action / Measurements
Dust levels are safe for people, vegetation, aquatic life, and wildlife in the long-term	Best management practices for controlling dust during active reclamation	Implement best management practices as during operation Routine air quality monitoring
Consider community land use expectations and traditional knowledge in the closure planning	Community engagement will continue to be implemented	Public engagement

Other recommendations are presented in the Code of Practice for Metal Mines as follows (adapted from EC, 2009):

- Carry out detailed inspections and assessments of waste rock piles. The objective of these inspections and assessments is to evaluate the actual performance against design projections related to anticipate post-closure conditions. (R524);
- Conduct a comprehensive risk assessment for mine closure to evaluate the long-term risks associated with possible failure modes for waste rock piles. Identify possible impacts and critical parameters and develop control strategies. If warranted, implement a long-term monitoring plan. (R525/526);
- Re-evaluate, and revise as necessary, plans for the management of waste rock to prevent, control and treat metal leaching and acidic drainage to ensure that they are consistent with the objectives and plans for mine closure and post closure. If warranted, implement a long-term site-specific monitoring program (R527/538).

5.2.5.4 Consideration of Closure Options and Selection of Closure Activities

Considerations for rock storage facilities closure are provided by the AANDC/MVLWB (AANDC/MVLWB, 2013). Closure activities for the WRSFs were selected in consideration of the closure aspects listed below, related to mine design stage, closure and post-closure periods.

- Construct the WRSFs in lifts with slopes where individual lifts can be set back to provide long-term stability;
- Controlled runoff water by having sediment collection ponds where required for use during operation and possibly for the initial portion of the closure phase until seepage water quality is proven to be acceptable and stable;
- Design and operate the WRSF during operation to promote permafrost aggradation.

All three WRSFs were designed to be stable in operation and closure, in consideration of both frozen and unfrozen foundation conditions. Thus, the stability of the facilities does not rely on the presence of permafrost foundations even though permafrost foundation conditions are expected to be present over long term based on the geothermal analyses that consider long-term climate change, waste rock placement schedule, and annual thaw of the active layer.

5.2.5.5 Engineering Work Associated with Selected Closure Activity

The description of the closure activities for the WRSFs as presented herein is taken from the Mine Waste Management Plan (AEM, 2019b). Reclamation of the WRSFs will use currently accepted management practices and appropriate mine closure techniques that will comply with accepted protocols and standards. Geochemical testing indicates that the waste rock and overburden from the Project is non-potentially acid generating (NPAG) and non-metal leaching (NML). Kinetic tests completed on all waste rock type and at various scales show that drainage water quality is expected to meet MDMER monthly mean effluent limits, including results for arsenic. Therefore, a closure cover system is not proposed for the WRSFs.

The WRSFs were designed for long-term stability and no additional re-grading will be required at closure. Reprofiling could be required if waste rock material is excavated for reclamation work such as TSF cover or rock berms around the open pits.

The contact water management system for the WRSFs will remain in place until mine closure activities are completed and that monitoring results demonstrate that water quality conditions from the WRSFs are acceptable for discharge to the environment with no further treatment required. Once water quality meets the discharge criteria, diversion channels/berms/dikes will be decommissioned to allow the surface runoff and seepage water from the WRSFs to naturally flow to the outside environment.

Dust from the WRSFs is anticipated to be a minor issue during closure. Waste rock produced at the site will generally be large in size, and not susceptible to wind erosion. The overburden materials are relatively high in moisture content and are expected to be completely frozen at the time of closure. The need for additional dust control measures will be evaluated and implemented during operations and closure, as required (AEM, 2015a).

5.2.5.6 Predicted Residual Effects

The following residual effects are predicted at the WRSFs after reclamation:

- The WRSFs will be permanent features on the landscape. The vegetation communities which formerly occupied the areas will be permanently lost but it is expected that some of the native community will re-vegetate the RSFs cover surface over time (AEM, 2015a);
- No significant adverse impact on the continued opportunity for traditional and non-traditional use of wildlife in the region is anticipated with the closure of the WRSFs (AEM, 2015a);
- Runoff from the WRSFs will eventually be discharged in the receiving environment, once water quality demonstrates that water flowing from the facilities is acceptable for direct release. It is predicted that concentrations will meet discharge criteria.

5.2.5.7 Uncertainties

The thermal conditions within the WRSFs will depend on the actual waste placement plan and schedule, initial waste temperatures when placed, and thermal conditions of the original ground before the waste materials are placed. Therefore, thermistors will be installed in each WRSF to monitor the rate of freeze back and permafrost development progress in the facilities during the operations stage (AEM, 2015a). Thermal monitoring will be done during operation and closure.

The WRSFs will be allowed to naturally re-vegetate. It is anticipated that the native lichen community will naturally re-vegetate the surface over time. As part of a research project at Meliadine, re-vegetation studies will be completed to assess the potential for vegetation on rockfill surfaces.

5.2.5.8 Post-Closure Monitoring, Maintenance, and Reporting

The overall post-closure monitoring and maintenance program for the Meliadine Mine are discussed in Section 9.0 along with the general reporting requirements. The following presents the relevant post-closure monitoring and maintenance strategies for the WRSFs as presented by AANDC/MVLWB (2013):

- Periodic inspections will be performed by a geotechnical engineer to visually assess stability and performance of the WRSFs;
- Ground conditions in the WRSFs will be monitored to confirm permafrost conditions are being established as predicted;
- Thermistor data will be monitored where required to determine thermal conditions within the WRSFs to confirm predicted permafrost aggradation/encapsulation and to verify that the thickness of the active zone is less than the design thickness of the cover;
- Water quality from the WRSFs will be monitored to confirm that drainage is performing as predicted and is not adversely affecting the environment;
- Any seepage areas from the toe of the WRSFs will be identified and monitored.

5.2.5.9 Contingencies

The contact water management system for the WRSFs will remain in place until mine closure activities are completed, and monitoring results demonstrate that water quality conditions from the WRSFs are acceptable for the discharge of all contact water to the environment with no further treatment required. Treatment systems will remain on site until suitable water quality is reached.

5.2.6 Tailings Storage Facilities

5.2.6.1 Description of the components

The tailings storage facility at Meliadine consists in a dry stack tailings pile. Dry stack tailings produced in the mill at Meliadine will be dewatered to a solids content of approximately 85% and will be trucked to the TSF with haul trucks. The tailings will then be spread out and compacted into thin lifts using a dozer and vibratory compactor.

The description presented below is extracted from the Waste Rock Management Plan (AEM, 2019b).

The TSF is located on high ground west of the proposed mill and east of Lake B7, as shown in Figure 4-4. The direct distance from the mill to the tailings stack ranges from 400 to 800 m. The minimum setback distance from the edge of Lake B7 is approximately 200 m. Except for the southeast corner of the facility, which encompasses the top of the northern tip of the Tiriganiaq esker, the ground surface of the footprint is generally relatively flat. Straddling two watersheds, the majority of the TSF falls within Watershed B and gently slopes (less than 2%) to the southwest towards Lake B7. A portion of the eastern side of the footprint lies within Watershed B and slopes towards the CP1 area. No major waterbodies are within the footprint, although a few shallow localized depressions hold small volumes of water on a seasonal basis. Polygonal

or linear topographic expressions typically associated with the presence of vertical ice wedges are not readily apparent (AEM, 2019b).

The TSF is designed to accommodate approximately 10.9 Mt of tailings. The two cells system (Cell 1 and Cell 2) is designed to limit dust generation, control tailings surface erosion, and to facilitate the progressive reclamation and closure of the TSF. As the tailings reach final elevation, the tailings will be progressively encapsulated with either waste rock or a layered combination of waste rock and overburden (AEM, 2019b).

The properties of the tailings and TSF operation parameters relevant to the design of the TSF are presented in Table 5-8.

Table 5-8 : Design Parameters for the Tailings Storage Facilities Operations

Parameters	Value
Mine design life	8 years
Mill production	3,000 tpd in Years -1 to 3 5,000 tpd in Years 4 to 8
Ore processed	14.9 Mt
Tailings to TSF as dry stack	10.9 Mt (or 80 % of total tailings)
Tailings backfilled to underground mine	4.0 Mt (or 20 % of total tailings)
Average specific gravity of tailings	2.83
Tailings solid content to TSF	85 % w/w (weight percentage)
Moisture content of tailings to TSF	17.6 % (by mass)
Minimum target dry density of compacted tailings	1.65 t/m^3
Average height of TSF over original ground surface	33 m
Side slope for lower placed tailings (or below elevation 80.2 m)	4H:1V
Side slope for upper placed tailings (or above elevation 80.2 m)	3H:1V
Slope of the final tailings surface at crest	4%
Final top tailings surface area (Cell 1)	46,359 m^2
Final bottom tailings surface area (Cell 1)	179,741 m^2
Final top tailings surface area (Cell 2)	84,655 m^2
Final bottom tailings surface area (Cell 2)	149,632 m^2
TSF storage capacity	10.9 Mt (6.61 Mm^3)

Source: (AEM, 2019b)

Commissioning of the process plant started near the end 2018. The production schedule, quantities, and distribution of tailings by year are presented in Table 5-9. Approximately 14.9 Mt of tailings will be produced over an 8.5-year period. Approximately 10.9 Mt or 73% of the tailings will be deposited within the TSF and the remaining 4.0 Mt or 27% will be used as underground cemented paste backfill. Based on a tailings dry density of 1.65 t/m^3, the TSF will have a storage volume of 6.61 Mm^3 (AEM, 2019b).

Table 5-9 : Schedule, Quantities and Distribution of Tailings per Year

Year	Mine Year	Tailings Solids from Mill (t)	Tailings Solids to be Used as Underground Backfill (t)	Tailings Solids to be Placed in Dry Stacked TSF (t)
2019	Yr -1	962,543	380,517	582,026
2020	Yr 1	1,328,999	443,962	885,037
2021	Yr 2	1,368,750	316,143	1,052,607
2022	Yr 3	1,368,750	371,743	997,007
2023	Yr 4	2,007,500	518,249	1,489,251
2024	Yr 5	2,196,000	485,926	1,710,074
2025	Yr 6	2,190,000	500,187	1,689,813
2026	Yr 7	2,190,000	521,941	1,668,059
2027	Yr 8	1,320,570	474,318	846,252
Total		**14,933,113**	**4,012,986**	**10,920,127**

Source: (AEM, 2019b).

A starter waste rock berm is initially placed along the outside perimeter to contain the initial lifts of the tailings; the berm will become a part of the closure cover. Additional lifts of waste rock (with a maximum lift thickness of 1 m) will be placed as the tailings surface is brought up as erosion and thermal protection. Safety berms will be placed on each lift of the waste rock. The safety berm will also help to reduce dust generation from the tailings surface (AEM, 2019b).

Tailings placement started in Cell 1 in the first quarter of Year -1 (2019). The dewatered tailings is hauled to the TSF Cell 1 with haul trucks, end dumped, and bladed into thin lifts using a dozer. Thereafter, the tailings lifts are compacted using a vibratory drum roller. This compaction is intended to promote runoff, reduce the potential for oxygen ingress and water infiltration, and maintain geotechnical stability. The thickness of each lift is approximately 0.3 m. Based on ground temperatures and climate data for the Project site, it is anticipated that the TSF will freeze back in the long term. The TSF is designed to minimize the impact to the environment and the design does not rely on freeze back of the tailings to meet the design intent of the structure. However, the freeze-back of the TSF and the foundations will provide additional benefits such as increasing stability and minimizing seepage from the TSF during operation and closure of TSF. The stability analysis of the TSF indicates that the calculated minimum factors of safety meet or exceed the acceptable factors of safety (AEM, 2019b).

Based on the tailings production schedule, Cell 1 will reach its design capacity by Year 5 (2024) at an average height of 33 m above the original ground. Cell 2 will start operation from Year 4 (2023) and will reach design capacity in Year 8 (2027) (AEM, 2019b).

Site contact water from the TSF is collected by the perimeter water management system located to the northwest and south of the TSF. The contact water quality and the water management structures for the TSF will be monitored and assessed according to the Type A Water License 2AM-MEL1631 during operation, closure and post-closure periods.

5.2.6.2 Pre-Disturbance, Existing, and Final Site Conditions

Pre-disturbance conditions are based on baseline data collection programs presented in the Meliadine FEIS (AEM, 2014). The pre-disturbance site conditions are also summarized in Section 3.0 of this plan.

In 2018, no tailings were sent to the tailings storage facility. In 2019, 962 543 tonnes of solid tailings are planned to be generated from the Mill; 380 517 tonnes of solid tailings will be used as underground backfill and 582 026 tonnes will be placed in the dry stacked TSF (AEM, 2019a).

As the tailings reach final elevation, the tailings will be progressively encapsulated with either waste rock or a layered combination of waste rock and overburden.

5.2.6.3 Closure Objectives and Criteria

The closure relevant objectives and closure criteria for the Meliadine TSF are listed in Table 5-10, along with the specific actions and monitoring associated (modified from AANDC/ MVLWB 2013 and AEM, 2015a).

Table 5-10: Closure Objectives and Criteria – Tailings Storage Facilities

Closure Objectives	Closure Criteria	Action / Measurements
Remnant embankments and surfaces of tailings containment areas are physically and geotechnically stable in the long-term	The TSF is designed for closure and will account for seismic and permafrost conditions A cover is placed during operation and closure for dust control (wind erosion), stability and water infiltration	Place cover in progressive reclamation and closure Physical /geotechnical inspection by a qualified engineer Monitoring
Surface runoff and seepage water quality is safe for humans and wildlife Ensure runoff and seepage is collected	Ensure runoff and seepage from the TSF is collected and meet water licence criteria for direct discharge	The runoff and seepage from the TSF will continue to be collected as needed and monitored as per operational practices, and until monitoring results demonstrate that water quality is acceptable for direct discharge Routine water quality monitoring and sampling Physical inspection
Ensure the TSF is safe for monitoring and physical inspections	TSF at post-closure will not compromise people's health	Ensure stability of the TSF Routine monitoring and physical inspection
Control dust generation from active reclamation activities Dust levels are safe for people, vegetation, aquatic life, and wildlife in the long-term	Best management practices for controlling dust, fugitive and exhaust emissions during active reclamation	Implement best management practices Routine air quality monitoring

Closure Objectives	Closure Criteria	Action / Measurements
Be compatible with wildlife use, and/or meet future land use targets	TSF at post-closure will not compromise wildlife safety TSF will be covered	Place cover in progressive reclamation and closure Physical /geotechnical inspection by a qualified engineer Routine monitoring and physical inspection
Consider community land use expectations and traditional knowledge in the closure planning	Community engagement will continue to be implemented	Public engagement

Other recommendations are presented in the Code of Practice for Metal Mines as follows (adapted from EC, 2009):

- Carry out detailed inspections and assessments of Tailings Storage Facilities. The objective of these inspections and assessments is to evaluate the actual performance against design projections related to anticipate post-closure conditions (R524);
- Conduct a comprehensive risk assessment for mine closure to evaluate the long-term risks associated with possible failure modes for Tailings Storage Facilities. Identify possible impacts and critical parameters and develop control strategies (R525). If warranted, implement a long-term monitoring plan (R526);
- Re-evaluate and revise as necessary plans for management of tailings to prevent; and control and treat metal leaching and acidic drainage to ensure that they are consistent with the objectives and plans for mine closure and post closure (R527). If warranted, implement a long-term site-specific monitoring program (R528).
- At all mines that exist in permafrost conditions, downstream slopes of tailings containment structures should be revegetated (R529).

5.2.6.4 Consideration of Closure Options and Selection of Closure Activities

Considerations for the TSF closure are provided by the AANDC/MVLWB (AANDC/MVLWB, 2013). Closure activities for the TSF were selected in consideration of the closure aspects listed below, related to mine design stage, closure and post-closure periods.

- Construct a cover system to prevent surface erosion and create a stable landform in the long-term;
- Collect water that does not meet the discharge criteria for treatment.

The closure options considered different approaches to achieving a stable configuration for the TSF. Placing the cover in a progressive manner is considered the most appropriate approach to achieving a stable configuration for the TSF. The runoff and seepage from the TSF will continue to be collected as needed and monitored as per operational practices. Water treatment facilities will remain on site during closure if required, until water quality meets discharge criteria.

5.2.6.5 Engineering Work Associated with Selected Closure Activity

The description of the TSF reclamation presented below is extracted from the Waste Rock Management Plan (AEM, 2019b).

Mine closure and reclamation of the TSF will utilize currently accepted management practices and appropriate mine closure techniques that will comply with accepted protocols and standards. Results of geochemical characterization indicates that the tailings produced at the Mine are NPAG and ML is not predicted to be an issue as there will be limited seepage from the tailings porewater at closure (AEM, 2019b).

The closure plan for the TSF is to progressively place an engineered cover over the tailings surface as the tailings deposit reaches the ultimate elevation. The proposed closure cover includes:

- A minimum thicknesses of 4.5 m waste rock cover over the lower toe of the final tailings side slopes and a minimum thicknesses of 4.0 m waste rock cover over the upper side slopes, placed during operation along with tailings deposition;
- A minimum thicknesses of 2.5 m waste rock cover over 0.5 m thick select overburden till fill over the top surface of final tailings. The top closure cover material will be placed when each cell reaches its operational capacity and sloped 4% to discourage ponding and surface infiltration.

Waste rock cover will consist of 600 mm minus NPAG waste rock. Select overburden till will be placed and compacted over the top surface of the tailings. The till material is intended to reduce surface infiltration and will meet the following specifications:

- Inorganic, sandy silt or silty sand with a fines content of 20% to 60% and maximum particle size of 300 mm;
- Placed in an unfrozen condition and have a minimum thickness of 0.5 m.

About 0.1 Mt of selected ice-poor overburden will be stored in a temporary overburden stockpile as TSF closure cover material. This temporary overburden stockpile is located at the east side of the TSF and has a footprint of approximately 1.12 ha.

The contact water management system for the TSF will remain in place until mine closure activities are completed and monitoring results demonstrate that water quality conditions from the TSF are acceptable for the discharge of all contact water to the environment with no further treatment required. Once the water quality meets the discharge criteria established through the water licensing process, the TSF water management infrastructure will be decommissioned to allow the water to naturally flow to the outside environment (AEM, 2019b).

An adaptive closure strategy has been adopted for the Meliadine Mine. The preliminary closure cover design adopted for the TSF at this stage will be further evaluated and updated based on the TSF performance monitoring, water quality monitoring and evaluation, and the overall mine closure plan. The final closure cover design for the TSF will be developed before mine closure (AEM, 2019b).

The placement of the engineered cover will also help prevent dust production. It is anticipated that the native lichen community will naturally re-vegetate the TSF cover over time (AEM, 2015a).

5.2.6.6 Predicted Residual Effects

The following residual effects are predicted at the TSF after reclamation (AEM, 2015a):

- The TSF will be a permanent feature on the landscape. The vegetation communities which formerly occupied the areas will be permanently lost but it is expected that some of the native community will re-vegetate the TSF cover surface over time;
- No significant adverse impact on the continued opportunity for traditional and non-traditional use of wildlife in the region is anticipated with the closure of the TSF.

5.2.6.7 Uncertainties

The main uncertainties for the closure planning of the TSF are related to the cover design, the water quality from the TSF, the permafrost development and the re-vegetation.

As mentioned in the Water Management Plan (AEM, 2019c), according to the water quality model predictions, during operation, CP3 arsenic concentration may exceed MDMER on occasion if precipitation events or the freshet flows generate drainage from the TSF (Golder, 2012). The main source of arsenic in CP3 is predicted to be from residual process water that is assumed to be present in the filtered tailings. Arsenic transfer from process water to CP3 water will be minimized by effective dewatering of the tailings prior to placement into the TSF, and from freezing of the tailings in the TSF. Water from CP3 will be pumped to CP1 and dissolved arsenic concentration in CP1 is predicted to meet the MDMER monthly average maximum concentration. Long-term, post-closure arsenic concentrations in CP3 could slightly exceed the SSWQO post-closure, a criterion that is conservatively protective of the receiving aquatic environment (Golder, 2013). Concentrations that exceed predictions are minor, much less than the mixing capacity in the receiving environment. These arsenic concentrations (Golder, 2013) are within the tolerance levels that have been deemed non deleterious by Environment Canada for the Mine.

The cover design will consider infiltration and potential metal loadings in surface runoff. If necessary, water quality analysis through hydrogeological (groundwater) modelling, unsaturated flow modelling in the cover layer, and field trials will be undertaken to assess the water quality from the TSF at closure (AEM, 2015a). The water quality modelling will be completed during operations and will be considered in the design of the final closure concept for the TSF.

The thermal conditions within the TSF will depend on the actual tailings placement plan and schedule, tailings temperatures when placed, and thermal conditions of the original ground before the tailings are placed. Based on ground temperatures and climate data for the Mine site, it is anticipated that the TSF will freeze back in the long term. Tailings placement strategies will be adopted during mine operation to promote freeze back. Thermistor cables will be installed in the TSF to monitor the permafrost development progress within the facility during the operations stage (AEM, 2019b).

It is anticipated that the native lichen community will naturally re-vegetate the TSF cover over time. As part of a research project at Meliadine, re-vegetation studies will be completed to assess the potential for vegetation on the TSF cover surface.

5.2.6.8 Post-Closure Monitoring, Maintenance, and Reporting

The overall post-closure monitoring and maintenance program for the Meliadine Mine are discussed in Section 9.0 along with the general reporting requirements. The following presents the relevant post-closure monitoring and maintenance strategies for the WRSFs as presented by AANDC/MVLWB (2013):

- Periodic inspections will be performed by a geotechnical engineer to visually assess stability and performance of the TSF;
- Ground conditions in the TSF will be monitored to confirm permafrost conditions are being established as predicted;
- Thermistor data will be monitored to determine thermal conditions within the TSF to confirm predicted permafrost aggradation;
- Water quality from controlled discharge points around the TSF will be monitored to confirm that drainage is performing as predicted and is not adversely affecting the environment; and
- Any seepage areas from the toe of the TSF will be identified and monitored.

5.2.6.9 Contingencies

The contact water management system for the TSF will remain in place until mine closure activities are completed and monitoring results demonstrate that water quality conditions from the TSF are acceptable for the discharge of all contact water to the environment with no further treatment required. Treatment systems will remain on site until suitable water quality is reached.

5.2.7 Water Management Structures

5.2.7.1 Description of the components

As presented in the Water Management Plan (AEM, 2019c), a network of berms, dikes, containment ponds, channels, culverts and sumps are in place and maintained to facilitate water management. The Figure 4-4 shows a general view of the major components listed below.

- Water containments ponds and associated dikes or berms: Five water containment ponds (CP1, CP3, CP4, CP5, and CP6) and their associated dikes or thermal berms (D-CP1, Berm-CP3, Berm-CP4, D-CP5, and D-CP6) are included in the water management system to manage contact water. Three water containment ponds (CP1, CP3, CP4 and CP5) have been constructed to date as part of the water management infrastructure. Two more water containment ponds (CP6) will be constructed in 2023, respectively. Table 5-11 presents the locations and the required operational period of the containment ponds. Table 5-12 and 5-13 presents the design parameters of the ponds. Water retention dikes D-CP1, D-CP5, and future D-CP6 have been designed as a zoned earth fill dam with a geomembrane liner keyed into the expected permafrost foundation to limit the seepage through the dike and its foundation.

Table 5-11 : Location of Containment Pond and Required Operation Periods

Containment Pond	Relative Location	Required Operation Period
CP1	Pond H17	Year 2017 to Mine Closure
CP3	North of Lake B7 and southwest of TSF	Year 2019 to Mine Closure
CP4	Southeast of Lake B7 and south of WRSF1	Year 2019 to Mine Closure
CP5	North of Tiriganiaq Pit 2	Year 2017 to Mine Closure
CP6	Pond H19 and north of WRSF3	Year 2023 to Mine Closure

Source: AEM, 2019c

Table 5-12 : Design Parameters for CP1, CP5 and CP6

Pond	CP1	CP5	CP6
Pond Volume for Water Elevation at Projected Maximum Pond Operating Water Elevation under Normal Operating Conditions and Mean Precipitations Years (m^3)	742,075	46,674	19,154
Estimated Maximum Operating Water Elevation (m)	66.2	66.0	63.9
Dike for Pond	D-CP1	D-CP5	D-CP6
Design Crest Elevation of Dike Containment Element (liner system) (m)	66.50	66.30	64.30
Pond volume for Water Elevation at Design Crest Elevation of Dike Containment Element (m^3)	778,502	66,231	49,627

Source: AEM, 2019c

Table 5-13 : Design Parameters for CP3 and CP4

Pond	CP3	CP4
Elevated Pond Bottom Elevation (m)	56.0	56.0
Estimated Maximum Water Elevation during IDF (m)	63.0	63.0
Pond Volume for Water Elevation at Estimated Maximum Water Elevation during IDF (m^3)	28,800	35,093
Pond Surface Area at Estimated Maximum Water Elevation during IDF (m^2)	6,583	8,805
Thermal Berm for Pond	Berm-CP3	Berm-CP4

Source: AEM, 2019c

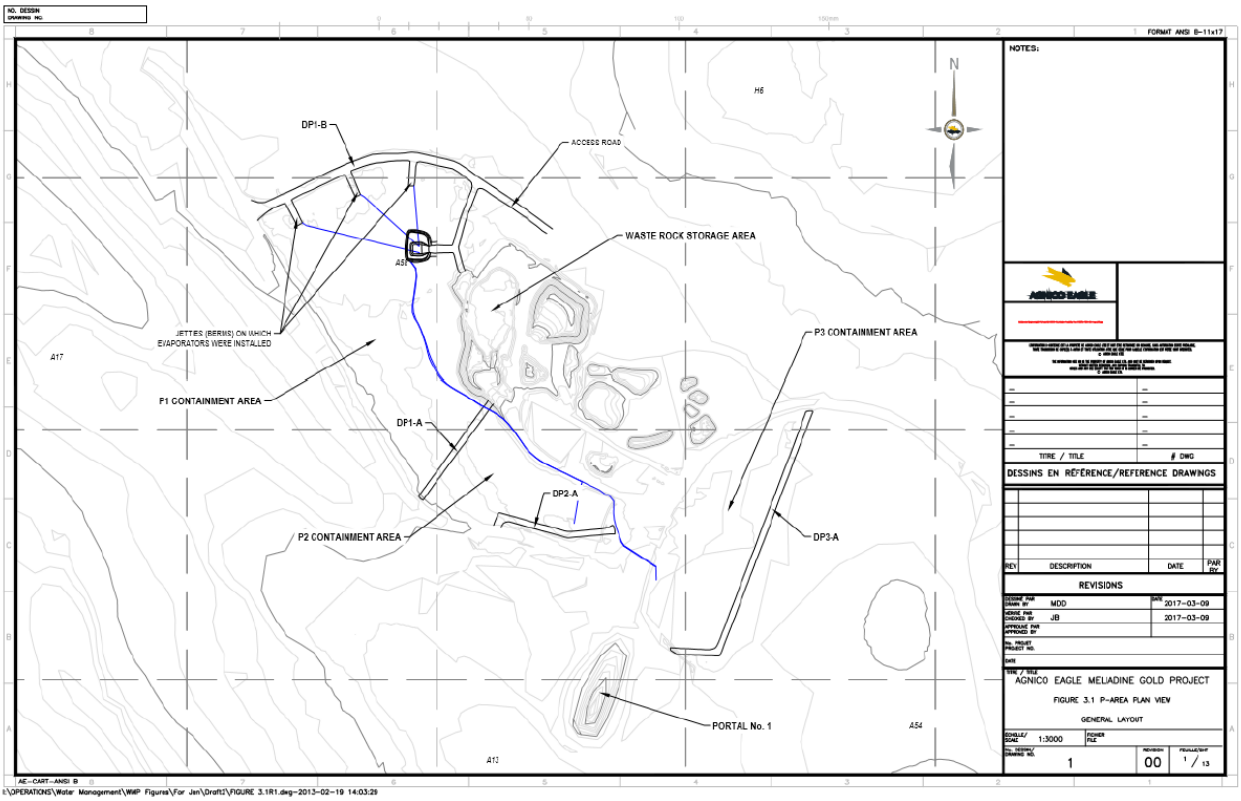
- P-Area: The P-area includes three P-Area containment ponds (P1, P2, and P3,) four containment berms (DP1-A, DP1-B, DP2-A, and DP3-A) and five evaporators. It is part of the surface water management system dedicated to saline water. The total storage capacity of the P-Area ponds is 46,041 m^3. P1 is divided by a berm; P1-A (6,131.8 m^3) is the southern section of P1 and P1-B (14,649 m^3) is the northern section. P2 is adjacent and located south of P1-A. P3 was constructed east of the existing south access road, with the primary purpose of collecting seepage originating from the P2 confining berm and its abutments. A pumping station was installed to collect and pump any collected water from P3 to P1. P1, P2 and P3 are contained by berms DP1-A, DP1-B, DP2-A, and DP3-A. Five evaporators have been installed on DP1-B, to accommodate the quantity of excess saline water before saline water treatment options and disposal plans have been implemented. In Q2 of 2019, SP3 was installed within southwestern portion of P3. SP3 acts as the final treatment pond for saline water that is to be discharged to sea. Table 5-14 summarizes the as-built capacities for the P-Area ponds and Figure 5-3 illustrates the P-Area plan view and general location. Eventually, the P-Area will be covered by WRSF2.

Table 5-14 : As-Built Capacity for P-Area Ponds

Pond	P1	P2	P3
As-Built Capacity (m^3)	20,781	6,828	18,432
Maximum Design Water Elevation (m)	68.5	67.5	67.0
Total P-Area Capacity (m^3)	46,041		

Source: AEM, 2019c

Figure 5-3 : P-Area plan view and general location



Source: AEM, 2019c

- Saline ponds: The Saline Pond (SP1) was constructed in Q3 2016 to accommodate excess saline water from underground. The Saline Pond is located east of P3 and north of CP5, as presented on Figure 4-4. Approximately 9,000 m^3 capacity should be available to accommodate precipitation that may accumulate throughout winter and at freshet. The Project required a second saline water storage pond (SP2). SP2 will be temporary in nature and is constructed in bedrock within the footprint of Tiriganiaq Pit 2. Saline Pond 2 is designed to have a minimum storage volume of 75,000 m^3. Groundwater will be pumped to SP2 where it may then be treated for TDS removal at the saline water treatment plant (SWTP). Water stored in SP2 will also contribute to saline water being discharged to sea. The SP3 arrangement is described in the P-Area section above.
- Water diversion channels and berms: Eight (8) water diversion channels (Channel 1 to Channel 8) are part of the water management system. Four (4) water diversion channels (Channels 1, 2, 3, and 5) have been constructed and four (4) remaining channels (Channels 4, 6, 7, and 8) have yet to be constructed. Channels 4, 7, and 8 are planned to be constructed respectively in Q2 of 2019, Q3 of 2019 and Q3 of 2019. Construction of Channel 6 is tentative based on future water management strategies downstream of WRSF2. The as-built and design parameters for the water diversion channels are presented in Table 5-15. Three diversion berms (Berm 1, Berm 2, and Berm 3) can manage or contain water overflowing the channels.

Table 5-15 : As-Built and Design Parameters for Channels

Item	Channel							
	1 (As-Built)	2 (As-Built)	3	4	5 (As-Built)	6	7	8
Approximate Total Length (m)	528	269.5	619	710	429[1]	69	214	315
Bottom Width (m)	3	1.257	1 or 2[2]	1 or 2[2]	2.3 to 2.9	1	1	1
Side Slopes	3H:1V[3]	1.82H:1V	3H:1V	3H:1V	1.9H:1V	3H:1V	3H:1V	3H:1V
Rip-rap Thickness (m)	0.3 to 0.5	0.277	0.3	0.3	0.2	0.3	0.3	0.3
Minimum Bottom Slope Gradient (%)	0.20	0.30[1]	0.17	0.13	0.17[1]	0.44	0.42	0.38

[1] As-built parameter values not available; value displayed is from design.

[2] 1 m bottom width for first 100 m upstream section, and 2 m bottom wide for the remaining channel section.

[3] Except from Sta. 0+050 to 0+130 where to side slope is 2H:1V.

Source: AEM, 2019c

- Water Treatment Plants: Contact water will be treated (if necessary) to meet Water Licence requirements prior to being discharged to the environment. Water for potable use is also treated.

  An effluent water treatment plant (EWTP): Approximately 642,521m^3 of contact water from CP1 was treated and discharged from the EWTP during 2018. Based on the anticipated water quality and water quantity, the EWTP will be continuing to be used to remove TSS at CP1 in 2019. The volume of water requiring treatment for TSS removal and discharge will increase to a maximum

of 798,000 m^3 in 2022 and then decrease to 673,000 m^3 during the final year of the life of mine (2027). Based on the maximum flow rate of the Actiflo® system model ACP-600R, the EWTP has a maximum capacity of 520 m^3/h (nominal flow). The system will have the capacity to treat the anticipated discharge from CP1 for the life of the mine.

A saline water treatment plant (SWTP): A Saline Water Treatment Plant (SWTP) was constructed in 2018 and is planned to be in full operation during 2019. The system consists of two evaporators crystallizers (SaltMakers) and a chemical RO unit that will be used to treat groundwater. The purpose of the SWTP is to remove total dissolved solids (TDS), which is also referred to as salinity, in underground saline water. The SWTP is in a dome approximately 50 m to the southeast of Portal 1. The SWTP will be used to treat water from the underground mine, P-Area or from the saline ponds. The SWTP will remove excessive total suspended solids (TSS), calcium chloride ($CaCl_2$), sodium chloride (NaCl), metals, phosphorous (P), and nitrogen compounds from the influent saline water. Effluent from the SWTP is intended to be discharged to CP1.

A reverse osmosis (RO) treatment plant: Beginning July 2018, water stored in pond CP5 was treated through a Reverse Osmosis (RO) system and then pumped through the EWTP for treatment (prior to discharge into Meliadine Lake).

A sewage treatment plant (STP): Wastewater from the accommodation complex and from satellite sewage tanks is treated in the STP before being directed to CP1.

A potable water treatment plant (WTP): Freshwater from Meliadine Lake will be treated in the WTP before being directed to the camp areas for potable (domestic) water uses. The design flow rate for freshwater for the main camp and accommodations is 216 m^3/day.

- A freshwater intake: Freshwater usage includes potable uses, fire suppression, make-up water for the mill, and other operational requirements, such as drilling water, dust suppression, batch plant use, and use at the wash bay. The main freshwater intake and its causeway are located northeast of the industrial pad in Meliadine Lake, as shown on Figure 4-4 and an additional freshwater intake pump is located at Lake A8. The intakes consist of vertical filtration wells fitted with vertical turbine pumps that supply water on demand. Both intake pipes are fitted with a screen.
- An effluent diffuser located in Meliadine Lake and a saline effluent diffuser at Melvin Bay.
- Sixteen water passage culverts to convey water (Culverts 1 to 8, 10, 11, 13, 14 to 16, 18, 19).
- A network of surface pumps and pipelines.

5.2.7.2 Pre-Disturbance, Existing, and Final Site Conditions

Pre-disturbance conditions are based on baseline data collection programs presented in the Meliadine FEIS (AEM, 2014). The pre-disturbance site conditions are also summarized in Section 3.0 of this plan.

The water management components are required during the operation phase of the Meliadine Mine. The water management objectives are to minimize potential impacts to the quantity and quality of surface water at the Mine. Water management structures are in place or will be constructed as needed during operation to contain and manage the contact water from the areas affected by mining activities. All mining components have been located to avoid or minimize impact on the local environment to the extent possible.

All water management facilities will be decommissioned at different stages of closure, the open pits will be flooded and natural drainage will be restored as much as possible.

5.2.7.3 Closure Objectives and Criteria

The closure relevant objectives and closure criteria for the dikes and dams are listed in Table 5-16, along with the specific actions and monitoring associated (modified from AANDC/ MVLWB 2013 and AEM, 2015a).

Table 5-16: Closure Objectives and Criteria – Water Management Structures

Closure Objectives	Closure Criteria	Action / Measurements
Ensure physical stability of residual earth structures for environmental, human, and wildlife safety	Stabilize slopes to minimize erosion, failure and slumping Ensure long-term stability	Routine monitoring and sampling Physical and geotechnical inspection
Dismantle and remove as much of water management systems as possible and restore natural or establish new drainage patterns	Re-establish natural grade and drainage where possible Runoff is channelled through the watershed	Dismantle all water management systems Surface will be regraded to promote natural drainage Physical inspection, routine monitoring and sampling
The systems are dismantled and removed/disposed of (i.e. pipelines, culverts, pump systems).	Remove all components above ground or buried	Components or materials will be cleaned up and salvageable materials removed, shipped or disposed at the landfill Concrete slabs on grade will be perforated and covered or removed and the area re-graded to avoid erosion and promote natural drainage Physical inspection to confirm removal
Remove all hazardous wastes to avoid contamination	All hazardous wastes are removed and disposed properly	Hazardous wastes will be removed for disposal by Licenced handler as per operation practices
Meet water quality objectives for the site surface water	Water licence criteria for direct discharge to the receiving environment	Routine monitoring of water quality as per the Water Licence requirements
Remove treatment facilities when water treatment is no longer required	Water licence criteria for direct discharge to the receiving environment Collected runoff and seepage will be treated until water quality meets licence criteria for direct discharge	Dismantle all water management and treatment systems when possible Routine monitoring of water quality as per the Water Licence requirements

Closure Objectives	Closure Criteria	Action / Measurements
	When water quality from the mine components is deemed suitable for direct discharge to the environment berms and dikes will be breached	
Stable release of water discharge to the environment is maintained at designated discharge points	Maintain water management components until they are no longer required Long term water management structures are properly designed for long term stability	Design and construct structures for long term water management with adequate dimensions at proper locations Routine monitoring and inspection
Discourage wildlife from entering the facilities	Wildlife will be discouraged from entering the facilities until water quality is acceptable	Limit access to facilities with berms Routine monitoring and sampling
Systems are physically and geotechnically stable for the safety of humans and wildlife	Limit access until water quality is acceptable and meet required criteria	Place berms and signs to limit access Physical inspection
Consider community land use expectations and traditional knowledge	Community engagement will continue to be implemented	Public engagement

5.2.7.4 Consideration of Closure Options and Selection of Closure Activities

Considerations for the water management facilities closure are provided by the AANDC/ MVLWB (AANDC/ MVLWB, 2013). Closure activities were selected in consideration of the closure aspects listed below, related to mine design stage, closure and post-closure periods.

- For any water management structures that may be required post-closure, select design parameters to reflect the need to maintain stability in the long term;
- Design water management systems to minimize the migration of potential contaminants;
- Treat non-compliant water in storage and subsequently release upon achievement of discharge criteria;
- Open and level/contour of embankments, berms, dikes and culverts not required for long-term use and restore the pre-disturbance drainage network to the extent possible;
- Locate permanent spillways in competent rock or material;
- Drain and backfill all sumps and collection trenches;
- Drain, dismantle, and remove tanks and pipelines from the site;
- Ensure any remnant embankments or other water management structures have appropriate erosion control measures in place to maintain stability post-closure;

- Stabilize embankments by removing weak or unstable materials from slopes and foundations and/or construct toe berms to flatten overall slope;
- Open water retention dams and drain impoundments, avoid post closure impoundment of water when possible.

All the options listed above will be required to address closure and reclamation of the water management system. Details on the implementation of those considerations are provided as applicable in the following section.

5.2.7.5 Engineering Work Associated with Selected Closure Activity

The description of the closure activities for the water management structures as presented herein is taken from the Water Management Plan (AEM, 2019c). During mine closure, the water management infrastructure on site will remain in place until mine closure activities are completed, and monitoring demonstrates that the water quality is acceptable for environmental discharge without treatment. Once water quality meets the discharge criteria, the water management systems will be decommissioned to allow the water to naturally flow to the environment.

The open pits will be flooded at closure and passive flooding of the Tiriganiaq Underground Mine will also occur. These activities are detailed respectively in section 5.2.4 and 5.2.3 of this plan.

The containment ponds, dikes and berms will remain in place to collect the surface runoff water and seepage from the mine until the water quality meets discharge criteria. Once the water quality meets discharge criteria, dikes/berms will be breached to allow runoff to follow natural (topographically induced) flow paths. Dikes/berms breaching will involve the removal of a portion of the dikes to a minimum depth of 1 m below average water level or back to original ground levels. Consideration will be given to breach staging, with the above water portions of the dike/berm in the breach area removed during winter periods, when there will be little surface water flow, thereby minimizing the potential release of sediments to the neighboring waterbodies. The remainder of the breach would be conducted during the open water season following freshet. Turbidity curtains would be deployed to minimize any potential sediment release to surface water (AEM, 2019c).

Culverts will be maintained as required in closure until site water quality monitoring results indicate that water can be released to the environment without further management and without erosion. Culverts on site will be dismantled and disposed of in the on-site landfill and the areas will be re-graded to promote natural drainage (AEM, 2019c).

Once monitoring results have indicated that contact water conveyed in channels and sumps meets acceptable water quality, the infrastructure will be graded and/or surface treated according to site specific conditions to minimize wind-blown dust and erosion from surface runoff, if required. This closure activity is intended to enhance site area development for re-colonization by native plants and wildlife habitat. The long-term, post-closure water quality in the containment ponds and in the flooded open pit lakes are anticipated to meet Metal and Diamond Mining Effluent Regulations (MDMER), Canadian Council of Ministers of the Environment Water Quality Guidelines (CCME-WQG) for the protection of aquatic life and/or the Site-Specific Water Quality Objectives (SSWQO's) developed for the Mine (AEM, 2019c).

Water treatment facilities will remain on site until water quality is suitable for direct discharge to the environment. The water treatment and Meliadine Lake effluent diffuser will be maintained for three (3) water treatment seasons as a contingency before being dismantled and disposed of in an appropriate landfill.

5.2.7.6 Predicted Residual Effects

No significant residual effects have been identified for closure of the water management facilities, as it is predicted that concentrations in post-closure will meet discharge criteria. Changes to terrain caused by the construction and reclamation of the facilities could result in some alteration or loss of plant populations and plant communities.

5.2.7.7 Uncertainties

Uncertainties are related to water quality during closure and post-closure. However water quality modelling will continue during operation.

5.2.7.8 Post-Closure Monitoring, Maintenance, and Reporting

The overall post-closure monitoring and maintenance program for the Meliadine Mine are discussed in Section 9.0 along with the general reporting requirements. The following presents the relevant post-closure monitoring following the closure of the water management facilities, and maintenance strategies as presented by AANDC/ MVLWB (2013):

- Periodically inspect the remaining water management structures to assess their performance;
- Continue monitoring climatic conditions at site to compare them to design assumptions (e.g., regarding storm events) and performance of selected closure activities;
- Monitor the performance of erosion protection on embankment structures, such as riprap, and the physical stability of water management systems including permafrost integrity where applicable;
- Monitor water quality, quantity, and flows to ensure system is working as predicted and water quality objectives are being met;
- Sample surface water as per Water Licence requirement;
- Evaluate post-closure drainage patterns and confirm that they compare to pre-development patterns as described in the closure objectives;
- Periodic inspections will be performed by a geotechnical engineer to visually assess stability and performance of the structures.

5.2.7.9 Contingencies

The water treatment facilities are included as a contingency measure should water on site not be suitable for release to the environment. The diffuser will be maintained in place for three (3) water treatment seasons as a contingency before being dismantled and disposed. Water quality monitoring will occur during mine operation to include in the site water quality and to provide additional information for future closure water quality prediction and planning modifications if required.

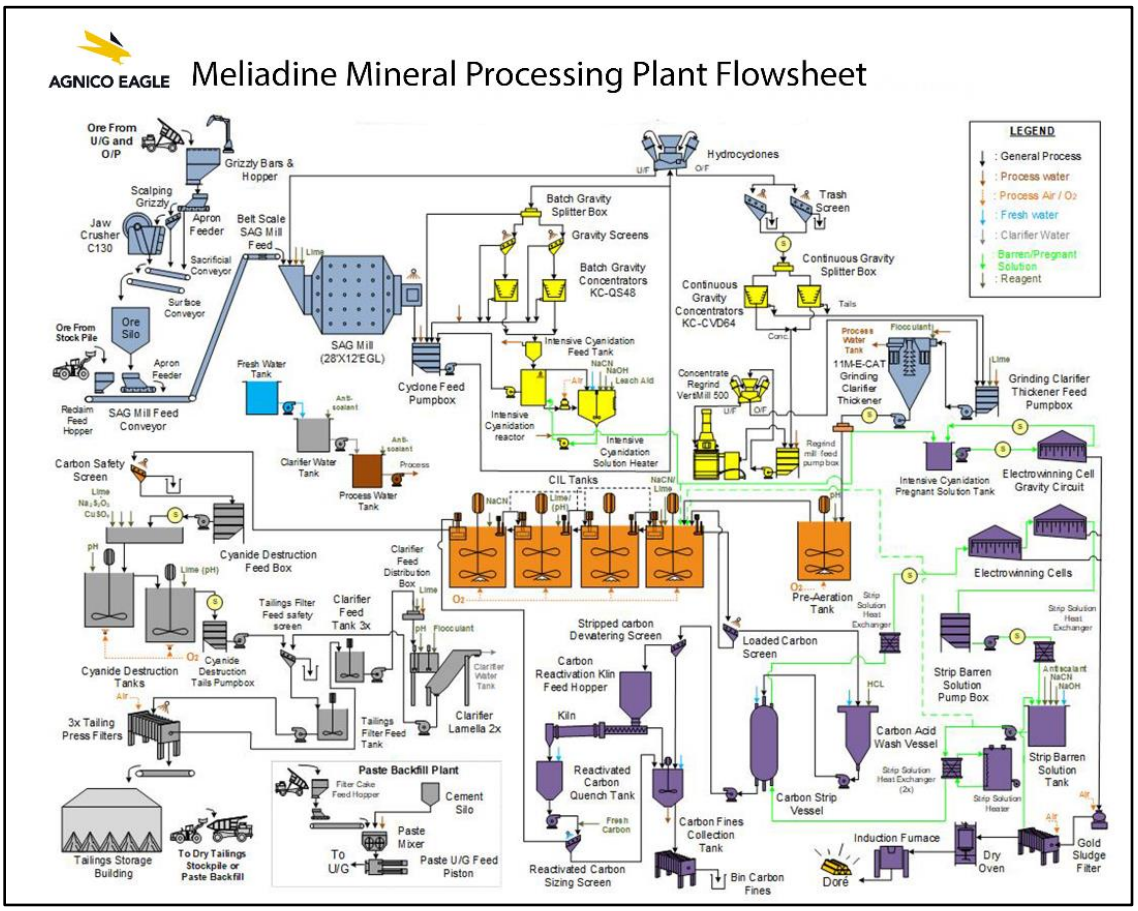
5.2.8 Site Buildings and Equipment

5.2.8.1 Descriptions of the components

During the life of mine, surface infrastructures are required at different periods for mining, processing, accommodation, fuel storage and electricity. Most of the infrastructures are located within the industrial site of Meliadine.

- Mill: The mineral processing facility consists of four main components: a crusher plant, a belt conveyor from crusher to the ore bin, a process plant and a paste backfill plant. The ore processing facility is centrally located relative to the mining site. The facilities will comprise crushing, grinding, gravity recovery, cyanidation, and gold recovery in a carbon-in-leach circuit. The main ore processing streams will be continuous operations, while the carbon-handling and gold recovery circuits will be batch operations. The Figure 5-4 presents the Meliadine mineral processing flowsheet.

Figure 5-4 : Meliadine mineral processing flowsheet



Source : https://www.agnicoeagle.com/English/operations-and-development-projects/operations/meliadine/maps-and-surveys/default.aspx

- Ore Pad: The ore stockpile is located on a pad close to the process plant pad. No ore will remain in the ore stockpiles by the end of operations. The stockpile will have a maximum footprint of 10.3 ha.
- Accommodation and Service Building: Due to the remote location of the mine, it is necessary to provide catered accommodation on-site. The permanent camp includes individual rooms, shared bathrooms and recreational facilities. The camp complex is constructed out of insulated structural wood frames resting on a structural steel frame floor on piles. At full operational capacity, the camp will house approximately 680 people. The building houses also the kitchen, dry warehouse, and offices (administration offices, an engineering and training room, various departmental offices (e.g., human resources, training, geology, engineering, planning, environment).
- Laboratory and Core Shack: The assay laboratory and core shack will be designed to accommodate, but not be limited to, an average of 300 samples/day in a building located on the mine site. The assay laboratory and core shack are in a building near the south of the warehouse. The building is aa prefabricated steel frame (foldaway type) structure covered by cladding and roofing panels.
- Maintenance Shop: An industrial mine maintenance shop containing several maintenance bays, a wash bay, a machine shop, and a welding shop is in the industrial area, on a concrete foundation.
- Emulsion Plant: The Emulsion Plant, raw material storage, and magazines are located north west of the site, away from vulnerable facilities, as stipulated by the federal and territorial Explosives Use Act and Regulations. The explosives trucks are based at the Emulsion Plant. A garage is also included in the building for the maintenance and washing of trucks and equipment used to handle explosives.
- Fuel Storage: The main storage tanks include one (1) tank of 6 ML and one (1) tank of 3 ML. Smaller storage tanks are also located on site. The total diesel fuel storage capacity on site is in the range of 9.7 ML.
- Power Plants: The power plant is a diesel-fuelled facility using multiple medium-speed reciprocating engines housed in a building (Murox type building). A separate modular building is required to house all the switchgears, transformers, mechanical rooms, electrical rooms, and heat recovery systems.

Approximate dimensions of site infrastructures are available in the RECLAIM model and the cost calculations details presented in **Appendix P**.

The equipment fleet include mobile surface equipment and underground mining equipment. The list is provided in **Appendix P**. The list includes the equipment on site, but additional equipment will be mobilized in the future for the open pits exploitation. The list will be adjusted in the new version of the ICRP.

5.2.8.2 Pre-Disturbance, Existing, and Final Site Conditions

Pre-disturbance conditions are based on baseline data collection programs presented in the Meliadine FEIS (AEM, 2014). The pre-disturbance site conditions are also summarized in Section 3.0 of this plan.

The existing supporting facilities are described in Section 5.2.8.1. The Figures 4-4 show the main existing infrastructure at the mine site. The mine site area is approximately 453 ha.

At closure, the facilities will be dismantled and reclaimed following best practices put in place during operation and in order to minimize long term disturbance. The facilities could also be transferred to the local community upon interest.

5.2.8.3 Closure Objectives and Criteria

The closure relevant objectives and closure criteria for the Meliadine buildings and equipment are listed in Table 5-17, along with the specific actions and monitoring associated (modified from AANDC/ MVLWB 2013 and AEM, 2015a).

Table 5-17: Closure Objectives and Criteria – Site Buildings and Equipment

Closure Objectives	Closure Criteria	Action / Measurements
Return area to its original state or to a condition compatible with the end land-use targets	Remove all facilities and restore natural/compatible terrain as much as possible	Dismantle and reclaim all infrastructure, fuel reservoirs, chemicals and industrial wastes Surface will be regraded to promote natural drainage, revegetation and to suit the surrounding topography Physical inspection
Transfer of usable surface infrastructure	Any above-ground infrastructure will be offered to the Kivalliq Inuit Association (the land owner) at closure for potential re-use elsewhere, or will be dismantled and demobilize from site	Agreement with the Kivalliq Inuit Association
Remove surface infrastructure Buildings and equipment will not be a source of contamination to the environment or a safety hazard to humans and wildlife	Limit access during closure Remove all facilities and restore natural/compatible terrain as much as possible Clean up and remove machinery, materials and equipment	Place signs to limit access Machinery and equipment will be removed off-site for salvage Dismantle and reclaim all infrastructure and fuel reservoirs Approved demolition waste will be placed in on-site landfill Metals will be separated and shipped off-site as scrap if economical to do so or disposed on-site, salvageable material will be remove off-site for salvage Remaining areas will be scarified and remaining concrete foundations and slabs will be cut in the pieces and buried Soil and water monitoring Physical inspection

Closure Objectives	Closure Criteria	Action / Measurements
Remove all hazardous wastes to avoid contamination	Remove all hazardous material	Remove all hazardous material for disposal by licensed handler
Maintain required site infrastructure during active reclamation	Promote early decommissioning	Reduce the use of facilities as much as possible after closure
Ensure the remaining surface areas are safe for wildlife use and access	Restore natural/compatible terrain as much as possible	Surface will be regraded to promote the use for wildlife Physical inspection
Ensure contaminated soil is removed from site	Remove and remediate contaminated soils	An assessment will be carried out to identify areas where soils may be contaminated by hydrocarbons A more detailed investigations will be carried out of the potential soil contaminated areas (i.e., Phase 1 and 2 ESA investigations) to determine the extent of the contamination Selected hydrocarbon contaminated soils will be excavated and hauled to the landfarm for remediation
Control dust generation from demolition and active reclamation activities	Best management practices for controlling dust, fugitive and exhaust emissions during active reclamation	Implement best management practices Routine air quality monitoring
Ensure reclaimed areas support continuation of human land use activities	Human land use of the reclaimed area at post-closure will not compromise people's health	Dismantle and reclaim all infrastructure Surface will be regraded to promote natural drainage, revegetation and to suit the surrounding topography Routine monitoring and physical inspection
Consider community land use expectations and traditional knowledge in the closure planning	Community engagement will continue to be implemented	Public engagement

Other recommendations are presented in the Code of Practice for Metal Mines as follows (adapted from EC, 2009):

- On-site facilities and equipment that are no longer needed should be removed and disposed of in a safe manner. Efforts should be made to sell equipment for reuse elsewhere or to send equipment for recycling, rather than disposing of it in landfill facilities. (from R514);
- The walls of on-site buildings should be razed to the ground. Foundations should be removed or covered with a sufficiently thick layer of soil to support re-vegetation. (from R515);

- Any remaining structures and foundations should be inspected to ensure that no contamination is present. If contamination is found, it should be remediated as necessary to ensure public health and safety for post-closure land use. (from R516);
- Support infrastructure, such as fuel storage tanks, pipelines, conveyors and underground services, should be removed. (from R517);
- Electrical infrastructure, including pylons, electrical cables and transformers, should be dismantled and removed. (from R520).

5.2.8.4 Consideration of Closure Options and Selection of Closure Activities

Considerations for the buildings and equipment dismantling are provided by the AANDC/MVLWB (AANDC/MVLWB, 2013). Reclamation activities were selected in consideration of the closure aspects listed below, related to mine design stage, closure and post-closure periods.

- Recycling or reusing building materials and equipment where possible to reduce waste and importation of materials to site;
- Dismantle all buildings that are not necessary to achieve the future land use target;
- Raze/level all walls to the ground and remove foundations;
- Remove foundations where possible or cover with natural materials to blend into natural surroundings. Cover materials should be conducive to vegetation growth (this may include lichen) where possible;
- If disposing on site, decontaminate building materials (free of any batteries, fuels, oils, bulk process chemicals, or other deleterious substances), and use toxicity characteristic leaching procedure testing to confirm suitability for non-hazardous disposal;
- Cut, shred, crush, or break demolition debris to minimize the void volume during disposal;
- Maintain photographic records of major items placed into landfills, as well as a plan showing the location of various classes of demolition debris (e.g., concrete, structural steel, piping, metal sheeting, and cladding);
- Remove and dispose of concrete in an approved hazardous waste landfill if it contains contaminants that may pose a hazard over time;
- Backfill/grade all excavations to achieve the final desired surface contours to re-establish the original drainage or a new acceptable drainage;
- Backfill excavations in permafrost to limit permafrost degradation;
- Control dust emission during demolition of buildings that contain or contained asbestos, lead paint, hazardous chemicals, or other deleterious material;
- Remove buried tanks, where they already exist, to prevent subsidence;
- Remove hazardous waste to an approved on- site waste storage facility prior to shipping for off-site disposal;

- If possible, transport equipment off the site for reuse at other locations. This may include sale or salvage to local communities if sufficient interest exists;
- If sale or salvage of equipment is not possible, dispose of decontaminated equipment in an approved landfill or as recommended by the regulatory authorities;
- Decontaminate equipment (free of any batteries, fuels, oils, or other deleterious substances) and reuse or sell (local communities may have interests in some of the materials);
- Reclaim areas to the original topography and drainage or to a new topography or drainage compatible with end land use targets.

5.2.8.5 Engineering Work Associated with Selected Closure Activity

Prior to closure, infrastructure and equipment will be offered to the Kivalliq Inuit Association (the land owner) at closure for potential re-use elsewhere.

At closure, all buildings and structures will be decontaminated, decommissioned and dismantled. Demolition waste that cannot be reused, recycled or provided to local interests will be disposed of in the on-site landfill. Salvageable material will be removed off site and metals will be separated and shipped off-site as scrap if economical to do so.

Any above grade concrete structures or foundation will be demolished, and the rubble will be disposed of in the landfill. Any slabs on grade will be punctured and then left in place and covered with soil or non-potentially acid generating/non-metal leaching waste rock. Any subgrade foundations will be left in place. All disturbed site areas will be re-graded to promote natural drainage, revegetation and to suit the surrounding topography. In areas where the original ground surface was lowered for site grading or structural requirements, the slopes will be stabilized and contoured. Cover materials may be required for erosion and dust control.

Remaining bulk fuel and empty portable fuel storage tanks will be offered to community interests. The tanks will be emptied, cleaned, and dismantled for disposal in the site landfill or shipped south. Fuel not required during the closure and reclamation activities will be sold, returned to suppliers, disposed by a licensed handler, or incinerated.

All hazardous wastes will be removed for disposal by a licensed handler during the dismantling of buildings and infrastructure. An assessment will be carried out to identify areas where soils may be contaminated by hydrocarbons. Any contaminated soil will be excavated and taken to the landfarm for treatment.

Most of the mobile equipment will be removed once the closure stage is complete. Equipment used for closure activities and long-term maintenance will be removed from the site once they are no longer required. A small subset of equipment will be retained on-site for a portion of the post-closure stage.

If not properly reclaimed, wildlife maybe injured by entering reclaimed areas with depressions and if subsidence occurs. Environmental design features and mitigation, as well as current wildlife management practices used in other mining projects will be implemented at the Meliadine Mine to limit wildlife injury such as re-contouring reclaimed areas to reduce hazards to wildlife. Proper reclamation is also required to leave the site in appropriate conditions that do not present safety risks for humans.

5.2.8.6 Predicted Residual Effects

No significant residual effects have been identified for after closure of the supporting buildings but changes to terrain caused by the construction and subsequent reclamation of the facilities could result in some alteration of the natural terrain and alteration or loss of plant populations and plant communities.

5.2.8.7 Uncertainties

No major uncertainties are related to the closure activity of the site building and equipment. The pre-disturbance terrain was covered by discontinuous vegetation interspersed with few bedrock outcroppings. The reclamation plan will be designed to encourage a natural succession of indigenous plant species within disturbed site areas. Grading and contouring would be done, where appropriate, to control soil stability and promote re-vegetation by natural colonization. Re-vegetation studies would be completed to assess the potential for vegetation to establish in disturbed areas or on rockfill covers (AEM, 2015a).

5.2.8.8 Post-Closure Monitoring, Maintenance, and Reporting

The overall post-closure monitoring and maintenance program for the Meliadine Mine are discussed in Section 9.0 along with the general reporting requirements. The following presents the relevant post-closure monitoring and maintenance strategies for the WRSFs as presented by AANDC/MVLWB (2013):

- Periodic inspections will be performed to visually assess the reclaimed areas; and
- All buildings and equipment left on-site during closure will be maintained until no longer required, at which time they will be removed from the site or demolished and disposed in the on-site landfill.

5.2.8.9 Contingencies

There are no activities proposed as contingencies with regards to the closure of the buildings and equipment.

5.2.9 Waste Management Facilities

5.2.9.1 Description of the components

The waste management facilities include the landfill, landfarm and incinerator. Hazardous waste management is also part of the global waste management. At the Mine site, wastes are safely managed from the time they are produced to their final disposal. All waste is segregated at the mine site and will predominately be landfilled, incinerated, or recycled. Used oil burning will be maximized as much as possible using the secondary chamber of the incinerator. Remaining wastes on site, including hazardous waste, will be packaged for shipment to a certified waste management facility for treatment, recycling, and/or disposal.

Waste management begins by keeping all materials that can be economically recycled out of the waste stream destined for the landfill or incineration. The three R's of waste management - reduce, reuse, and recycle - is encouraged within the waste management program. Reduce, reuse, and recycle initiatives will be developed at the Project to minimize the quantity of waste incinerated or directed to the landfill. To support this initiative, operating procedures will be developed to maximize the volume of materials that are recycled and/or reused. This will include eliminating the use of disposable materials where possible, and segregating waste destined for reuse, and recycle alternatives.

Similar to the waste management philosophy, plans are to actively work towards minimizing spills through suitable work procedures. Plans developed from the environmental impact study address the management

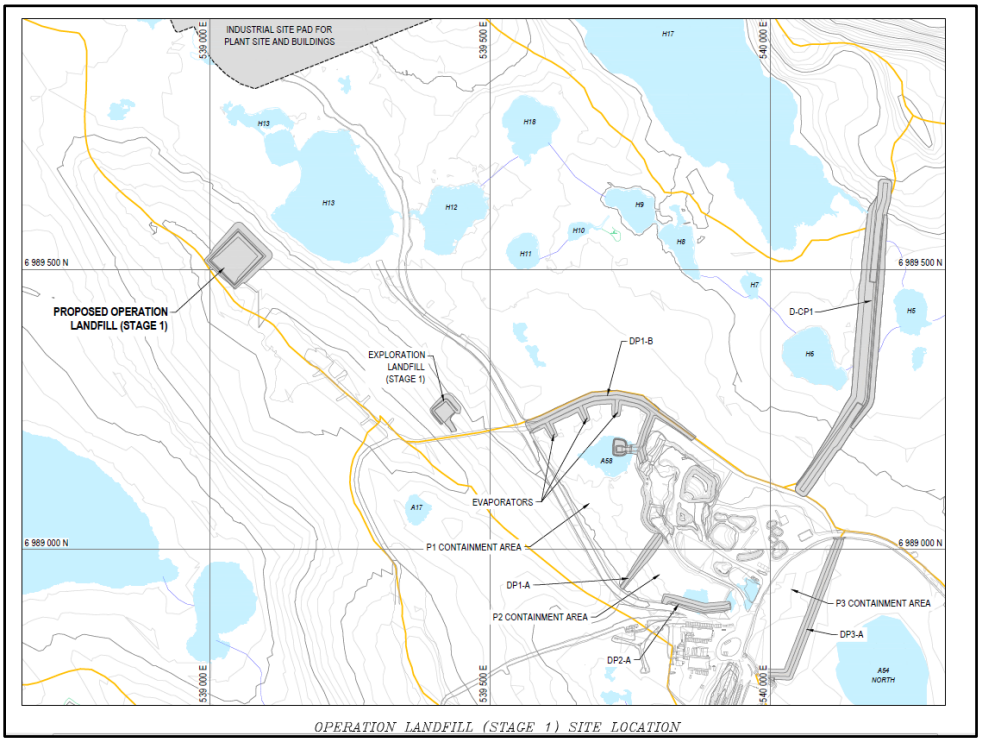
of spills on land, ice, water, and into the marine environment. When spills do occur, the goal is to limit the spread of the spill, and then manage contaminated material resulting from the spill.

The major components of the waste management system are described below.

Landfill:

As described in the Landfill Management Plan (AEM, 2019i), a landfill is required on site for the disposal of non-salvageable, non-hazardous, non-putrescible solid industrial wastes that cannot be incinerated and that result from construction, operations, and closure of Meliadine Mine. An operation landfill (Stage 1) is required to permanently store acceptable waste materials during mine preproduction and early operation. The acceptable waste materials are non-salvageable, non-hazardous, nonputrescible solid industrial wastes that have a low leachate and low heat generation potential and cannot be incinerated in the site's incinerator. As presented on Figure 5-5. The landfill is situated at the northeast corner of the WRSF1. This location was selected to facilitate site drainage management, minimize overall environmental footprint of the project, facilitate easy access and final closure/reclamation, and provide enough storage capacity and operation flexibility (Tetra tech, 2017b).

Figure 5-5 : Operation Landfill (Stage 1) Location



Source: (Tetra tech, 2017b).

The active WRSF 1 sets the boundary of the landfill on its south and west sides, while berms were constructed on the north and east sides of the landfill. The purpose of the berms is to confine the area for waste disposal and to act as a wind shield to reduce windblown debris. The landfill is a rectangular shape with the length perpendicular to the prevailing wind direction so that much of the waste will be protected from the wind by the berm. The design of the berms does not assume that they will be in a frozen state or permanently impermeable to leakage. The final design will consider berm and subgrade stability (AEM, 2019i).

The landfill will be used for the construction, operations, and closure phases. It will not be required for post-closure. The schedule for the landfill is as follows:

- Years -3 (2017) to Year -1 (2019): Construction of the landfill occurred directly after the placement of minimum 1.2 m of waste rock or rockfill to serve as a base or foundation;
- Years 1 (2020) to Year 8 (2027): The landfill will be used continuously during operations;
- Years 9 (2028) to 11 (2030): The landfill will be one of the last parts of mine infrastructure to close. It is expected to be extensively used during closure for demolition waste and will remain operational until it is no longer needed.

As mentioned in the Landfill Management Plan (AEM, 2019i), the following materials are acceptable for disposal in the landfill:

- Plastic (except expanded polystyrene);
- Steel, copper, aluminum, iron;
- White goods;
- Wire;
- Wood;
- Fiberglass insulation and fiberglass;
- Roofing;
- Asphalt;
- Concrete;
- Carpet;
- Bricks;
- Ceramics;
- Rubber;
- Empty caulking tubes;
- Hardened caulk;
- Clothing;
- Air filters;
- Glass, including light bulbs;
- Waste Asbestos;
- Small appliances (with batteries removed);
- Gyproc;
- Ash, provided it has cooled to 60 degrees Celsius or less;
- Vehicles and machinery provided all liquids, grease, batteries, and electronics have been removed;
- Treated soils from landfarm.

An estimate of waste volume is required to determine the appropriate size of the landfill. However, an exact waste volume is not a critical parameter in the design because of the flexibility of the design to accommodate extensions (larger to accept more waste) or contractions (smaller to accept less waste) within WRSF 1. Table 5-18 indicates the estimated mass of waste destined for the landfill each year and cumulatively for the life of the Meliadine Mine.

Table 5-18 : Estimated Waste in Landfill

Project Phase	Waste Not Incinerated (t/year)	Ash From Incinerator (t/year)	Estimated Volume of Non-Hazardous Waste and Ash Produced (m^3/year)	Approximate Treated Soil From Landfarm (m^3/year)	Maximum Accumulated Waste Material in Landfill (m^3)
Construction	100	30	260	0	1,040
Operations	340	102	884	446	37,043
Closure	25	7.5	65	525	25,226
Total					**63,309**

Source: (AEM, 2019i).

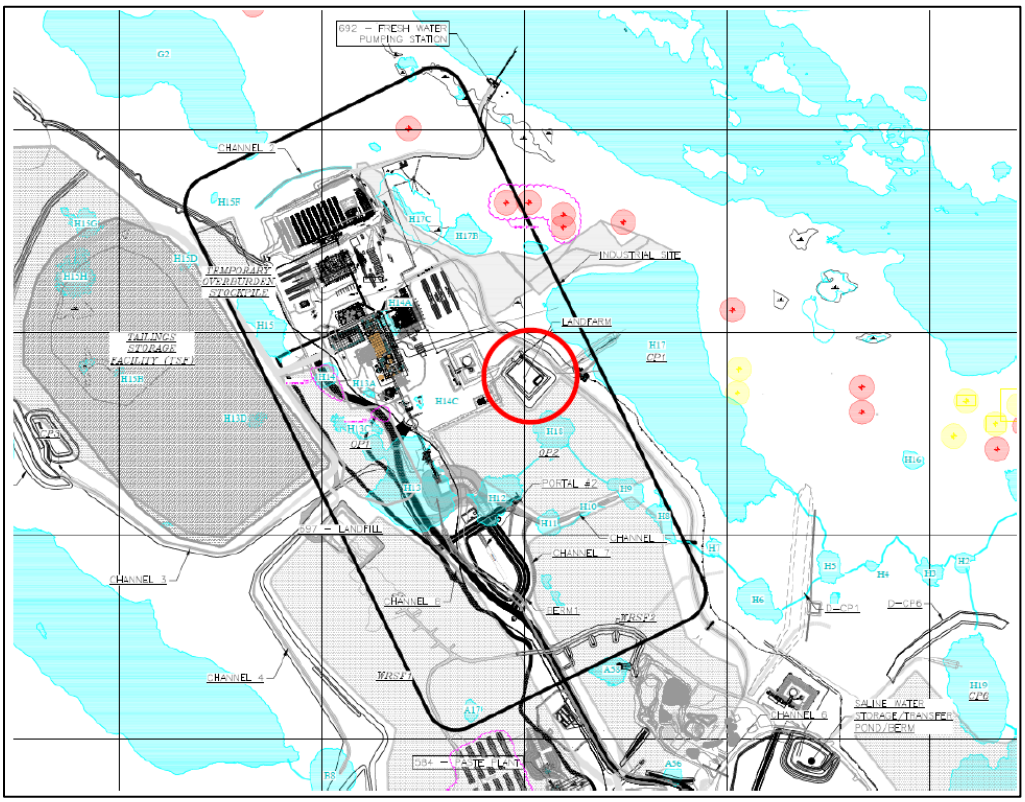
The landfill will progressively be filled in an orderly manner. Specifically, waste are placed to full height at one end of the landfill and then the active waste area will progressively advance. An “area method” of dumping is used such that materials is dumped in rows and covered as required. Wastes are deposited directly onto the landfill floor and compacted with heavy equipment against the berm or an existing row of debris that was compacted earlier. Areas where the waste has been placed to full height, compacted and levelled is progressively covered by placement of a minimum of 0.3 m thick of rock fill on top of the waste to reduce windblown debris. Owing to its placement within the WRSF 1, the landfill will become encapsulated within waste rock. Upon closure, the entire landfill will be covered with 3.7 m of waste rock (AEM, 2019i).

The leachate from the landfill is anticipated to be of very low ionic strength (dilute) due to controls on materials to be placed in the landfill, and, as a result, site-specific landfill leachate management is not considered necessary. In the event there is leachate from the landfill during periods of heavy rainfall or spring freshet, the runoff will be collected and directed to CP1.

Landfarm:

As described in the Landfarm Management Plan (AEM, 2019j), on site storage and remediation has been established as the preferred method for treatment of light petroleum hydrocarbons (PHC) contaminated soil that may be generated at the mine. Specifically, remediation through landfarming has been identified as the primary treatment option and, as such, is the focus of this contaminated soil management plan. It is estimated that soils contaminated with light end PHCs would require three full summer seasons for complete remediation. The general location of the landfarm is presented on Figure 4-4, and the specific location is shown on Figure 5-6. The area has no exposed bedrock and up to 20 m of glacial-fluvial till that has little ground ice and shows no permafrost degradation. The central location of the landfarm was chosen to minimize the footprint of the site and the transport distance of contaminated material from potential spill locations.

Figure 5-6 : Landfarm Location



Source: (AEM, 2019j)

The landfarm was designed to have an engineered rockfill pad and perimeter berms with a geomembrane liner system. The geomembrane liner crest elevation was installed at an elevation of 74.80 m, it does allow for 0.45 m of freeboard before reaching the geomembrane liner crest elevation. Its footprint is approximately 10,040 m^2, with a perimeter berm that is approximately 1.4 m to 5.2 m high over the landfarm surface (Tetra Tech, 2018).

The landfarm is located on land that slopes towards the southwest corner, which results in any rainwater or snowmelt draining to temporary water storage having the capacity to store a 1:100 wet year spring freshet plus 500 m^3 of water from melting of contaminated snow/ice. Drainage from the landfarm may be used as water in the turning of the windrows during the remediation process. Excess water is collected within a sump inside the landfarm and will be pumped to an oil separator plant for removal of excess oil. The treated water will then be discharged into the CP1 (AEM, 2019j).

The landfarm was built with the expectation of effectively treating up to 5,000 m^3 of contaminated soil over the construction, operations, closure, and 500 m^3 of snow and ice annually. Table 5-19 outlines the estimated volumes of contaminated soils and rock, and contaminated snow and ice expected during each phase of the mine (AEM, 2019j).

Table 5-19 : Estimated Volume of Petroleum Hydrocarbon Contaminated Soil and Ice/Snow to be Managed

Project Phase	Volume of PHC Soil/Rock (m^3)	Annual PHC Snow/Ice (m^3)
Advanced exploration	2,209 (volume in exploration landfarm to date)[1]	500 per year
Predevelopment (2 years)	350 (175 per year)	
Construction (3 years)	1,050 (350 per year)	
Operations (7 years)	2,450 (350 per year)	
Closure and Reclamation (2 years)	700 (350 per year)	
Total	**4,970**	

[1] The contaminated soil in the advanced exploration landfarm will be transferred to the mine landfarm upon its completion and commissioning.

Source: (AEM, 2019j)

Diesel and aviation fuel, gasoline, hydraulic oil and other light oil are acceptable for treatment in the landfarm if generated on-site and spilled on soil. Remediation of fine grained PHC contaminated soil in the landfarm occurs naturally through volatilization and aerobic microbial degradation. Soil aeration, nutrient amendment and water addition, are recognized as methods for improving rates of remediation. Agnico Eagle commissioned the National Research Council Canada to undertake the bioremediation research study to optimize the biodegradation process. Agnico Eagle will look at increasing biodegradation rates through potential opportunities such as nutrient amendment (AEM, 2019j).

Landfarm windrows are sampled annually at the end of the summer season to determine if remediation objectives have been met. Parameters are compared with the GN industrial remediation criteria to determine whether PHC contaminated soil has been adequately remediated. When remediated, the soils will be removed from the facility and can be used for construction purposes such as part of the cover of the Tailings Storage Facility (TSF) or stacked in the Waste Rock Storage Facility (WRSF). Based on a remediation period of three seasons, it would be possible to close the landfarm facility three years after the end of the process plant operation (AEM, 2019j).

Incinerator:

Incineration is an essential part of waste management at the proposed mine site. The incineration of acceptable solid waste from the accommodation complex, kitchen, lunch rooms, shops, warehouses, and offices will divert waste from directly reporting to the on-site landfill. It will have the advantage of eliminating putrescible waste that could potentially attract wildlife to the landfill, thereby reducing possible dangerous interactions between humans and wildlife.

The incinerator is located in its own building on the south end of the infrastructure pad, downwind of other mine infrastructures. Figure 4-4 shows the location of the incinerator. The ECO 1.75 TN 1PVC100L incinerator system consists of a primary chamber and a secondary chamber. Both chambers are vessels constructed of steel with a special insulating liner known as refractory. Incinerator components also include a main control panel, diesel fuel (4,500L) and used oil (5,000L) tanks (AEM, 2017).

The ashes collected from the incinerator are disposed into the landfill. Ash testing protocol is implemented to ensure that the incinerator ash is suitable for disposal in the landfill. The incinerator stack design includes two (2) sampling ports with caps, as well as an in-line opacity meter to allow for stack testing to be undertaken during incinerator operation. Performance limits for the incinerator at Meliadine are in accordance with the emission guidelines set out by the CCME: Canada-Wide Standard for Dioxins and Furans, and Canada-Wide Standards for Mercury Emissions.

Hazardous material storage area:

As presented in the Hazardous Waste Management Plan (AEM, 2018), all hazardous materials are stored in secured areas to prevent tampering, as well as access by unauthorized personnel. Hazardous materials that become waste will be stored and/or disposed of in accordance with specific government regulations and guidelines. The Environment Department monitors the movement of hazardous waste, from the generator to final disposal, through use of a tracking document known as a Waste Manifest. Hazardous wastes at the Itivia docking site in Rankin Inlet will be managed according to the appropriate regulation(s). The Project requires the use of the following types of hazardous materials:

- Petroleum products and lubricants – diesel fuel, oil, grease, anti-freeze, and solvents used for equipment operation and maintenance;
- Process Plant consumables – chemicals for mineral extraction;
- Water treatment consumables – chemicals;
- Explosives – emulsion, caps, explosives, surfactants, and sodium nitrate used for blasting; and
- Laboratory consumable and wastes – various by-products classified as hazardous waste and chemicals used in the assay laboratory.

5.2.9.2 Pre-Disturbance, Existing, and Final Site Conditions

Pre-disturbance conditions are based on baseline data collection programs presented in the Meliadine FEIS (AEM, 2014). The pre-disturbance site conditions are also summarized in Section 3.0 of this plan.

The landfill and landfarm are currently in use at Meliadine and will be until post-closure. The incinerator and the hazardous waste management area are also operating and will be until the end of active closure.

The waste management facilities will be reclaimed following best practices put in place during operation and in order to minimize long term disturbance.

5.2.9.3 Closure Objectives and Criteria

The closure relevant objectives and closure criteria for the Meliadine waste management facilities are listed in Table 5-20, along with the specific actions and monitoring associated (modified from AANDC/MVLWB 2013 and AEM, 2015a).

Table 5-20: Closure Objectives and Criteria – Waste Management Facilities

Closure Objectives	Closure Criteria	Actions/Monitoring
Inadvertent access to landfill debris by humans and wildlife has been prevented	Limit access to facility Dispose only appropriate waste type in landfill	Limit access to the WRSF with berms and signs Avoid food waste in landfill that could attract wildlife Routine inspection of the facilities
Waste disposal areas are not and will not become a source of contamination to the environment	Dispose only appropriate waste type in landfill Treat light hydrocarbon contaminated soil Remove all hazardous waste	Manage and dispose waste in landfill as per operation best practices Treat light hydrocarbon contaminated soil in the landfarm Hazardous wastes will be removed for disposal by licensed handler as per operational practices Routine inspection of the facilities
Erosion and effects to the ground thermal regime have been controlled to ensure physical stability	Appropriate cover and drainage over the landfarm and landfill	The landfill and landfarm area will be covered with waste rock at the end of active closure stage Surfaces will be re-graded to promote natural drainage Inspection during cover construction
Surface runoff and seepage water quality is safe for humans and wildlife	Water quality meets Water Licence requirements Appropriate cover and drainage over the landfarm and landfill	Water quality monitoring
Return area to its original state or to a state compatible with the desired end land use	Human land use of the reclaimed area at post closure will not compromise people and wildlife health	Routine monitoring and physical inspection

The Code of Practice for Metal Mines also provides the following recommendations related to the closure of waste facilities and to the handling of contaminated materials (adapted from EC 2009):

- Waste from the decommissioning of ore processing facilities and site infrastructure, such as waste from the demolition of buildings and the removal of equipment, should be removed from the site and stored in an appropriate waste disposal site or disposed of on site in an appropriate manner in accordance with relevant regulatory requirements. If material is disposed of on site, the location and contents of the disposal site should be documented. (from R522);
- Sampling and analysis of soils and other materials should be conducted to ensure that none of the material is contaminated, e.g., with asbestos and mercury from buildings. If contaminated materials are identified, they should be handled and disposed of in an appropriate manner in accordance with all applicable regulatory requirements. (from R523)

5.2.9.4 Consideration of Closure Options and Selection of Closure Activities

Considerations for waste management facilities closure are provided by the AANDC/MVLWB (AANDC/MVLWB, 2013). Closure activities for the waste management facilities were selected in consideration of the closure aspects listed below, related to mine design stage, closure and post-closure periods.

- Plan activities to limit the amount of waste generated throughout the life of the mine;
- Locate waste management facilities away from waterways to minimize environmental impacts that could result from leachate generation/migration;
- Select location and design that will have minimal impact on wildlife habitat and therefore require minimal reclamation effort;
- Divert runoff around waste disposal area with ditches or berms to minimize migration of contaminants;
- Burn domestic waste and special waste (i.e., waste oil) in an approved incinerator;
- Remove hazardous waste to an approved on-site waste storage facility prior to shipping for off-site disposal;
- Cover landfill/landfarm with an appropriately designed cover system to limit infiltration to acceptable levels. The surface of the landfill cover should comprise erosion resistant materials, and the surface landform should be sustainable in the long-term.

5.2.9.5 Engineering Work Associated with Selected Closure Activity

Landfill:

The closure activities planned for the landfill presented herein are taken from the Landfill and Waste Management Plan (AEM, 2019i).

The location of the landfill in the WRSF1 serves to minimize the area of surface disturbance, stabilize disturbed land surfaces against erosion, and return the land to a post-mining use that is chemically and physically stable, and consistent with past traditional pursuits and wildlife habitat. While waste rock will be disposed on land and in a manner that encourages total freezing. The design, operation, and/or closure of the WRSFs and landfill do not rely on total freezing. Any unacceptable leachate that is generated following closure of these facilities will be contained, collected, and/or treated, if necessary.

Upon closure, it is estimated that the landfill will have a volume of approximately 63,000 m^3 of waste. The landfill will be covered with a minimum of 3.7 m of waste rock and should thereafter be stable. When finalizing the design for the cover, the need for thermistors to be installed will be evaluated. The cover surface will be left irregular to capture snow, windblown sediment, and collect seeds.

Contact water from the landfill at its closure will continue to be managed using best management practices as in operation. The leachate from the landfill is anticipated to be of very low ionic strength (dilute) due to controls on materials to be placed in the landfill. Moreover, drainage from the landfill is largely expected to freeze within WRSF1, with little to none reporting to the water collection infrastructure (FEIS, 2014).

Landfarm:

The closure activities planned for the landfarm presented herein are taken from the Landfarm Management Plan (AEM, 2019j).

After removal of all remediated soil and prior to closure and reclamation of the landfarm, the berm and base will be sampled on a 10 m grid, to determine if these soils are free from PHC contamination. Results of this analysis will be compared to GN criteria. No excavation will be necessary if agricultural/wildlife criteria are met. If industrial criteria are used, the landfarm will be covered with 2 m of waste rock or other material used for reclamation. The surrounding berm will be breached to avoid water accumulation on the landfarm.

Incinerator:

Approved waste will be burned in the incinerator during operation and closure. At the end of the active closure phase, the incinerator will be emptied and offered for local use and/or relocation. If there is no local interest, the infrastructure will be demolished and taken to the on-site landfill for disposal or barged out to a southern waste disposal facility.

Hazardous Material:

The hazardous materials will be managed in operations such that minimal quantities remain on site at closure. Any remaining hazardous materials that cannot be used during closure activities will be transported to licensed disposal facilities in the south, as per operation procedures, in accordance with the Hazardous Material Management Plan (AEM, 2018). Any remaining cyanide reagents will be packaged and transported to licensed facilities in the south or other Agnico Eagle divisions in accordance with the International Cyanide Management Code, and the Hazardous Materials Management Plan.

5.2.9.6 Predicted Residual Effects

No significant residual effects have been identified for closure of the waste management facilities other than changes to terrain caused by the construction and subsequent reclamation of the facilities.

5.2.9.7 Uncertainties

No major uncertainties have been identified in regard to closure of the waste management facilities.

5.2.9.8 Post-Closure Monitoring, Maintenance, and Reporting

The overall post-closure monitoring and maintenance program for the Meliadine Mine are discussed in Section 9.0 along with the general reporting requirements. The following presents the relevant post-closure monitoring and maintenance strategies for the WRSFs as presented by AANDC/MVLWB (2013):

- Test water quality and quantity to measure the success of the selected closure activities for landfills and waste disposal areas;
- Monitor the ground thermal regime and the cover system performance to determine if permafrost has aggraded into the landfill;
- Inspect surface of landfill cover systems for cracking or slumping of the cover and for the underlying waste material's migrating to surface;
- Monitor wildlife and human use to ensure the selected closure activities have been effective in preventing access to these areas.

The landfill and landfarm monitoring programs completed in operation will continue during the closure period.

Hazmat disposal will be audited in closure or post-closure to ensure all material have been disposed off site in appropriate facilities.

5.2.9.9 Contingencies

No specific activities are proposed as contingencies for the closure of the waste management facilities.

6.0 Progressive Reclamation

6.1 Definition of Progressive Reclamation

Progressive reclamation takes place prior to permanent closure to reclaim components and/or decommission facilities that no longer serve a purpose. These activities can be completed during operations with the available resources to reduce future reclamation costs, minimize the duration of environmental exposure, and enhance environmental protection. Progressive reclamation may shorten the time for achieving closure objectives and may provide valuable experience on the effectiveness of certain measures that might be implemented during permanent closure (AANDC/MVLWB 2013).

The Code of Practice for Metal Mines includes the following recommendations related to progressive reclamation (adapted from EC 2009):

- Progressive reclamation, including that of waste rock piles, tailings management facilities and mine site infrastructure, should be undertaken during the mine operations phase to the extent feasible;
- Progressive reclamation activities should be consistent with the site-specific objectives and intended post closure land use for the site. Planning and implementation should consider final contouring, final drainage, cover requirements, and re-vegetation;
- The project schedule should be used to monitor the status of progressive reclamation, and the schedule should be updated on a regular basis.

6.2 Opportunities for Progressive Reclamation

The key closure activities that have been identified for progressive reclamation are summarized in the following sections for each individual component of the Meliadine Mine. The progressive reclamations activities provided in this ICRP will be updated in future versions of the plan to include new opportunities for progressive reclamation identified during operations.

Details related to schedule of progressive reclamation is included in the closure schedule presented in **Appendix O**.

6.2.1 Rankin Inlet Site Facilities

No progressive reclamation activities have been identified for the Rankin Inlet site facilities at this time, as the facilities will be required throughout the operation period and the active closure.

6.2.2 Transportation Routes and Quarries

No progressive reclamation activities on the roads are planned as they will be required for transportation throughout the operation period and the active closure.

The quarries and granular borrow sites no longer required for operations will be progressively reclaimed during operation, as equipment and resources are available. Specific timeline for quarries progressive reclamation during operation will be eventually defined.

In 2018, reclamation work occurred at the Itivia quarry. Agnico Eagle proceeded to the reclamation according to the quarry conditions by removing all equipment and material, stabilizing and gently sloping the walls (AEM, 2019a).

6.2.3 Underground

Mined-out work specific areas are being backfilled for reasons of ground stability, using coarse rock waste, cemented waste rock, paste tailings, or some combination of these during operations. Following completion of underground mining in Year 7 (2026), the flooding of the underground mine workings with natural groundwater seepage will start as progressive reclamation in Year 8 (2027).

6.2.4 Open Pits

Following completion of open pits mining in Year 7 (2026), the flooding of the open pits with water from Meliadine Lake will start as progressive reclamation in Year 8 (2027).

6.2.5 Waste Rock Storage Facilities

The waste rock and overburden storage facilities will be closed during operations with the deposition of the waste rock, based on the current deposition plan. The WRSF1 is expected to reach its design capacity at the end of Year 4 (2023). The WRSF2 and WRSF3 are expected to reach their design capacity by the end of Year 7 (2026).

6.2.6 Tailings Storage Facilities

Additional lifts of waste rock will be placed as the tailings surface is brought up as erosion, stability and thermal protection. At the final elevation, the top of the tailings stack will be progressively capped with a layered combination of overburden and waste rock. Based on the tailings production schedule, Cell 1 will reach its design capacity by Year 5 (2024) and Cell 2 will start operation from Year 4 (2023) and will reach design capacity in Year 8 (2027).

6.2.7 Water Management Facilities

No progressive reclamation activities have been identified for the water management facilities at this time. Water management facilities or equipment not used or deemed not necessary will be evaluated and could be removed during operations.

6.2.8 Site Buildings and Equipment

Potential progressive reclamation activities could include removal of equipment and facilities as they are identified as no longer being required for operations. Efforts could also be made to reduce inventories of consumables and sea containers (sea cans) leading up to the end of operations.

6.2.9 Waste Management Facilities

The landfill will be in active use throughout the operation and closure period in order to receive debris from decommissioning. The landfill will be covered with waste rock progressively over time. The final closure of the landfill will occur at the end of the active closure stage. The landfarm will be required in operation and active closure for soil decontamination, so no specific progressive reclamation is identified for the landfarm. The hazardous material will be managed throughout operation and closure.

7.0 Temporary Closure

Temporary closure occurs when an advanced mineral exploration or mining operation ceases with the intent of resuming activities in the near future. Temporary closure could be due to an unplanned closure or a planned closure of certain facilities in a complex mining project (AANDC/MVLWB, 2013).

The Meliadine Mine operation is planned to be continuous for the full proposed operating period. However, the mine may need to shut down for a short-term or indefinitely (long-term) due to economic, environmental and/or social factors. The plans for both closure periods are discussed below.

Notification of temporary closure would be presented to the staff and the local population with at least 30 days of notice; if the conditions allow, a longer notice period will be provided where possible (AEM, 2015a).

As per the Water License 2AM-MEL1631, Part J, condition 2, the Licensee shall notify the NWB in writing, at least sixty (60) days prior to, or as soon as practically possible, the intent to enter into a Care and Maintenance Phase.

As per the Meliadine Inuit Impact and Benefit Agreement (IIBA), written notice of a temporary closure decision would be given immediately to the Kivalliq Inuit Association (KIA) and the Parties would “enter into good faith negotiations and use commercially reasonable efforts to conclude an agreement on appropriate implementation measures which shall be in keeping with the purpose and the objectives of” the IIBA (KIA, 2017).

7.1 Temporary Closure Goal and Closure Objectives

The goal of temporary closure is ongoing protection of the environment, and regulatory compliance during the shutdown period. Temporary closure measures deemed necessary will depend upon the duration and extent of site activities/presence during the temporary closure. It is anticipated that water management and treatment facilities will function at the same level during temporary shutdown periods as during operations.

The objectives of temporary closure activities are to:

- Maintain all operating facilities and programs necessary to protect humans, wildlife, and the environment, including necessary environmental monitoring;

- Make available appropriate financial resources to continue environmental monitoring and reporting during temporary closure;
- Keep care and maintenance staff at the site and in sufficient number and expertise to care for the site and any potential problems that may arise;
- Make available enough equipment and supplies on site for any maintenance or reclamation activities that may need to take place; and
- Comply with all applicable federal and territorial laws and regulations, in addition to the operator's Land Use Permits, Land Leases and Water Licence.

7.2 Temporary Closure Activities

The proposed short-term and long-term temporary closure activities are presented in the following subsections. The extent to which the activities listed will be implemented depends on the site conditions at the time of the temporary closure, and the anticipated length of the closure (short-term or long-term). In all cases, access to the sites, buildings, and all other infrastructures will be secured and restricted to authorized personnel only.

In most circumstances, planned temporary closure activities are expected to occur as described above and in the following sections. Should a situation arise in which temporary closure cannot be executed as planned (e.g. major fire or spill, major problem in the open pits or underground, etc.), the affected features will be subject to alternative temporary closure measures, with the planned temporary closure activities resuming as soon as practical.

In most circumstances, the AWAR will continue to be open to public access during any temporary closure of the mine. The status of the road during such periods would be assessed by Agnico Eagle on a case-by-case basis. For short duration temporary shutdowns (short-term temporary closure), the AWAR would remain open and be maintained in the same manner as proposed during the operational phase. While each case would be assessed separately, temporary shutdowns of less than 6 months duration would not change the way the access road is operated or maintained. For temporary shutdowns of greater than six months and less than 12 months in duration, and/or for indefinite shutdowns (period of time greater than one year: long-term temporary closure), Agnico Eagle would have to change the way it operates and maintains the road. In such an instance, Agnico Eagle would evaluate what level of activity was expected to continue at the site during the shutdown period and adjust its care and maintenance of the access road accordingly (AEM, 2019d).

7.2.1 Short-term Temporary Closure

Short term shut down or closure period is defined as a period of less than one year and could last for a period of weeks or several months (up to 12 months) based on economic, environmental, and social factors. The following Table 7-1 summarizes the measures that will be taken as required during a short-term temporary closure (adapted from SLI, 2018 and AEM, 2015a).

Table 7-1 : Short-term Temporary Closure Activities

Sites	Closure Activities
Underground	Warning signs and berms will be erected as needed to block the entrance to underground
	Maintain required activities where possible to ensure stability. Dewatering underground areas will continue as conducted during operations since flooding and subsequent dewatering may adversely impact stability
Open pits	Warning signs and berms will be erected as needed around the pit perimeter
	Dewatering of open pits will continue as conducted during operations since flooding and subsequent dewatering may adversely impact stability.
Water Management	Surface water management facilities will be maintained to manage contact water runoff
	Unused water distribution lines will be drained, but would be left in place
	All water will be treated and discharged during a four-month period from June to September each year. If the temporary shutdown occurs during the October to May period (i.e., during the winter period), little or no water will need to be considered for storage or treatment
	The sewage treatment plant and potable water treatment plant will continue to operate as needed
Infrastructures and services areas	All mobile equipment except for small service equipment required for pit inspections will be removed and placed in secure on-site storage
	Fuel, lubricants, and hydraulic fluids will be removed from the site, open pit and underground area and stored in designated areas
	Fluid levels in all fuel tanks will be recorded and monitored regularly for leaks, or fuel will be removed from the site
	An inventory of chemicals and reagents, petroleum products, and other hazardous materials will be conducted. These materials will be secured appropriately, or the materials will be removed from the site
	All explosives will be relocated to the main powder magazine and secured, disposed of, or removed from the site
	Minimum staffing levels will be maintained to carry out care and maintenance
	The accommodations will be operated at reduced staffing level
	Critical facilities will have nominal heat to prevent freezing of the facilities and possible damage
	Hazardous wastes on-site will be collected and stored in an appropriate area for annual disposal to a registered disposal facility
	In most circumstances, the AWAR will continue to be open to public access. The status of the road during such periods would be assessed by Agnico Eagle on a case-by-case basis
Monitoring	Monitoring of water quality of the collection ponds will continue as per during operations
	Environmental monitoring and sampling will continue at regular intervals as set out in the Meliadine Mine operations and monitoring program and in accordance with all applicable Licences, permits, and authorizations
	Routine geotechnical stability monitoring and maintenance will continue at a reduced rate compared to that conducted during operations. The pit area will be inspected routinely to check for rock falls, changes to groundwater inflows and overall integrity. Underground will be inspected for geotechnical stability in area safe to do so

7.2.2 Long-term temporary closure

Long-term temporary closure (indefinite shutdown) is a cessation of mining and processing operation for an indefinite period greater than one year. The intention is that the mine will resume operations as soon as

possible after the cause for the indefinite shutdown has been addressed. The site must maintain safety and environmental stability during this time. Possible causes for an indefinite shutdown could include prolonged adverse economic conditions or extended labor disputes. A decision on the estimated length of the indefinite shutdown would be made after the initial one-year period. Decisions on possible extensions to the indefinite shutdown would be made every 6 months thereafter and would be based on the conditions at that time. At present, the maximum length of time or number of extensions for interim shutdown before moving to final closure has not been defined. Table 7-2 summarizes the measures that will be taken as required **in addition** to the short-term temporary closure activities presented in Table 7-1 during a long-term temporary closure (adapted from SLI, 2018 and AEM, 2015a).

Table 7-2 : Long-term Temporary Closure Activities

Category	Closure Activities
Underground and open pits	Monitoring of the pumps in the underground and open pits will continue and the underground and open pits will be maintained in a dry condition to maintain dry, stable conditions to allow a restart of mining as appropriate
	Pumps in the pit will be relocated and the pit will be allowed to flood passively (from rainfall and groundwater inflow)
WRSF	If necessary, the working face of the WRSFs slopes will be graded to ensure stability and drainage to the contact water management system adjacent to the rock storage facilities. As the WRSFs will be designed and operated for long-term stability, it is anticipated that any grading required will be localized and minimal. The WRSFs will be monitored to ensure the site stays in compliance with any permits and/or licences
TSF	The tailings surface area will be re-graded, if needed, to promote slope stability. Erosion control measures will be implemented, if required, to reduce the potential mobilization of tailings by wind, such as a minimum 0.75 to 1 m cover of non-potentially acid generating waste rock placed over the exposed tailings to control dust
	The TSF will be subject to routine geotechnical stability monitoring and maintenance. Monitoring will be at the same frequency as that of operations, to ensure the site stays in compliance with any permits and/or licences. Maintenance will be completed as required
Water Management	The dikes/dams will be monitored and maintained, and none of the dikes/dams will be opened and reconnected to adjacent lakes
Water Management	Surface water control structures will be maintained as required. In areas where water quality is suitable for discharge, natural drainage courses may be re-established
	Unused water distribution lines will be drained. Unused lines on surface will be removed and placed in a secure lay down area to reduce impacts on wildlife
Infrastructures and services areas	Dependent on the cause of the closure, the AWAR may be inaccessible during the winter for cars and trucks. If continued presence on-site is required, then it is likely Agnico Eagle would maintain the road open in some manner over the winter
Monitoring	Environmental and geotechnical monitoring and sampling will continue at the regular level as set out in the mine operations and monitoring program, and in accordance with all applicable Licences, permits and authorizations

7.3 Temporary Closure Monitoring, Maintenance, and Reporting

Monitoring and reporting during the short-term and long-term temporary closure will continue at the regular level as set out in the mine operations and monitoring program, and in accordance with all applicable Licenses, permits and authorizations. Adjustment of monitoring frequencies for long term temporary closure might be made only following approval from the licensing and permitting authorities concerned.

As required by the Meliadine Water Licence 2AM-MEL1631, Part J, items 2, 3 and 4:

2. The Licensee shall notify the Board in writing, at least sixty (60) days prior to, or as soon as practically possible, the intent to enter into a Care and Maintenance Phase.

3. The Licensee shall provide the Board for review, within thirty (30) days of the Licensee providing notice of intent to enter into Care and Maintenance under Part J, Item 2, a Care and Maintenance Plan that details the Licensee's plans for maintaining compliance with the Terms and Conditions of the Licence.

4. The Licensee shall provide the Board for approval in writing, within ninety (90) days of the Licensee providing a notice of intent to enter into Care and Maintenance under Part J, Item 2, all operational revised Plans to reflect the Care and Maintenance status.

The reclamation security deposit will also be kept up to date during temporary closure.

The numbers of personnel on-site would be reduced to reduce operation costs. The staff present at site during temporary closure would be sufficient in number and expertise to successfully carry out care, maintenance and monitoring duties, and to address and remediate any potential problems that may arise. Sufficient equipment and supplies/reagents would be left on-site for any maintenance or reclamation activities that may need to take place.

7.4 Temporary Closure Contingency Program

The key staff present at site during temporary closure would be sufficient in number and expertise to successfully address and remediate any conditions or unforeseen events that may arise through the monitoring programs. The key staff at the site would also have access to external consultants and advisors, as required. The contingency options and actions for events or incidents defined for operations would be also implemented during the temporary closure (i.e., spill responses and reports) (AEM, 2015a).

7.5 Temporary Closure Schedule

Mining activities during short-term closure are typically stopped. However, activities such as care-and maintenance, monitoring, intermittent testing, periodic operation of equipment and appropriate facilities will be on-going as described above. Activities related to ensuring public and wildlife safety would be a priority and would focus upon maintenance and monitoring of all facilities and equipment to maintain physical and chemical stability. A sufficient number of care-and-maintenance staff would be present on site, and an appropriate level of security would be implemented at selected facilities. Access to temporarily inactive facilities would be restricted to authorized personnel only.

The temporary closure schedule would depend on when temporary closure occurs (i.e., what year of the operations stage) and its duration, both of which are commonly uncertain. Therefore, the schedule for the

activities presented in Section 7.2 would be developed as temporary closure advances. Establishing a temporary closure schedule inherently contains uncertainty as this is not a planned activity, and the duration of a temporary closure will vary based on the cause for closure. As a result, the schedule will be progressive (AEM, 2015a).

The sequence of activities for short-term and long-term temporary closure would, in summary, be as follows:

- Restrict access to the site, buildings, and infrastructures to authorized personnel as required;
- Carry out an inventory of chemicals and reagents, petroleum products, and other hazardous materials and secure the inventory appropriately or remove some of it from site;
- Post warning signs and berms as needed around the open pit's perimeter and underground openings;
- Remove all mobile equipment except for small service equipment required for open pits and site inspections and place them in secure on-site storage;
- Temporary closure of unnecessary facilities and systems;
- Continue with environmental and geotechnical monitoring and sampling required for care, maintenance and monitoring at the regular level as set out in the mine operations and monitoring program, and in accordance with all applicable Licenses, permits, and authorizations.

8.0 Integrated Schedule of Activities

Reclamation of the Meliadine site can be divided into the following three general stages:

- Operations (Progressive Reclamation Stage): during which reclamation of the TSF will start with the initial placement of the cover material over the tailings surface. Reclamation of the open pits and underground mining will start at the end of operations;
- Active Closure: during which the decommissioning of major facilities will occur, and active flooding of the open pits will continue using water pumped from Meliadine Lake. Active care, maintenance and monitoring will be required for the decommissioned and remaining facilities throughout this stage;
- Post Closure: during which continued monitoring and maintenance will be carried out at a reduced frequency than during Operations and Active Closure stages, depending on the results of the monitoring and measures of success selected for closure.

The preliminary schedule of the Meliadine closure is presented **in Appendix O** and provides a schedule detailing the closure stages of major components of the Meliadine progressive closure, active closure and post closure. The main key periods included in the schedule are presented in Table 8-1.

Table 8-1 : Meliadine - Closure and Post-Closure Main Phases

Period	Operations/Closure Main Phases
2020 to 2027	**Mining and processing operations at Meliadine**
2028 to 2030	**Active Closure Monitoring**
2028 to 2037	**Post-Closure Monitoring**
2020 to 2028	Progressive reclamation of TSF
2027 to 2032	Passive flooding of underground mine
2027 to 2029	Active open pits flooding
2028 and 2029	Infrastructures and facilities demolition
2034	Decommission WTP and Meliadine effluent diffuser
2037	Breach dikes/berms and reclaim channel and pond areas
2037	AWAR closure

It is anticipated that the schedule will be refined throughout the Meliadine Mine life as the designs for closure are advanced and the closure methods and strategies are further developed. The schedule is subject to changes following mine plan and development as well as market conditions.

9.0 Post-Closure Site Assessment

The ICRP is alive document and includes a commitment to adaptive management and monitoring during all stages of the mine life to demonstrate the safe performance of the Project facilities and to reduce any contamination on the site or in the adjacent area after operations cease. Monitoring during operations and in closure will identify non-compliant conditions, allow timely maintenance and clean up as needed, allow timely planning for adaptive and corrective measures, and enable successful completion of the ICRP. In this way, the Project is not anticipated to contribute residual impacts to the environment after closure and reclamation (SLI, 2018).

Monitoring programs is already ongoing and will continue throughout operation to provide additional baseline information on which to base the Final Closure and Reclamation plan (FCRP) document. The adaptive management plans to be used in closure will follow the actions completed during operations and will be coordinated with the existing operational monitoring programs to set appropriate trigger levels, and mitigation plans and actions.

Monitoring programs will be initiated during pre-development and operations to provide additional baseline information on which to base the ICRP and FRCP documents. The adaptive management plans to be used in closure and post-closure will follow the actions completed during operations and will be coordinated with the operational monitoring programs to set appropriate trigger levels, and mitigation plans and actions.

Monitoring and maintenance programs that are implemented during the closure and post-closure phases of the Project life will use the data collected during operational monitoring to assess the performance of the

reclamation and closure procedures, and to identify long-term maintenance requirements, if any. The data collected during post-closure monitoring will allow the procedures and activities to be adjusted or modified as necessary to confirm ongoing environmental protection.

Post closure general arrangement is presented in **Appendix N**.

9.1 Operational Monitoring Strategies

The overall objectives during operations are to provide programs to identify and mitigate potential adverse Project related impacts so that construction and operational activities do not cause any undue harm to water quality, sediment quality, vegetation, biota, wildlife, and wildlife habitats. The various monitoring programs required during operation will be reviewed and updated during operation to reflect conditions at the site as the mine approaches closure. The changes would allow the basic portions of the monitoring plans to continue to be used to cover the closure period activities.

9.2 Closure and Post-Closure Monitoring Strategies

Guidance on monitoring and maintenance programs for closure and post-closure is provided in the guidelines for closure and reclamation (AANDC/MVLWB, 2013). «Post-closure monitoring will be required to confirm the success of the closure objectives once operations cease indefinitely. Closure criteria will assist in the development of post-closure monitoring programs and will provide clear interpretation of monitoring results. If it is determined that closure objectives were not met for individual project components (as demonstrated by the closure criteria not being met), the proponent will need to implement ongoing monitoring, maintenance measures, and possibly contingency plans. Where a catastrophic event or natural disaster occurs prior to relinquishment, additional monitoring and maintenance may be necessary. Proponents should consider establishing monitoring programs with involvement from local Aboriginal communities. If closure criteria are achieved, then a cessation in monitoring activities for the reclamation of an individual project component may be approved by the Boards. However, if risks to the site remain, additional monitoring may be necessary. When closure criteria have been achieved and verified by Inspectors for specific components, the proponent is then eligible to request the appropriate reduction in their security deposit».

Development of monitoring and maintenance programs is an iterative process in consultation with communities and regulators as the Project advances. The closure and post-closure monitoring and maintenance programs will be extensions of efforts undertaken during the operations phase and would reflect the success of the management of the site during operations to limit the effect on the environment.

The actual conditions or impact from the operations within the mine footprint will be analysed and this information will be integrated to modify monitoring plans moving to closure and post closure. It is anticipated that monitoring and maintenance will be carried out during the active closure stage at frequencies similar to those required during operations. Post closure monitoring and maintenance will be carried out at a reduced frequency depending on the results of the monitoring and the measures of success selected for closure. As the closure effort is completed and the post-closure period begins, the various monitoring programs will be reviewed and updated again to cover the remaining (post-closure) monitoring period. It is also anticipated that after several years in the post-closure period, monitoring would no longer be required. The monitoring plan for closure and post-closure will be included in the Final Closure and Reclamation Plan.

It is planned to maintain access to the site with the AWAR until maintenance requirements at the Project site are anticipated to be minor and could be achieved with small crews sent to site via helicopter in the summer. It is anticipated that the need for ongoing maintenance would be reduced with time and will not be required once the site is physically and chemically stable.

9.3 Reporting

The preparation of the following reports is suggested in the AANDC/MVLWB (2013) guidelines for closure and reclamation of all components of mine sites:

- **Annual Closure and Reclamation Plan Progress Report**: The general purpose of these annual reports is to provide an opportunity for all parties to track, modify, and report on reclamation. The annual review of research results also provides an opportunity to identify missing research tasks, which allows the research plans to continually evolve. The progress reports keep all parties informed about closure planning and allow the NWB to confirm that the proponent has remained on schedule. Any proposed changes to the Closure Reclamation Plan (CRP) should be presented with supporting rationale in these reports for NWB approval;
- **Reclamation Completion Report**: The general purpose of the reclamation completion report is to provide details, including figures, of the actual reclamation work completed, and an explanation of any work that deviated from the original or approved CRP. The report should also provide a preliminary assessment on whether appropriate closure objectives and criteria have been achieved. With each reclamation completion report, there may be an opportunity to revise the financial security estimate depending on the stage of the operation and the current CRP;
- **Performance Assessment Report**: A performance assessment report is prepared at the completion of the reclamation work and following submission of the reclamation completion report. The general purpose of the performance assessment report is to provide a detailed comparison of conditions at the site against the appropriate closure objectives and closure criteria. With each performance assessment report, there may be an opportunity to revise the security estimate depending on the stage of the operation and the current CRP.

The timelines for preparation and submission to NWB of the above described reports will be according to the Meliadine Mine approved Water Licence requirements.

10.0 Financial Security

A permanent closure and reclamation financial security cost estimate has been prepared with the present Project layout and infrastructure. The cost estimate covers the closure and reclamation of all Project facilities as described in this report and was prepared using RECLAIM Version 7.0 for permanent closure of the Project.

Agnico Eagle is required to submit a detailed financial security cost estimate for the Meliadine ICRP 2019 to Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) and to the Kivalliq Inuit Association (KIA) to support land use and water licensing requirements. RECLAIM Version 7.0 workbook has been used for this estimate, as per the Guidelines for Closure and Reclamation Cost Estimates for Mines, issued by

Crown-Indigenous Relations and Northern Affairs Canada, Mackenzie Valley Land and Water Board and the Government of the Northwest Territories (INAC, MVLWB, GNWT, 2017).

This cost estimate provides for the closure measures described in detail in the Meliadine ICRP 2019. Most closure activities will occur within the active closure period, from 2028 to 2030 inclusively. The schedule of closure activities presented in **Appendix O** outlines the major closure measures and their expected timeline considered for the cost estimate.

For the purpose of this financial security cost estimate, no progressive rehabilitation measures have been considered. It will be possible to consider these measures in the upcoming calculations of the financial security cost estimate if they have been completed.

The 2019 estimated closure and reclamation costs for the Meliadine Mine represent a total of $ 59,514,717. This total includes $ 34,462,041 of direct costs and $ 25,052,677 of indirect costs. The financial security cost estimate assumptions and methodology used for the calculations, along with the complete RECLAIM 7.0 spreadsheets are presented in **Appendix P**.

SNC·LAVALIN

11.0 Personnel

This report has been prepared by Marie-Hélène Picard, Jonathan Leblanc and Érika Voyer, revised by Érika Voyer and approved by Sandra Pouliot.

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

SNC LAVALIN INC.

Prepared by:
(*under ICS*[2])
Jonathan Leblanc
Jonathan Leblanc, Jr. Eng., M. Sc.
Junior geotechnical engineer
#OIQ: 5056213
Mining & Metallurgy

Prepared by:
Marie-Hélène Picard, Eng., M.Sc.A.
#OIQ: 5026544
Geotechnical Engineer
Mining & Metallurgy

Prepared and revised by:
Erika Voyer, Eng., M.Sc.A.
#OIQ:146740
Geotechnical Expert
Mining & Metallurgy

Approved by:
Erika Voyer FOR : SANDRA POULIOT
Sandra Pouliot. Eng.
#OIQ: 121003
Senior Mining Environment Engineer
Mining & Metallurgy

EV/bsp

[2] ICS: Immediate control and supervision.
In terms of supervising the engineering activities and supervision of people who are not engineers or junior engineers, the Ordre des ingénieurs du Québec uses a term often used in its regulation: Immediate control and supervision (ICS). In other words, an engineer must be involved in a continuous and active manner throughout the reserved tasks entrusted to him, and not just before or after.

12.0 References

AANDC (1992). Aboriginal Affairs and Northern Development Canada. 1992. Guideline for Acid Rock Drainage Prediction in the North. Northern Mine Environment Neutral Drainage Studies No. 1. Formerly Indian and Northern Affairs Canada. September 1992.

AANDC (2002). Aboriginal Affairs and Northern Development Canada. Mine Site Reclamation Policy for Nunavut. Formerly Indian and Northern Affairs Canada (INAC).

AANDC (2007). (Aboriginal Affairs and Northern Development Canada. Mine Site Reclamation Guidelines for the Northwest Territories. Formerly Indian and Northern Affairs Canada (INAC). January 2007.

AANDC (2013). Aboriginal Affairs and Northern Development Canada and Mackenzie Valley Land and Water Board (AANDC/MVLWB). Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories. November 2013.

AEM (2014). Meliadine Gold Project, Nunavut. Final Environmental Impact Statement (FEIS). Volume 1 to 10. Submitted to the Nunavut Impact Review Board. April 2014

AEM (2015a). Agnico Eagle Mines Limited Report No. 6513-CRP-01 (April) Meliadine Gold Project. Preliminary Closure and Reclamation Plan. Version 1.0.

AEM (2015b). Agnico Eagle Mines Limited (February). Updated Technical Report on the Meliadine Gold Project, Nunavut, Canada

AEM (2015c). Agnico Eagle Mines Limited (April). Type A Water Licence Main Application Document. Version 1.

AEM (2015 d). Agnico Eagle Mines Limited (November) Meliadine Gold Project. Air Quality Monitoring Plan. Version 1.0.

AEM (2017). Agnico Eagle Mines Limited (April). Meliadine Incinerator Design Report and Drawings. 30-Day Notice to Nunavut Water Board In Accordance with Water License 2AM-MEL1631 (Part D, item 1)

AEM (2018). Agnico Eagle Mines Limited. (March) Hazardous Materials Management Plan. Version 5. 6513-MPS-12

AEM (2019a) Agnico Eagle Mines Limited.(March). Meliadine Gold Project 2018 Annual Report. 87 p

AEM (2019b). Agnico Eagle Mines Limited. Report No. 6513-MPS-09 (March) Mine Waste Management Plan. Version 5.

AEM (2019c). Agnico Eagle Mines Limited. Report No. 6513-MPS-11 (August) Water Management Plan. Version 7.

AEM (2019d). Agnico Eagle Mines Limited. Report No. 6513-MPS-03 (March) Roads Management Plan. Version 7.

AEM (2019e). Agnico Eagle Mines Limited. (January) Water Quality and Flow Monitoring Plan , Version 1.

AEM (2019f). Agnico Eagle Mines Limited. (March) Groundwater Management Plan , Version 4.

AEM (2019g). Agnico Eagle Mines Limited. (March) 2018 Metal leaching and acid rock drainage monitoring report.

AEM (2019h). Agnico Eagle Mines Limited. (January) Wildlife protection and response plan. Version 8.

AEM (2019i). Agnico Eagle Mines Limited. (March) Landfill and Waste Management Plan. Version 7. 6513-MPS-06

AEM (2019j). Agnico Eagle Mines Limited. (February) Landfarm Management Plan. Version 3. 6513-MPS-15

AEM (2019k). Agnico Eagle Mines Limited. (February) Analysis of the Risk of Temporary Mine Closure. Presented to: Nunavut Impact Review Board

AEM website: (https://www.agnicoeagle.com/English/operations-and-development-projects/operations/meliadine/default.aspx

CCME (2001). (Canadian Council of Ministers of the Environment). 2001. Canadian sediment quality guidelines for the protection of aquatic life: Introduction. In: Canadian Environmental Quality Guidelines. Winnipeg, MB.

CCME (2006). Canadian Environmental Quality Guidelines (CEQG) for Soil for the Protection of Environmental and Human Health, Update 7.0 Summary Tables. September 2009.

CCME (2007). Canadian soil quality guidelines for the protection of environmental and human health. Summary Table Updated September 2007.

CCME (2012). Canadian Environmental Quality Guidelines.

CESCC (2011). Canadian Endangered Species Conservation Council. 2011. Wild species 2010: the general status of species in Canada. National General Status Working Group: 302 pp.

COSEWIC (2012). Committee on the Status of Endangered Wildlife in Canada. 2012. Status of Endangered Wildlife in Canada. Available at http://www.cosewic.gc.ca/eng/sct1/index_e.cfm. Accessed August 2012.

DFO (2006). Fisheries and Oceans Canada. Regulations Amending the Metal Mining Effluent Regulations (MMER). Department of the Environment, Extract Canada Gazette, Part II Volume 140 No 21. October 18, 2006. Registration SOR/2006-239.

Environment Canada (2009). Environmental code of practice for metal mines, 2009.

Golder (2012). SD 7-2 Aquatic Baseline Studies- Meliadine Gold Project, Nunavut, Canada. A Technical Report Submitted to Agnico Eagle Mines Ltd. by Golder Associates, September 19, 2012.

Golder (2013). Site specific Water Quality Objectives (SSWQO) Assessment – Meliadine Gold Project, Nunavut. Document 371. Report to Agnico-Eagle Mines Ltd. February 22, 2013. 57 p.

Golder (2015). Golder Associates Ltd. SD 6-4 Terrestrial Environment Management and Monitoring Plan (TEMMP) – Meliadine Gold Project, Nunavut. Prepared for Agnico Eagle Mines Limited. Rankin Inlet, NU.

Golder (2019a). Nuqsana Golder (March 2019). Cycle 1 Environmental Effects Monitoring Report and 2018 Aquatic Effects Monitoring Program Annual Report18110868-720-R-Rev0-2100

Golder (2019b). Golder Associates Ltd. (March 2019). 2018 Terrestrial Effects Monitoring and Mitigation Program Annual Report. 1893783_667_RPT_Rev

KIA (2017). Kivalliq Inuit Association. Meliadine Project Inuit Impact & Benefit Agreement between the Kivalliq Inuit Association and Agnico Eagle Mines Limited. March 1, 2017.

BGC (2003). (BGC Engineering Inc.) Implications of Global Warming and the Precautionary Principle in Northern Mine Design and Closure. Report prepared for Department of Indian Affairs and Northern Development Canada.

Heginbottom, J. A., M. A. Dubreuil, and P. A. Harker (1995). Canada permafrost, in National Atlas of Canada, 5th ed., Nat. Resour. Can., Ottawa, Ont., Canada.

IPCC (2014). (Intergovernmental Panel on Climate Change). Fifth Assessment Report (AR5). Summary for Policymakers. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1-32.

NRC (2010). (Natural Resources Canada). Climate Warming - National Annual Temperature Scenario: 2050 / Réchauffement climatique - Scénario de température nationale annuelle : 2050; Atlas of Canada. Atlas of Canada Reference Outline Map Series 613, (ed. 6), 2010, 2 sheets. On-line map accessed May 2018.

NRC (2015). Natural Resources Canada. 2015. Earthquake Canada. On-line calculation accessed October 2019.

Overland, J.E., M. Wang, J.E. Walsh, and J.C. Stroeve (2013). Future Arctic climate changes: Adaptation and mitigation time scales, Earth's Future, 2, doi: 10.1002/2013EF000162.

SARA (*Species at Risk Act*). 2012. Species at Risk Public Registry website. Available at http://www.sararegistry.ga.ca.

SLI (2018). Report No. 654769 (June). Meadowbank Interim Closure and Reclamation Plan Update 2018.

Smith, S.L. and M.M. Burgess (1998). Mapping the response of permafrost in Canada to climate warming. In, Current Research 1998-E, Geological Survey of Canada, p 163-171.

Smith, S.L. and M.M. Burgess (2004). Sensitivity of permafrost to climate warming in Canada. Bulletin 579, Geological Survey of Canada, Ottawa, ON.

Tetra Tech (2017a). (April) Design report for Itivia laydown area culvert Meliadine Project, Nunavut. Tetra Tech project number: 28920. AEM Number: 6515-C-230-005-230-REP-002

Tetra Tech (2017b). (July). Design Report for Operation Landfill (Stage 1), Meliadine Gold Project Tetra. FILE: 704-ENG.EARC03076-01.WM13. AEM Number: 6515-C-230-005-230-REP-002

Tetra Tech (2018). (February). Construction summary (as-built) report for landfarm, Meliadine project, NU. Project number: 28920. AEM Number: 6515-E-132-007-132-REP-016

Tetra Tech (2019). (February) Construction summary report for Rankin Inlet bypass road and culverts, Meliadine project, NU. Project number: 28920. AEM Number: 6515-E-132-007-132-REP-010

Woo, M.K., A.G. Lewkowicz and W.R. Rouse (1992). Response of the Canadian Permafrost Environment to Climatic Change. Physical Geography, 13:287–317.

Appendix A

Glossary of Terms and Definitions

The following terms are utilized in this document following the definitions provided in the Mine Site Reclamation Guidelines for the Northwest Territories (INAC 2007), the Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories (AANDC/MVLWB, 2013) and the Meliadine Gold Project Type "A" Water Licence 2AM-MEL1631.

This Appendix includes discipline-specific technical terms and key closure and reclamation planning terms (Adapted from SNC-Lavalin, 2018).

Abandonment: The permanent dismantlement of a facility so it is permanently incapable of its intended use. This includes the removal of associated equipment and structures.

Acid Base Accounting (ABA): Acid base accounting; a static test that defines the amounts, and relative balance, of potentially acid-generating and acid-neutralizing (or base) minerals in a sample.

Acid Rock Drainage (ARD): Acid rock drainage/metal leaching. The production of acidic leachate, seepage or drainage from underground workings, open pits, ore piles, waste rock or construction rock that can lead to the release of metals to groundwater or surface water during the life of the Project and beyond closure.

Active layer: The layer of ground above the permafrost which thaws and freezes annually.

Adaptive management: A management plan that describes a way of managing risks associated with uncertainty and provides a flexible framework for mitigation measures to be implemented and actions to be taken when specified thresholds are exceeded.

Advanced mineral exploration: Any appurtenant undertaking in which the proponent requires a Type A or Type B water licence in order to carry out the proposed activities.

All-Weather Access Road (AWAR): The all-weather access road and associated water crossings between the Hamlet of Rankin Inlet and the Meliadine Gold Project mine site.

Aquatic Effects Monitoring Plan (AEMP): A monitoring program designed during the Environmental Impact Statement stage of the Project to determine the short and long-term effects in the aquatic environment resulting from the Project, to evaluate the accuracy of impact predictions, to assess the effectiveness of planned impact mitigation measures and to identify additional impact mitigation measures to avert or reduce environmental effects. An overarching "umbrella" program that conceptually provides an opportunity to integrate results of individual, but related, monitoring programs in accordance with the Water Licence.

Backfill: Material excavated from a site and reused for filling the surface or underground void created by mining.

Background: An area near the site under evaluation not influenced by chemicals released from the site, or other impacts created by onsite activity.

Baseline: A surveyed condition and reference used for future surveys.

Berm: A mound or wall, usually of earth, used to retain substances or to prevent substances from entering an area.

Appendix A

Glossary of Terms and Definitions

Best management practices: Any program, technology, process, operating method, measure, or device that controls, prevents, removes, or reduces pollution and impact on the environment.

Biodiversity: The variety of plants and animals that live in a specific area.

Bioremediation: The use of microorganisms or vegetation to reduce contaminant levels in soil or water.

Borrow pit: A source of fill or embanking material.

Canadian Council of the Minister of Environment (CCME): The organizations of Canadian Ministers of Environment that set guidelines for environmental protection across Canada such as the Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life.

Care and maintenance: A term to describe the status of a mine when it undergoes a temporary closure. In respect of a mine, means the status of the facility when the License ceases production or commercial operation temporarily for an undefined period of time.

Closure: When a mine ceases operation without the intent to resume mining activities in the future.

Closure criteria: Details to set precise measures of when the objective has been satisfied.

Closure goal: The guiding statement that provides the virion and purpose of reclamation. Attainment of the closure goal happens when the proponent has satisfied all closure objectives. By its nature, the closure goal is a broad, high-level statement and not directly measurable.

Closure objectives: Statements that describe what the selected closure activities are aiming to achieve; they are guided by the closure principles. Closure objectives are typically specific to project components, are measurable and achievable, and allow for the development of closure criteria.

Closure options: A set of proposed alternatives for closing and reclaiming each mine components. The closure options are evaluated to determine the selected closure activity, which must be approved by the NWB.

Closure principles: The four core closure principles are 1) physical stability, 2) chemical stability, 3) no long-term active care requirements, and 4) future use (including aesthetics and values). The principles guide the selection of closure objectives.

Commercial operation: In respect of a mine, an average rate of production that is equal to or greater than 25% of the design capacity of the mine over a period of ninety consecutive days.

Construction: Activities undertaken to construct or build any components of, or associated with, the development of the Meliadine Gold Project.

Contact water: Any water that may be physically or chemically affected by mining activities.

Contaminant: Any physical, chemical, biological or radiological substance in the air, soil or water that has an adverse effect. Any chemical substance with a concentration that exceeds background levels or which is not naturally occurring in the environment.

Contouring: The process of shaping the land surface to fit the form of the surrounding land.

Appendix A

Glossary of Terms and Definitions

Core Receiving Environmental Monitoring Program (CREMP): A monitoring program designed to determine the short and long-term effects in the aquatic environment resulting from the Project, to evaluate the accuracy of impact predictions, to assess the effectiveness of planned impact mitigation measures and to identify additional impact mitigation measures to avert or reduce environmental effects.

Cumulative Effects: The combined environmental impacts that accumulate over time and space as a result of a series of similar or related actions or activities.

Decommissioning: The process of permanently closing a site and removing equipment, buildings and structures. Rehabilitation and plans for future maintenance of affected land and water are also included.

Deleterious substances: A substance as defined in section 34(1) of the Fisheries Act.

Dike: Retaining structure designed for water control to enable safe open pit mining and for containing tailings impoundments.

Discharge: The release of any water or waste to the receiving environment.

Disposal: The relocation, containment, treatment or processing of unwanted materials. This may involve the removal of contaminants or their conversion to less harmful forms.

Domestic waste: All solid waste generated form the accommodations, kitchen facilities and all other site facilities, excluding those hazardous wastes associated with the mining and processing of ore.

Drainage: The removal of excess surface water or groundwater from land by natural runoff and permeation, or by surface or subsurface drains.

Effluent: Treated or untreated liquid waste material that is discharged into the environment from all site water management facilities or from a structure such as a settling pond or a treatment plant.

End land use: The allowable use of disturbed land following reclamation. Municipal zoning and/or approval may be required for specific land uses.

Engagement: The communication and outreach activities a proponent is required to undertake with affected communities and Aboriginal organizations/governments prior to and during the operation of a project, including closure and reclamation phases.

Engineered structure: Any facility, which was designed and approved by a Professional Engineer registered with the Association of Professional Engineers, Geologists and Geophysicists of Nunavut.

Environment: The components of the Earth, and includes: land, water and air, including all layers of the atmosphere; all organic and inorganic matter and living organisms; and the interacting natural systems that include the aforementioned components.

Environmental assessment: An assessment of the environmental effects of a project that is conducted in accordance with the Canadian Environmental Assessment Act and its regulations.

Environmental management system: A management system that incorporates environmentally and socially responsible practices into the project operations.

Erosion: The wearing away of rock, soil or other surface material by water, rain, waves, wind or ice; the process may be accelerated by human activities.

Appendix A

Glossary of Terms and Definitions

Explosives: Gunpowder, blasting powder, nitroglycerine, gun-cotton, dynamite, blasting gelatine, gelignite, fulminates of mercury or of other metals and every other substance made, manufactured or used with a view to producing a violent effect by explosion.

Final discharge point: In respect of an effluent, an identifiable discharge point of a mine beyond which the operator of the mine no longer exercises control over the quality of the effluent (Metal Mining Effluent Regulations).

Fish habitat: Areas used by fish for spawning, nursery, rearing, foraging and overwintering.

Geotechnical Engineer: A professional engineer registered with the Association of Professional Engineers, Geologist and Geophysicists of Nunavut and whose principal field of specialization with the engineering properties of earth materials in dealing with man-made structures and earthworks that will be built on a site. These can include shallow and deep foundations, retaining walls, dams, and embankments.

Geothermal analysis: The analysis of temperature below the ground surface.

Glacial till: Unsorted and unlayered rock debris deposited by glacier.

Greywater: The component of effluent produced from domestic use (i.e. washing, bathing, food preparation and laundering), excluding sewage.

Ground thermal regime: Temperature conditions below the ground surface; a condition of heat losses and gains from geothermal sources and the atmosphere.

Groundwater: All subsurface water that occurs beneath the water table in rocks and geologic formations that are fully saturated. Water that occupies pores and fractures in rock and soil below the ground surface in a liquid or frozen state.

Habitat: The place where animal or plant naturally lives and grows.

Hazardous materials/waste: A contaminant which is a dangerous good that is no longer used for its original purpose and is intended for recycling, treatment, disposal or storage. Materials or contaminant which are categorized as dangerous goods under the Transportation of Dangerous Good Act (1992) and/or that is no longer used for their original purpose and is intended for recycling, treatment, disposal or storage.

Humidity cell test (HCT): A type of kinetic test in which a small sample (about 1 kg) is placed in an enclosed chamber in a laboratory, alternating cycles of moist and dry air is constantly pumped through the chamber, and once a week the sample is rinsed with water; chemical analysis of rinse water yields concentrations of elements and other parameters used to calculate reaction rates.

Hydrology: The science that deals with water, its properties, distribution and circulation over the Earth's surface.

In situ treatment: A method of managing or treating contaminated soils, sludges and waters "in place" in a manner that does not require the contaminated material to be physically removed or excavated from where it originated.

Incinerator: The dual chamber, high temperature facility designed with the capacity to service the camp.

Appendix A

Glossary of Terms and Definitions

Interim Closure and Reclamation Plan (ICRP): A conceptual detailed plan on the reclamation of mine components which will not be closed until the end of the mining operations, and operational detail for components which are to be progressively reclaimed throughout the mine life.

Kinetic test: A geochemical procedure for characterizing the chemical status of a sample through time during continued exposure to a known set of environmental conditions, such as a humidity cell.

Land owner: The responsible authority with administrative control and ownership of a type of land classified as crown land, commissioners land or Inuit Owned Land.

a. Crown land is a land belonging to Her Majesty or in respect of which Government has the power of disposition. In Nunavut, this power rests with Aboriginal Affairs and Northern Development Canada (AANDC).
b. Commissions land is a land belonging to the Commissioner for the Government of Nunavut; which typically is a land within an established municipality administered by a Municipal Corporation and/or the Department of Community Government and Services (CGS).
c. Inuit Owned Land (IOL) are those lands vested in the Designated Inuit Organization (DIO) pursuant the Nunavut Land Claims Agreement. For this Project the DIO is the Kivalliq Inuit Association.

Land use permit:

a. For Crown land a Class A Permit or Class B Permit as required by the Territorial Land Use Regulations SOR/82-217, s.1; SOR/88-169, s.2 administered by AANDC Lands Department.

b. For IOL's- Land Use Licence I, II or III or Commercial Lease I, II, III as defined by the DIO.

c. For Commissioners land - a permit or lease as required by the Municipal Land Administration Policy.

Landfarm: The lined, engineered facility designed to treat petroleum hydrocarbon contaminated snow and soil that may be generated during mining activities using bioremediation.

Landfill: An engineered waste management facility at which waste is disposed by placing it on or in land in a manner that minimizes adverse human health and environmental effects.

Leachate: Water or other liquid that has washed (leached) from a solid material, such as a layer of soil or water; leachate may contain contaminants.

Long-term active care: A post-closure mine site is in long-term active care when sustained monitoring and maintenance of active facilities is required (e.g., for more than 25 years). This should be avoided whenever possible.

Metal leaching: The mobilization of metals into solution under neutral, acidic or alkaline conditions.

Migration: The movement of chemicals, bacteria, and gases in flowing water or vapour.

Mine design: The detailed engineered designs for all mine components stamped by a design engineer.

Mine plan: The plan for the development of the mine, including the sequencing of the development.

Mine water: Any water, including groundwater, which is pumped or flows out of any underground workings or open pit.

Appendix A

Glossary of Terms and Definitions

Mitigation: The process of rectifying an impact by repairing, rehabilitating or restoring the affected environment, or the process of compensating for the impact by replacing or providing substitute resources or environments.

Monitoring: Observing the change in geophysical, hydrogeological or geochemical measurements over time.

No net loss: A term found in Canada's Fisheries Act. It is based on the fundamental principle of balancing unavoidable losses of fish habitats with habitat replacement on a project-by-project basis in order to prevent depletion of Canada's fisheries resources.

Non-contact water: The runoff originating from areas unaffected by mining activity that does not come into contact with developed areas.

Nunavut Land Claims Agreement: The "Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada," including its preamble and schedules, and any amendments to that agreement made pursuant to it.

Objectives: Objectives describe what the reclamation activities are aiming to achieve. The goal of mine closure is to achieve the long-term objectives that are selected for the site.

Operations: The set of activities associated with mining, ore processing and recovery of gold; excluding construction and decommissioning activities.

Operator: The person who operates, has control or custody of, or is in charge of a mine or recognized closed mine.

Ore: Rock that is considered economic according to the parameters used in the ore reserve estimate. Ore will be processed at the mineral processing plant after it is mined from the Project underground mine and open pits.

Overburden: A general term referring to soil and broken rock, lying above ore and mine rock, that can usually be removed without blasting; at mines in soft sedimentary rock like coal, overburden can be synonymous with mine rock.

Passive long-term care: Occasional monitoring, coupled with infrequent maintenance or repairs that takes place following reclamation in the post closure phase of the mine site. Many mine sites require ongoing passive care, which can be an acceptable practice.

Passive Treatment: Treatment technologies that can function with little or no maintenance over long periods of time.

Permafrost: Permafrost is defined as ground that remains at or below 0°C for at least two years. Permafrost does not necessarily contain ice; rather, the definition is based solely on temperature criteria of the mineral or organic parent material.

Permafrost Aggradation: A naturally or artificially caused increase in the thickness and/or area extent of permafrost.

Permanent Closure: Final closure of the mine site after mining has ceased, when no further exploration, mining, or processing activities are anticipated at the site.

Appendix A

Glossary of Terms and Definitions

Permeability: The ease with which gases, liquids, or plant roots penetrate or pass through soil or a layer of soil. The rate of permeability depends upon the composition of the soil.

pH: A measure of the alkalinity or acidity of a solution, related to hydrogen ion concentration; a pH of 7.0 being neutral.

Piezometer: An instrument used to monitor pore water pressure.

Pore water pressure: The pressure of groundwater held within the spaces between sediment particles.

Pore water: The groundwater present within the spaces between sediment particles.

Post-closure: The period of time after active closure of the mine.

Potentially acid generating (PAG): Rock with an NP/AP ratio less than 2 as determined by static tests, as defined by MEND (2009). PAG rock can also be operationally defined based on the results of static testing such as ABA and NAG testing.

Progressive Reclamation: Actions that can be taken during mining operations before permanent closure, to take advantage of cost and operating efficiencies by using the resources available from mine operations to reduce the overall reclamation costs incurred. It enhances environmental protection and shortens the timeframe for achieving the reclamation objectives and goals.

Project: The Meliadine Gold Project as outlined in the Final Environmental Impact Statement. It comprises two (2) open pit mines, an underground mine, an All Weather Private Access Road from Rankin Inlet to the mine site, and site facilities in the Hamlet of Rankin Inlet (Itivia Harbor).

Proponent: Applicant for, or a holder of, a water licence and/or land use permit.

Quarry: The areas of surface excavation for extracting rock material for use as construction materials along the All Weather Private Access Road and facilities at the mine site.

Receiving environment: The aquatic and terrestrial environments that receive any discharge resulting from the Project.

Reclaim Pond: The pond located within the active zone of the Tailings Storage Facility, designed to contain process (tailings related) water, and where water in the pond will be used to satisfy mill process water make up requirements.

Reclamation: The process of returning a disturbed site to its natural state or one for other productive uses that prevents or minimizes any adverse effects on the environment or threats to human health and safety.

Reclamation Research: Literature reviews, laboratory or pilot-scale tests, engineering studies, and other methods of resolving uncertainties. Proponents conduct reclamation research to answer questions pertaining to environmental risks; the design of reclamation research plans aims to provide data and information which will reduce uncertainties for closure options, selected closure activities, and/or closure criteria.

Rehabilitation: Activities to ensure that the land will be returned to a form and productivity in conformity with a prior land use plan, including a stable ecological state that does not contribute substantially to environmental deterioration and is consistent with surrounding aesthetic values.

Appendix A

Glossary of Terms and Definitions

Remediation: The removal, reduction, or neutralization of substances, wastes or hazardous material from a site in order to prevent or minimize any adverse effects on the environment and public safety now or in the future.

Restoration: The renewing, repairing, cleaning-up, remediation or other management of soil, groundwater or sediment so that its functions and qualities are comparable to those of its original, unaltered state.

Re-vegetation: Replacing original ground cover following a disturbance to the land.

Ripping: A method of loosening rock or soil using steel tynes attached to the rear of a bulldozer. The tynes are lowered into the ground and as the bulldozer moves forwards the soil or blocks of rock are displaced by the tynes.

Risk assessment: Analysis of potential threats and options for mitigation for a given site, component, or condition. Risk assessments consider factors such as risk acceptability, public perception of risk, socio-economic impacts, benefits, and technical feasibility. It forms the basis for risk management.

Runoff: Water that is not absorbed by soil and drains off the land into bodies of water.

Salvageable Materials: Decommissioned materials which can be sold or reused elsewhere.

Scarification: Seedbed preparation to make a site more amenable to plant growth. This is typically conducted with a grader.

Security deposit: Funds held by the Crown or land owner that can be used in the case of abandonment of an undertaking to reclaim the site, or carry out any ongoing measures that may remain to be taken after the abandonment of the undertaking.

Sediment: Solid material, both mineral and organic, that has been moved by air, water, gravity, or ice and has come to rest on the earth's surface either above or below sea level.

Seepage: Any water that drains through or escapes from any structure designed to contain, withhold, divert or retain water or waste. Seepage also includes any flows that have emerged through open pits, runoff from rock storage facilities, ore stockpile areas, quarries, and landfill or landfarm areas.

Seismic: Relating to an earthquake or to other tremors of the Earth, such as those caused by large explosions.

Selected closure activity: The closure and reclamation activity chosen from the closure options for each Project component.

Sewage: All toilet wastes and greywater.

Stakeholders: Industry, federal agencies, the territorial government, Aboriginal organizations/governments, land owners, affected communities, and other parties with an interest in a project.

Sump: An excavation in impermeable soil for the purpose of catching or storing water or waste.

Surface water: Natural water bodies such as river, streams, brooks, ponds and lakes, as well as artificial watercourses, such as irrigation, industrial and navigational canals, in direct contact with the atmosphere. Sustainable development: Industrial development that does not detract from the potential of the natural environment to ensure benefits for future generations.

Appendix A

Glossary of Terms and Definitions

Tailings: Material rejected from a mill after most of the recoverable valuable minerals have been extracted.

Tailings Storage Facility: The facility designed to permanently contain the solid fraction of the mill tailings.

Taliks: Unfrozen zones that can exist within, below, or above permafrost layers. They are usually located below deep water bodies.

Temporary closure: When a mine ceases operations with the intent to resume mining activities in the future. Temporary closures can last for a period of weeks, or for several years, based on economical, environmental, political, or social factors.

Total dissolved solids: A measure of the amount of dissolved substances in a waterbody.

Total suspended solids: A measure of the particulate matter suspended in the water column.

Traditional knowledge: A cumulative, collective body of knowledge, experience, and values built up by a group of people through generations of living in close contact with nature. It builds upon the historic experiences of a people and adapts to social, economic, environmental, spiritual and political change. The practical knowledge that has been gathered through the experience of living in close contact with nature and has been passed along or communicated orally and handed down from generation to generation.

Turbidity: The degree of clarity in the water column typically reflected as the amount of suspended particulate matter in a waterbody.

Type A water licence: A Type A water licence is required if the use is of a type set out in column 2 of Schedule 2 and satisfies a criterion set out in column 5 in respect of an undertaking set out in column 1 of the Nunavut Water Regulations SOR/2013-69

(Note: despite definition of Type B water licence item a), a Type A licence is the appropriate licence for a use of waters if a Type A licence is required for another use of waters, or a deposit of waste, in respect of the same undertaking.)

Type B water licence: A Type B water licence required if

a) The use is of a type set out in column2 of Schedule 2 and satisfies a criterion set out in column 4 in respect of an undertaking set out in column 1, or
b) The use satisfies the criterion set out in paragraph 4(1)(a) but does not satisfy one or more criterion set out in paragraphs 4(1)(b) to (d) of the Nunavut Water Regulations SOR/2013-69.

Waste rock: All rock materials, except ore and tailings that are produced as a result of mining operations. All unprocessed rock materials that are or were produced as a result of mining operations and have no current economic value.

Wastewater: The water generated by site activities or originates on-site that requires treatment or any other water management activity.

Wastewater treatment system: A tertiary treatment plant designed to remove organic material and nutrients.

Watershed: A region or area bordered by ridges of higher ground that drains into a particular watercourse or body of water.

Appendix A

Glossary of Terms and Definitions

Water table: The level below where the ground is saturated with water.

Appendix B

List of Acronyms, Abbreviations, Units and Symbols

List of Acronyms and Abbreviations

AANDC	Aboriginal Affairs and Northern Development Canada (formerly known as Indian and Northern Affairs Canada)
ABA	Acid-Base Accounting
AEMP	Aquatic Effects Monitoring Plan
Agnico Eagle	Agnico Eagle Mines Limited
ARD	Acid Rock Drainage
ANFO	Ammonium Nitrate/Fuel Oil
AWAR	All-weather Access Road
BIF	Banded Iron Formation
CCME-WQG	Canadian Council for Ministers of the Environment Water Quality Guidelines
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
CLARC	Community Lands and Resources Committee
CLEY	Culture, Language, Elders and Youth
CGS	Community and Government Services
Comaplex	Comaplex Mines Corporation
CP	Collection Pond
CRA	Commercial, Recreational and Aboriginal
CRP	Closure and Reclamation Plan
D-CP	Water Retention Dike
DFO	Fisheries and Oceans Canada
ECCC	Environment and Climate Change Canada
EMPP	Environmental Management and Protection Plan
EWTP	Effluent Water Treatment Plant
FCRP	Final Closure and Reclamation Plan
FEIS	Final Environmental Impact Statement
Golder	Golder Associates Ltd.
GN	Government of Nunavut
GWMP	Groundwater Management Plan
HADD	Harmful Alteration Disruption or Destruction

Appendix B

List of Acronyms, Abbreviations, Units and Symbols

HCT	Humidity Cell Test
HTO	Hunters and Trappers Organizations
IDF	Inflow Design Flood
INAC	Indian and Northern Affairs Canada
ISQG	Interim Sediment Quality Guidelines
KIA	Kivalliq Inuit Association
Licence	Type A Water Licence 2AM-MEL1631
LSA	Local Study Area
MDMER	Metal and Diamond Mining Effluent Regulations
MEND	Mining Environment Neutral Drainage
Mine	Meliadine Gold Project
ML	Metal Leaching
MMER	Metal Mining Effluent Regulations
MVLWB	Mackenzie Valley Land and Water Board
NIRB	Nunavut Impact Review Board
NLCA	Nunavut Land Claims Agreement
non-PAG	non-Potentially Acid-Generating
NPR	Net Potential Ratio
NRC	Natural Resources Canada
NWB	Nunavut Water Board
NWR	Nunavut Water Regulations
NWNSRTA	Nunavut Waters and Nunavut Surface Rights Tribunal Act
PAG	Potentially Acid-Generating
Project	Meliadine Gold Project
PEL	Probable Effect Level
RO	Reverse Osmosis
RSA	Regional Study Area
SD	Support Document
SFE	Shake Flask Extraction
SSWQO	Site Specific Water Quality Objectives

Appendix B

List of Acronyms, Abbreviations, Units and Symbols

STP	Sewage Treatment Plant
SWTP	Saline Water Treatment Plant
TDS	Total Dissolved Solids
TEMMP	Terrestrial Environment Management and Monitoring Plan
TSF	Tailings Storage Facility
TSS	Total Suspended Solids
WMP	Water Management Plan
WRSF	Waste Rock Storage Facility
WRTP	Waste Rock Transfer Pad
WTP	Water Treatment Plant

Appendix B

List of Acronyms, Abbreviations, Units and Symbols

List of Units and Symbols

%	percent
°	degrees
°C	degrees Celsius
°C/m	degrees Celsius per metre
Bgs	below ground surface
cm/s	centimetre per second
dBA	decibels
g	gravity
H:V	horizontal to vertical
ha	hectares
km	kilometre
km/h	kilometres per hour
km²	square kilometres
kPa	kilopascal
m	metres
m²	square metres
m²/year	cubic metre per year
m³	cubic metres
m³/day	cubic metres per day
m³/hour	cubic metre per hour
m³/s	cubic metre(s) per second
m³/year	cubic metre per year
masl	metres above sea level
mg	milligram
mm	millimetres
mm/hour	millimetres per hour
mm/year	millimetres per year
mg/L	milligrams per litre
mg/kg	milligrams per kilogram

Appendix B

List of Acronyms, Abbreviations, Units and Symbols

M-m3	million cubic metres
M-m³/year	million cubic metre per year
Mt	million tonnes
t	tonnes
t/m³	tonne per cubic metre
tpd	tonnes per day
µm	micrometre

Appendix C

Record of Engagement

This is a table that outlines all engagement specific to closure that has occurred to date. No issue has been identified.

Engagement specific to closure
In 2018, reclamation work occurred at the Itivia quarry. Agnico Eagle proceeded to the reclamation according to the quarry conditions by removing all equipment and material, stabilizing and gently sloping the walls. Once the reclamation work was completed, a GN Regional Lands Administrator and a Hamlet foreman inspected the quarry and confirmed that they were satisfied with the current state of the Itivia quarry site (AEM, 2019a).

Appendix D

Lessons Learned from Other Projects

This summary table present lessons form similar projects that would have direct application for the Meliadine closure and reclamation. This table will be updated during further states of the Project, during the next revision of the interim Closure and Reclamation Plan and for the Final Closure and Reclamation Plan.

Development	Activity Which Led to Lesson	Lesson Learned	Adaptive Management Result
Ekati and Diavik diamond mine sites	Re-vegetation	Standard re-vegetation methods may need adaptation for northern areas	Re-vegetation studies would be completed to assess the potential for vegetation to establish in disturbed areas or on rockfill covers
Ekati, Diavik and Snap Lake mine sites	Open pit mining	Wildlife injury or mortality may occur by entering the open pit	A rock berm(s) will be constructed around the open pits
Ekati, Diavik and Snap Lake mine sites	Mine site infrastructure	Wildlife injury or mortality may occur by entering the mine site facilities	Disturbed areas will be re-contoured at closure reducing hazards to wildlife
Meadowbank mine site	Landfill located within WRSF	Birds or wildlife injury or mortality by entering the landfill	Landfill will be located within the WRSF1 and covered at closure reducing hazards to birds and wildlife

(Modified from SNC-Lavalin, 2018)

Reference to similar projects:

DDMI (Diavik Diamond Mines Incorporated), 2019. Interim Closure and Reclamation Plan, Version 3, Yellowknife, December 2019.

Golder Associate Ltd., 2016. Whale Tail Interim Closure and Reclamation Plan, Report N° 1541520, Report to Agnico Eagle Mines Limited, June 2016.

Agnico Eagle Mines Limited, 2015. Meliadine Gold Project Preliminary Closure and Reclamation Plan, Version 1.0, 6513-CRP-01, April 2015.

SNC-Lavalin, 2018. Meadowbank Interim Closure and Reclamation Plan (ICRP) – Update 2018, 654769-5000-4EER-0001, June 2018.

Appendix E

Reclamation Research Plans

Tundra Revegetation / Restoration Study

Agnico Eagle in partnership with the University of Saskatchewan started a tundra revegetation / restoration study in the summer of 2018. Both past mineral exploration drilling and proposed operations have and will impact the tundra environment at Meliadine; with over 3000 drilling sites in the regional area and further drilling and mine site development expected, there is a strong need for site-specific tundra restoration techniques. Seeding and fertilization is commonly used in many revegetation efforts.

(Agnico Eagle Mines Limited, 2018. Meliadine Gold Project 2018 Annual Report, 87 p., 2018.)

Marine Environmental Reconnaissance Surveys into Melvin Bay

With the objective to eventually discharge excess groundwater effluent into Melvin Bay, Golder was retained by Agnico Eagle to conduct marine environmental reconnaissance surveys in Melvin Bay to establish appropriate reference areas and collect preliminary baseline data on physical properties of the water column, water and sediment quality, benthic substrate, benthic communities and marine mammal occurrence.

(Agnico Eagle Mines Limited, 2018. Meliadine Gold Project 2018 Annual Report, 87 p., 2018.)

Contribution to Regional Monitoring

Caribou are an important part of Inuit life, providing food, fuel (from caribou fat), and materials for clothing, tools and traditional crafts. The Kivalliq Region includes the major summer range and calving grounds for some of Canada's largest caribou herds. The Qamanirjuaq caribou herd in particular uses the Project area and Agnico Eagle has committed to supporting the GN Department of Environment's caribou satellite-collaring program for the Qamanirjuaq herd.

Agnico will also be working with raptor researcher Dr. Alastair Franke from the University of Alberta to document presence of raptors in the Meliadine area. Dr. Franke's Arctic Raptors group will be tracking changes that may occur as a result of mining activity and sharing results across the scientific community through publications.

(Agnico Eagle Mines Limited, 2015. Meliadine Gold Project, Type A Water Licence Main Application Document, 334p., April 2015.)

Appendix F

Meliadine Site Photos

Photo 01: Meliadine mine site with Portal #1 entrance view (August 2016)

Photo 02: Meliadine Process Facility Complex (February 2019)

Appendix F

Meliadine Site Photos

Photo 03: Meliadine site complex, looking southeast (June 2019)

Photo 04: Meliadine site complex, looking northwest (June 2019)

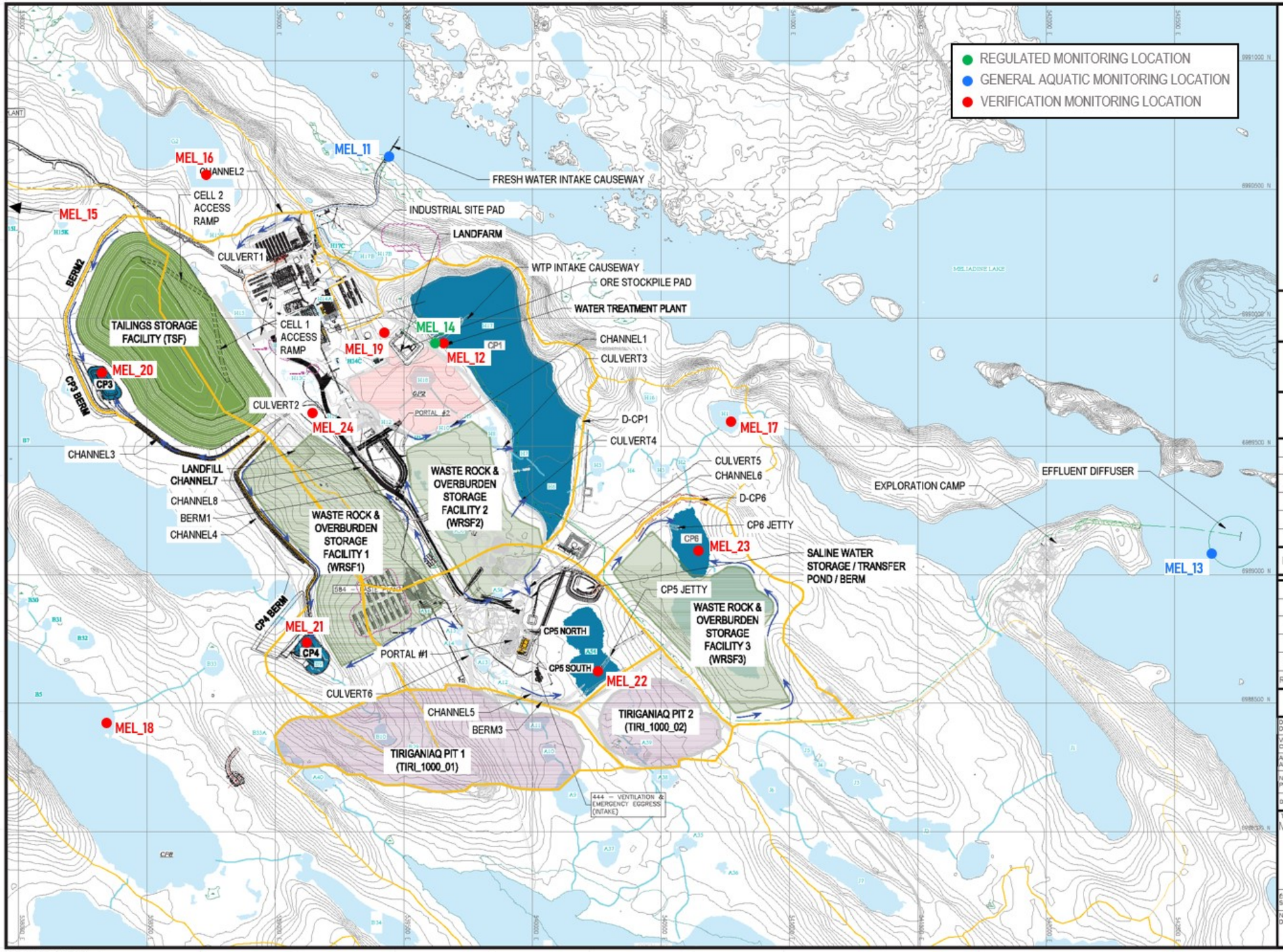
Source: https://www.agnicoeagle.com/English/operations-and-development-projects/operations/meliadine/default.aspx

Appendix G

Monitoring water quality stations

NO. DESSIN
DRAWING NO.

FORMAT ANSI B–11x17



LEGEND

- CATCHMENT BOUNDARY
- WATERBODY
- WATER COLLECTION POND
- OPEN PIT
- WASTE ROCK
- ORE
- CONTACT WATER FLOW DIRECTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date Nov. 14, 2018
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PROFESSIONAL ENGINEER
G. ZHANG
LICENSEE
NWT/NU

AGNICO EAGLE

TETRA TECH

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 11/14/2018

L'INFORMATION CONTENUE SUR LA PRÉSENTE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET NE PEUT ÊTRE REPRODUITE SANS AUTORISATION ÉCRITE PRÉALABLE. TOUTE TRANSMISSION DE COPIE(S) À AUTRE QU'UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES.
© AGNICO EAGLE LTÉE

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD, AND ASKED BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL IS STRICTLY AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED.
© AGNICO EAGLE LTD.

TITRE / TITLE	# DWG

DESSINS EN RÉFÉRENCE/REFERENCE DRAWINGS

REV	DESCRIPTION	DATE	PAR BY
0	ISSUED FOR CONSTRUCTION	2018–11–14	
B	ISSUED FOR REVIEW	2018–11–06	
A	ISSUED FOR REVIEW	2018–11–05	

REVISIONS

DESSINÉ PAR / DRAWN BY	EL/EP	DATE 2018–11–14
VÉRIFIÉ PAR / CHECKED BY	GZ/WTH	2018–11–14
APPROUVÉ PAR / APPROVED BY		
No. PROJET / PROJECT NO.		
DATE		

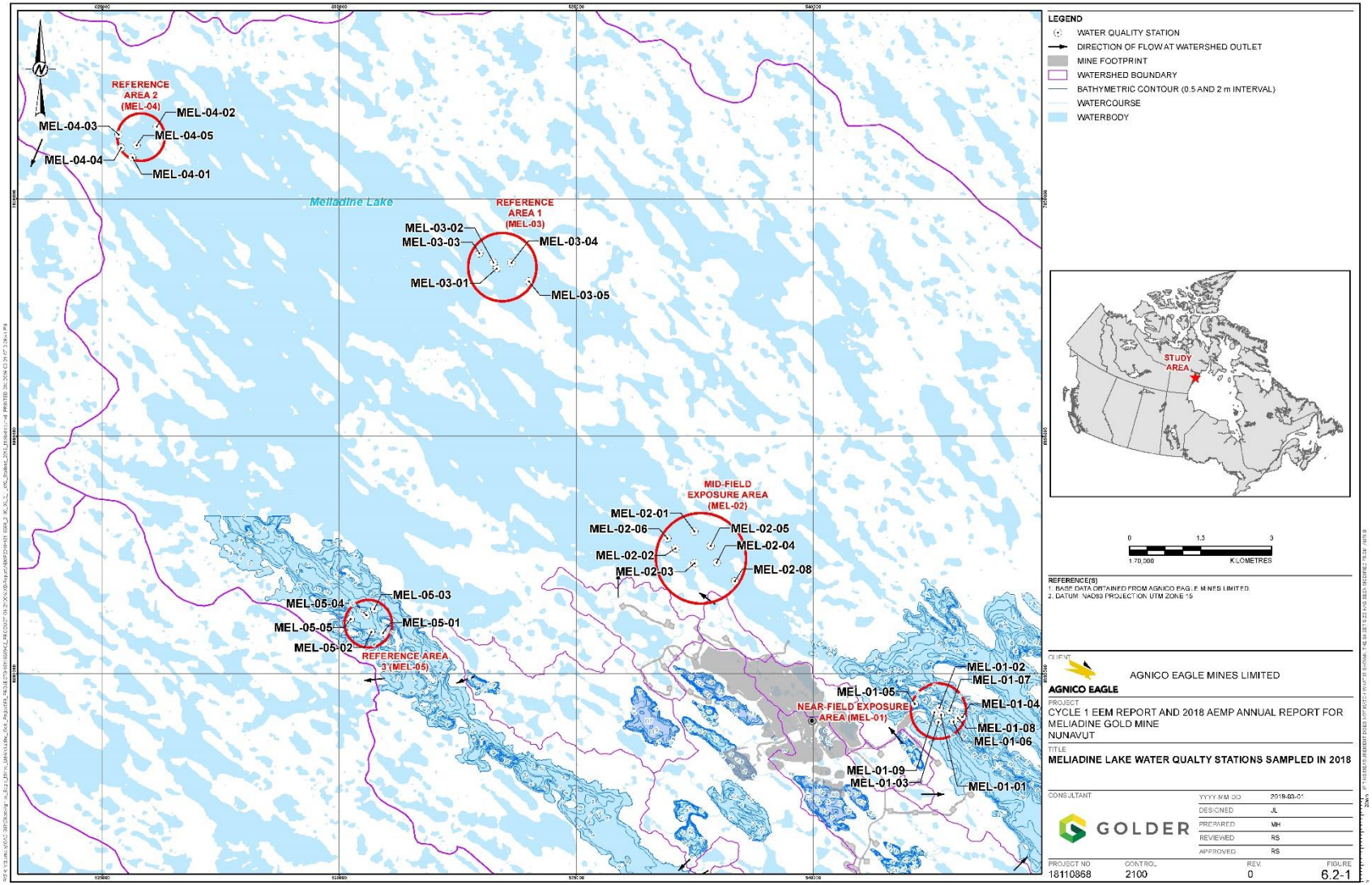
TITRE / TITLE
MELIADINE TAILINGS STORAGE FACILITY DESIGN

GENERAL ARRANGEMENT

ÉCHELLE/ SCALE	FICHIER / FILE .DWG		
No. DESSIN/ DRAWING NO. 6515–583–163–001		REVISION 0	FEUILLE/SHT 1 / 8

AE–CART–ANSI B

Figure 1.3 EEM Receiving Environment Sampling Locations



Appendix H

Regulatory Instruments

Issued By	ID	Description	Issue	Expiry
KIA	KVPL11D01	Production lease	2017/06/30	2029/06/30
KIA	KVCA07Q08	Tiriganiaq/Westmeg/Meliadine quarry permit	2018/07/19	2021/09/12
KIA	KVCA11Q01	Exploration road quarries	2018/04/19	2021/04/19
KIA	KVRW11F02	Exploration road right-of-way	2012/04/19	2027/06/29
KIA	n/a	Water Compensation Agreement	2016/02/11	2031/03/31
NWB	2BB-MEL1424	Bulk Sampling and exploration drilling water license	2009/07/31	2024/07/21
NWB	2AM-MEL1631	Mining undertaking water license	2016/04/01	2031/03/31
NIRB	006	Project certificate (Meliadine Phase 1)	2015/02/26	N/A
NIRB	16QN071	Screening decision (Itivia Quarry)	-	-
GN-NAD	102631	Land lease, laydown Itivia		2021/07/01
GN-CGS	01-600-23	Quarry permit – site D	2019/07/16	2020/07/01
GN-CGS	L-51809T	Right-of-Way permit AWAR on Municipal land	2017/06/01	2027/05/31
GN-CGS	L-51808T	Right-of-Way Lease Bypass Road km 2-7	2017/06/01	2027/05/31
GN-NAD	102893	Right-of-way lease bypass road km 1-2	2017/07/01	2027/07/01
GN-ENV	2019-058	Wildlife Research Permit	2019/08/06	2020/09/30
CIRNAC	55K/16-42-2	Saline Effluent Discharge and Diffuser Lease		15 years after issued

Appendix I

Permafrost Map

The Atlas of Canada / L'Atlas du Canada
atlas.gc.ca
Since 1906 / Depuis 1906

Atlas of Canada 6th Edition
(archival version)

Climate Warming — National Annual Temperature Scenario: 2050

A simulation of projected changes in annual mean temperatures from the period 1961 to 1990 to the period 2040 to 2060 for Canada is shown on this map. The temperature changes would not be evenly distributed geographically. The largest warming projected is for the interior and northern parts of the country. Temperatures are projected to continue increasing as the century progresses. Temperatures would generally increase as a consequence of the projected increase in greenhouse gas concentrations in the atmosphere. The results are based on climate change simulations made with the Coupled Global Climate Model developed by Environment Canada

0 150 300 450 600 km

Lambert Conformal Conic Projection. Standard Parallels 49°N and 77°N

Annual Temperature Change from 1961-90 to 2040-60 (°C)
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 6

Capitals (Canada)
- National
- Provincial and Territorial

Populated Places
- 1 - 4999
- 5 000 - 49 999
- 50 000 - 99 999
- 100 000 and greater

International Boundaries
- EEZ (200 mile)
- Canada / Kalaallit Nunaat dividing line
- International

Provincial and Territorial Boundaries
- Provincial / Territorial

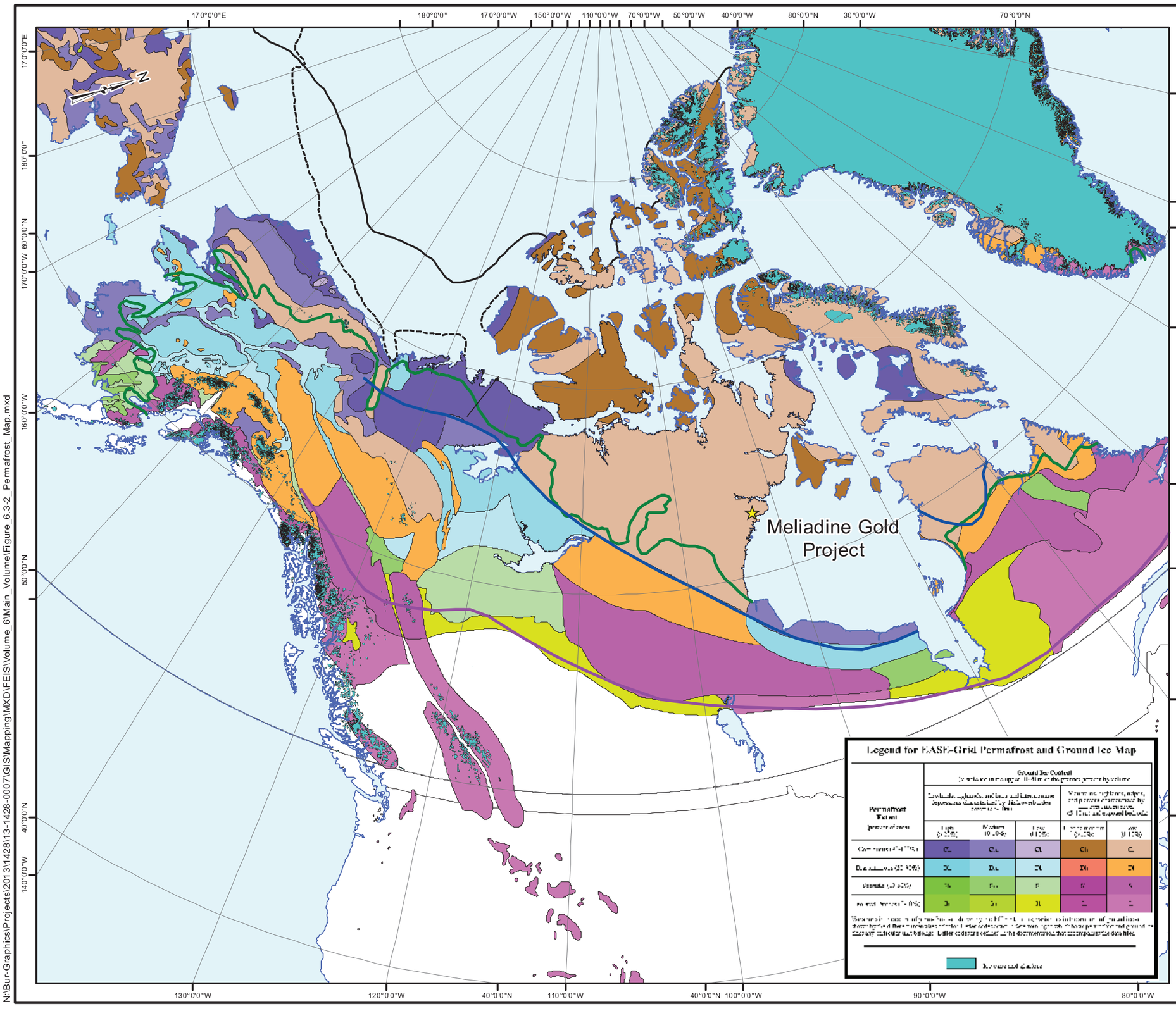
Road network
- Road Network
- Ferry route

Source(s):
Annual Temperature Change from 1961-90 to 2040-60 (°C)
The results are based on climate change simulations made with the Coupled Global Climate Model (CGCM2) developed at the Canadian Centre for Climate Modelling and Analysis of Environment Canada. The projected changes in greenhouse gases concentrations and aerosol loadings are based on the IS92a scenario developed in conjunction with the Intergovernmental Panel on Climate Change to portray one of several possible futures. The output of the model is produced on a grid of 3.75 degrees in latitude and longitude. This represents a grid square of approximately 400 kilometres by 300 kilometres at Canadian latitudes. For forestry and other applications, the Canadian Forest Service of National Resources Canada has derived the changes in climate based on the simulation output with reference to the 1961 to 1990 normals, and interpolated the data over Canada to finer resolution using a multi-step methodology.

© 2009. Her Majesty the Queen in Right of Canada. Natural Resources Canada.

Alert
Resolute
Pond Inlet
Igloolik
Pangnirtung
Cambridge Bay
Kugluktuk
Old Crow
Inuvik
Dawson
Norman Wells
Faro
Whitehorse
Watson Lake
Fort Simpson
Yellowknife
Hay River
Fort Nelson
Fort Smith
High Level
Prince Rupert
Fort St. John
Grande Prairie
Prince George
Fort McMurray
Port Hardy
Williams Lake
Hinton
Edmonton
Lloydminster
Kamloops
Red Deer
Vancouver
Kelowna
Banff
Calgary
Saskatoon
Victoria
Cranbrook
Lethbridge
Swift Current
Regina
Yorkton
Dauphin
Brandon
Winnipeg
Estevan
La Ronge
Thompson
Flin Flon
Norway House
Churchill
Rankin Inlet
Iqaluit
Cape Dorset
Kuujjuaq
Nain
Happy Valley-Goose Bay
Labrador City
Gander
St. John's
Corner Brook
Channel-Port aux Basques
Chisasibi
Sept-Îles
Gaspé
Cape Breton
Moosonee
Chibougamau
Rimouski
Bathurst
Charlottetown
Saguenay
Moncton
Fredericton
Saint John
Halifax
Québec
Val-d'Or
Timmins
Kenora
Marathon
Thunder Bay
Drummondville
Yarmouth
Montréal
Greater Sudbury
Ottawa
Sault Ste. Marie
Kingston
Toronto
Hamilton
London
Windsor

This product was originally published as an interactive map in the online Atlas of Canada, 6th Edition. It was not intended for high resolution reproduction and therefore does not conform to the standards of cartographic representation and map design found on the Atlas of Canada's paper reference maps.



LEGEND

- Meliadine Gold Project
- Southern boundary of continuous permafrost - Present
- Southern boundary of discontinuous permafrost - Present
- Treeline
- Sea-Ice Edge Limit
- Subsea Permafrost Limit

REFERENCE

Brown, J., O.J. Ferrians Jr., J.A. Heginbottom, and E.S. Melnikov. 1998. Circum-Arctic Map or Permafrost and Ground-Ice Conditions. Boulder, Co: National Snow and Ice Data Centre/World Data Centre for Glaciology. Digital Media. Predicted Permafrost Boundaries Based On Woo *et al.*, 1992.

Datum: NAD83 Projection: UTM Zone 15

500 0 500

KILOMETRES

PROJECT

AGNICO EAGLE

AGNICO EAGLE MINES LIMITED
MELIADINE GOLD PROJECT
NUNAVUT

TITLE

PERMAFROST MAP OF CANADA

Golder Associates

PROJECT	10-1373-0076		FILE No.	
DESIGN	JC	27 July 2011	SCALE AS SHOWN	REV. 1
GIS	AL	27 July 2011		
CHECK	JC	28 Jun. 2012		
REVIEW	CJC	28 Jun. 2012		

FIGURE 6.3-2

N:\Bur-Graphics\Projects\2013\1428113-1428-0007\GIS\Mapping\MXD\FEIS\Volume_6\Main_Volume\Figure_6.3-2_Permafrost_Map.mxd

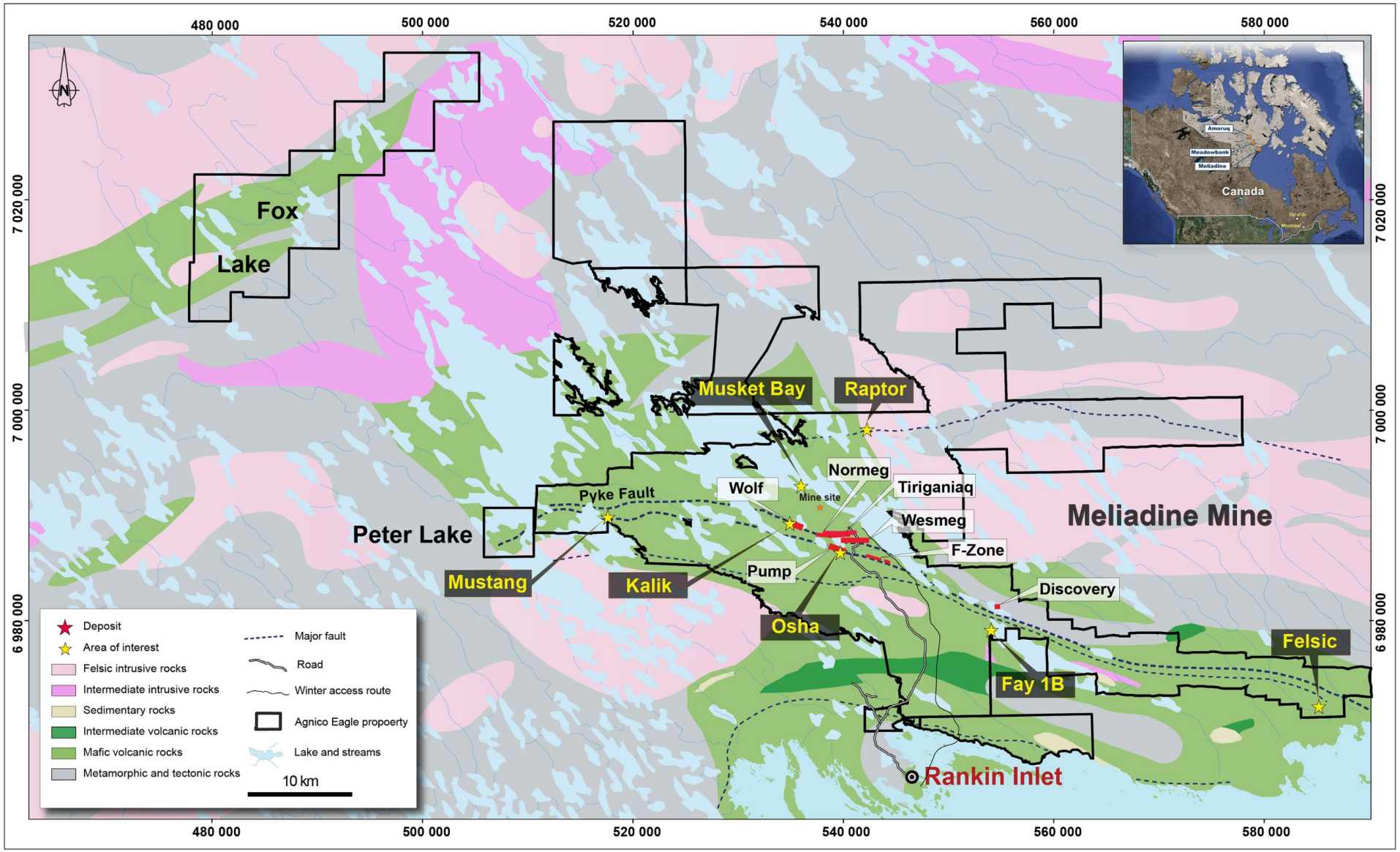
Appendix J

Meliadine Geology, Seismic Zone, Groundwater Flow and Bathymetry

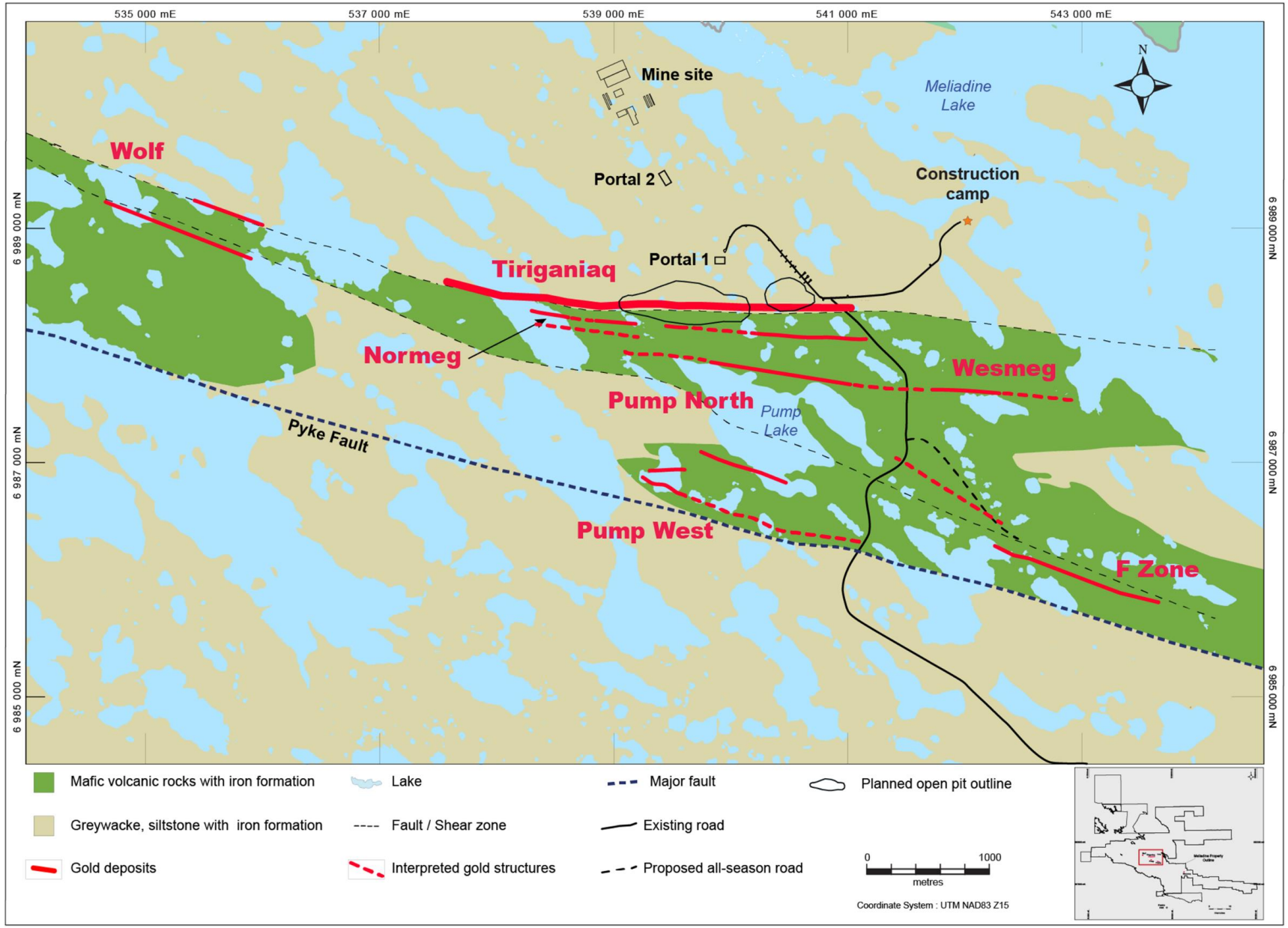
300000
400000
500000
600000
7300000
7200000
7100000
7000000
6900000
N
AMARUQ PROJECT
GOT
YUKA
STARK
MEADOWBANK
CERSEI
ARYA
MUSKOX
MEADOWBANK MINE
GREYHOUND
51% AEM- 49 % Aura Silver
GREY HILL
SAM
WHITE HILLS
Baker Lake
CONE HILL
PARKER LAKE
FOX LAKE
MELIADINE PROJECT
PETER LAKE
MELIADINE
Rankin Inlet
FAT LAKE NTI
TYRON
FAT LAKE INAC
Whale Cove
SNOW
Amaruq
Meadowbank
Meliadine
Canada
Val-d'Or
Agnico Eagle property
Archean greenstone belt
All-weather road
Camp and maintenance buildings
0
50
Km

AGNICO EAGLE

Meliadine Mine - Regional Geology Map



Meliadine Mine - Local Geology Map



2015 National Building Code Seismic Hazard Calculation

INFORMATION: Eastern Canada English (613) 995-5548 français (613) 995-0600 Facsimile (613) 992-8836
Western Canada English (250) 363-6500 Facsimile (250) 363-6565

Site: 63.023N 92.218W **User File Reference:** Meliadine Mine Site 2019-11-25 14:04 UT

Requested by: SNC-Lavalin (for Agnico Eagle Mines Limited)

Probability of exceedance per annum	0.000404	0.001	0.0021	0.01
Probability of exceedance in 50 years	2 %	5 %	10 %	40 %
Sa (0.05)	0.047	0.027	0.017	0.005
Sa (0.1)	0.067	0.039	0.026	0.009
Sa (0.2)	0.066	0.042	0.028	0.011
Sa (0.3)	0.057	0.037	0.026	0.009
Sa (0.5)	0.047	0.031	0.021	0.007
Sa (1.0)	0.028	0.018	0.012	0.004
Sa (2.0)	0.013	0.008	0.005	0.001
Sa (5.0)	0.003	0.002	0.001	0.000
Sa (10.0)	0.001	0.001	0.001	0.000
PGA (g)	0.037	0.022	0.015	0.005
PGV (m/s)	0.035	0.022	0.014	0.004

Notes: Spectral (Sa(T), where T is the period in seconds) and peak ground acceleration (PGA) values are given in units of g (9.81 m/s^2). Peak ground velocity is given in m/s. Values are for "firm ground" (NBCC2015 Site Class C, average shear wave velocity 450 m/s). NBCC2015 and CSAS6-14 values are highlighted in yellow. Three additional periods are provided - their use is discussed in the NBCC2015 Commentary. Only 2 significant figures are to be used. **These values have been interpolated from a 10-km-spaced grid of points. Depending on the gradient of the nearby points, values at this location calculated directly from the hazard program may vary. More than 95 percent of interpolated values are within 2 percent of the directly calculated values.**

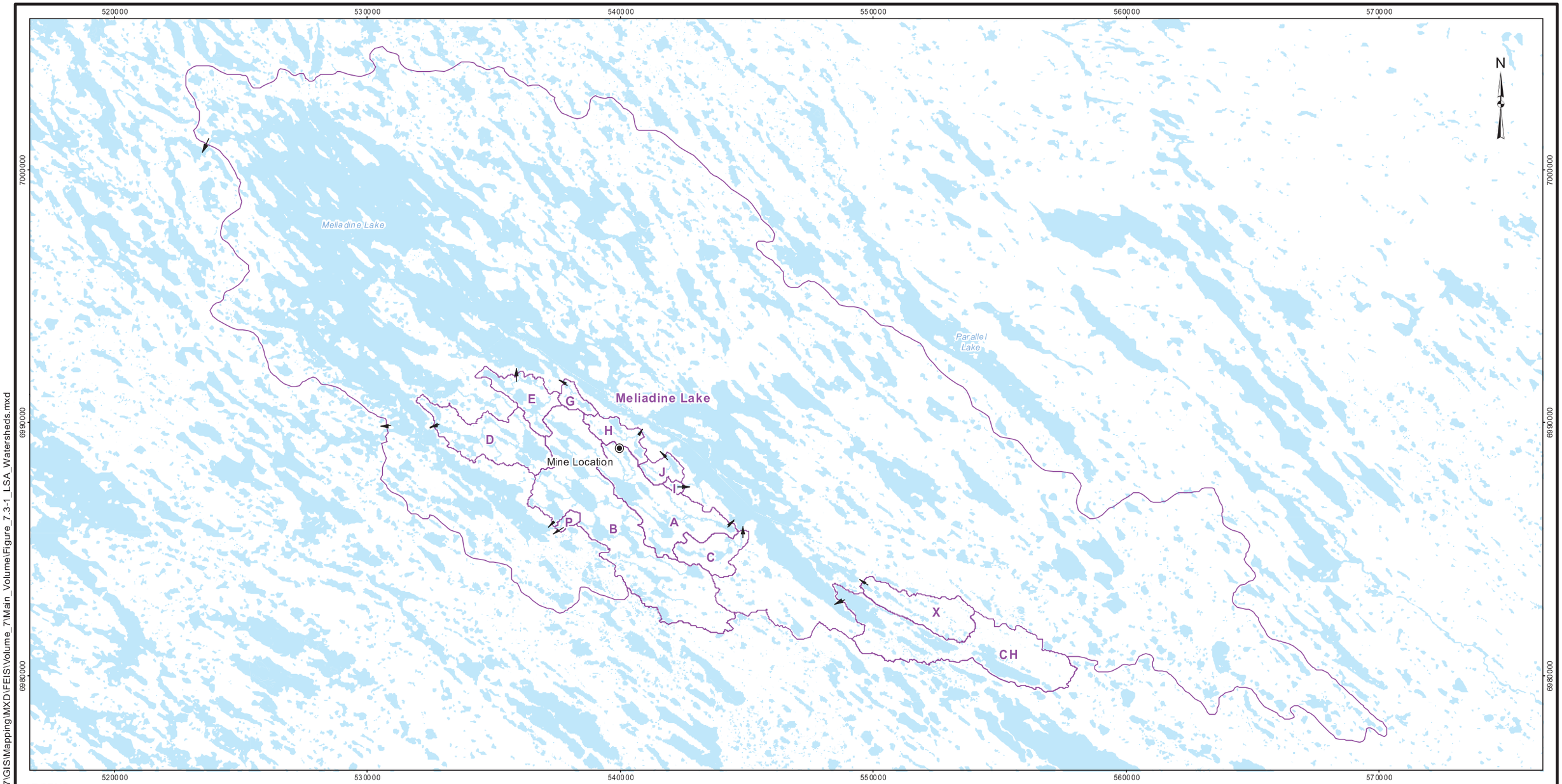
References

National Building Code of Canada 2015 NRCC no. 56190; Appendix C: Table C-3, Seismic Design Data for Selected Locations in Canada

Structural Commentaries (User's Guide - NBC 2015: Part 4 of Division B)
Commentary J: Design for Seismic Effects

Geological Survey of Canada Open File 7893 Fifth Generation Seismic Hazard Model for Canada: Grid values of mean hazard to be used with the 2015 National Building Code of Canada

See the websites www.EarthquakesCanada.ca and www.nationalcodes.ca for more information



LEGEND

- Direction of Flow at Watershed Outlet
- Watercourse
- Watershed Boundary
- Waterbody

3 0 3
KILOMETRES

REFERENCE

Base data obtained from Agnico Eagle Mines Limited (AEM).
Datum: NAD 83 Projection: UTM Zone 15

PROJECT

AGNICO EAGLE

AGNICO EAGLE MINES LIMITED
MELIADINE GOLD PROJECT
NUNAVUT

TITLE

LSA WATERSHEDS

Golder Associates

PROJECT NO. 10-1373-0076			FILE No.	
DESIGN	JL	20 Aug. 2012	SCALE AS SHOWN	REV. 0
GIS	DSC	21 Aug. 2012		
CHECK	DW	20 Jan. 2013		
REVIEW	DW	20 Jan. 2013		

FIGURE 7.3-1

N:\Bur-Graphics\Projects\2013\1428\13-1428-0007\GIS\Mapping\MXD\FEIS\Volume_7\Main_Volume\Figure_7.3-1_LSA_Watersheds.mxd

520000
530000
540000
7000000
6990000

N

Meliadine Lake

E2 E1 E3 E4 G D1 D2 D3 D4 D5 D7 B7 B6 B5 B4 H17 H1 A8 H20 J

Mine Location

LEGEND

- Direction of Flow
- Watercourse
- Sub-Watershed Boundary
- Waterbody

REFERENCE

Base data obtained from Agnico Eagle Mines Limited (AEM).
Datum: NAD 83 Projection: UTM Zone 15

2 0 2
KILOMETRES

PROJECT
AGNICO EAGLE
AGNICO EAGLE MINES LIMITED
MELIADINE GOLD PROJECT
NUNAVUT

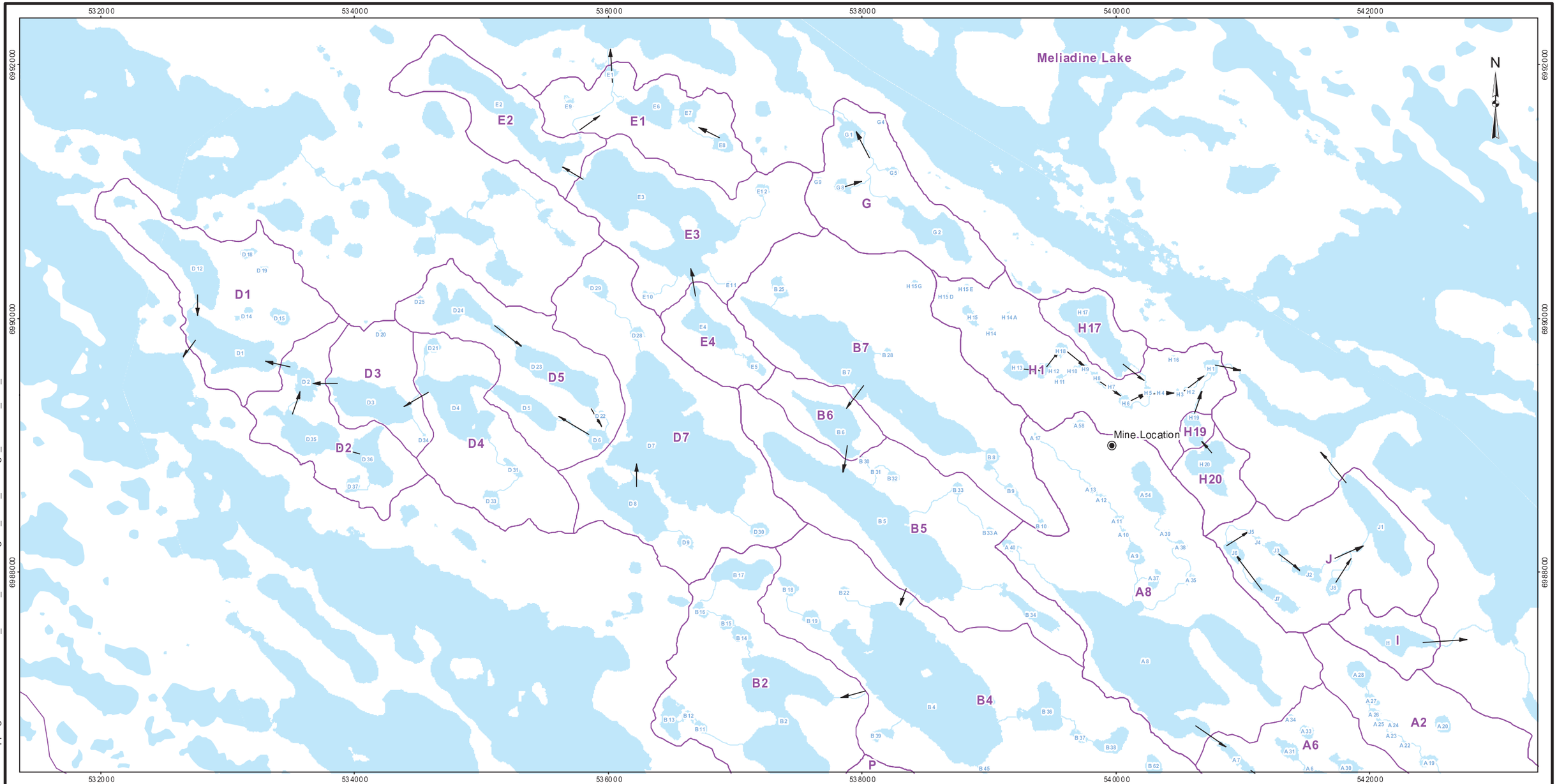
TITLE
DRAINAGE PATTERNS OF LSA WATERSHEDS (NORTH)

Golder Associates

PROJECT NO. 10-1373-0076			FILE No.	
DESIGN	JL	20 Aug. 2012	SCALE AS SHOWN	REV. 0
GIS	DSC	22 Aug. 2012		
CHECK	DW	20 Jan. 2013		
REVIEW	DW	20 Jan. 2013		

FIGURE 7.3-2

N:\Bur-Graphics\Projects\2013\1428\13-1428-0007\GIS\Mapping\MXD\FEIS\Volume_7\Main_Volume\Figure_7.3-2_Drainage_Patterns_LSA_North.mxd



LEGEND

- Direction of Flow
- Watercourse
- Sub-Watershed Boundary
- Waterbody

750 0 750
METRES

REFERENCE

Base data obtained from Agnico Eagle Mines Limited (AEM).
Datum: NAD 83 Projection: UTM Zone 15

PROJECT

AGNICO EAGLE

AGNICO EAGLE MINES LIMITED
MELIADINE GOLD PROJECT
NUNAVUT

TITLE

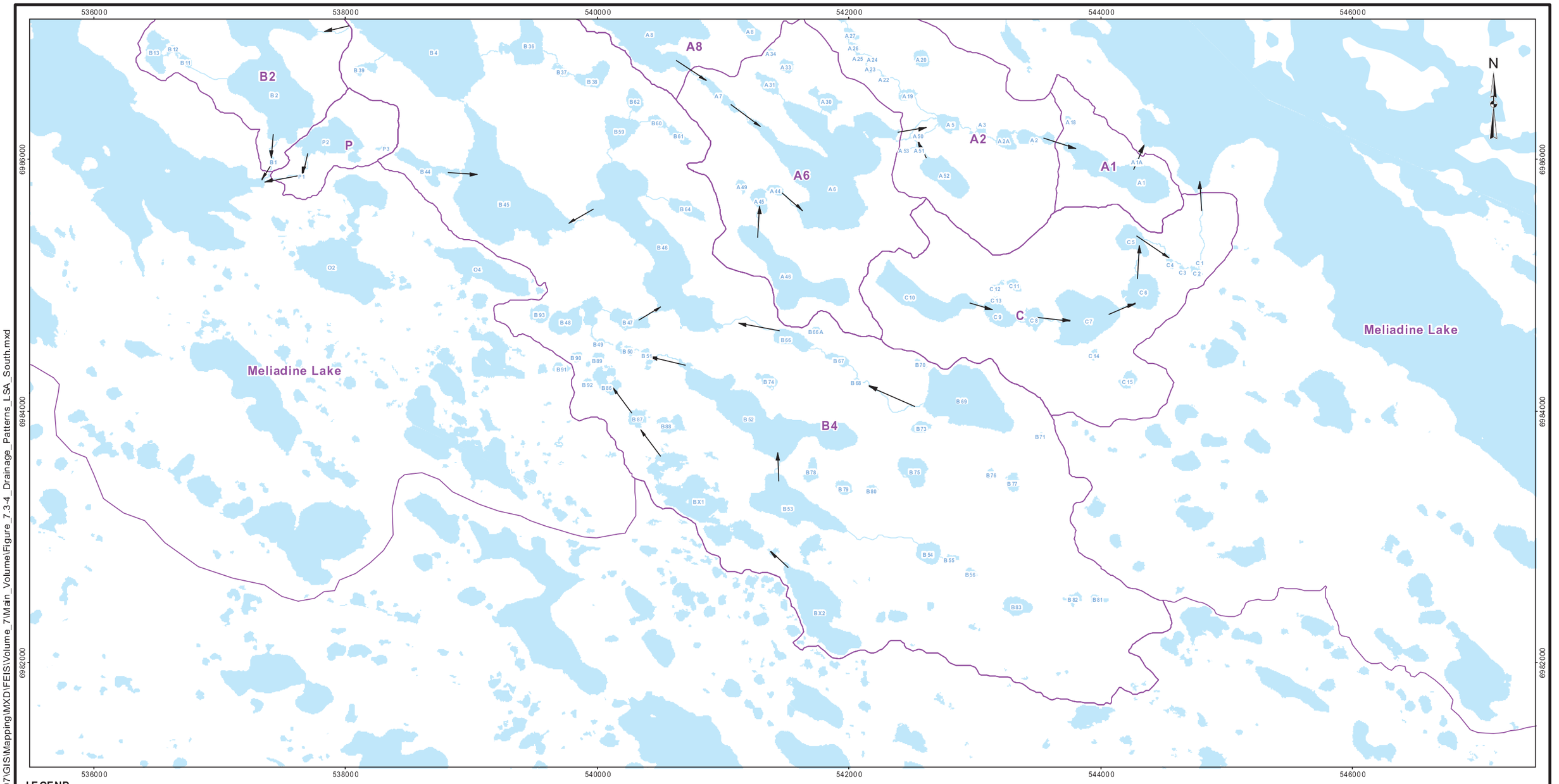
DRAINAGE PATTERNS OF LSA WATERSHEDS (CENTRAL)

Golder Associates

PROJECT NO. 10-1373-0076			FILE No.	
DESIGN	JL	20 Aug. 2012	SCALE AS SHOWN	REV. 0
GIS	DSC	22 Aug. 2012		
CHECK	DW	20 Jan. 2013		
REVIEW	DW	20 Jan. 2013		

FIGURE 7.3-3

N:\Bur-Graphics\Projects\2013\1428\13-1428-0007\GIS\Mapping\MXD\FEIS\Volume_7\Main_Volume\Figure_7.3-3_Drainage_Patterns_LSA_Central.mxd



LEGEND

- Direction of Flow
- Watercourse
- Sub-Watershed Boundary
- Waterbody

750 0 750
METRES

REFERENCE

Base data obtained from Agnico Eagle Mines Limited (AEM).
Datum: NAD 83 Projection: UTM Zone 15

PROJECT

AGNICO EAGLE

AGNICO EAGLE MINES LIMITED
MELIADINE GOLD PROJECT
NUNAVUT

TITLE

DRAINAGE PATTERNS OF LSA WATERSHEDS (SOUTH)

Golder Associates

PROJECT NO. 10-1373-0076			FILE No.		
DESIGN	JL	20 Aug. 2012	SCALE AS SHOWN	REV.	0
GIS	DSC	21 Aug. 2012			
CHECK	DW	20 Jan. 2013			
REVIEW	DW	20 Jan. 2013			

FIGURE 7.3-4

N:\Bur-Graphics\Projects\2013\1428\13-1428-0007\GIS\Mapping\MXD\FEIS\Volume_7\Main_Volume\Figure_7.3-4_Drainage_Patterns_LSA_South.mxd

548000 550000 552000 554000 556000 558000

6984000

6982000

6980000

Meliadine Lake

X

CH1 CH2 CH3 CH4 CH5 CH6 CH7 CH8 CH9 CH10 CH11 CH12 CH13 CH14 CH15 CH16 CH17 CH18 CH19 CH20 CH21 CH24 CH25 CH26 CH27 CH28 CH29 CH32 CH33 CH34 CH35 CH36 CH37 CH38 CH39 CH40 CH41 CH42

N

LEGEND

- Direction of Flow
- Watercourse
- Sub-Watershed Boundary
- Waterbody

REFERENCE

Base data obtained from Agnico Eagle Mines Limited (AEM).
Datum: NAD 83 Projection: UTM Zone 15

750 0 750
METRES

PROJECT

AGNICO EAGLE

AGNICO EAGLE MINES LIMITED
MELIADINE GOLD PROJECT
NUNAVUT

TITLE

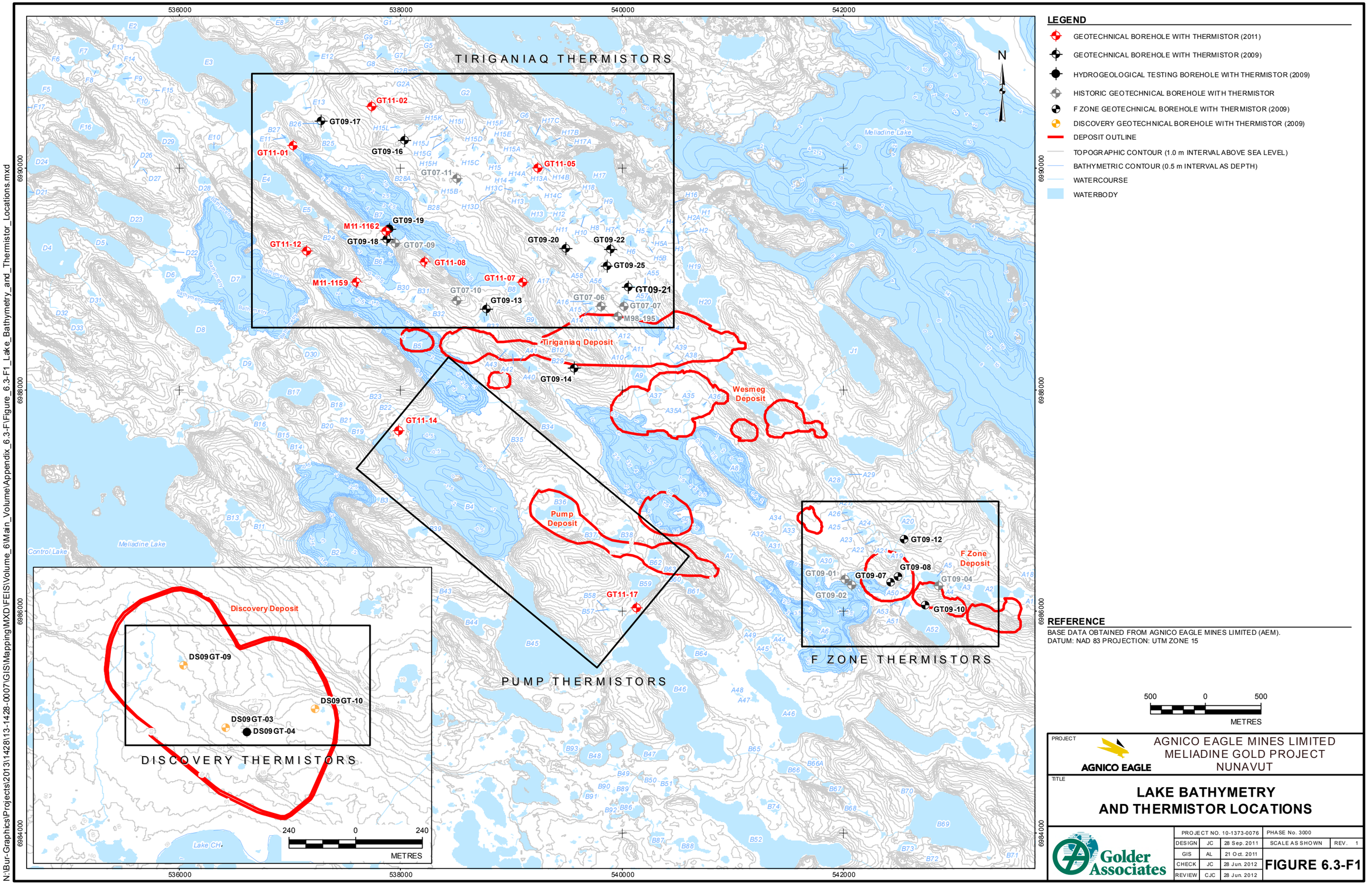
DRAINAGE PATTERNS OF LSA WATERSHEDS (EAST)

Golder Associates

PROJECT NO.	10-1373-0076		FILE No.		
DESIGN	JL	20 Aug. 2012	SCALE AS SHOWN	REV.	0
GIS	DSC	21 Aug. 2012			
CHECK	DW	20 Jan. 2013			
REVIEW	DW	20 Jan. 2013			

FIGURE 7.3-5

N:\Bur-Graphics\Projects\2013\1428\13-1428-0007\GIS\Mapping\MXD\FEIS\Volume_7\Main_Volume\Figure_7.3-5_Drainage_Patterns_LSA_East.mxd



LEGEND

- GEOTECHNICAL BOREHOLE WITH THERMISTOR (2011)
- GEOTECHNICAL BOREHOLE WITH THERMISTOR (2009)
- HYDROGEOLOGICAL TESTING BOREHOLE WITH THERMISTOR (2009)
- HISTORIC GEOTECHNICAL BOREHOLE WITH THERMISTOR
- F ZONE GEOTECHNICAL BOREHOLE WITH THERMISTOR (2009)
- DISCOVERY GEOTECHNICAL BOREHOLE WITH THERMISTOR (2009)
- DEPOSIT OUTLINE
- TOPOGRAPHIC CONTOUR (1.0 m INTERVAL ABOVE SEA LEVEL)
- BATHYMETRIC CONTOUR (0.5 m INTERVAL AS DEPTH)
- WATERCOURSE
- WATERBODY

REFERENCE

BASE DATA OBTAINED FROM AGNICO EAGLE MINES LIMITED (AEM).
DATUM: NAD 83 PROJECTION: UTM ZONE 15

500 0 500
METRES

PROJECT
AGNICO EAGLE
AGNICO EAGLE MINES LIMITED
MELIADINE GOLD PROJECT
NUNAVUT

TITLE
LAKE BATHYMETRY AND THERMISTOR LOCATIONS

Golder Associates

PROJECT NO. 10-1373-0076			PHASE No. 3000		
DESIGN	JC	28 Sep. 2011	SCALE AS SHOWN	REV.	1
GIS	AL	21 Oct. 2011			
CHECK	JC	28 Jun. 2012			
REVIEW	CJC	28 Jun. 2012			

FIGURE 6.3-F1

N:\Bur-Graphics\Projects\2013\1428\13-1428-0007\GIS\Mapping\MXD\FEIS\Volume_6\Main_Volume\Appendix_6.3-F\Figure_6.3-F1_Lake_Bathymetry_and_Thermistor_Locations.mxd

544000 546000 548000 550000 552000

6964000

6962000

Johnston Cove

RLts
Ro Trs(45)

RLts
(56)

Rankin Inlet

Rankin Inlet
Tank Farm

Fist Pt

Melvin Bay

REFERENCE 1

AEM Tank
Farm

IMPACT 1

Anchor Point for
Smaller Fuel Tanker

Itivia
Harbour

Survey
Pt

REFERENCE 2

Panorama I

Access Passage

Buff I

Silent
Cove

Cargo Ship
and Fuel Tanker
Moorage/Offloading

Aukpik I

Bunting I

Kreaik

Bn
Cur I

Horseshoe

Bag I

Guillemot
Rocks

Enlarged Area

Rankin
Inlet

Hudson Bay

LEGEND

- Proposed Spud Barge
- Baseline Sampling Area
- Moorage and Offloading
- Marine Regional Study Area (Marine RSA)
- Marine Local Study Area (Marine LSA)
- Bathymetric Depth Contour
- Waterbody

REFERENCE

Base data obtained from Agnico Eagle Mines Limited (AEM). Baseline Sampling and Spud Barge obtained from Nunami Stantec on behalf of Agnico Eagle Mines Limited (AEM). Atlas of Canada data Obtained from © Department of Natural Resources Canada. All rights reserved. Nautical chart data obtained from the Canadian Hydrographic Service. Country background data obtained from ESRI.
Datum: NAD 83 Projection: UTM Zone 15

500 0 500
METRES

PROJECT
AGNICO EAGLE

AGNICO EAGLE MINES LIMITED
MELIADINE GOLD PROJECT
NUNAVUT

TITLE

MARINE LOCAL STUDY AREA

Golder Associates

PROJECT NO.	10-1373-0076		FILE No.	
DESIGN	AK	25 Jul. 2012	SCALE AS SHOWN	REV. 0
GIS	DSC	25 Jul. 2012		
CHECK	PR	18 Jan. 2013		
REVIEW	DW	18 Jan. 2013		

FIGURE 8.1-1

N:\Bur-Graphics\Projects\2013\1428\13-1428-0007\GIS\Mapping\MXD\FEIS\Volume_8\Main_Volume\Figure_8.1-1_Marine_LSA_Nautical_Charts.mxd

Appendix K

Water Balance

(Water Management Plan, AEM, 2019. Appendix H)

Containment Pond 1											
Result:	Volume	TDS	Inflows								
	Volume (end of month)	Monthly Average TDS	South of Esker	H15 Watershed	CP1 East Watershed	CP1 West Watershed	Ore Stockpiles	CP1 West Shore Watershed	Industrial Pad Runoff	Portal 2 Catchment	Crusher Pad Runoff
Unit:	m3	mg/L	m3	m3	m3	m3	m3	m3	m3	m3	m3
2019 Jan	112247.2	1969.523	0	0	0	0	0	0	0	0	0
2019 Feb	119396.3	1879.312	0	0	0	0	0	0	0	0	0
2019 Mar	126733.5	1797.157	0	0	0	0	0	0	0	0	0
2019 Apr	131650.3	1745.63	0	0	0	0	0	0	0	0	0
2019 May	136730.4	1709.831	0	0	0	0	0	0	0	0	0
2019 Jun	235123.7	1804.616	9371.438	17273.25	11579.31	22168.33	1932.813	11475.49	24239.98	3237.486	1029.42
2019 Jul	262239.8	2329.541	1625.417	2995.935	2125.795	3981.168	521.462	1381.294	6038.066	876.312	278.64
2019 Aug	314478.2	2786.252	2357.999	4346.216	3000.123	5678.327	799.5072	1715.708	7451.265	1046.706	332.82
2019 Sep	365789.9	3026.668	1927.459	3552.654	2414.665	4597.84	484.9281	1156.391	5502.455	754.602	239.94
2019 Oct	390387	3174.841	595.223	1097.103	731.3918	1403.299	66.20123	313.6647	1476.144	194.736	61.92
2019 Nov	398063.8	3222.95	0	0	0	0	0	0	0	0	0
2019 Dec	405744.6	3171.37	0	0	0	0	0	0	0	0	0

Containment Pond 1											
Result:	Inflows										
	Landfill Runoff	H13 Catchment Runoff	WRSF2 Catchment	Direct Precipitation	Runoff from TSF	WRSF1 Runoff	Recirculated from EWTP	Pumped from CP3	Pumped from CP4	Pumped from CP5	SWTP Permeate
Unit:	m3	m3	m3	m3	m3	m3	m3	m3	m3	m3	m3
2019 Jan	0	0	0	0	0	0	0	0	0	0	3303.72
2019 Feb	0	0	0	0	0	0	0	0	0	0	3696
2019 Mar	0	0	0	0	0	0	0	0	0	0	3493
2019 Apr	0	0	0	0	0	0	0	0	0	0	1200
2019 May	0	0	0	0	0	0	0	0	0	0	1240
2019 Jun	931.266	24362.21	18771.24	15324.5	7095.284	2972.649	0	24074.28	0	0	1551.942
2019 Jul	252.072	4225.471	3554.507	0	1920.528	750.6201	0	10481.84	0	0	4119.5
2019 Aug	301.086	6129.909	4943.415	0	2293.964	908.4846	0	13856.72	0	0	4092
2019 Sep	217.062	5010.668	3944.967	2233.305	1653.788	617.0021	0	10719.85	0	0	3965.5
2019 Oct	56.016	1547.356	1181.911	4082.843	426.784	119.1622	0	3080.324	0	0	4092
2019 Nov	0	0	0	0	0	0	0	0	0	0	3960
2019 Dec	0	0	0	0	0	0	0	0	0	0	3960

Containment Pond 1										
Result:	Inflows			Outflows						
	Truck Wash	STP	RO Permeate	Steady Rate Treatment	Overflow	Discharge to Sea	Evaporation	To CP5	Seepage through DCP1	EWTP
Unit:	m3	m3	m3	m3	m3	m3	m3	m3	m3	m3
2019 Jan	16	3798.21	0	0	0	0	0	0	0	0
2019 Feb	16	3437.13	0	0	0	0	0	0	0	0
2019 Mar	20	3824.16	0	0	0	0	0	0	0	0
2019 Apr	16	3700.8	0	0	0	0	0	0	0	0
2019 May	16	3824.16	0	0	0	0	0	0	0	0
2019 Jun	20	3700.8	0	0	0	0	0	0	0	106353.2
2019 Jul	16	3824.16	0	0	0	0	18444.97	0	0	4038.207
2019 Aug	16	3824.16	0	0	0	0	7409.704	0	0	4360.83
2019 Sep	20	3700.8	0	0	0	0	0	0	0	2149.706
2019 Oct	16	3824.16	0	0	0	0	0	0	0	0
2019 Nov	16	3700.8	0	0	0	0	0	0	0	0
2019 Dec	20	3700.8	0	0	0	0	0	0	0	0

Containment Pond 3								
Result:	Volume	TDS	Inflows				Outflows	
	Volume (end of month)	Monthly Average TDS	Direct Precipitation	Natural Runoff	Disturbed Runoff	TSF Runoff	To Environment	To CP1
Unit:	m3	mg/l	m3	m3	m3	m3	m3	m3
2019 Jan	0	0	0	0	0	0	0	0
2019 Feb	0	0	0	0	0	0	0	0
2019 Mar	0	0	0	0	0	0	0	0
2019 Apr	0	0	0	0	0	0	0	0
2019 May	0	0	0	0	0	0	0	0
2019 Jun	25454	4872.601	0	30075.3	5054	14398.98	0	24074.28
2019 Jul	25454	5158.659	0	5216.37	1368	3897.468	0	10481.84
2019 Aug	25454	5441.455	0	7567.41	1634	4655.309	0	13856.72
2019 Sep	25454	5460.194	0	6185.7	1178	3356.153	0	10719.85
2019 Oct	25454	5387.477	0	1910.22	304	866.104	0	3080.324
2019 Nov	25454	5349.831	0	0	0	0	0	0
2019 Dec	25454	5349.831	0	0	0	0	0	0

Containment Pond 5											
Result:	Volume	TDS	Inflows							Outflows	
	Volume (end of month)	Monthly Average TDS	CP5 Catchment	WRSF 1 Catchment	Direct Precipitation	WRSF1 Runoff	Pumped from DCP5	Pumped from P3	Pumped from CP1	Overflow to CP1	Overflow to P1
Unit:	m3	mg/L	m3	m3	m3	m3	m3	m3	m3	m3	m3
2019 Jan	21482.37	12200	0	0	0	0	0	0	0	0	0
2019 Feb	21482.37	12200	0	0	0	0	0	0	0	0	0
2019 Mar	21482.37	12200	0	0	0	0	0	0	0	0	0
2019 Apr	21482.37	12200	0	0	0	0	0	0	0	0	0
2019 May	21482.37	12200	0	0	0	0	0	0	0	0	0
2019 Jun	10000	5592.921	22712.53	18195.42	2956.112	3973.06	0	0	0	0	0
2019 Jul	10000	4334.254	4361.398	3340.417	0	1002.185	0	0	0	0	0
2019 Aug	10000	5705.95	6155.219	4714.314	0	1213.01	0	0	0	0	0
2019 Sep	13591.38	5630.497	4923.284	3794.34	287.2397	824.9692	0	0	0	0	0
2019 Oct	16964.68	6914.495	1431.923	1149.29	633.2043	158.8829	0	0	0	0	0
2019 Nov	16964.68	7950.064	0	0	0	0	0	0	0	0	0
2019 Dec	16964.68	7950.064	0	0	0	0	0	0	0	0	0

Containment Pond 5							
Result:	Outflows						
	Overflow to P2	Overflow to P3	Pumped to CP1	Seepage to DCP5	Evaporation	RO Unit - Brine	RO Unit - Permeate
Unit:	m3	m3	m3	m3	m3	m3	m3
2019 Jan	0	0	0	0	0	0	0
2019 Feb	0	0	0	0	0	0	0
2019 Mar	0	0	0	0	0	0	0
2019 Apr	0	0	0	0	0	0	0
2019 May	0	0	0	0	0	0	0
2019 Jun	0	0	0	0	0	10084.31	49235.18
2019 Jul	0	0	0	0	2460.033	2497.587	3746.38
2019 Aug	0	0	0	0	953.5013	4451.617	6677.425
2019 Sep	0	0	0	0	0	2495.382	3743.073
2019 Oct	0	0	0	0	0	0	0
2019 Nov	0	0	0	0	0	0	0
2019 Dec	0	0	0	0	0	0	0

Saline Pond											
Result:	Volume	TDS	Inflows						Outflows		
	Volume (end of month)	Monthly Average TDS	Catchment Runoff	Direct Precipitation	Pumped P3	RO Brine	SWTP Brine	Pumped from UG	Evaporation	Pumped to SWTP Brine Mode	Pumped to SWTP Solids Mode
Unit:	m3	mg/L	m3	m3	m3	m3	m3	m3	m3	m3	m3
2019 Jan	13742.88	14808.54	0	0	0	0	1415.88	0	0	0	0
2019 Feb	13742.88	13903.09	0	0	0	0	0	0	0	0	0
2019 Mar	13742.88	13903.09	0	0	0	0	0	0	0	0	0
2019 Apr	13742.88	13903.09	0	0	0	0	0	0	0	0	0
2019 May	13742.88	13903.09	0	0	0	0	0	0	0	0	0
2019 Jun	24627.83	20260.96	1006.166	346.7753	0	10084.31	0	0	0	0	552.3078
2019 Jul	22919.93	19988.99	266.0104	0	0	2497.587	0	0	379.4909	0	4092
2019 Aug	23451.4	19071.36	318.4354	0	0	4451.617	0	0	146.5843	0	4092
2019 Sep	22715.32	18078	229.4377	42.59506	0	2495.382	0	0	0	0	3503.5
2019 Oct	22850.69	17785.79	59.33286	76.04437	0	0	0	0	0	0	0
2019 Nov	22850.69	17736.85	0	0	0	0	0	0	0	0	0
2019 Dec	22850.69	17736.85	0	0	0	0	0	0	0	0	0

Saline Pond		
Result:	Outflows	
	Pumped to P3	Overflow (tracked)
Unit:	m3	m3
2019 Jan	0	0
2019 Feb	0	0
2019 Mar	0	0
2019 Apr	0	0
2019 May	0	0
2019 Jun	0	0
2019 Jul	0	0
2019 Aug	0	0
2019 Sep	0	0
2019 Oct	0	0
2019 Nov	0	0
2019 Dec	0	0

Underground											
Result:	Volume				TDS			Inflows		Outflows	
	Sump System Volume (end of month)	Stope 75 Volume (end of month)	Stope 350 Volume (end of month)	Cumulative Underground Overflow (tracked)	Sump System Monthly Average TDS	Stope 75 Monthly Average TDS	Stope 350 Monthly Average TDS	Truck Wash	Groundwater Inflow	Lost to Rock Water Content	To SWTP Solids Mode
Unit:	m3	m3	m3	m3	mg/L	mg/L	mg/L	m3	m3	m3	m3
2019 Jan	830	4830	1100	0	55800	55794.9	55800	0	1240	0	0
2019 Feb	830	2254	1100	0	55800	55772.9	55800	0	1120	0	3696
2019 Mar	830	1	1100	0	55800	56572.61	55800	0	1240	0	3493
2019 Apr	830	1	1100	0	55800	55800	55800	0	1200	0	1200
2019 May	830	1	1100	0	55800	55800	55800	0	1240	0	1240
2019 Jun	830	168.366	1100	0	55800	55800	55800	0	1200	0	1032.634
2019 Jul	813.2645	1370.033	1100	0	55800	55800	55800	0	1240	55.06886	0
2019 Aug	830	7253.963	1100	0	55800	55800	55800	0	7440	1539.334	0
2019 Sep	830	10000	3543.666	0	55800	55800	55800	0	7200	1553.797	456.5
2019 Oct	830	10000	5169.999	0	55800	55800	55800	0	7440	1721.668	4092
2019 Nov	830	10000	6340	509.5294	55800	55800	55800	0	7200	1560.469	3960
2019 Dec	830	10000	6340	2390.044	55800	55800	55800	0	7200	1359.485	3960

Underground							
Result:	Outflows						
	To SWTP Brine Mode	Pumped to P3	Pumped to P2	Pumped to P1	Pumped to Saline Pond	Discharged to Sea	Uncontained
Unit:	m3	m3	m3	m3	m3	m3	m3
2019 Jan	5244	0	0	0	0	0	0
2019 Feb	0	0	0	0	0	0	0
2019 Mar	0	0	0	0	0	0	0
2019 Apr	0	0	0	0	0	0	0
2019 May	0	0	0	0	0	0	0
2019 Jun	0	0	0	0	0	0	0
2019 Jul	0	0	0	0	0	0	0
2019 Aug	0	0	0	0	0	0	0
2019 Sep	0	0	0	0	0	0	0
2019 Oct	0	0	0	0	0	0	0
2019 Nov	0	0	0	0	0	0	509.5294
2019 Dec	0	0	0	0	0	0	1880.515

P-Area (P1)											
Result:	Volume	TDS	Inflows								
	Volume (end of month)	Monthly Average TDS	Pumped from Portal 2	Overflow from CP5	Natural Runoff	Disturbed Runoff	Direct Precipitation	Waste Rock Runoff	From WRSF1	Batch Plant	Pumped from DP1
Unit:	m3	mg/L	m3	m3	m3	m3	m3	m3	m3	m3	m3
2019 Jan	4780.69	21869.53	0	0	0	0	0	0	0	0	0
2019 Feb	4780.69	22578.54	0	0	0	0	0	0	0	0	0
2019 Mar	4780.69	23287.54	0	0	0	0	0	0	0	0	0
2019 Apr	4780.69	24020.59	0	0	0	0	0	0	0	0	0
2019 May	4780.69	24753.63	0	0	0	0	0	0	0	0	0
2019 Jun	2519.543	71092.29	0	0	0	10797.06	1339.07	1442.724	0	0	0
2019 Jul	1000	385783.2	0	0	0	3301.09	0	390.5118	0	0	0
2019 Aug	1000	477220.1	0	0	0	3957.756	0	466.4446	0	0	0
2019 Sep	1000	553830.9	0	0	0	2853.266	61.0435	336.274	0	0	0
2019 Oct	2447.435	406213.1	0	0	0	705.5518	171.3472	86.7804	0	0	0
2019 Nov	2447.435	250700.6	0	0	0	0	0	0	0	0	0
2019 Dec	2447.435	252109	0	0	0	0	0	0	0	0	0

P-Area (P1)								
Result:	Inflows				Outflows			
	Cement Truck Water	Pumped from P2	Pumped from P3	Overflow from P3	Evaporators	Seepage to DP1	Evaporation	Overflow (tracked)
Unit:	m3	m3	m3	m3	m3	m3	m3	m3
2019 Jan	0	0	0	0	0	0	0	0
2019 Feb	0	0	0	0	0	0	0	0
2019 Mar	0	0	0	0	0	0	0	0
2019 Apr	0	0	0	0	0	0	0	0
2019 May	0	0	0	0	0	0	0	0
2019 Jun	0	0	0	0	15840	0	0	0
2019 Jul	0	0	0	0	4641.166	0	569.9786	0
2019 Aug	0	0	0	0	4213.94	0	210.2609	0
2019 Sep	0	0	0	0	3250.583	0	0	0
2019 Oct	0	0	0	513.8342	30.0788	0	0	0
2019 Nov	0	0	0	0	0	0	0	0
2019 Dec	0	0	0	0	0	0	0	0

P-Area (P2)											
Result:	Volume	TDS	Inflows								Outflows
	Volume (end of month)	Monthly Average Concentration	Natural Runoff	Disturbed Runoff	Direct Precipitation	Waste Rock Runoff	Pumped from P3	Pumped from Stope 75	Overflow from CP5	Waste Rock Drainage	Evaporation
Unit:	m3	mg/L	m3	m3	m3	m3	m3	m3	m3	m3	m3
2019 Jan	104.81	19600	0	0	0	0	0	0	0	0	0
2019 Feb	104.81	19600	0	0	0	0	0	0	0	0	0
2019 Mar	104.81	19600	0	0	0	0	0	0	0	0	0
2019 Apr	104.81	19600	0	0	0	0	0	0	0	0	0
2019 May	104.81	19600	0	0	0	0	0	0	0	0	0
2019 Jun	5563.494	11014.63	378.162	3440.459	463.2935	1176.769	0	0	0	0	0
2019 Jul	6226.724	10836.17	65.5898	880.3659	0	318.524	0	0	0	0	601.2498
2019 Aug	6828.18	11539.06	95.1514	1044.319	0	380.4593	0	0	0	0	238.2542
2019 Sep	6828.18	11569.89	77.778	751.9566	69.43901	274.2846	0	0	0	0	0
2019 Oct	6828.18	11355.95	24.0188	194.0533	124.373	70.78312	0	0	0	0	0
2019 Nov	6828.18	11245.97	0	0	0	0	0	0	0	0	0
2019 Dec	6828.18	11245.97	0	0	0	0	0	0	0	0	0

P-Area (P2)		
Result:	Outflows	
	Pumped to P1	Overflow (to P3)
Unit:	m3	m3
2019 Jan	0	0
2019 Feb	0	0
2019 Mar	0	0
2019 Apr	0	0
2019 May	0	0
2019 Jun	0	0
2019 Jul	0	0
2019 Aug	0	680.2193
2019 Sep	0	1173.458
2019 Oct	0	413.2282
2019 Nov	0	0
2019 Dec	0	0

P-Area (P3)											
Result:	Volume	TDS	Inflows								
	Volume (end of month)	Monthly Average TDS	Natural Runoff	Disturbed Runoff	Direct Precipitation	Waste Rock Runoff	Pumped from DP3	Pumped from Saline Pond	Pumped from Portal 1	Overflow from P2	Pumped from Stope 75
Unit:	m3	mg/L	m3	m3	m3	m3	m3	m3	m3	m3	m3
2019 Jan	7482.97	20100	0	0	0	0	0	0	0	0	0
2019 Feb	7482.97	20100	0	0	0	0	0	0	0	0	0
2019 Mar	7482.97	20100	0	0	0	0	0	0	0	0	0
2019 Apr	7482.97	20100	0	0	0	0	0	0	0	0	0
2019 May	7482.97	20100	0	0	0	0	0	0	0	0	0
2019 Jun	13783.23	16377.66	0	3433.21	1228.547	0	0	0	1638.5	0	0
2019 Jul	13747.94	14232.56	0	892.0443	0	0	0	0	450	0	0
2019 Aug	15480.77	14502.28	0	1055.891	0	0	0	0	537.5	680.2193	0
2019 Sep	17951.49	13947.89	0	749.296	160.4624	0	0	0	387.5	1173.458	0
2019 Oct	18431.67	13431.39	0	193.3503	287.4392	0	0	0	100	413.2282	0
2019 Nov	18431.67	13259.85	0	0	0	0	0	0	0	0	0
2019 Dec	18431.67	13259.85	0	0	0	0	0	0	0	0	0

P-Area (P3)								
Result:	Inflows	Outflows						
	Overflow from CP5	Evaporation	Pumped to P1	Pumped to P2	Pumped to CP5	Seepage to DP3	Pumped to Saline Pond	Overflow (to P1)
Unit:	m3	m3	m3	m3	m3	m3	m3	m3
2019 Jan	0	0	0	0	0	0	0	0
2019 Feb	0	0	0	0	0	0	0	0
2019 Mar	0	0	0	0	0	0	0	0
2019 Apr	0	0	0	0	0	0	0	0
2019 May	0	0	0	0	0	0	0	0
2019 Jun	0	0	0	0	0	0	0	0
2019 Jul	0	1377.335	0	0	0	0	0	0
2019 Aug	0	540.7764	0	0	0	0	0	0
2019 Sep	0	0	0	0	0	0	0	0
2019 Oct	0	0	0	0	0	0	0	513.8342
2019 Nov	0	0	0	0	0	0	0	0
2019 Dec	0	0	0	0	0	0	0	0

Appendix L

Ecological Land

Appendix L

Ecological Land

Total Area and Percent Cover of Land Cover Classes within the Regional Study Area (FEIS, AEM, 2014)

Regional Land Cover Class	Regional Land Cover Class Description	Total Area of RSA (ha)	Total percent of RSA
Heath			
Heath boulder	Occurs on rapidly to well-drained sites that contain a high proportion of boulder deposits in association with bedrock outcrop.	26,499	11
Heath lichen – hair lichen	Typically associated with eskers and the crests and upper slopes of small ridges with poorly developed, rapidly drained soils.	4,503	2
Heath lichen – *Cetraria*	Typically occurs on the lower slopes of ridges and eskers or as veneers over flat rocky plains characterized by frost boils.	1,733	1
Heath tundra	Occurs on well-drained soils.	109,826	45
	Heath vegetation subtotal	**142,562**	**58**
Wetlands / Riparian			
Low shrub	Associated with imperfectly to poorly drained soils characteristic of riparian areas and depressions.	3,478	1
Tussock-hummock	Typically found in flat to low-lying areas, where soils are poorly to very poorly drained.	25,699	10
	Wetlands / riparian subtotal	**29,177**	**12**
Miscellaneous			
Bare ground (rock outcrop)	Represents areas with limited to no vegetation cover and is typically associated with eskers, steep sandy slopes, and the tidal an inter-tidal beaches along Hudson's Bay.	5,263	2
Water	Associated with rivers and lakes, as well as portions of Hudson's Bay.	69,298	28
	Miscellaneous subtotal	**74,561**	**30**
	Total	**246,300**	**100**

Note: Some numbers are rounded for presentation purposes. Therefore, it may appear that the totals do not equal the sum of the individual values.

ha = hectares; RSA = Regional Study Area

Appendix M

Water Quality Results

(Water Management Plan, AEM, 2019)

Table 18: Effluent Characteristics of MEL-14 (CP1 to Meliadine Lake)

	MDMER and Licence Part F, Item 3 Maximum Concentrations		2018 MEL-14 End-of-Pipe Concentrations		Maximum MEL-14 End-of-Pipe Concentrations Predictions based on Tiriganiaq Monthly Average	
	Maximum MEL-14 Average Concentration [mg/L]	Maximum MEL-14 Concentration of Any Grab Sample [mg/L]	Maximum MEL-14 Average Concentration [mg/L]	Maximum MEL-14 Concentration Grab Sample [mg/L]	Dissolved Concentration[mg/L]	Total Used in the Model (Dissolved + 15 mg/L TSS) [mg/L]
pH	6 to 9.5	6 to 9.5	7.1 to 7.4	6.8 to 7.5	-	-
Total Dissolved Solids	1400	1400	1254	1430*	204	204
Total Suspended	15	30	12	21	-	15
Total Ammonia as Nitrogen	14	18	2.4	4.1	4.6	4.6
Phosphorus (total)	2	4	0.0475	0.099	0.4	0.4
Total cyanide	0.5	1.0	<0.005	<0.005	0.005	0.005
Aluminum	2	3	1.8	4.39*	0.09	1.20
Arsenic	0.3	0.6	0.002	0.002	0.101	0.191
Copper	0.2	0.4	0.003	0.009	0.0011	0.0037
Lead	0.2	0.4	0.0003	0.0003	0.0011	0.0049
Nickel	0.5	1.0	0.003	0.003	0.0023	0.0032
Zinc	0.4	0.8	0.007	0.009	0.009	0.010
Radium-226	0.37 Bq/L	1.11 Bq/L	0.0058 Bq/L	0.008 Bq/L	-	-
Total Petroleum Hydrocarbon	5	5	1.2	1.8	-	-

*Exceeds effluent quality limit listed under Part F, Item 3 of the Licence (2AM-MEL1631).

Table 19: MEL-SR-1 to MEL-SR-14 runoff quality characteristics - Licence requirements & 2018 results

		TSS (mg/L)	Oil and Grease	pH
Licence Part D, Item 18 Maximum Concentrations	Max. Average Concentration	50	No Visible Sheen	6.0 - 9.5
	Max. Concentration of Any Grab Sample	100	No Visible Sheen	6.0 - 9.5
MEL-SR-1	Max. Average Concentration	143*	No Visible Sheen	7.8 - 8.0
	Max. Concentration of Any Grab Sample	500*	No Visible Sheen	7.5 - 8.1
MEL-SR-2	Max. Average Concentration	N/A[a]	No Visible Sheen	N/A[a]
	Max. Concentration of Any Grab Sample	38	No Visible Sheen	7.6
MEL-SR-7	Max. Average Concentration	12	No Visible Sheen	7.8
	Max. Concentration of Any Grab Sample	42	No Visible Sheen	8.0
MEL-SR-8	Max. Average Concentration	N/A[a]	No Visible Sheen	N/A[a]
	Max. Concentration of Any Grab Sample	3	No Visible Sheen	7.9
MEL-SR-9	Max. Average Concentration	N/A[a]	No Visible Sheen	N/A[a]
	Max. Concentration of Any Grab Sample	670*	No Visible Sheen	8.0
MEL-SR-11	Max. Average Concentration	450*	No Visible Sheen	7.9 - 8.0
	Max. Concentration of Any Grab Sample	1200*	No Visible Sheen	7.8 - 8.1
MEL-SR-12	Max. Average Concentration	N/A[a]	No Visible Sheen	N/A[a]
	Max. Concentration of Any Grab Sample	15	No Visible Sheen	7.0
MEL-SR-13	Max. Average Concentration	N/A[a]	No Visible Sheen	N/A[a]
	Max. Concentration of Any Grab Sample	3	No Visible Sheen	8.0
MEL-SR-14	Max. Average Concentration	N/A[a]	No Visible Sheen	N/A[a]
	Max. Concentration of Any Grab Sample	17	No Visible Sheen	7.9

[a] Insufficient quantity of sample results to calculate an average as it is defined in the Licence (requires 4 sample dates for moving average).

*Exceeds effluent quality limit listed under Part F, Item 3 of the Licence (2AM-MEL1631).

Table 3: Average Saline Groundwater Quality

Source: Groundwater quality data from DDH sample location (Agnico Eagle, December 2018)

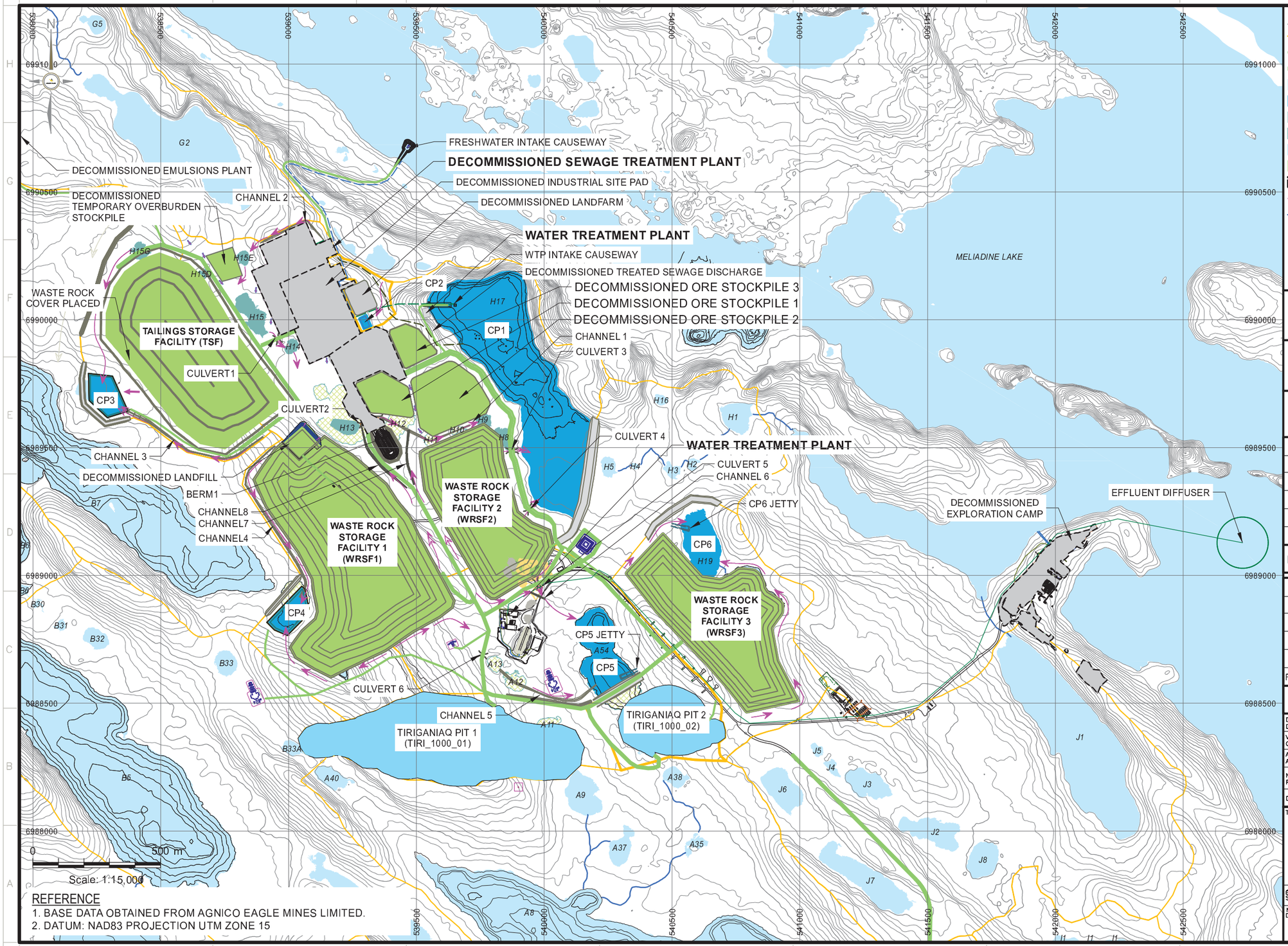
Representative Months (average per month)		Jan-17	Feb-17	Mar-17	Apr-17	-	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18
Parameters (total metal)	**Units**																							
pH	pH	7.08	6.87	7.11	7.32	7.38	7.27	8.27	7.45	7.33	7.41	7.26	7.18	7.35	7.49	7.80	7.26	7.26	7.79	7.08	7.72	6.99	7.02	7.28
Alkalinity	mg/L	57	61.7	51	64.5	68	68	75	68.2	64	64	69	66	73	73	78	70	62	67	65	85	71	67	57
Conductivity	µmhos/cm	77000	76500	77000	79000	79000	76308	74385	72200	72667	78667	85000	80667	81083	82667	81200	83000	69500	83125	83333	83000	78000	69571	81000
Total Hardness (as $CaCO_3$)	mg/L	13200	18267	12700	18400	12433	12623	12500	12583	11700	12600	14100	12733	13164	14367	12680	13550	13100	13538	13450	13925	13500	11131	16500
Turbidity	NTU	123.75	69	88	90	51	75	61	47.02	104.33	55.00	30.00	53.00	74.83	72.89	27.18	49.33	75.50	27.51	52.00	27.5	83.95	69.43	52
Total Dissolved Solids (TDS)	mg/L	54350	66433	54900	57500	57300	55123	57815	57520	54567	57867	62000	55133	53975	52233	55460	51367	56900	58325	55917	60975	56900	49229	57600
Total Suspended Solids (TSS)	mg/L	45	75.7	63	248.5	102.7	102.2	156	86	102	316.7	30.0	56.0	181.8	108.1	31.0	38.7	37.5	85.4	58.5	50.0	216.0	42.4	46
Aluminum (Al)	mg/L	0.21	0.1	6.02	1.29	0.51	1.45	0.73	0.97	1.75	2.063	0.150	0.250	2.979	1.466	0.270	0.290	0.128	0.798	0.245	0.261	4.145	0.353	0.15
Ammonia Nitrogen (NH_3-NH_4)	mg/L	4.125	7.9	4.5	4.95	5.2	5.508	11.08	4.87	4.7	6.100	4.800	4.700	5.825	4.711	5.180	4.800	4.300	5.250	4.233	6.925	4.550	5.714	6.55
Arsenic (As)	mg/L	0.003	0.005	0.01	0.008	0.004	0.016	0.016	0.102	0.013	0.047	0.006	0.009	0.027	0.057	0.009	0.010	0.004	0.024	0.006	0.005	0.011	0.009	0.0138
Barium (Ba)	mg/L	0.06	0.61	0.1	0.27	0.07	0.09	0.25	0.1	0.07	0.113	0.082	0.094	0.109	0.109	0.098	0.072	0.073	0.100	0.058	0.073	0.170	0.110	0.163
Beryllium (Be)	mg/L	0.003	0.002	0.01	0.002	0.002	0.005	0.008	0.01	0.01	0.008	0.005	0.008	0.010	0.009	0.009	0.007	0.004	0.004	0.006	0.004	0.005	0.009	0.005
Boron (B)	mg/L	1.6	4.98	5	4.9	1.5	2.7	3.97	5	2.5	4.17	2.50	4.17	4.79	4.72	4.50	3.33	2.10	2.28	2.92	2.35	2.80	4.64	3
Total Organic Carbon (TOC)	mg/L	2.23	11.67	2.1	2.95	2.63	3.2	5.3	2.57	2.5	16.27	3.00	2.67	2.50	2.42	2.36	2.47	2.20	3.00	1.97	2.4	2.95	2.73	5.3
Dissolved Organic Carbon	mg/L	1.9	10.17	1.7	2.3	2.37	2.7	4.9	2.32	2.1	13.70	2.80	2.33	2.38	2.27	2.36	2.27	1.90	2.55	1.90	2.4	2.55	2.53	5
Calcium (Ca)	mg/L	1710	3777	1650	3737	1593	1608	1771	1610	1565	1720	1770	1587	1646	1777	1656	1737	1690	1748	1653	1715	2165	1487	2960
Cadmium (Cd)	mg/L	0.0003	0.0002	0.001	0.0003	0.0002	0.0005	0.001	0.001	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0005
Chloride (Cl - dissolved)	mg/L	31250	38000	31000	31500	32000	31385	31538	32800	29333	32333	34000	33000	33833	34444	34800	34333	32500	33875	33333	36250	33500	27143	35000
Chromium (Cr)	mg/L	0.025	0.017	0.01	0.02	0.017	0.05	0.075	0.1	0.88	0.083	0.050	0.083	0.096	0.094	0.090	0.067	0.035	0.043	0.058	0.043	0.052	0.093	0.05
Copper (Cu)	mg/L	0.01	0.008	0.05	0.01	0.01	0.02	0.04	0.05	0.03	0.042	0.025	0.032	0.048	0.048	0.045	0.028	0.018	0.021	0.029	0.021	0.040	0.046	0.025
Cyanide (Cn)	mg/L	0.005	0.19	0.005	0.028	0.005	0.006	0.01	0.005	0.008	0.005	0.025	0.015	0.017	0.033	0.021	0.012	0.025	0.005	0.005	0.005	0.005	0.005	–
Iron (Fe)	mg/L	4.76	8.96	3.6	8.78	6.19	9.81	6.33	8.24	4.1	10.67	6.46	6.50	14.84	12.79	5.50	5.37	6.36	5.94	7.96	5.36	18.80	5.64	6.81
Lead (Pb)	mg/L	0.005	0.005	0.02	0.004	0.003	0.009	0.015	0.02	0.018	0.017	0.010	0.017	0.020	0.019	0.018	0.013	0.007	0.009	0.012	0.009	0.010	0.019	0.01
Magnesium (Mg)	mg/L	2168	2150	2080	2200	2050	2092	1962	2105	1975	2017	2350	2150	2208	2411	2078	2220	2150	2229	2267	2335	1970	1800	2200
Mercury (Hg)	mg/L	0.00001	0.00001	0.00001	0.000001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum (Mo)	mg/L	0.025	0.055	0.01	0.25	0.026	0.047	0.075	0.1	0.17	0.083	0.050	0.083	0.096	0.094	0.090	0.067	0.035	0.043	0.058	0.043	0.050	0.093	0.061
Nickel (Ni)	mg/L	0.025	0.04	0.1	0.07	0.017	0.05	0.08	0.1	0.35	0.083	0.050	0.083	0.096	0.094	0.090	0.067	0.035	0.043	0.058	0.043	0.050	0.093	0.05
Nitrate (NO_3) as N	mg/L	0.5	116.39	0.1	2.58	0.23	0.89	4.35	0.17	0.34	0.293	0.100	0.213	2.015	0.376	0.240	0.297	0.300	0.420	0.517	0.608	0.455	2.929	0.1
Nitrite (NO_2) as N	mg/L	0.05	8.01	0.1	0.125	0.086	0.14	0.391	0.042	0.027	0.032	0.024	0.023	0.120	0.043	0.042	0.028	0.030	0.044	0.052	0.065	0.039	0.109	0.061
Total Kjeldahl Nitrogen (TKN)	mg/L	3.78	8.7	4.6	5.2	7.83	7.4	12	72.02	4.5	9.00	5.60	4.87	6.12	4.97	5.90	5.27	4.95	5.54	4.18	7.5	4.60	6.77	6.5
Phosphorous (P)	mg/L	0.07	0.14	0.04	0.13	0.12	0.08	0.09	0.1	—	0.390	0.080	0.080	0.075	0.083	0.162	0.073	0.200	0.173	0.118	0.175	0.420	0.154	0.1
Potassium (K)	mg/L	496	595	407	609	433	463	518	488	763	502	528	465	490	532	512	479	474	500	491	539	444	391	680
Radium-226 (Ra 226)	mg/L	0.49	0.33	0.3	1.2	1.95	1.8	1.9	2.2	0.29	2.200	2.400	1.673	1.853	3.678	3.880	2.633	2.050	1.938	1.833	2.450	0.670	0.906	1.8
Selenium (Se)	mg/L	0.003	0.002	0.01	0.002	0.002	0.005	0.0075	0.01	0.007	0.008	0.005	0.008	0.010	0.009	0.009	0.007	0.004	0.004	0.006	0.016	0.005	0.009	0.005
Silver (Ag)	mg/L	0.001	0.0003	0.002	0.0009	0.0004	0.0012	0.0018	0.0002	0.018	0.003	0.001	0.002	0.002	0.004	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.001
Sodium (Na)	mg/L	14625	14700	13400	15400	13900	14369	14654	14417	9433	14900	17000	15300	15183	16389	14860	14967	14750	15725	15333	16450	13550	12629	16600
Strontium (Sr)	mg/L	43.1	171	38.4	136	40	39	43.5	36.5	23.6	40.03	35.10	35.70	37.24	37.30	37.14	40.10	47.65	43.85	40.00	41.33	61.90	47.40	83.4
Sulphate (SO_4 – dissolved)	mg/L	3125	2700	3100	3100	3233	3169	2969	3120	3067	3200	3500	3433	3367	3500	3320	3367	3350	3250	3467	3625	3200	2829	3200
Thallium (Tl)	mg/L	0.001	0.001	0.001	0.0002	0.0002	0.0005	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.000	0.001	0.001	0.0005
Uranium (U)	mg/L	0.003	0.002	0.01	0.006	0.002	0.005	0.008	0.01	0.09	0.008	0.005	0.008	0.010	0.009	0.009	0.007	0.004	0.004	0.006	0.006	0.005	0.009	0.005
Vanadium (V)	mg/L	0.13	0.08	0.5	0.1	0.08	0.23	0.38	0.5	0.33	0.417	0.250	0.417	0.479	0.472	0.450	0.333	0.175	0.213	0.292	0.213	0.250	0.464	0.25
Zinc (Zn)	mg/L	0.125	0.1	0.5	0.12	0.08	0.23	0.38	0.5	0.34	0.417	0.250	0.417	0.479	0.472	0.450	0.333	0.175	0.259	0.292	0.213	0.250	0.464	0.25

Appendix N

Post Closure General Site Layout

NO. DESSIN
DRAWING NO.

FORMAT ANSI B – 11x17



LEGEND

- CATCHMENT BOUNDARY
- SERVICE ROAD
- HAUL ROAD
- NON CONTACT WATERBODY
- WATER COLLECTION POND
- CONTACT WATERBODY
- DRAINED LAKE AREA
- FLOODED OPEN PIT
- DECOMMISSIONED WASTE ROCK
- DECOMMISSIONED INDUSTRIAL SITE PAD
- CONTACT WATER FLOW DIRECTION
- STREAM

AGNICO EAGLE

Golder Associates

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE. SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE, SONT INTERDITES.
© AGNICO EAGLE LTÉE.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPYING, TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED.
©AGNICO EAGLE LTD.

–	–
–	–
–	–
–	–
–	–
TITRE / TITLE	# DWG

DESSINS EN RÉFÉRENCE/REFERENCE DRAWINGS

–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–

REV	DESCRIPTION	DATE	PAR BY

REVISIONS

DESSINÉ PAR DRAWN BY	CDB	DATE	10–12–2014
VÉRIFIÉ PAR CHECKED BY	IM		10–12–2014
APPROUVÉ PAR APPROVED BY	JH		10–12–2014
No. PROJET PROJECT NO.	1405283		
DATE	–		

TITRE / TITLE

AGNICO EAGLE – MELIADINE DIVISION
FIGURE 8 GENERAL ARRANGEMENT PLAN
AT END OF CLOSURE STAGE (YEAR 3 OF CLOSURE)

ÉCHELLE/ SCALE	1:12500	FICHIER FILE	.DWG

No. DESSIN/ DRAWING NO.	REVISION	FEUILLE/SHT
–	0	1 / 1

REFERENCE

1. BASE DATA OBTAINED FROM AGNICO EAGLE MINES LIMITED.
2. DATUM: NAD83 PROJECTION UTM ZONE 15

AE–CART–ANSI B

N:\Client\Agnico_Eagle_Mines_Ltd\Meliadine_Gold_Project\99_PROJECTS\1405283_Meliadine_Water_License\02_PRODUCTION\3000_Application_Preparation\MXD\3200\Report\Closure\1405283_Figure_8_General_Arrangement_Plan_Closure.mxd

NO. DESSIN
DRAWING NO.

FORMAT ANSI B – 11x17

DECOMMISSIONED CHANNEL 2
DECOMMISSIONED FRESHWATER INTAKE CAUSEWAY
DECOMMISSIONED SEWAGE TREATMENT PLANT
DECOMMISSIONED EMULSIONS PLANT
DECOMMISSIONED INDUSTRIAL SITE PAD
DECOMMISSIONED LANDFARM
DECOMMISSIONED TEMPORARY OVERBURDEN STOCKPILE
DECOMMISSIONED CP2
DECOMMISSIONED WATER TREATMENT PLANT
DECOMMISSIONED WTP INTAKE CAUSEWAY
DECOMMISSIONED TREATED SEWAGE DISCHARGE
WASTE ROCK COVER PLACED
DECOMMISSIONED ORE STOCKPILE 3
DECOMMISSIONED ORE STOCKPILE 1
DECOMMISSIONED ORE STOCKPILE 2
DECOMMISSIONED TAILINGS STORAGE FACILITY (TSF)
DECOMMISSIONED CP1
DECOMMISSIONED CHANNEL 1
DECOMMISSIONED CULVERT 3
DECOMMISSIONED CULVERT1
DECOMMISSIONED CP3
DECOMMISSIONED CULVERT2
DECOMMISSIONED CULVERT 4
DECOMMISSIONED WATER TREATMENT PLANT
DECOMMISSIONED CHANNEL 3
DECOMMISSIONED CULVERT 5
DECOMMISSIONED CHANNEL 6
DECOMMISSIONED LANDFILL
DECOMMISSIONED BERM1
DECOMMISSIONED WASTE ROCK STORAGE FACILITY 2 (WRSF2)
DECOMMISSIONED CP6 JETTY
DECOMMISSIONED EXPLORATION CAMP
DECOMMISSIONED CHANNEL8
DECOMMISSIONED CHANNEL7
DECOMMISSIONED CHANNEL4
DECOMMISSIONED CP6
DECOMMISSIONED WASTE ROCK STORAGE FACILITY 1 (WRSF1)
DECOMMISSIONED WASTE ROCK STORAGE FACILITY 3 (WRSF3)
DECOMMISSIONED CP5 JETTY
DECOMMISSIONED CP4
DECOMMISSIONED CULVERT 6
DECOMMISSIONED CHANNEL 5
DECOMMISSIONED TIRIGANIAQ PIT 2 (TIRI_1000_02)
DECOMMISSIONED TIRIGANIAQ PIT 1 (TIRI_1000_01)
DECOMMISSIONED CP5
MELIADINE LAKE

0 500 m
Scale: 1:15,000

REFERENCE
1. BASE DATA OBTAINED FROM AGNICO EAGLE MINES LIMITED.
2. DATUM: NAD83 PROJECTION UTM ZONE 15

LEGEND

- CATCHMENT BOUNDARY
- SERVICE ROAD
- HAUL ROAD
- NON CONTACT WATERBODY
- DECOMMISSIONED WATER COLLECTION POND
- CONTACT WATERBODY
- DRAINED LAKE AREA
- FLOODED OPEN PIT
- DECOMMISSIONED WASTE ROCK
- DECOMMISSIONED INDUSTRIAL SITE PAD
- CONTACT WATER FLOW DIRECTION
- STREAM
- BREACHED DIKE/BERM

AGNICO EAGLE

Golder Associates

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE. SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE, SONT INTERDITES.
© AGNICO EAGLE LTÉE.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPYING, TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LONNED ARE PROHIBITED.
©AGNICO EAGLE LTD.

–	–
–	–
–	–
–	–
TITRE / TITLE	# DWG

DESSINS EN RÉFÉRENCE/REFERENCE DRAWINGS

–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
REV	DESCRIPTION	DATE	PAR BY

REVISIONS

DESSINÉ PAR DRAWN BY	CDB	DATE 10-12-2014
VÉRIFIÉ PAR CHECKED BY	IM	10-12-2014
APPROUVÉ PAR APPROVED BY	JH	10-12-2014
No. PROJET PROJECT NO.	1405283	
DATE	–	

TITRE / TITLE

AGNICO EAGLE – MELIADINE DIVISION
FIGURE 9 POST-CLOSURE
GENERAL ARRANGEMENT PLAN

ÉCHELLE/ SCALE	1:12500	FICHIER FILE	.DWG
No. DESSIN/ DRAWING NO.	–	REVISION 0	FEUILLE/SHT 1 / 1

AE-CART-ANSI B

N:\Client\Agnico_Eagle_Mines_Ltd\Meliadine_Gold_Project\99_PROJECTS\1405283_Meliadine_Water_License\02_PRODUCTION\3000_Application_Preparation\MXD\3200\Report\Closure\1405283_Figure_9_Post_Closure_Arrangement_Layout_Plan.mxd

Appendix P

Closure Integrated Schedule

Component	Description	Operation Stage (Progressive Reclamation)								Active Closure Stage			Post-Closure Stage						
		Y1 2020	Y2 2021	Y3 2022	Y4 2023	Y5 2024	Y6 2025	Y7 2026	Y8 2027	Y9 2028	Y10 2029	Y11 2030	Y12 2031	Y13 2032	Y14 2033	Y15 2034	Y16 2035	Y17 2036	Y18 2037
Machinery, Mobile Equipment and Containers (Sea Cans)	Decommission machinery and equipment and ship off-site (leaving only on-site equipment required for closure and post-closure activities).																		
	Mobilization of demolition shear that will be required for buildings and facilities demolition during active closure phase.																		
	Remove equipment used for closure activities (e.g., trucks, backhoes, etc.).																		
	Remove equipment used for long-term maintenance (e.g., backhoes).																		
	Containers (sea cans) off-site demobilization.[a]				Progressive demobilization														
Underground Mine Workings	Passive flooding (groundwater seepage).								Passive flooding										
	Decommission of surface openings as needed.																		
	Underground backfill.																		
Open Pits	Active flooding from Meliadine Lake.								Active flooding										
	Place warning signs around Open Pits perimeter and replace as needed, construct rock berm(s).																		
	Pump and piping decommissioning after open pits flooding.																		
TSF	Rockfill placement alon slope (erosion and thermal protection).	Progressive reclamation																	
	Cover placement (top surface, overburden and rockfill).																		
WRSF	Regrading and contouring of the borrow area in WRSF1																		
Mine Infrastructure and Support Buildings	Decommission facilities and re-grade areas as needed.																		
Meliadine Lake Pumping System	Decommission pumping system.																		
Water Management Facilities	Breach dikes / berms and reclaim channel and pond areas.																		
	Decommission WTP and Meliadine Lake effluent diffuser.[b]																		
Off-site Facilities	Decommission floating dock, tank farm and laydown pad at Rankin Inlet (Itivia Harbour).																		
AWAR and Quarries	Decommission AWAR and Bypass road.																		
	Quarries reclamation.[c]	Progressive reclamation																	
Long-term Care and Maintenance (assumed for 10 years after closure)																			
Monitoring[d]										Active Closure			Post-Closure						

[a] Assuming that on-site containers will gradually be shipped off-site during operations.

[b] Assuming that the WTP and Meliadine Lake effluent diffuser will be maintained for 3 years as a contigency after the closure stage and that site water quality is acceptable for direct discharge to the environment.

[c] Assuming progressive reclamation of quarries during operation when no longer required, except quarries that have been kept for road maintenance.

[d] Assumed for 10 years after operation; however, closure schedule depends on monitoring results. Activities will occur until water quality satisfies water licence criteria for direct discharge and/or acess to the site is no longer required.

Appendix P

Financial Security Cost Estimate Assumptions and RECLAIM 7.0 Spreadsheets

Title of document: **Meliadine – ICRP Update 2019 – Financial Security Cost Estimate Assumptions**

Client: **AGNICO EAGLE MINES LTD.**

Project: **Meliadine Interim Closure and Reclamation Plan 2019**

Prepared by (under ICS[1]) : Jonathan Leblanc, Jr. Eng., M. Sc.
#OIQ: 5056213

Prepared by: Alain Lebel, Mining Environment Specialist

Reviewed by: Erika Voyer, Eng., M. Sc.
#OIQ: 146740

Approved by: Sandra Pouliot, Eng.
#OIQ:121003

Jonathan Leblanc

FOR : SANDRA POULIOT

[1] ICS: Immediate control and supervision.
In terms of supervising the engineering activities and supervision of people who are not engineers or junior engineers, the Ordre des ingénieurs du Québec uses a term often used in its regulation: Immediate control and supervision (ICS). In other words, an engineer must be involved in a continuous and active manner throughout the reserved tasks entrusted to him, and not just before or after.

LIST OF REVISIONS

Revision					Pages Revised	Remarks
#	Prep.	Rev.	App.	Date		
PA	JL & AL	EV		2019-11-14	All	Issue for internal comments
PB	JL & AL	EV	SP	2019-11-28	All	Issue for client's comments
00	MHP	EV	SP	2019-12-12	All	Issue for use

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 September 16th 2019 (the "Agreement") between SNC-Lavalin and Agnico Eagle Mines Ltd. (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.

To the extent permitted by law, SNC-Lavalin disclaims any liability to the Client and to third parties in respect of the publication, reference, quoting, or distribution of this report or any of its contents to and reliance thereon by any third party.

TABLE OF CONTENTS

1.0 Introduction 1

2.0 Closure Measures and Considerations 1

3.0 Cost Estimate 2

3.1 Model 2
3.2 Summary of Costs 2
3.3 Direct Cost Assumptions 3
3.3.1 Open Pits 4
3.3.2 Underground Mining 5
3.3.3 Tailings Storage Facility 5
3.3.4 Waste Rock and Overburden Storage Facilities 6
3.3.5 Buildings and Equipments 6
3.3.6 Chemicals and Soil Management 9
3.3.7 Water Management 10
3.3.8 Interim Care and Maintenance 12
3.4 Indirect Costs 12
3.4.1 Mobilization / Demobilization 13
3.4.2 Post-Closure 13
3.4.3 Other Indirect Costs 14

4.0 Comparison with 2015 Estimates 14

5.0 References 17

List of tables

Table 3-1: Summary of Financial Security Cost Estimate 2
Table 3-2: Buildings List and Dimensions 7
Table 4-1: Comparison between 2015 and 2019 ICRP cost estimates 14

List of Appendix

APPENDIX A: Compilation Tables

APPENDIX B: RECLAIM 7.0 Spreadsheets

1.0 Introduction

Agnico Eagle Mines Limited (Agnico Eagle) is developing the Meliadine Gold Project (the Project), located approximately 25 km north of Rankin Inlet, and 80 km southwest of Chesterfield Inlet in the Kivalliq Region of Nunavut. The mine plan proposes open pit and underground mining methods for the development of the Tiriganiaq gold deposit, with two (2) open pits (Tiriganiaq Pit 1 and Tiriganiaq Pit 2) and one (1) underground mine.

Agnico Eagle is required to submit a detailed financial security cost estimate for the Meliadine Gold Project Interim Closure and Reclamation Plan (ICRP) to Indigenous and Northern Affairs Canada (INAC) and to the Kivalliq Inuit Association (KIA) to support land use and water licensing requirements. RECLAIM 7.0 workbook has been used for this estimate, as per Guidelines for Closure and Reclamation Cost Estimates for Mines, issued by Indigenous and Northern Affairs Canada, Mackenzie Valley Land and Water Board and the Government of the Northwest Territories (INAC, MVLWB, GNWT, 2017).

Only the activities covered under the Meliadine Type A Water License 2AM-MEA1631 are included in the updated Meliadine ICRP 2019 and in the herein financial security cost estimate methodology.

2.0 Closure Measures and Considerations

The cost estimate in this memorandum covers the closure and reclamation of all facilities currently identified within the Meliadine Gold Project property including the following:

- Open pits (Tiriganiaq 1 and Tiriganiaq 2);
- Underground mine;
- Tailings Storage Facility (TSF);
- Waste Rock Storage Facilities (WRSF1, WRSF2 and WRSF3);
- Support facilities on the property including accommodations and services building, process plant (mill) and contractor facilities, power plant, water and wastewater treatment facilities, bulk fuel storage facilities, contractor facilities, warehouses and cold storage, assay lab, emulsion plant, paste plant, incinerators, quarries and borrow areas, on-site roads and laydown areas;
- Rankin Inlet Site Facilities (Itivia Harbor);
- All Weather Access Road (AWAR); and,
- Bypass Road, from Itivia Harbor to the AWAR (bypassing Rankin Inlet).

The present updated Meliadine ICRP 2019 and cost estimate are based on the current Life of Mine (LOM) of Meliadine, including the mining activities planned, as well as the activities related to the ore processing and tailings deposition.

The cost estimate provides for the closure measures described in detail in the Meliadine ICRP 2019. Most closure activities will occur within the active closure period, from 2028 to 2030. The schedule of closure activities presented in Appendix O of the Meliadine ICRP 2019 outlines the major reclamation activities and their expected timeline.

For the purpose of this financial security cost estimate, progressive rehabilitation measures are not considered in the calculations. Only when completed, these will have to be considered.

3.0 Cost Estimate

3.1 Model

RECLAIM is a model developed in Microsoft Excel used to calculate the estimation of reclamation costs for mine sites in Northern Canada. It provides line items for each reclamation activity which might be required at a given site. For each, the model presents the "quantity" of work multiplied by the appropriate "Unit Cost" provided in the model or based in past or current Agnico Eagle experience (i.e. from Amaruq or Meadowbank projects).

RECLAIM version 7.0 consists of eleven (11) reclamation costing worksheets used to compute the overall closure cost estimate. These include direct costs associated with the following mine components:

- Open pit;
- Underground mine;
- Tailings Storage Facilities;
- Rock pile;
- Building and equipment (for the Meliadine site and Itivia Harbor, including transportation roads);
- Chemicals, hazardous materials and contaminated soils;
- Water treatment;
- Water management;
- Interim care and maintenance.

It also includes the following indirect costs:

- Closure and post-closure monitoring and maintenance;
- Mobilization and demobilization.

Additional cost factors such as engineering, project management, health and safety / QA-QC / Engagement, bonding/insurance and contingency are automatically calculated in the cost summary worksheet, based on applied percentages to the total direct cost.

3.2 Summary of Costs

The updated 2019 estimated closure and reclamation costs for the Meliadine Gold Project using RECLAIM Version 7.0 represents a total of 59,514,717 $. This total includes 34,462,041 $ of direct costs and 25,052,677 $ of indirect costs. The costs are summarized in Table 3-1 presented below.

Table 3-1: Summary of Financial Security Cost Estimate

Cost Items	Subtotal (Land and Water Liability)
Direct Costs	
Open Pit	1,704,963 $
Tiriganiaq Pit 1	*1,388,171 $*
Tiriganiaq Pit 2	*316,792 $*
Underground Mine	1,096,384 $
Control Access	*612,004 $*
Remove Hazardous Materials	*434,380 $*
Instrumentation	*50,000 $*
Tailings Storage Facility	4,831,700 $

Cost Items	Subtotal (Land and Water Liability)
Rock Piles	307,350 $
Buildings and Equipment	17,919,956 $
Meliadine site	*16,412,878 $*
Itivia Harbor, AWAR and Bypass Road	*1,503,078 $*
Chemicals and Contaminated Soil Management	1,864,355 $
Surface and Groundwater Management	1,446,713 $
Interim Care and Maintenance	5,294,620 $
Subtotal Direct Costs	**34,462,041 $**
Indirect Costs	
Mobilization / Demobilization	6,942,680 $
Closure monitoring and Maintenance	3,032,829 $
Post-Closure and Maintenance	3,704,694 $
Engineering (5 %)	1,723,102$
Project Management (5 %)	1,723,102$
Health and Safety Plans / Monitoring / QA-QC and Engagement Costs (2 %)	689,241$
Bonding / Insurance (1 %)	344,620 $
Contingency (20 %)	6,892,408 $
Market Price Adjustment (0 %)	0 $
Subtotal Indirect Costs	**25,052,677 $**
GRAND TOTAL	**59,514,717 $**

Refer to **Appendix B** for the RECLAIM spreadsheets, presenting the detailed breakdown of closure and reclamation costs by mine components.

The methodology and assumptions used for the calculations of the direct costs and the indirect cost calculations are explained in the sections below.

3.3 Direct Cost Assumptions

The direct costs include the cost related to the physical work activities to be completed for the various project components, as well as the interim care and maintenance requirements.

In most cases, costs have been developed using unit rates provided by the RECLAIM 7.0 template applied to calculated quantities. Where an appropriate RECLAIM supplied rate was not available, an independent rate was used from operational data or from precedent data for similarly sized AEM projects located in comparable conditions. In this case, Meadowbank (SNC-Lavalin, 2018) and Amaruq (AEM, 2016) sites were mainly used as comparable projects. Unit rates used assume third party contractor pricing.

Specific assumptions and quantities used for the financial security cost estimate are provided for each closure component in sections 3.3.1 to 3.3.7.

3.3.1 Open Pits

For this component, it is assumed that the entrance (access ramp) and the perimeter of each pit will be blocked with non-acid generating (NPAG) berms to control access of wildlife and motorized vehicles in the open pits during flooding. The length of berms was estimated from "6515-583-163-Fig-001-ACAD-Figure 1.dwg" provided by Agnico Eagle in September 2019. Berms are assumed to be 1 m high and 1 m wide at crest, with 1.5 H:1V side slopes and made on NPAG rockfill.

Berms at ramp entrance and at the perimeter of Tiriganiaq Pit 1

- Berm around perimeter - 2523 m long x 1 m tall with 1.5 H:1V side slopes = 6308 m³;
- Rock barricade at ramp access – Assuming a 2 m thick rockfill barricade on a 20 m wide ramp access = 200 m³;
- Installation of one sign every 150 m around the pit for a total of 17 signs.

Berms at ramp entrance and at the perimeter of Tiriganiaq Pit 2

- Berm around perimeter - 1134 m long x 1 m tall with 1.5 H:1V side slopes = 2835 m³;
- Rock barricade at ramp access – Assuming a 2 m thick rockfill barricade on a 20 m wide ramp access = 200 m³;
- Installation of one sign every 150 m around the pit for a total of 8 signs.

Pit Flooding

Following the completion of mining, the open pits will be flooded with water for over a period of three (3) years. Flooding will be achieved primarily by active pumping from Meliadine Lake, with the planned pumping period during the open water season of each year. Preliminary annual flooding rates for each pit are approximately 3.07 Mm³/year and 0.75 Mm³/year for Tiriganiaq Pit 1 and Tiriganiaq Pit 2, respectively. The total water pumped from Meliadine Lake in Tiriganiaq Pit 1 is 9.2 Mm3 and 2.25 Mm3 in Tiriganiaq Pit 2.

Pumping Station

- Supply and install the pumping station required for pit flooding, based on similar operation at the Amaruq Project of Agnico Eagle (AEM, 2016) for 500,000 $;
- Installation and removal of 5 km of piping from the freshwater intake to the pits. It was assumed the pipes are already on site and will be re-used for pits flooding, hence new pipes would not require to be supplied on site.
- Removal of sump pumps from the pit (one for each pit) before the beginning of the flooding operations.

Pumping System Maintenance

- Pumping system maintenance by two (2) skilled laborers over 3 years, 12 hours per day, during the four (4) months open water season. Accommodation is also considered for the two (2) laborers;
- Annual pump servicing by two (2) manufacturer consultants once a year for a seven (7) days trip, 12 hours per day. Accommodation is also considered for the two (2) consultants;
- Pumping costs to pump Meliadine Lake water into Tiriganiaq Pit 1 and Tiriganiaq Pit 2 based on Meadowbank pumping costs (SNC-Lavalin, 2018) of $0,0265 per cubic meter of water.

Capital and annual costs for pits flooding have been divided between Tiriganiaq Pit 1 and Tiriganiaq Pit 2 in relation with water volume to be pumped into each pit (80 % of water will be pumped in Tiriganiaq Pit 1 and 20% in Tiriganiaq Pit 2).

3.3.2 Underground Mining

The underground mine workings will be flooded at closure by natural groundwater inflows. Openings and access to the underground mine works will be capped. The ground surface around the sealed surface opening will be contoured to minimize natural surface water accumulation to flow into the underground.

Control Access and Backfill

The main works for the closure of underground are:

- Removal of Portal #1 (TTOG STEEL) – 100 m long with a diameter of 6.3 m for 1980 m² of steel that will be cut and disposed in the landfill. Unit cost for salvaging steel buildings was used for the estimation of Portal #1 removal;
- Removal of Portal #2 (concrete) – 131 m long with a diameter of 8.0 m for 3,300 m² of concrete wall that will be disposed in the landfill. Unit cost for the breaking of concrete foundation of buildings was used for the estimation of Portal #2 removal;
- Backfill and contour of Portal #1 - for 12,600 m3;
- Backfill and contour of Portal #2 - for 26,100 m3;
- Capping of four (4) raises with concrete, two (2) used as underground exhaust and two (2) used for fresh air. Based on SNC-Lavalin experience in similar Northern projects, a lump sum of $20,000 per raise was assumed, for a total of 80,000 $.

Hazardous Materials Removal

The cost estimation for the hazardous materials removal includes:

- Removal of hazardous materials from underground – Assuming two (2) laborers will work 12 hours per day during a three (3) months period (2,160 hours) for a total of 367,200 $;
- Removal and decontamination of stationary and electric equipment – Nine (9) stationary equipment that will require 8 hours each to be decontaminated, for a total of 3,528 $;
- Removal and decontamination of underground mobile equipment – Decontamination of 156 mobile equipment, 8 hours per equipment, for a total of 61,152 $ (refer to **Appendix A** for complete list of equipment);
- Removal of miscellaneous and hazardous materials– It is assumed that 250 kg of such material will remain underground at the beginning of the closure operation at 10 $ per kg based on past SNC-Lavalin's experience, for a total of 2,500 $.

Instrumentation

In addition to the instrumentation placed during operation, it is assumed that additional instrumentation will be supplied and installed for monitoring of underground during closure and post-closure. A provision of 50,000 $ is accounted for additional instrumentation.

3.3.3 Tailings Storage Facility

The dry stack tailings produced in the mill will have a solids content of 85% and a water content of 17% by mass. The TSF will be located on the high ground west of the mill. The direct distance from the mill to the tailings pile ranges from 300 to 900 m.

Approximately 12.1 Mt of tailings will be produced during life of mine. Of this amount, about 9.7 Mt or 80% of the tailings will be deposited in the TSF with the remaining 2.4 Mt or 20% being used for the underground backfill.

Filtered tailings will be managed using a two-cell placement system and incorporating a progressive closure of waste rock cover as placement advances. The TSF cover has the objectives of controlling erosion and dust generation, in addition to enhancing the freeze-back capabilities of the facility. As presented in the Waste Management Plan (AEM,

2019), waste rock cover material over the slope of the facility will be placed progressively on the TSF slopes as the filtered tailings is brought up, mainly for stability and dust control.

For closure, it has been assumed that TSF slopes will be entirely covered during operation, leaving only the top surface of the cells to be covered. It is planned to cover the top surface of the TSF with 0.5 m of overburden overlaid with 2.5 m thick waste rock. It is assumed that the required overburden material source will be the planned temporary overburden stockpile and the waste rock will come from the WRSF1.

Based on the detailed Deposition Plan of the Tailings Storage Facility (AEM, 2019a), the top surface of the TSF (2 cells) will have a final area of 15.4 ha, resulting in the placement of 77,000 m^3 of overburden and 385,000 m^3 of waste rock to complete the TSF reclamation.

Finally, it was assumed that five (5) additional permanent instruments will be supplied and installed in the TSF for post-closure monitoring. Supply and installation of a single instrument has been considered to be 10,000 $, based on Meadowbank instrumentation installation.

3.3.4 Waste Rock and Overburden Storage Facilities

Waste rock from the open pits and underground mining that will not be used for site development purposes will be transported to the waste rock storage facilities (WRSFs) until the end of mining. Three (3) WRSFs are planned for the Project: WRSF1, WRSF2 and WRSF3. Overburden material stripped as part of the mine development will either be co-disposed within the WRSFs or be stored within the temporary overburden stockpile facility for later use as TSF closure cover material. Non-potentially acid generating (NPAG) and non-metal leaching (NML) material will be used for TSF cover.

The cost estimate assumes that part of WRSF 1 will be used as potential borrow material for the TSF reclamation and for the construction of the perimeter berms around the open pits. WRSF 1 will hence require to be regraded and contoured to ensure long term stability.

Permanent instrument supply and installation was also considered in the estimate for the three (3) WRSFs.

Gradation and contouring of WRSF 1

> Grading of waste rock assuming a quantity equal to 1.0 m over the entire area of the last bench of WRSF 1 (ha assuming 50% of WRSF1 footprint, i.e. 41.4 ha

Instrumentation

> Three (3) additional permanent instruments will be supplied and installed in each WRSF: 3 x 10,000 $ = 30 000 $ for WRSF 1, WRSF 2 and WRSF 3, respectively.

3.3.5 Buildings and Equipments

The footprints of buildings and infrastructures for Meliadine and Itivia Harbor were reviewed and adjusted. All the changes are presented in Table 3-2. The changes were communicated by AEM on October 24, 2019 (email from Mark Long, October 24, 2019).

The area of each buildings has been scaled by the ratio of the total height over an average of 3 m height. Scaled footprints are also presented on Table 3-2.

Table 3-2: Buildings List and Dimensions

Buildings / Infrastructures	Footprint (m²)	Height (m)	Stories (3 m high)	Total Demolition Scaled for Height (m²)	Concrete Foundation (m²)
Accomodation Complex	10,610	4.5	1.5	15,915	
Multi Services Building (Mine Surface General)	3,995	16.1	5.4	21,454	3,995
Core Shack	1,750	9.8	3.3	5,705	1,750
Main Building Process Plant	12,420	35.8	11.9	148,212	12,420
Crusher and Conveyor	1,524	-	-	1,524	698
Sewage Water Treatment Plant	171	5.5	1.8	311	
Effluent Water Treatment Plant	392	9.0	3.0	1,182	392
Saline Water Treatment Plant	1,897	15.5	5.2	967	1,897
Potable Water Treatment Plant	59	2.7	0.9	54	
Emulsion Plant and Garage	439	5.8	1.9	851	189
Fuel Tanks on-site	807	14.0	4.7	3,768	
Power Plant	1,976	14.3	4.8	9,392	2,566
Paste Plant	660	16.5	5.5	3,630	660
Guard House	37	3.0	1.0	37	
Incinerator Building	190	8.4	2.8	533	190
Maintenance Shop	3,279	5.8	1.9	6,285	
Exploration Camp	4,257	3.0	1.0	4,257	
Raises Building	770	8.4	2.8	2,156	239
Communication Tower	12	61.0	20.3	247	6
Batch Plant	1,105	8.2	2.7	3,013	
Tire Shop	70	5.8	1.9	134	70
Fuel Tanks (Itivia)	4,242	3.0	1.0	4,242	4,242
Saline Water Tank (Itivia)	23	3.0	1.0	23	

Source: AEM communication

Removal of buildings and scarification of foundations

- Building footprints are listed in Table 3-2 with demolition areas scaled for heights assuming 3 m stories. The low unit cost was selected since it was assumed that all demolition waste from buildings demolition will be disposed in the on-site landfill. High unit cost was selected for the main building of the process plant because of the more complex demolition expected due to the height, size and components of the building;
- Lump sum of 80,000 $ for removal of pumping systems in treatment facilities;
- Removal of concrete structures and foundations at 1 m below the final ground surface based on building concrete foundations listed on Table 3-2.;
- Grading and contouring of building pads, using the building footprint with an additional 10 % contingency to consider for larger pads. A unit cost of 8.47 $ per m³ was selected based on Agnico Eagle cost in similar projects (AEM, 2015b and 2016).

Reclaim roads and laydown areas at Meliadine site

- Based on the General Arrangement Plan (Autocad drawing Surface_Master_updated 2019-09-08.dwg), about 15 km of on-site roads (access and haul roads) will require to be scarified. Assuming that the average width of on-site road is 12 m, an area of 18 ha will be scarified;
- A total of 16 culverts were installed on Meliadine site (AEM, 2019g). A unit cost of 4,000 $ was considered for the removal of a culvert, based on the ICRP 2018 of Meadowbank site (SNC-Lavalin, 2018);
- Laydown areas for containers (sea cans) disposal was measured from the General Arrangement Plan (Autocad drawing Surface_Master_updated 2019-09-08.dwg). A total area of 51,562 m^3 will require to be graded and contoured at a unit cost of 8.47 $ per m^3. This unit cost was selected based on past Agnico Eagle experience (AEM 2015b and 2016).

Ore pad reclamation

- A total area of 10.3 ha will require to be graded and contoured at a unit cost of 8.47 $ per m^3 for the ore pad reclamation. This unit cost was selected based on past Agnico Eagle experience (AEM 2015b and 2016).

Landfill reclamation

- Based on the preliminary closure and reclamation plan (AEM, 2015a) and the Landfill and Waste Management Plan (AEM, 2019c), the landfill is expected to be covered with a 3.7 m thick waste rock layer. Assuming a surface of 7,750 m^2 that will require to be covered (Tetra Tech, 2017j), 28,675 m^3 of waste rock will have to be placed for landfill reclamation.

Reclaim Quarries

- Quarry slopes setback to 1H:1V slope, assuming cut/fill with blasted rock from the upper slope used to form lower slope;
- The 2018 ICRP of Meadowbank (SNC-Lavalin, 2018) estimated that a total volume of 14,319 m^3 of blasted rock would be required for the reclamation of 22 quarries. The same order of magnitude was assumed for Meliadine, with a similar number of quarries to be reclaimed, i.e. 18 quarries (15 quarries along the AWAR and 3 quarries on site) (AEM, 2018b).

AWAR

- The AWAR road surface will have to become impassable for vehicles (i.e. cars and trucks) by ripping (scarification) of its 23.8 km long road bed (AEM, 2015a). Assuming a 6.5 m width, an area of 15.5 ha will be scarified;
- Lump sum of 4,000 $ per culvert removal and 25,000 $ per bridge removal (unit cost based on ICRP 2018 of Meadowbank (SNC-Lavalin, 2018) is accounted for in the calculation. A total of eight (8) culverts and two (2) bridges (AEM, 2015a) are considered for the AWAR;

Itivia Harbor and Bypass Road

- Footprints of the buildings located at Itivia Harbor are listed in Table 3-2. It was assumed that all buildings of Itivia Harbor are one-story buildings. Low unit cost was selected since it is assumed that all demolition waste from Itivia's buildings demolition will be disposed off-site;
- Removal and/or burial of concrete structures and foundations to 1 m below the final ground surface based on building concrete foundations listed on Table 3-2. It was assumed that the fuel tanks will have a concrete foundation to be removed;
- Grading and contouring of building pads using an additional 10 % contingency over the footprint area to consider larger pads. A unit cost of 8.47 $ per m^3 was selected based on past Agnico Eagle experience (AEM, 2015b and 2016);
- Laydown areas for containers (sea cans) disposal was measured from the General Arrangement Plan (Autocad drawing Surface_Master_updated 2019-09-08.dwg). A total area of 66,800 m^3 will require to be

graded and contoured at a unit cost of 8.47 $ per m³. This unit cost was selected based on past Agnico Eagle experience (AEM, 2015b and 2016);
- The Bypass road was built around the south of the airstrip to Itivia Harbor. Its design and width are similar to the AWAR (AEM, 2015a): 6.2 km long x 6.5 m wide, for a total area of 4.0 ha that will require to be scarified;
- Lump sum of 4,000 $ per culvert removal (SNC-Lavalin, 2018) is assumed. A total of 19 culverts (AEM, 2015a) are considered for the Bypass road;
- Lump sum of 50,000 $ is assumed for the reclamation of the floating dock, including the demobilization of the portable crane located at Itivia Harbor.

Decontamination of surface mobile equipment

A total of 189 surface mobile equipment is considered (based on equipment list provided by Agnico Eagle and shown in **Appendix A**), with an additional 15 % contingency to consider for additional surface equipment not yet on site. Eight (8) hours per equipment are considered for decontamination (1,739 hours total). As presented in section 3.3.2, decontamination of underground equipment is included in the underground group of components. Due to the limited capacity of the landfill, it was assumed that all decontaminated surface mobile equipment will be transported to Itivia Harbor and shipped off-site (Transportation cost of equipment is available in Mobilization / Demobilization section).

3.3.6 Chemicals and Soil Management

Chemicals and soil management were reviewed in accordance with the information available in the Landfarm Management Plan (AEM, 2019b), the Hazardous Materials Management Plan (AEM, 2018a) and the Meliadine Annual Report 2018 (AEM, 2019e).

Building Decontamination

- Building decontamination was considered for the maintenance shop, the power plant, the fuel storage and the emulsion plant. A total cost of 32,737 $ was estimated for decontamination including 38 man-days.

Hazardous Material

- The waste oil quantity remaining at the end of operation is estimated at 40,000 liters, corresponding to 5 % of the maximal storage capacity of 800,000 liters;
- Fuel dregs assumed to be 0.5% (235 919 liters) of bulk fuel storage capacity (47,182,200 million liters on site and at Itivia Harbor), for a total of 101,441 $;
- One (1) year accumulation of oil and glycol contaminated waste water is considered, for a total of 60,000 liters (Meliadine Annual Report 2018, AEM, 2019e);
- A lump sum of 3,000 $ is considered for battery disposal, based on Meadowbank ICRP 2018 (SNC-Lavalin, 2018);
- Mill and water treatment reagents at closure assumed to be 5 % of annual consumption (5 % of 6,798 tons) (AEM, 2018a). The total amount for this item is 849,718 $;
- A total of 10,000 kg of assay lab and environmental reagents are assumed (AEM, 2018a), for $25,000;
- A total of 60,000 kg of glycol is considered based on the reported quantity on site (AEM, 2018a);
- Machine shop paints and solvents to be disposed of at closure assumed to be 7,500 litres, for a total of 11,250 $.

Contaminated soil

- A contingency of 5,000 m³ of hydrocarbon contaminated soil requiring on-site remediation at closure is considered, based on total capacity of the landfarm (AEM, 2019b);

- The total of contaminated soil to excavate, load and haul to the landfarm at closure is estimated at 700 m³ (AEM, 2019b);
- A volume of contaminated soil representing 5% (250 m³) of the total volume of contaminated soil is considered for heavily contaminated soil not treatable on site and to be managed as hazmat material;
- Lump sums of 25,000 $ and 100,000 $ was considered for Phase 1 and Phase 2 of contaminated soils investigation, respectively.

Soil Characterization

- An allowance of 7,500 $ and 50,000 $ has been provided for Phase 1 and 2 characterization campaigns investigating the presence of contaminated soil on site. Hazmat removal audit is included under this audit.

3.3.7 Water Management

According to the Water Management Plan (AEM, 2019g), the water management systems include the following component:

- Five (5) water containment ponds and their associated dikes or thermal berms;
- Three (3) surface saline ponds to support Agnico Eagle's strategies to store, treat and discharge saline water to sea;
- Three (3) diversion berms;
- Eight (8) diversion channels;
- Reverse osmosis (RO) treatment plant (considered in Buildings and equipment section);
- Effluent water treatment plant (EWTP) (considered in Buildings and equipment section);
- Saline water treatment plant (SWTP) (considered in Buildings and equipment section);
- Sewage treatment plant (STP) (considered in Buildings and equipment section);
- Potable water treatment plant (WTP) (considered in Buildings and equipment section);
- Network of surface pumps and pipelines;
- Freshwater intake causeway;
- Effluent diffuser in Meliadine Lake and a saline water diffuser at Melvin Bay.

The containment ponds, dikes and berms will remain in place to collect the surface runoff water and seepage from the Mine until the water quality meets discharge criteria. Once the water quality meets discharge criteria, dikes and berms will be breached to allow runoff to follow natural flow paths. Dike and berm breaching will involve the removal of a portion of the dikes to a minimum depth of 1 m below average water level or back to original ground levels.

Once monitoring results have indicated that contact water conveyed in channels and sumps meets acceptable water quality, the infrastructure will be graded, and surface treated according to site specific conditions to minimize wind-blown dust and erosion from surface runoff, if required.

The annual cost for operation of the water treatment plant is also calculated. However, the annual cost, considered for a period of 3 years, is included in the "Interim Care and Maintenance" portion of the cost estimate, and presented in Section 3.3.8.

Dike Breach and Berm Reclamation in Containment Ponds

There are three (3) containment dikes, D-CP1, D-CP5 and D-CP6, that will require to be breached 1 m below the average water level. It was assumed that each breach will have a 20 m width. Dimensions and expected average water levels of each dike are based on corresponding As-Built reports, except for D-CP6 that was assumed to be similar to D-CP1 in terms of design (no available documentation for D-CP6):

- D-CP1 (Tetra Tech, 2017h) – Crest elevation of 67 m and average water elevation at 66.2 m, therefore the breach must be 1.8 m deep x 20 m wide breach x 19,6 m wide dike at crest = 705.6 m³ excavation;

- D-CP5 (Tetra Tech, 2017i) - Crest elevation of 66.8 m and maximum operating water elevation before and after each spring freshet at 64.8 m, therefore the breach must be 3.0 m deep x 20 m wide breach x 16,6 m wide dike at crest = 996 m³ excavation;
- D-CP6 design is assumed identical to D-CP1, therefore a 705.6 m³ excavation will be required to breach D-CP6.
- Berm-CP3 (Tetra Tech, 2017e) - Berm length of 330 m x area of 94 m² for a typical cross-section = volume of 31,020 m³ to be removed entirely;
- Berm-CP4 (Tetra Tech, 2017e) - Berm length of 260 m x area of 376 m² for a typical cross-section = volume of 97,760 m³ to be removed entirely.

Saline Ponds

Saline Ponds reclamation consists of berm excavation and complete removal of two (2) of the three (3) ponds (SP1 and SP3). Saline Pond SP2 is in the footprint of Tiriganiaq Pit 2. It was thus assumed that it will disappear during Pit 2 exploitation and will not require to be reclaimed during closure.

- SP1 berm (Tetra Tech, 2017a) – Berm length of 195 m x area of 12 m² for a typical cross-section = volume of 2,340 m³ to be excavated;
- SP3 berm (AEM, 2019d) - Berm length of 246 m x area of 15 m² for a typical cross-section = volume of 3,690 m³ to be excavated.

Reclamation of Diversion Channels and Berms

- Diversion Berm 1 (Tetra Tech, 2017b) - Berm length of 485 m x area of 11 m² for a typical cross-section = volume of 5,335 m³ to be removed entirely;
- Diversion Berm 2 – Based on Water Management Plan (AEM, 2019g), diversion berm 2 will remain in place to prevent non-contact water from flowing into the TSF;
- Diversion Berm 3 (Tetra Tech, 2017k) – Based on the As-Built report, the volume of Diversion Berm 3 is 7,682 m³;
- Channel 1 (Tetra Tech, 2017c) – Based on As-Built report, Channel 1 will require 5,625 m³ for backfill and contour;
- Channel 2 (Tetra Tech, 2017f) - Based on As-Built report, Channel 2 will require 545 m³ for backfill and contour;
- Channel 3 (Tetra Tech, 2017e) - Channel length of 640 m with typical cross section area of 3.5 m² between stations 0+000 to 0+195 and of 9 m² between stations 0+195 to 0+640. A volume of 4,688 m³ is expected to be required for backfill and contouring (based on design report);
- Channel 4 (Tetra Tech, 2017e) - Channel length of 923 m with typical cross section area of 12 m² between stations 0+000 to 0+135 and of 14 m² between stations 0+135 to 0+923. A volume of 12,652 m³ is expected to be required for backfill and contouring (based on design report);
- Channel 5 (Tetra Tech, 2017d) - Based on As-Built report, Channel 5 will require 1,178 m³ for backfill and contour;
- Channel 6 – Assumed to be about 150 m long, 1.5 m deep with 2.5H:1V slope (no available documentation since its construction is tentative based on future water management strategies downstream of WRSF2). It would require 1,350 m³ to backfill and contour;
- Channel 7 (Tetra Tech, 2017g) – Based on design report, a volume of 652 m³ is expected to be required to backfill and contour Channel 7;
- Channel 8 (Tetra Tech, 2017g) - Based on design report, a volume of 91 m³ is expected to be required to backfill and contour Channel 8;

Containment Pond Pumps Decommissioning

- Pumps decommissioning for containment ponds. A lump sum of $80,000 per pump was considered based on SNC-Lavalin's experience for decommissioning of similar infrastructures (SNC);
- Pipeline network of about 18.5 km length based on the General Arrangement Plan (Autocad drawing Surface_Master_updated 2019-09-08.dwg) and assumed to be removed and disposed on-site in landfill.

Water Diffuser Reclamation at Meliadine Lake and at Itivia Harbor

- Effluent diffuser reclamation at Meliadine Lake at 3,000 $, based on Meadowbank ICRP 2019 (SNC-Lavalin, 2018). Additionally, the removal of 390 m long pipe is also included for 8,580 $;
- Saline water effluent diffuser at Itivia Harbor at 3,000 $, based on Meadowbank ICRP 2019 (SNC-Lavalin, 2018). Based on the Groundwater Management Plan (AEM, 2019f), the removal of a 778 m long pipe is also included for an additional 17,116 $;
- Removal of the pump associated with the freshwater intake for 3,000 $, based on Meadowbank ICRP 2019 (SNC-Lavalin, 2018).

Temporary Water Treatment Plant Operation

- Temporary water treatment plant operation cost is estimated at 561,460$ annually, over a period of three (3) years, based on the following considerations: Operation of the temporary water treatment plant considered for treatment of reclaim water during 6 months per year (treatment required of 742,075 m^3 per year, corresponding to CP1 maximum volume in normal condition). A unit cost of 0.75 $ per m^3 is used (AEM, 2015b), considering the pumping cost and the required reagents for water treatment. This unit cost will have to be reviewed based on upcoming water quality forecast and expected treatment technology;
- For operation, one (1) skilled labor is considered for 12 hours/day during a period of six (6) months per year;
- Annual plant servicing provided by two (2) manufacturer consultants for a seven (7) days site visit each year (168 hours total) over three (3) years, with associated travel allowance costs.

3.3.8 Interim Care and Maintenance

Based on experience at abandoned sites in the Northwest Territories, it is assumed that a minimum period of time of 2 to 3 years is required to transfer ownership of the site to the Government of Northwest Territories, finalize a Closure and Reclamation Plan, retain a water licence for closure, mobilize equipment to the site and conduct procurement activities to retain reclamation contractors (GNT, 2017). The Interim Care and Maintenance cost estimation is therefore based on a 3-year period and includes the annual surveillance and annual water treatment. Monitoring and surveillance costs (active closure) are presented in the Post Closure Monitoring and Maintenance section 3.4.2.

- The annual operational cost for the interim water treatment is estimated at 561,460 $ (see Temporary Water Treatment Plant Operation of section 3.3.7);
- The annual cost related to surveillance, monitoring and inspection of the active closure period represents 1,072,197 $, which corresponds to the annual monitoring and maintenance cost during the active closure period;
- The total cost for three (3) years of care and maintenance is evaluated at 4,948,971 $.

3.4 Indirect Costs

The indirect costs include the cost related to post-closure monitoring and maintenance, mobilization and demobilization, as well as some cost factors such as contingency, engineering, project management, health and safety / QA-QC / engagement costs and bonding / insurance.

Specific assumptions used for the financial security cost estimate are provided for each closure component in sections 3.4.1 to 3.4.3.

3.4.1 Mobilization / Demobilization

During the active closure, mobilization costs have been accounted for by allowing costs for mobilization and demobilization of equipment from site to Itivia Harbor (Rankin Inlet), the mobilization of workers to perform closure work, in addition to barge trips into and out of Itivia Harbor exclusively for Meliadine closure.

- Mobilization and demobilization of heavy equipment (surface and underground) is based on a distance of 30 km along the AWAR and the Bypass Road from Meliadine to Itivia Harbor (Rankin Inlet). A contingency of 15% has been added to the number of mobile equipment to be demobilized to account for the additional equipment for surface mining not yet on site. Due to the limited capacity of the landfill, it was assumed that all mobile equipment will be demobilized off-site;
- Lump sum of 1,000,000 $ for one (1) demolition shear for buildings and infrastructures demolition;
- Seasonal work for of 26 workers over three (3) years period (2028 to 2030), considering a six (6) months per year demolition / reclamation seasons, with associated accommodation and transportation costs;
- Demobilization of 3,000 seacans from Meliadine to Itivia Harbor (Rankin Inlet). It was estimated there is approximately 6,000 seacans on site and that 50 % of them will still be on site at the beginning of the active closure;
- Three (3) barge round trips are considered for seacans demobilization, demolition and hazardous material sent south (1 trip) and for equipment demobilization (2 trips), for a total cost of 3,000,000 $;

3.4.2 Post-Closure

The post-closure costs are separated in two (2) main categories, the monitoring / inspection program and the site maintenance / surveillance. The closure period will extend over a three (3) years period. The post-closure activities will extent on a 10-year period. The cost related to site monitoring / inspection and maintenance / surveillance are presented below.

The annual operation cost of the interim water treatment plan is not included in the post-closure costs as it is already accounted for in “Interim care and maintenance“ for a period of three (3) years.

Monitoring and Inspections

- One (1) annual geotechnical inspection is planned per year for 16,000 $ – including one (1) week visit by one (1) specialized engineer, seven (7) days, twelve (12) hours per day at $150/hour, plus 3,000 $ of reporting work and associated travel and accommodation fees;
- An estimated annual cost of 42,927 $ for the surface water quality monitoring (in closure and post-closure), based on Meliadine water sampling program costs, as presented in **Appendix A**;
- For active closure (2028 to 2030), an estimated annual cost of 955,000 $ for general monitoring programs (i.e. aquatic, wildlife, air quality, noise monitoring program, vegetation study), based on Meliadine monitoring program costs (communication by AEM on November 9th, 2019);
- For post-closure (2031 to 2037), an estimated annual cost of 477,500 $ for general monitoring programs, corresponding to 50 % of the active closure monitoring programs cost.

Maintenance and Surveillance

- For closure and post-closure, two (2) site caretakers provided with biweekly overnight visits, twelve (12) hours per day, 5 months of the year, along with annual allowances for a site vehicle and equipment (20,000 $), accommodation and site maintenance (7,000 $).

3.4.3 Other Indirect Costs

Other indirect costs are calculated based on a percentage of the direct costs total.:

- Project management and engineering fees are assumed at 5 % each of the direct closure costs;
- Health and safety plans / monitoring, QA & QC and engagement costs (communication with stakeholders from the community) are assumed as 2 % of the direct closure costs;
- Bonding / insurance fees are assumed as 1 % of the direct closure costs;
- Finally, due to the current level of engineering and uncertainties, a contingency of 20 % of the direct closure costs has been provided for.

4.0 Comparison with 2015 Estimates

Table 4-1 lists the key differences between this cost estimate and the cost estimate prepared in the 2015 ICRP (AEM, 2015b).

Table 4-1: Comparison between 2015 and 2019 ICRP cost estimates

Component Group	ICRP 2019 - Cost Estimate ($)	ICRP 2015 (AEM, 2015b) - Cost Estimate ($)	Differences between 2019 and 2015 estimates ($)	Main Difference Explanations between 2019 and 2015 estimates
Open pit	1,704,963 $	2,836,125 $	(1,131,162) $	
Tiriganiaq Pit 1	*1,388,171 $*	*2,781,689 $*	*(1,393,518) $*	Significant cost reduction for items related to pit flooding. - Pump installation and associated piping system, based on cost from AEM similar projects; - Annual cost for the operation of the pump to flood pits, based on cost from AEM similar projects.
Tiriganiaq Pit 2	*316,792 $*	*54,436 $*	*262,356 $*	All cost and capital related to pit flooding was distributed between Pit 1 and Pit 2 based on water volume proportion: 80 % for Pit 1 and 20 % for Pit 2.
Underground Mine	1,096,384 $	969,540 $	126,844 $	
Control Access	*612,004 $*	*602,340 $*	*9,664 $*	Backfill of Portal #1 and Portal #2 in ICRP 2019 rather than proposed cap bulkhead of ICRP 2015. Removal of TTOG of Portal #1 and concrete in Portal #2 in ICRP 2019. Unit cost for raises capping reduced in ICRP 2019, based on experience and similar northern closure and reclamation projects.
Remove Hazardous Materials	*434,380 $*	*367,200 $*	*67,180 $*	ICRP 2019 considers the removal and decontamination of stationary (6) and mobile (156) equipment used in underground mining. It has been assumed that all equipment is removed off-site (Barge).
Tailings Storage Facility	4,831,700 $	1,489,584 $	3,342,116 $	
Cover Tailings	*4,831,700 $*	*1,489,584 $*	*3,342,116 $*	ICRP 2019 considers the closure and reclamation (overburden and rockfill cover) of the entire top surface of the facility, estimated at 15.4 ha rather than about 5 ha in the ICRP 2015.

Component Group	ICRP 2019 - Cost Estimate ($)	ICRP 2015 (AEM, 2015b) - Cost Estimate ($)	Differences between 2019 and 2015 estimates ($)	Main Difference Explanations between 2019 and 2015 estimates
Rock Pile	307,350 $	- $	307,350 $	ICRP 2019 considers that the regrading of WRSF 1 will be required since it will be used as a potential borrow area for the capping of the TSF.
Buildings and Equipment	17,919,956 $	18,916,071 $	(1,000,115) $	
Meliadine	*16,412,878 $*	*18,916,071 $*	*(2,503,193) $*	Only decontamination of surface mobile equipment has been considered in this group. Demobilization is now in " Mobilization / Demobilization". Landfill reclamation cost has decreased significantly and was estimated based on As-Built Report of the Landfill, assuming that the facility will be covered with a 3.7 m thick waste rock layer. Footprint, height and concrete foundation area of all buildings and facilities have been reviewed based on information provided by AEM.
Itivia Harbor, AWAR & Bypass Road	*1,503,078 $*	*- $*	*1,503,078 $*	AWAR was not separated from Meliadine site in ICRP 2015. Bypass Road not included in ICRP 2015. Buildings from Itivia Harbour was not considered in ICRP 2015.
Chemicals and Contaminated Soil Management	1,864,355 $	1,917,862 $	(53,507) $	Reviewed based on the Hazardous Materials Management Plan and the Landfarm Management Plan.
Surface and Groundwater Management	1,446,713 $	127,050 $	1,319,663 $	List of items that was added in ICRP 2019: - Backfill and contour of diversion channels; - Removal of diversion berms 1 and 3 (assuming Berm 2 will remain in place); - Removal of the berms of Saline ponds SP1 and SP3; - Removal of Berm-CP3 and Berm-CP4; - Removal of piping on site; - Removal of pumps at CP1, CP5 and CP6; - Removal of effluent diffusers; - Removal of freshwater intake.
Interim Care and Maintenance	5,294,620 $	1,684,380 $	3,610,240 $	For a period of 3 years, cost related to environmental monitoring added to Interim Care and Maintenance cost (based on annual cost for closure period in "Maintenance, surveillance, monitoring and inspection"). Temporary Water Treatment Plant Operation for 3 years has been updated and included in Interim Care and Maintenance.
Subtotal Direct Costs	**34,462,041 $**	**27,940,612 $**	**6,521,429 $**	

Component Group	ICRP 2019 - Cost Estimate ($)	ICRP 2015 (AEM, 2015b) - Cost Estimate ($)	Differences between 2019 and 2015 estimates ($)	Main Difference Explanations between 2019 and 2015 estimates
Mobilization / Demobilization	6,942,680 $	9,687,952 $	(2,745,272) $	Three (3) barges will be required for closure: 1 for on-site seacans demobilization and demolition waste and 2 for demobilization of mobile equipment. Demobilization of all underground and surface mobile equipment is included, based on tranportation distance from Meliadine site to Itivia Harbour.
Closure and Post-Closure Monitoring and Maintenance	6,737,523 $	879,778 $	5,857,745 $	Unit costs for Monitoring and Inspections was updated based on AEM sampling cost list and monitoring program costs. ICRP 2019 considers costs related to Maintenance and Surveillance: Site care-taker, Site vehicule and equipment, accommodation and site maintenance. Post-closure annual monitoring program cost has been added, corresponding to 50 % of the annual monitoring program cost during active closure.
Engineering (5%)	1,723,102 $	1,397,031 $	326,071 $	Adjusted with direct costs in 2019.
Project Management (5%)	1,723,102 $	1,397,031 $	326,071 $	Adjusted with direct costs in 2019.
Health and Safety Plans / Monitoring and QA/QC and Engagement Costs (2%)	689,241 $	279,406 $	409,835 $	Adjusted with direct costs in 2019. 1% added for engagement, based on similar AEM projects.
Bonding / Insurance (1%)	344,620 $	279,406 $	65,214 $	Adjusted with direct costs in 2019.
Contingency (20%)	6,892,408 $	5,588,122 $	1,304,286 $	Adjusted with direct costs in 2019.
Market Price Factor Adjustment (0%)	- $	- $	- $	No change.
Subtotal Indirect Costs	**25,052,677 $**	**19,508,726 $**	**5,543,951 $**	
GRAND TOTAL	**59,514,718 $**	**47,449,338 $**	**12,065,380 $**	

5.0 References

Agnico Eagle Mines Limited (2015a). Preliminary Closure and Reclamation Plan, Version 1.0, 6513-CRP-01, April 2015.

Agnico Eagle Mines Limited (2015b). RECLAIM Model, Meliadine Gold Project 2015, excel file 150513 2AM-MEL----AEM Reclaim 7.0_Meliadine_sept 15-Rev2-IMLE.xlsm.

Agnico Eagle Mines Limited (2016). Whale Tail Pit Interim Closure and Reclamation Plan, Version WT, Report No. 1541520, June 2016.

Agnico Eagle Mines Limited (2018a). Meliadine Gold Project, Hazardous Materials Management Plan, Version 5, 6513-MPS-12, March 2018.

Agnico Eagle Mines Limited (2018b). Meliadine Gold Project, Borrow Pits and Quarries Management Plan, Version 6, 6513-MPS-04, March 2018.

Agnico Eagle Mines Limited (2019a). Tailings Storage Facility (TSF) Detailed Deposition Plan, 6515-583-163-REP-002, January 2019.

Agnico Eagle Mines Limited (2019b). Meliadine Gold Project, Landfarm Management Plan, Version 3, 6513-MPS-15, February 2019.

Agnico Eagle Mines Limited (2019c). Meliadine Gold Project, Landfill and Waste Management Plan, Version 7, 6513-MPS-06, March 2019.

Agnico Eagle Mines Limited (2019d). Design Report Meliadine Saline Pond #3 (SP-3), Prepared by WSP Canada Inc., 6528-680-132-REP-002, March 2019.

Agnico Eagle Mines Limited (2019e). Meliadine Gold Project 2018 Annual Report, March 2019.

Agnico Eagle Mines Limited (2019f). Meliadine Gold Project, Groundwater Management Plan, Version 4, March 2019.

Agnico Eagle Mines Limited (2019g). Meliadine Gold Project, Water Management Plan, Version 7, 6513-MPS-11, August 2019.

Government of Northwest Territories (2017). RECLAIM 7.0, User Manual, Revised November 2017.

Nunavut Water Board (2016). Water Licence No: 2AM-MEL1631, issued on April 1st, 2016.

SNC-Lavalin (2018). Meadowbank ICRP 2018 – Financial Security Cost Estimate Assumptions (Internal Memo), 654769-5000-4EER-0002_00, December 2018.

Tetra Tech (2017a). Construction Summary (As-Built) Report for Saline Water Storage/Transfer Pond and Berm, Meliadine Gold Project, Revision 0, AEM number 6515-E-132-007-132-REP-006, February 2017.

Tetra Tech (2017b). Design Report for Channel 1, Berm 1 and Culvert 2, Meliadine Project, Nunavut, Tetra Tech number 28920, AEM number 6515-C-235-007-230-REP-001, February 2017.

Tetra Tech (2017c). Construction Summary (As-Built) Report for Channel 1 and Culvert 13, 1, 2, 15, 16, Tetra Tech number 28920, AEM number 6515-E-132-007-132-REP-018, February 2017.

Tetra Tech (2017d). Construction Summary (As-Built) Report for Channel 5, Meliadine Gold Project, Revision A, AEM number 6515-E-132-007-132-REP-008, February 2017.

Tetra Tech (2017e). Design Report for CP3, CP4, CP Berms, Berm 2, Channel 3, and Channel 4, Meliadine Project, Nunavut, AEM number 6515-E-132-007-132-REP-017. June 2017.

Tetra Tech (2017f). Construction Summary (As-Built) Report for Channel 2, Meliadine Project, Nunavut, Tetra Tech number 28920, AEM number 6515-C-230-005-230-REP-003, July 2017.

Tetra Tech (2017g). Design Report for Channel 7 and Channel 8, Meliadine Project, Nunavut, Tetra Tech number 28920, AEM number 6515-C-235-007-230-REP-002, September 2017.

Tetra Tech (2017h). Construction Summary (As-Built) Report for Dike D-CP1, Meliadine Gold Project, Nunavut, Revision 0, AEM number 6515-E-132-004-132-REP-012, October 2017.

Tetra Tech (2017i). Construction Summary (As-Built) Report for Dike D-CP5, Meliadine Gold Project, Nunavut, Revision 0, AEM number 6515-E-132-007-132-REP-013, October 2017.

Tetra Tech (2017j). Construction Summary (As-Built) Report for Operational Landfill (Stage 1), Meliadine Project, Nunavut, Tetra Tech number 28920, AEM number 6515-E-132-007-132-REP-014, December 2017.

Tetra Tech (2017k). Construction Summary (As-Built) Report for Berm 3, Meliadine Project, Nunavut, Tetra Tech number 28920, AEM number 6515-E-132-007-132-REP-015, December 2017.

Appendix A

Table A-1 : List of Mobile Equipment

Unit Number	Description	Equipment Group
65ATV01	HONDA ATV #01	Surface
65ATV02	HONDA ATV #02	Surface
65ATV03	HONDA ATV #03	Surface
65ATV04	HONDA ATV #04	Surface
65ATV05	HONDA ATV #05	Surface
65ATV06	HONDA ATV #06	Surface
65ATV07	CANAM ATV #07	Surface
65ATV08	HONDA ATV 420 4X4	Surface
65ATV09	CAN AM ATV	Surface
65ATV10	ENVIRONMENT ATV KUBOTA	Surface
65ATV11	ENVIRONMENT 4X4 ATV	Surface
65ATV12	TUNDRA BUGGY BV26	Surface
65BAC01	BACKOE CATERPILLAR 420E IT	Surface
65BAC02	BACKOE KUBOTA BX25	Surface
65BAC03	MINI EXCAVATOR 303.5 CAT	Underground
65BAC04	MINI EXCAVATOR 430 CAT	Surface
65BAC05	BACKOE CATERPILLAR 330F	Surface
65BOL03	MEM-946 SCISSOR BOLTER	Underground
65BOL04	MEM-946 SCISSOR BOLTER	Underground
65BOL06	BOLTER MACLEAN MEM-975	Underground
65BOL07	BOLTER MACLEAN MEM-975	Underground
65BOL08	BOLTER MACLEAN MEM-975	Underground
65BOL09	BOLTER MACLEAN MEM-975	Underground
65BOL10	BOLTER MACLEAN MEM-975	Underground
65BOL11	BOLTER MACLEAN MEM-975	Underground
65BOL12	BOLTER MACLEAN MEM-975	Underground
65BOL13	BOLTER MACLEAN MEM-975	Underground
65BUS01	BUS E450 SD FORD	Surface
65BUS02	BLUE BIRD BUS VISION SL	Surface
65BUS04	BLUE BIRD BUS VISION SL	Surface
65BUS05	BUS EXPRESS 4500 CHEVY	Surface
65CLD01	CONTAINER HANDLER HYSTER RS46	Surface
65CLD02	CONTAINER HANDLER HYSTER RS46	Surface
65COM01	KAESER M50 COMPRESSOR	Underground
65COM02	ATLAS COPCO XATS 400	Underground
65COM03	ATLAS COPCO XATS 375 JD6	Underground
65COM04	ATLAS COPCO XATS 375	Underground

Unit Number	Description	Equipment Group
65COM05	PORTABLE ELECTRIC COMPRESSOR	Underground
65COM06	PORTABLE ELECTRIC COMPRESSOR	Underground
65COM07	DOOSAN DIESEL COMPRESSOR	Underground
65COM08	DIESEL COMPRESSOR 1600 CFM	Underground
65COM09	MOBILE COMPRESSOR 915 CFM	Underground
65COM10	MOBILE COMPRESSOR 915 CFM	Underground
65COM11	MOBILE COMPRESSOR 425 CFM	Underground
65CPT01	CATERPILLAR CS56B COMPACTOR	Surface
65CPT02	COMPACTOR CS56B	Surface
65DOZ01	DOZER D6K LGP CATERPILLAR	Surface
65DOZ02	DOZER D6K LGP CATERPILLAR	Surface
65DRL02	CABLE DRILL DS422I	Underground
65DRL03	ITH DRILL DU411	Underground
65DRL04	TOP HAMMER DRILL	Underground
65DRL05	TOP HAMMER DRILL	Underground
65DRL06	RAISE BORER RHINO 100	Underground
65DRL07	BLOCK HOLER DRILL BH3	Underground
65DRL08	CABLE DRILL DS422I	Underground
65DRL09	TOP HAMMER DRILL	Underground
65DRL10	ITH DRILL	Underground
65DRL11	TOP HAMMER DRILL	Underground
65EQH01	PIPE HANDLER	Underground
65EQH02	PIPE HANDLER	Underground
65EQH03	FUEL-LUBE CASSETTE MEM-CS3	Underground
65EQH04	BOOM TRUCK CASSETTE MEM-CS3	Underground
65EQH05	PIPE HANDLER DA201	Underground
65EQM01	V30 HEAD	Underground
65EQM02	HIGH PRESSURE SUPPRESSOR	Underground
65EQM03	MENCARRIER CASSETTE CS3	Underground
65EQM04	MENCARRIER CASSETTE CS3	Underground
65EQM05	FUEL CASSETTE CS3	Underground
65EQM06	PROD. EMULSION CASSETTE CS3	Underground
65EQM07	PROD. EMULSION CASSETTE CS3	Underground
65EQM09	MENCARRIER CASSETTE CS3	Underground
65EQM10	MENCARRIER CASSETTE CS3	Underground
65FKL01	FORKLIFT MANITOU 625	Surface
65FKL02	FORKLIFT MANITOU 625	Surface
65FKL03	FORKLIFT YALE	Surface
65FKL04	YALE ELECTRIC FORKLIFT	Surface
65FKL05	ELECTRIC WALKIE PALLET	Surface

Unit Number	Description	Equipment Group
65FKL07	FORKLIFT HELI CPCD30	Surface
65FKL08	CAT 2ET4000 FORK LIFT	Surface
65FKL09	CAT FORKLIFT DP25N5	Surface
65FKL10	CAT FORKLIFT EP4000	Surface
65GRA01	GRADER 12M2 CAT	Underground
65GRA02	CATERPILLAR GRADER 140M	Surface
65GRA03	GRADER UG20M CAT	Underground
65HEA03	FROST FIGHTER IDF500	Surface
65HEA04	FROST FIGHTER IDF500	Surface
65HEA05	FROST FIGHTER NPV400	Surface
65HEA06	FROST FIGHTER IDF500	Surface
65HEA07	FROST FIGHTER IDF500	Surface
65HEA08	FROST FIGHTER IDF500	Surface
65HEA09	FROST FIGHTER IDF500	Surface
65HEA10	FROST FIGHTER IDF500	Surface
65HEA11	FROST FIGHTER IDF500	Surface
65HEA12	FROST FIGHTER IDF500	Surface
65HEA13	FROST FIGHTER IDF500	Surface
65HEA14	FROST FIGHTER IDF500	Surface
65HEA15	FROST FIGHTER IDF500	Surface
65HEA16	FROST FIGHTER IDF500	Surface
65HEA17	FROST FIGHTER IDF500	Surface
65HEA18	FROST FIGHTER IDF500	Surface
65HEA19	ALLMAND HEATER TRAILER (CONST)	Surface
65HEA20	ALLMAND HEATER TRAILER (CONST)	Surface
65HEA21	ALLMAND HEATER TRAILER (CONST)	Surface
65HEA22	ALLMAND HEATER TRAILER	Surface
65HEA23	ICE FIGHTER HEATER	Surface
65HEA24	ALLMAND HEATER TRAILER	Surface
65HTR04	AD30 MF CAT U/G TRUCK	Underground
65HTR06	U/G TRUCK CAT AD30	Underground
65HTR08	U/G TRUCK CAT AD30	Underground
65HTR09	U/G TRUCK CAT AD30	Underground
65HTR10	TRUCK VOLVO A40G	Surface
65HTR11	TRUCK VOLVO A40G	Surface
65HTR12	U/G 50 TONS TRUCK	Underground
65HTR13	U/G 50 TONS TRUCK	Underground

Unit Number	Description	Equipment Group
65HTR14	U/G 50 TONS TRUCK	Underground
65HTR15	U/G 50 TONS TRUCK	Underground
65HTR16	U/G 50 TONS TRUCK	Underground
65HTR17	U/G 50 TONS TRUCK	Underground
65HTR18	A40G HAUL TRAUCKS	Surface
65HTR19	A40G HAUL TRAUCKS	Surface
65HTR20	A40G HAUL TRAUCKS	Surface
65HTR21	U/G 50 TONS TRUCK	Underground
65HTR22	U/G 50 TONS TRUCK	Underground
65HTR23	U/G 50 TONS TRUCK	Underground
65HTR24	U/G 50 TONS TRUCK	Underground
65HTR25	U/G 50 TONS TRUCK	Underground
65JUM03	LONGTOM	Underground
65JUM05	JUMBO DRILL DD421	Underground
65JUM06	JUMBO DRILL DD4221-60C	Underground
65JUM07	JUMBO DRILL DD4221-60C	Underground
65JUM08	JUMBO DRILL DD422I	Underground
65LGT01	TOWER LIGHT	Surface
65LGT02	TOWER LIGHT	Surface
65LGT03	TOWER LIGHT	Surface
65LGT04	TOWER LIGHT	Surface
65LGT05	TOWER LIGHT	Surface
65LGT06	TOWER LIGHT	Surface
65LGT07	TOWER LIGHT	Surface
65LGT08	TOWER LIGHT	Surface
65LGT09	TOWER LIGHT	Surface
65LGT10	TOWER LIGHT	Surface
65LHM01	PLH LONG HOLE	Underground
65LOA01	LOADER CATERPILLAR IT 62H	Surface
65LOA02	LOADER WA500 KOMATSU	Surface
65LOA03	LOADER WA500 KOMATSU	Surface
65LOA04	DYNO - CAT 962H LOADER	Surface
65LOA05	WHEEL LOADER CAT 908M	Underground
65LOA06	WHEEL LOADER 980M CAT	Surface
65LOA07	WHEEL LOADER 914M CAT	Surface
65LOA08	WHEEL LOADER 988K CAT	Surface
65LOA09	WHEEL LOADER 988K CAT	Surface
65LOA10	WHEEL LOADER 988K CAT	Surface
65LOA11	WHEEL LOADER 988K CAT	Surface
65LOA12	WHEEL LOADER 914M CAT	Underground

Unit Number	Description	Equipment Group
65LOA13	FOUNTAIN TIRE LOADER	Surface
65LOM01	DYNO - CAT 297D SKID STEER	Surface
65LOM02	BOBCAT S770	Underground
65LOM03	BOBCAT S650	Surface
65MCR01	CRANE FREIGHTLINER	Surface
65MCR02	BRODERSON MOBILE CRANE 18T	Surface
65MCR03	BRODERSON MOBILE CRANE	Surface
65MCR04	MOBILE CRANE MANITOWOC 220T	Surface
65MCR05	MOBILE CRANE GROVE 130T	Surface
65PCK01	PICK UP SUBERBAN	Surface
65PCK02	PICK UP F550 (MECHANIC)	Surface
65PCK03	PICK UP F250 (IT)	Surface
65PCK04	PICK UP F250 (GEOLOGY)	Surface
65PCK05	PICK UP F350 (MINE)	Surface
65PCK06	PICK UP F250 (SITE SERVICES)	Surface
65PCK07	PICK UP CUTAWAY (AMBULANCE)	Surface
65PCK11	PICK UP F250 (MECHANIC)	Surface
65PCK12	PICK UP F250 (ELECTRICIAN)	Surface
65PCK13	PICK UP F250 (CARPENTER)	Surface
65PCK14	PICK UP F250 (CONSTRUCTION)	Surface
65PCK15	PICK UP F250 2011 (LOG/ROAD)	Surface
65PCK16	PICK UP F250 (CONSTRUCTION)	Surface
65PCK17	PICK UP F250 (CONSTRUCTION)	Surface
65PCK18	DYNO - FORD F250 PICKUP	Surface
65PCK19	PICK UP F250 (WAREHOUSE GF)	Surface
65PCK20	PICK UP F250 (CONSTRUCTION)	Surface
65PCK21	PICK UP F250 (MOBILE GF)	Surface
65PCK22	PICK UP F250 (WAREHOUSE)	Surface
65PCK23	PICK UP F250 (MANAGEMENT)	Surface
65PCK24	PICK UP F250 (LONNY/GUILLAUME)	Surface
65PCK25	PICKUP F-250 (OPERATION)	Surface
65PCK26	PICKUP F-250 (MOBILE SUPER)	Surface
65PCK27	PICKUP FORD F250 (JACK DUTIL)	Surface
65PCK28	PICKUP FORD F250 (JACK DUTIL)	Surface
65PCK29	PICKUP FORD F250 (JACK DUTIL)	Surface
65PCK30	PICKUP FORD F250 (JACK DUTIL)	Surface
65PCK31	PICKUP F250 FORD (JACK)	Surface
65PCK32	PICKUP F250 (KITCHEN AND CAMP)	Surface
65PCK33	PICKUP F250 (ENVIRONMENT)	Surface
65PCK34	PICKUP F250 (H&S)	Surface

Unit Number	Description	Equipment Group
65PCK35	PICKUP F250 (MANAGEMENT)	Surface
65PCK36	PICKUP F250 (E&I)	Surface
65PCK37	PICKUP F250 (E&I)	Surface
65PCK38	PICKUP F250 (TRAINING)	Surface
65PCK39	PICKUP F250 (UNDERGROUND)	Surface
65PCK40	PICKUP F250 (WAREHOUSE)	Surface
65PCK41	PICKUP F350 UG MOBILE MNTCE	Underground
65PCK42	CONSTRUCTION PICK UP	Surface
65PCK43	CONSTRUCTION PICK UP	Surface
65PCK44	CONSTRUCTION PICK UP	Surface
65PCK45	TANGMAARVIK PICK UP	Surface
65PCK46	DYNO PICK UP	Surface
65PCK49	F250 PICKUP TRUCK	Surface
65PCK50	F250 PICK-UP TRUCK	Surface
65PCK51	F250 PICK-UP TRUCK	Surface
65PCO01	GROUT PUMP #1	Underground
65PCO02	GROUT PUMP #2	Underground
65PCO03	GROUT PUMP #3	Underground
65PCO04	GROUT PUMP #4	Underground
65PCO05	GROUT PUMP #5	Underground
65PCO06	GROUT PUMP #6	Surface
65POD01	DIESEL FUEL PUMP KOHLER	Surface
65POD02	DIESEL FUEL PUMP KOHLER	Surface
65POD03	DIESEL FUEL PUMP KOHLER	Surface
65PWA01	WATER PUMP	Surface
65PWA02	WATER PUMP	Surface
65PWA03	WATER PUMP	Surface
65PWA04	WATER PUMP	Surface
65PWA05	WATER PUMP	Surface
65PWA06	WATER PUMP	Surface
65PWA07	WATER PUMP	Surface
65PWA08	WATER PUMP	Surface
65RBR01	MOBILE ROCK BREAKER RB3	Underground
65SBL01	SNOWBLOWER T85	Surface
65SCI02	GENIE LIFT S60	Surface
65SCI03	SCISSOR LIFT MACLEAN	Underground
65SCI05	SL3 SCISSOR LIFT	Underground
65SCI06	SL3 SCISSOR LIFT	Underground
65SCI07	SCISSOR LIFT MACLEAN SL3	Underground
65SCI08	SCISSOR LIFT MACLEAN SL3	Underground

Unit Number	Description	Equipment Group
65SCI09	MAN LIFT GENIE Z-45/25	Surface
65SCI10	MAN LIFT GENIE Z-45/25	Surface
65SCI11	MAN LIFT GENIE Z-45/25	Surface
65SCI12	MAN LIFT GENIE SX125	Surface
65SCI13	SL3 SCISSOR LIFT	Underground
65SCI14	SCISSOR LIFT MACLEAN SL3	Underground
65SCI15	SCISSOR LIFT MACLEAN SL3	Underground
65SCI16	ELECTRICAL SCISSOR LIFT	Underground
65SCO04	SCOOP LH514	Underground
65SCO05	SCOOP LH514	Underground
65SCO06	SCOOP LH514	Underground
65SCO07	SCOOP LH514	Underground
65SCO08	SANDVIK EJC-210	Underground
65SCO09	SCOOP R1300G CAT	Underground
65SCO10	SCOOP LH517	Underground
65SCO11	SCOOP LH517	Underground
65SCO12	SCOOP LH517	Underground
65SCO13	SCOOP LH517	Underground
65SCO14	SCOOP LH517	Underground
65SCO15	SCOOP R1300G CAT	Underground
65SKD01	SKID STEER 226D CATERPILLAR	Surface
65SKD02	SKID STEER 262D CATERPILLAR	Surface
65SKD03	SKID STEER 262D CATERPILLAR	Surface
65SNO02	SNOWMOBILE PRINOTH SNOWCAT	Surface
65SNO03	BEARCAT SNOWMOBILE	Surface
65SNO04	BEARCAT SNOWMOBILE	Surface
65SNO05	BEARCAT SNOWMOBILE	Surface
65SNO06	BEARCAT SNOWMOBILE	Surface
65TOO01	KIDNEY LOOP	Surface
65TOO04	WIRELESS JACK SET	Surface
65TOO05	A/C MACHINE	Surface
65TPA01	CAT PALLET HANDLER EJE120	Underground
65TPA02	CAT PALLET HANDLER EJE120	Surface
65TRA03	KUBOTA M5-111CAB	Underground
65TRA04	KUBOTA M5-111CAB	Underground
65TRA05	TRACTOR KUBOTA M8540DT	Underground
65TRA06	TRACTOR KUBOTA M9540DT	Underground
65TRA07	TRACTOR KUBOTA M9540DT	Underground
65TRA08	TRACTOR KUBOTA M9540DT	Underground
65TRA09	KUBOTA M8540DT	Underground

Unit Number	Description	Equipment Group
65TRA10	TRACTOR M5-111CAB	Underground
65TRA11	TRACTOR M5-111CAB	Underground
65TRA12	TRACTOR M5-111CAB	Underground
65TRA13	TRACTOR M5-111CAB	Underground
65TRA14	TRACTOR M5-111CAB	Underground
65TRA15	TRACTOR M5-111HDC	Underground
65TRA16	TRACTOR KUBOTA M9960D	Underground
65TRA17	TRACTOR M5-111CAB (SUPERVISOR)	Underground
65TRA18	TRACTOR M5-111CAB (SUPERVISOR)	Underground
65TRA19	TRACTOR M5-111CAB (SUPERVISOR)	Underground
65TRA20	TRACTOR M5-111CAB (MECHANIC)	Underground
65TRA21	TRACTOR M5-111CAB (SERVICE +)	Underground
65TRA22	TRACTOR M5-111CAB (SERVICE +)	Underground
65TRA23	TRACTOR M5-111CAB (SERVICE)	Underground
65TRA24	TRACTOR M5-111CAB (SERVICE)	Underground
65TRA25	TRACTOR M5-111CAB (SERVICE)	Underground
65TRA26	TRACTOR 6110M JOHN DEERE	Underground
65TRA27	TRACTOR 6110M JOHN DEERE	Underground
65TRA28	TRACTOR M5-111CAB	Underground
65TRA29	TRACTOR M5-111CAB	Underground
65TRA30	TRACTOR M5-111CAB	Underground
65TRA31	TRACTOR M5-111CAB	Underground
65TRA32	TRACTOR M5-111CAB	Underground
65TRA33	TRACTOR M5-111CAB	Underground
65TRK01	FUEL TRUCK	Surface
65TRK02	HIAB SERVICE TRUCK	Surface
65TRK03	WATER SERVICE TRUCK	Surface
65TRK04	VACUUM TRUCK	Surface
65TRK08	BOOM TRUCK MACLEAN BT3	Underground
65TRK09	CASSETTE CARRIER MACLEAN CS3	Underground
65TRK11	ROLL OFF KENWORTH TRUCK	Surface
65TRK12	FUEL TRUCK T800	Surface
65TRK13	WATER TRUCK	Surface
65TRK14	TRUCK T800	Surface
65TRK15	CASSETTE CARRIER MACLEAN CS3	Underground
65TRK16	CASSETTE CARRIER MACLEAN CS3	Underground
65TRK17	CASSETTE CARRIER MACLEAN CS3	Underground

Unit Number	Description	Equipment Group
65TRK19	CONCRETE TRUCK AG3	Underground
65TRK20	BOOM TRUCK MACLEAN BT3	Underground
65TRK21	FIRE TRUCK	Surface
65TRK22	CASSETTE CARRIER MACLEAN CS3	Underground
65TRK23	CASSETTE CARRIER MACLEAN CS3	Underground
65TRK24	DYNO EMULSION TRUCK	Surface
65TRK25	CASSETTE CARRIER MACLEAN CS3	Underground
65VSE01	KUBOTA MULE RTV1140	Underground
65VSE04	KAWASKI MULE	Surface
65VSE05	KAWASKI MULE	Surface
65VSE06	KUBOTA MULE RTV1100	Underground
65VSE08	ZOOM BOOM GRADALL 544D	Underground
65VSE09	TELEHANDLER GENIE 1056	Surface
65VSE10	ZOOM BOOM GENIE 1056	Surface
65VSE13	EMULSION CHARGER MACLEAN EC3	Underground
65VSE14	LANDCRUISER HZJ79 AMBULANCE	Underground
65VSE15	LANDCRUISER HZJ79 MENCARRIER	Underground
65VSE16	TELEHANDLER TL1055D CAT	Underground
65VSE17	LANDCRUISER HZJ79 MENCARRIER	Underground
65VSE18	LANDCRUISER HZJ79 MENCARRIER	Underground
65VSE19	TRANSIT 12 PASSENGERS (JACK D)	Surface
65VSE20	TRANSIT 12 PASSENGERS (JACK D)	Surface
65VSE21	TELEHANDLER TL943D CAT (E&I)	Surface
65VSE22	TELEHANDLER TL943D CAT WAREH.	Surface
65VSE23	EMERGENCY RESPONSE VEHICLE	Surface
65VSE24	SHOTCRETE ALIVA MODEL 246	Underground
65VSE25	TELEHANDLER GENIE 1056	Surface
65VSE26	TELEHANDLER GENIE 1056	Surface
65VSE27	SHOTCRETE SPRAYER SS3	Underground
65VSE28	DEV. EMULSION CHARGER EC3	Underground
65VSE29	DEV. EMULSION CHARGER EC3	Underground
65VSE30	LANDCRUISER HZJ79 MENCARRIER	Underground
65VSE31	LANDCRUISER HZJ79 MENCARRIER	Underground
65VSE32	LANDCRUISER HZJ79 MENCARRIER	Underground
65VSE33	LANDCRUISER HZJ79 MENCARRIER	Underground
65VSE34	LANDCRUISER HZJ79 MENCARRIER	Underground
65VSE35	TELEHANDLER TL1055D CAT	Underground
65VSE36	ZOOM BOOM MANITOU MLT625	Underground
65VSE37	SWATCRETE	Underground

Unit Number	Description	Equipment Group
65VSE38	LANDCRUISER HZJ79 MENCARRIER	Underground
65WMC01	PORTABLE WELDER	Surface
65WMC02	PORTABLE WELDER	Surface
65WMC03	PORTABLE WELDER	Surface
65WMC04	U/G WELDING MACHINE	Underground
65WMC05	MILLER WELDING MACHINE	Underground

AEM - Meliadine - Sampling Program

					Bureau Veritas			AGAT			H2Lab			SGS		
Sample Group Name	**Analysis**	**Sampling frequency**	**Sampling Stations for Reference**	**Estimated number of samples (nb/year)**	Unit Rate	Total Group Cost per sample	Total Group cost x Annual Samples	Unit Rate	Total Group Cost per sample	Total Group cost x Annual Samples	Unit Rate	Total Group Cost per sample	Total Group cost x Annual Samples	Unit Rate	Total Group Cost per sample	Total Group cost x Annual Samples
Potable water	Atypical colonies	Weekly	DW Produced, DW-Kitchen, DW-Kitchen 2, DW-WTP, DW-Wings	208	included with total	31.50 $	6 552.00 $	included with total	26.00 $	5 408.00 $	12.00 $	44.00 $	9 152.00 $	2.00 $	56.00 $	11 648.00 $
	Total coliforms				9.00 $			14.00 $						35.00 $		
	Fecal coliforms				13.50 $			12.00 $			12.00 $			19.00 $		
	E.coli and AAHB				9.00 $			included			20.00 $			included		
Wastewater	Atypical colonies	Weekly	MEL-7, STP-IN, STP-FINAL, STP- LIQUOR MIXED	208	included with total	170.60 $	35 483.76 $	included with total	179.00 $	37 232.00 $	included with total	189.50 $	39 416.00 $	2.00 $	208.00 $	43 264.00 $
	Total coliforms				9.00 $			10.00 $			12.00 $			19.00 $		
	Fecal coliforms				13.50 $			10.00 $			12.00 $			19.00 $		
	E.coli and AAHB				13.50 $			12.00 $			20.00 $			40.00 $		
	pH				4.50 $			7.00 $			5.00 $			5.00 $		
	BOD5				18.23 $			12.00 $			15.00 $			14.00 $		
	COD				18.23 $			11.00 $			12.00 $			15.00 $		
	Ammonia				12.78 $			15.00 $			12.00 $			10.00 $		
	Ammonia nitrogen										12.00 $					
	Nitrite				7.88 $			15.00 $			12.00 $			15.00 $		
	Nitrate				7.88 $			15.00 $			12.00 $			included		
	Kjedhal Nitrogen				12.78 $			16.00 $			18.00 $			10.00 $		
	Total Phosphorus				13.23 $			16.00 $			15.00 $			10.00 $		
	Total Oil and Grease				28.76 $			30.00 $			25.00 $			40.00 $		
	TSS				10.35 $			10.00 $			7.50 $			9.00 $		
Group 1	pH	Monthly during open water	Mel SR-1-14, MEL-12, MEL-19, MEL-20, MEL-21, MEL-22, MEL-23, MEL-24	84	4.50 $	226.89 $	19 058.76 $	7.00 $	222.00 $	18 648.00 $	5.00 $	239.30 $	20 101.20 $	15.00 $	150.00 $	12 600.00 $
	Turbidity				9.32 $			12.00 $			8.00 $			15.00 $		
	Hardness				0.00 $			18.00 $			15.00 $			included with metals		
	Alkalinity				8.37 $			15.00 $			7.00 $			included with ph		
	Chloride				12.78 $			35.00 $			16.00 $			20.00 $		
	Fluoride				12.78 $			included			20.00 $			10.00 $		
	Sulphate				12.78 $			included			13.50 $			included		
	TDS				10.35 $			15.00 $			11.30 $			12.00 $		
	TSS				10.35 $			10.00 $			7.50 $			9.00 $		
	Total Cyanide				23.99 $			18.00 $			15.00 $			12.00 $		
	Ammonia nitrogen				12.78 $			15.00 $			12.00 $			9.00 $		
	Nitrate				7.88 $			included			12.00 $			included		
	Nitrite				7.88 $			included			12.00 $			included		
	Total Phosphorus				13.23 $			16.00 $			15.00 $			included with metals		
	Orthophosphate				12.78 $			18.00 $			15.00 $			10.00 $		
	Total Metals - 16 (Aluminum, Arsenic, Barium, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Thallium, Zinc)				51.39 $			43.00 $			35.00 $			38.00 $		
	Mercury (cold vapor)				15.75 $			included			20.00 $			included		
Group 2	pH	Bi-Annually	MEL-15, MEL-16, MEL-17, MEL-18, RO-In and Out (Weekly during discharge, approx 3 months)	32	4.50 $	427.05 $	13 665.60 $	7.00 $	469.00 $	15 008.00 $	5.00 $	459.80 $	14 713.60 $	15.00 $	256.00 $	8 192.00 $
	Turbidity				9.32 $			12.00 $			8.00 $			15.00 $		
	Conductivity				9.32 $			12.00 $			5.00 $			included		
	Hardness				0.00 $			18.00 $			15.00 $			included		
	Bicarbonate Alkalinity				0.00 $			15.00 $			15.00 $			included		
	Carbonate Alkalinity				0.00 $			included			15.00 $			included		
	Total Alkalinity				8.37 $			15.00 $			7.00 $			included		
	Chloride				12.78 $			35.00 $			16.00 $			20.00 $		
	Sulphate				12.78 $			included			13.50 $			included		
	TDS				10.35 $			15.00 $			11.30 $			12.00 $		
	TSS				10.35 $			10.00 $			7.50 $			9.00 $		
	Total Cyanide				23.99 $			18.00 $			15.00 $			12.00 $		
	Free Cyanide				23.99 $			19.00 $			15.00 $			15.00 $		
	Cyanide WAD				23.99 $			30.00 $			15.00 $			15.00 $		
	Ammonia nitrogen				12.78 $			15.00 $			12.00 $			9.00 $		
	Total Kjeldahl Nitrogen				12.78 $			16.00 $			18.00 $			10.00 $		
	Nitrate				7.88 $			included			12.00 $			included		
	Nitrite				7.88 $			included			12.00 $			included		
	Total Phosphorus				13.23 $			16.00 $			15.00 $			included		
	Orthophosphate				12.78 $			18.00 $			15.00 $			10.00 $		
	Total Organic Carbon (TOC)				19.17 $			25.00 $			24.00 $			10.00 $		
	Dissolved Organic Carbon (DOC)				18.23 $			27.00 $			24.00 $			10.00 $		
	Reactive Silica				38.34 $			40.00 $			30.00 $			18.00 $		
	Total Metals - (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Copper, Iron, Lead, Lithium, Manganese, Molybdenum, Nickel, Selenium, Silver, Strontium, Thallium, Tin, Titanium, Uranium, Vanadium, Zinc) Ca, K, Mg, Na				51.39 $			53.00 $			45.00 $			38.00 $		
	Mercury (cold vapor)				15.75 $			included			20.00 $			included		

	Dissolved Metals - (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Copper, Iron, Lead, Lithium, Manganese, Molybdenum, Nickel, Selenium, Silver, Strontium, Thallium, Tin, Titanium, Uranium, Vanadium, Zinc)				51.39 $			53.00 $			47.00 $			38.00 $		
	Dissolved Mercury (cold vapor)				15.75 $			included			22.50 $			included		
Group 3	pH	Monthly	Calculate in the MDMER sections	12	4.50 $	580.22 $	6 962.58 $	7.00 $	586.00 $	7 032.00 $	5.00 $	726.00 $	8 712.00 $	5.00 $	960.00 $	11 520.00 $
	Turbidity				9.32 $			12.00 $			8.00 $			15.00 $		
	EEM parameters				-			142.00 $			-			210.00 $		
	Total Metals (As, Cu, Pb, Ni, Zn) + (Al, Cd, Fe, Mo, Se, Cr, Co, Tl, U, Mn)				45.00 $						35.00 $					
	Mercury (cold vapor)				15.75 $						20.00 $					
	Alkalinity				8.37 $						7.00 $					
	Hardness				included						15.00 $					
	Total CN				23.99 $						15.00 $					
	Total Phosphorous				13.23 $						15.00 $					
	TSS				10.35 $						7.50 $					
	Radium 226				103.50 $						75.00 $					
	Sulphate				12.78 $						13.50 $					
	NNH3 (as N)				12.78 $						12.00 $					
	Nitrate				7.88 $						12.00 $					
	Chloride				12.78 $						16.00 $					
	Acute Toxicity to Rainbow Trout and Daphnia Magna				300.00 $			425.00 $			470.00 $			730.00 $		
Group 4	Total Metals (Arsenic, Copper, Lead, Nickel)	2 or 3	MEL-25 (when needed)	3	31.50 $	178.97 $	536.90 $	25.00 $	122.00 $	366.00 $	28.00 $	152.50 $	457.50 $	30.00 $	178.00 $	534.00 $
	TSS				10.35 $			10.00 $			7.50 $			9.00 $		
	Ammonia				12.78 $			15.00 $			12.00 $			9.00 $		
	Benzene				119.84 $			30.00 $			100.00 $			125.00 $		
	Toluene															
	Ethylbenzene															
	Xylene															
	Total Petroleum Hydrocarbons (TPH)							35.00 $								
	pH				4.50 $			7.00 $			5.00 $			5.00 $		
Full Suite	pH	Monthly during open water	MEL-11, (year round) MEL-13 (monthly during open water), MEL-14 (weekly during open water), Culvert 2, 3, 4 (2x/month during open water) and channel 1, 2 and 5 (2x/month during open water), Nipissar Lake and Little Meliadine Lake (Annually), P1 and P3 (monthly during open water)	90	4.50 $	472.05 $	42 484.50 $	7.00 $	504.00 $	45 360.00 $	5.00 $	511.80 $	46 062.00 $	15.00 $	381.00 $	34 290.00 $
	Turbidity				9.32 $			12.00 $			8.00 $			15.00 $		
	Conductivity				9.32 $			12.00 $			5.00 $			included		
	Hardness				0.00 $			18.00 $			15.00 $			included		
	Bicarbonate Alkalinity				0.00 $			15.00 $			15.00 $			included		
	Carbonate Alkalinity				0.00 $			included			15.00 $			included		
	Total Alkalinity				8.37 $			15.00 $			7.00 $			included		
	Chloride				12.78 $			35.00 $			16.00 $			20.00 $		
	Calcium				0.00 $			included			0.00 $			included with metals		
	Potassium				0.00 $			included			0.00 $					
	Magnesium				0.00 $			included			0.00 $					
	Sodium				0.00 $			included			0.00 $					
	Sulphate				12.78 $			included			13.50 $			included		
	TDS				10.35 $			15.00 $			11.30 $			12.00 $		
	TSS				10.35 $			10.00 $			7.50 $			9.00 $		
	Total Cyanide				23.99 $			18.00 $			15.00 $			12.00 $		
	Free Cyanide				23.99 $			19.00 $			15.00 $			15.00 $		
	Cyanide WAD				23.99 $			30.00 $			15.00 $			15.00 $		
	Ammonia nitrogen				12.78 $			15.00 $			12.00 $			9.00 $		
	Total Kjeldahl Nitrogen				12.78 $			16.00 $			15.00 $			10.00 $		
	Nitrate				7.88 $			included			12.00 $			included		
	Nitrite				7.88 $			included			12.00 $			included		
	Phosphorus				13.23 $			16.00 $			15.00 $			included with metals		
	Orthophosphate				12.78 $			18.00 $			15.00 $			10.00 $		
	Total Organic Carbon				19.17 $			25.00 $			24.00 $			10.00 $		
	Dissolved Organic Carbon				18.23 $			27.00 $			24.00 $			10.00 $		
	Reactive Silica				38.34 $			40.00 $			30.00 $			18.00 $		
	Total Petroleum Hydrocarbons (TPH)				45.00 $			35.00 $			55.00 $			125.00 $		
	Total Metals (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Copper, Iron, Lead, Lithium, Manganese, Molybdenum, Nickel, Selenium, Silver, Strontium, Thallium, Tin, Titanium, Uranium, Vanadium, Zinc)				51.39 $			53.00 $			45.00 $			38.00 $		
	Mercury (cold vapor)				15.75 $			included			20.00 $			included		
	Dissolved Metals (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Copper, Iron, Lead, Lithium, Manganese, Molybdenum, Nickel, Selenium, Silver, Strontium, Thallium, Tin, Titanium, Uranium, Vanadium, Zinc)				51.39 $			53.00 $			47.00 $			38.00 $		
	Dissolved Mercury (cold vapor)				15.75 $			included			22.50 $			included		
	pH				4.50 $			7.00 $			5.00 $			15.00 $		
	Bicarbonate Alkalinity				0.00 $			15.00 $			15.00 $			included		

Underground Water	Carbonate Alkalinity	Monthly	DDH, Level 50, 75, 125	24	0.00 $	743.36 $	17 840.52 $	included	714.00 $	17 136.00 $	15.00 $	644.80 $	15 475.20 $	included	556.00 $	13 344.00 $
	Total Alkalinity				8.37 $			15.00 $			7.00 $			included		
	Chloride				12.78 $			35.00 $			16.00 $			20.00 $		
	Conductivity				9.32 $			12.00 $			5.00 $			included		
	Hardness				0.00 $			18.00 $			15.00 $					
	Calcium				0.00 $			included			0.00 $					
	Potassium				0.00 $			included			0.00 $			included with metals		
	Magnesium				0.00 $			included			0.00 $					
	Sodium				0.00 $			included			0.00 $					
	Sulphate				12.78 $			included			13.50 $			included		
	TDS				10.35 $			15.00 $			11.30 $			12.00 $		
	TSS				10.35 $			10.00 $			7.50 $			9.00 $		
	Turbidity				9.32 $			12.00 $			8.00 $			15.00 $		
	Ammonia nitrogen				12.78 $			15.00 $			12.00 $			9.00 $		
	Total Kjeldahl Nitrogen				12.78 $			16.00 $			18.00 $			10.00 $		
	Nitrate				7.88 $			included			12.00 $			included		
	Nitrite				7.88 $			included			12.00 $			included		
	Orthophosphate				12.78 $			18.00 $			15.00 $			10.00 $		
	Total Phosphorus				13.23 $			16.00 $			15.00 $			included with metals		
	TOC				19.17 $			25.00 $			24.00 $			10.00 $		
	DOC				18.23 $			27.00 $			24.00 $			10.00 $		
	Reactive Silica				38.34 $			40.00 $			30.00 $			18.00 $		
	Radium 226				191.70 $			180.00 $			75.00 $			150.00 $		
	TPH - included with BTEX costs below if 0,00$)				0.00 $			35.00 $			55.00 $			125.00 $		
	Oil and Grease				28.76 $			30.00 $			25.00 $			40.00 $		
	BTEX				119.84 $			30.00 $			45.00 $			included in TPH		
	Total Cyanide				23.99 $			18.00 $			15.00 $			12.00 $		
	Free Cyanide				23.99 $			19.00 $			15.00 $			15.00 $		
	Total Metals (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Copper, Iron, Lead, Lithium, Manganese, Molybdenum, Nickel, Selenium, Silver, Strontium, Thallium, Tin, Titanium, Uranium, Vanadium, Zinc)				51.39 $			53.00 $			45.00 $			38.00 $		
	Mercury (cold vapor)				15.75 $			included			20.00 $			included		
	Dissolved Metals (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Copper, Iron, Lead, Lithium, Manganese, Molybdenum, Nickel, Selenium, Silver, Strontium, Thallium, Tin, Titanium, Uranium, Vanadium, Zinc)				51.39 $			53.00 $			47.00 $			38.00 $		
	Dissolved Mercury (cold vapor)				15.75 $			included			22.50 $			included		
MDMER - Effluent Monitoring	pH	Weekly during periods of discharge (approx 3months)	MEL-14, MEL-26	24	4.50 $	274.82 $	6 595.56 $	7.00 $	255.00 $	6 120.00 $	5.00 $	142.00 $	3 408.00 $	5.00 $	215.00 $	5 160.00 $
	TSS				10.35 $			10.00 $			7.00 $			9.00 $		
	Radium 226				191.70 $			180.00 $			75.00 $			150.00 $		
	Total Cyanide				23.99 $			18.00 $			15.00 $			12.00 $		
	Total Ammonia (as N)				12.78 $			15.00 $			12.00 $			9.00 $		
	Metals ICPMS (As, Cu, Ni, Pb, Zn)				31.50 $			25.00 $			28.00 $			30.00 $		
MDMER - EEM - Mixing Zone	pH	Monthly during periods of discharge (approx 3 months)	MEL-13, MEL-26-EEM	6	4.50 $	158.13 $	948.78 $	7.00 $	161.00 $	966.00 $	5.00 $	135.50 $	813.00 $	15.00 $	82.00 $	492.00 $
	Alkalinity				8.37 $			15.00 $			7.00 $			included with pH		
	Chloride				12.78 $			35.00 $			16.00 $			20.00 $		
	Conductivity				9.32 $			12.00 $			5.00 $			included with pH		
	Hardness				0.00 $			18.00 $			15.00 $			include with metals		
	Nitrate				7.88 $			included			12.00 $			included		
	Sulphate				12.78 $			included			13.50 $			included		
	Ammonia (expressed as N)				12.78 $			15.00 $			12.00 $			9.00 $		
	Total Phosphorus				13.23 $			16.00 $			15.00 $			included with metals		
	Metals - **Trace** (Al, **Cd**, Co, **Cr**, Fe, Hg, Mn, Mo, **Se**, Tl, U)				76.50 $			43.00 $			35.00 $			38.00 $		
	pH				4.50 $			7.00 $			5.00 $			15.00 $		
	Dissolved Oxygen				19.80 $			12.00 $			16.00 $			10.00 $		
	Carbonate Alkalinity				0.00 $			15.00 $			15.00 $					
	Bicarbonate Alkalinity				0.00 $			included			15.00 $			included		
	Total Alkalinity				8.37 $			15.00 $			7.00 $					
	TDS				10.35 $			15.00 $			11.30 $			12.00 $		
	TSS				10.35 $			10.00 $			7.50 $			9.00 $		
	Chloride				12.78 $			35.00 $			16.00 $			20.00 $		
	Conductivity				9.32 $			12.00 $			5.00 $			included		
	Turbidity				9.32 $			12.00 $			8.00 $			15.00 $		
	TPH				45.00 $			35.00 $			55.00 $			125.00 $		
	Hardness				0.00 $			18.00 $			15.00 $					
	Calcium				0.00 $			included			0.00 $					
	Potassium				0.00 $			included			0.00 $			included with metals		
	Magnesium				0.00 $			included			0.00 $					
	Sodium				0.00 $			included			0.00 $					
	Sulphate				12.78 $			included			13.50 $			included		

MDMER - EEM - Receiving Environment	Ammonia	3 / year	MEL-03-01, MEL-26 Reference	6	12.78 $	702.27 $	4 213.62 $	-	696.00 $	4 176.00 $	12.00 $	575.30 $	3 451.80 $	9.00 $	541.00 $	3 246.00 $
	Ammonia nitrogen				-			15.00 $			12.00 $					
	Total Kjeldahl Nitrogen				12.78 $			16.00 $			18.00 $			10.00 $		
	Nitrate				7.88 $			included			12.00 $			included		
	Nitrite				7.88 $			included			12.00 $			included		
	Orthophosphate				12.78 $			18.00 $			15.00 $			10.00 $		
	Total Phosphorus				13.23 $			16.00 $			15.00 $			included with metals		
	TOC				19.17 $			25.00 $			24.00 $			10.00 $		
	DOC				18.23 $			27.00 $			24.00 $			10.00 $		
	Reactive Silica				38.34 $			40.00 $			30.00 $			18.00 $		
	Radium 226				191.70 $			180.00 $			75.00 $			150.00 $		
	Total Cyanide				23.99 $			18.00 $			15.00 $			12.00 $		
	Free Cyanide				23.99 $			19.00 $			15.00 $			15.00 $		
	Cyanide WAD				23.99 $			30.00 $			15.00 $			15.00 $		
	Total Metals - **Trace** (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Copper, Iron, Lead, Lithium, Manganese, Mercury, Molybdenum, Nickel, Selenium, Silver, Strontium, Thallium, Tin, Titanium, Uranium, Vanadium, Zinc)				76.50 $			53.00 $			45.00 $			38.00 $		
	Dissolved Metals - **Trace** (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Copper, Iron, Lead, Lithium, Manganese, Mercury, Molybdenum, Nickel, Selenium, Silver, Strontium, Thallium, Tin, Titanium, Uranium, Vanadium, Zinc)				76.50 $			53.00 $			47.00 $			38.00 $		
Acute Lethality	Acute Toxicity to Rainbow Trout	5 / year	MEL-14, MEL-26	10	200.00 $	300.00 $	3 000.00 $	425.00 $	425.00 $	4 250.00 $	350.00 $	470.00 $	4 700.00 $	440.00 $	730.00 $	7 300.00 $
	Acute Toxicity to Daphnia Magna				100.00 $						120.00 $			290.00 $		
Sublethal Toxicity	Fathead minnow; 7 day survival and growth	2 / year	MEL-14, MEL-26	4	1 728.00 $	5 013.00 $	20 052.00 $	1 100.00 $	3 750.00 $	15 000.00 $	1 250.00 $	4 450.00 $	17 800.00 $	1 440.00 $	4 815.00 $	19 260.00 $
	Ceriodaphnia dubia; 7-day survival and reproduction				1 620.00 $			1 000.00 $			1 400.00 $			1 305.00 $		
	Lemna minor; 7-day growth inhibition				1 125.00 $			1 150.00 $			1 250.00 $			1 200.00 $		
	Pseudokirchneriella subcapitata				540.00 $			500.00 $			550.00 $			870.00 $		
Oil	Metals (Cd, Cr, Pb)		W-Oil	4	208.80 $	614.93 $	2 459.70 $	45.00 $	299.00 $	1 196.00 $	650.00 $	650.00 $	2 600.00 $	50.00 $	1 365.00 $	5 460.00 $
	PCB				118.13 $			72.50 $						40.00 $		
	Total Organic Halogens (as Cl)				175.50 $			116.50 $						1 075.00 $		
	Flash Point				112.50 $			65.00 $						200.00 $		
Ash	Leachate: metals in mg/L (Ag, As, Ba, Cd, Cr, Pb, Se, Zn)	Monthly	I-Ash	12	27.00 $	42.75 $	513.00 $	88.00 $	88.00 $	1 056.00 $	35.00 $	55.50 $	666.00 $	115.00 $	115.00 $	1 380.00 $
	Mercury in leachate				15.75 $						20.50 $					
Hydrocarbon Spill	PHC F1-F4 BTEX (water and soil)	as needed		1	119.84 $	119.84 $	119.84 $	125.00 $	125.00 $	125.00 $	45.00 $	45.00 $	45.00 $	125.00 $	125.00 $	125.00 $
Air Passive	SO2	Monthly	DF-5, DF-7	24	54.90 $	109.80 $	2 635.20 $	55.00 $	110.00 $	2 640.00 $	180.00 $	180.00 $	4 320.00 $	100.10 $	200.20 $	4 804.80 $
	NO2				54.90 $			55.00 $						100.10 $		
Air Active	PM2.5	Every 6 days	2 partisol stations	122	54.90 $	164.70 $	20 038.50 $	16.50 $	16.50 $	2 007.50 $	270.00 $	270.00 $	32 850.00 $	27.30 $	81.90 $	9 964.50 $
	PM10				54.90 $									27.30 $		
	TSP				54.90 $									27.30 $		
Dust fall	Dustfall Total	Monthly	5 site, 3 AWAR, 13 Rankin Inlet, more stations to be added	240	120.60 $	194.40 $	46 656.00 $	106.00 $	156.00 $	37 440.00 $	180.00 $	245.00 $	58 800.00 $	45.00 $	115.00 $	27 600.00 $
	Dustfall Fixed															
	Dustfall Metals				73.80 $			50.00 $			65.00 $			70.00 $		
Snowpack	Total Metals	Annually	4 site dustfall stations	4	45.00 $	45.00 $	180.00 $	40.00 $	40.00 $	160.00 $	220.00 $	220.00 $	880.00 $	35.00 $	35.00 $	140.00 $
Tailings-solid	ABA	Weekly	tailings-solid	52		0.00 $	0.00 $	48.00 $	62.00 $	3 224.00 $	130.00 $	208.00 $	10 816.00 $	100.00 $	155.00 $	8 060.00 $
	Bulk Metals							14.00 $			78.00 $			55.00 $		
	Sample preparation and disposal							-			-			-		
Waste Rock	ABA	Monthly	10 waste rock	120	339.75 $	339.75 $	40 770.00 $	48.00 $	137.00 $	16 440.00 $	130.00 $	463.00 $	55 560.00 $	100.00 $	330.00 $	39 600.00 $
	Bulk Metals							14.00 $			78.00 $			55.00 $		
	WRA							25.00 $			50.00 $			35.00 $		
	Shake Flask							50.00 $			180.00 $			140.00 $		
	Sample preparation and disposal							-			25.00 $			-		
SUBTOTAL							**249 996.81 $**			**221 326.50 $**			**284 423.30 $**			**220 324.30 $**
	Environmental Disposal			1118	5.00 $	5.00 $	5 588.33 $	5.00 $	5.00 $	5 588.33 $	0.00 $	0.00 $			5.00 $	5 588.33 $
TOTAL							**255 585.14 $**			**226 914.83 $**			**284 423.30 $**			**225 912.63 $**

*** Tailings and waste rock analysis was removed from the total for easier comparison**

* Aquatox pricing

Appendix B

SUMMARY OF COSTS

CAPITAL COSTS	COMPONENT NAME	COST	LAND LIABILITY	WATER LIABILITY
OPEN PIT	Tiriganiaq Pit 1	$1 388 171	$694 085	$694 085
	Tiriganiaq Pit 2	$316 792	$158 396	$158 396
UNDERGROUND MINE	Tiriganiaq	$1 096 384	$523 192	$573 192
TAILINGS FACILITY	Tailings Storage Facility	$4 831 700	$2 415 850	$2 415 850
ROCK PILE	WRSF 1	$247 350	$123 675	$123 675
	WRSF 2	$30 000	$15 000	$15 000
	WRSF 3	$30 000	$15 000	$15 000
BUILDINGS AND EQUIPMENT	Meliadine	$16 412 878	$8 206 439	$8 206 439
	ITIVIA + Road	$1 503 078	$726 539	$776 539
CHEMICALS AND CONTAMINATED SOIL MANAGEMENT		$1 864 355	$932 178	$932 178
SURFACE AND GROUNDWATER MANAGEMENT		$1 446 713	-	$1 446 713
INTERIM CARE AND MAINTENANCE		$5 294 620	-	$5 294 620
	SUBTOTAL: Capital Costs	**$34 462 041**	**$13 810 354**	**$20 651 687**
	PERCENT OF SUBTOTAL		**40%**	**60%**

INDIRECT COSTS		COST	LAND LIABILITY	WATER LIABILITY
MOBILIZATION/DEMOBILIZATION		$6 942 680	$2 782 217	$4 160 463
CLOSURE MONITORING AND MAINTENANCE		$3 032 829	$1 215 379	$1 817 450
POST CLOSURE MONITORING AND MAINTENANCE		$3 704 694	$1 484 623	$2 220 071
ENGINEERING	5%	1 723 102 $	$690 518	$1 032 584
PROJECT MANAGEMENT	5%	$1 723 102	$690 518	$1 032 584
HEALTH AND SAFETY PLANS/MONITORING & QA/QC	2%	$689 241	$276 207	$413 034
BONDING/INSURANCE	1%	$344 620	138 103.54 $	$206 517
CONTINGENCY	20%	$6 892 408	$2 762 071	$4 130 337
MARKET PRICE FACTOR ADJUSTMENT	0%	$0	$0	$0
	SUBTOTAL: Indirect Costs	**$25 052 677**	**$10 039 636**	**$15 013 041**

TOTAL COSTS	**$59 514 717**	**$23 849 990**	**$35 664 728**

Unit Cost Table (for refining unit costs see "Estimator" worksheet)

Filter by unit

ITEM	Detail	COST CODE	UNITS	LOW $	HIGH $	SPECIFIED $	COMMENTS
Accomodation							
		ACCM	manday	100.00	175.00		
Buildings - Decontaminate							
	Asbestos	BDA	m2	25.60	51.20		Low: removal of asbestos siding & flooring; High: removal of insulated pipes, friable asbestos
Buildings - Remove							Unit costs are based on 3m high, single storey building. Scale areas accordingly.
	Wood	BRW	m2	27.50	41.00		
	Concrete	BRC	m2	40.00	65.00	6.00	Specified: puncture concrete foundation slabs
	Steel - teardown	BRS1	m2	45.00	65.00		demolition steel
	Steel - for salvage	BRS2	m2	67.00	100.00		steel for the south
Concrete work							
	Small pour	CSF	m3	426.50	639.75		Low: YK; High=1.5xLow
	Large pour	CLF	m3	353.50	530.25	2 130.00	Specified: concrete crown pillar
Contaminated Soils							
	ESA Phase 1	CS1	each	7500.00			Low: small, "clean" site
	ESA Phase 1	CS2	each	50000.00			Low: small, "clean" site
	Remediate on site	CSR	m3	47.00	146.00		
Dozing							
	doze rock piles	DR	m3	1.05	2.40		Low cost: doze crest off dump
	doze overburden/soil piles	DS	m3	0.95	3.80		High cost: push up to 300 m
Excavate Rock; Low Spec's and QA/QC							
	drill/blast/load/short haul	RB1	m3	11.40	17.05		Low:quarry operations for bulk fill
	drill/blast/load/long haul	RB2	m3	12.05	17.80		
	RB1 + spread and compact	RB3	m3	12.05	17.80		
	RB2 + spread and compact	RB4	m3	12.50	30.75		
	Specified activity	RBS	m3				
Excavate Rock; High Spec's and QA/QC							(e.g. ditch/spillway excavation)
	drill/blast/load/short haul	RC1	m3	12.05	17.80		Low:foundation excavation;High:spillway excavation
	drill/blast/load/long haul	RC2	m3	12.70	18.40		
	RC1 + spread and compact	RC3	m3	12.70	18.40		e,g, cover construction
	RC2 + spread and compact	RC4	m3	13.50	19.20		e,g, cover construction
	Specified activity	RCS	m3			175.00	Specified-drift excavation
Excavate Rip Rap							
	drill/blast/load/short haul/place	RR1	m3	13.50	17.75		High: quarry & place rip rap in channel
	drill/blast/load/long haul/place	RR2	m3	14.20	20.65		
	source is waste dump/short haul	RR3	m3	7.00			cost includes sorting
	source is waste dump/long haul	RR4	m3	7.60			
	Specified activity	RRS	m3				
Excavate Soil; Low Spec's and QA/QC							
	clear & grub	SBC	m2	3.40	5.00		
	excavate/load/short haul	SB1	m3	4.30	5.90		
	excavate/load/long haul	SB2	m3	4.60	7.30		
	SB1 + spread and compact	SB3	m3	5.10	8.90		Low: non-engineered; High:engineered
	SB2 + spread and compact	SB4	m3	5.50	11.00		Low: non-engineered; High:engineered
	Specified activity	SBS	m3	3.20	6.30		Low: rehandle waste rock dump by dozing; High:rehandle waste rock by hauling
	Tailings	SBT	m3	1.35	3.70	15.50	High:contour surface - wet or frozen; Specified:haul/place wet infill
Excavate Soil, High Spec's and QA/QC							
	excavate/load/short haul	SC1	m3	6.80	9.30		
	excavate/load/long haul	SC2	m3	7.10	11.75		
	SC1 + spread and compact	SC3	m3	8.90	14.20		Low: non-engineered; High:engineered
	SC2 + spread and compact	SC4	m3	9.30	23.20		Low: non-engineered; High:engineered (e.g. complex covers, low volume dam construction)
	Specified activity	SCS	m3			18.80	Backfill adit with waste rock
Fence							
		FNC	m	13.55	203.00		
Fuel and Electricity							
	Fuel cost - gas	FCG	litre	1.05	1.40		
	Fuel cost - diesel	FCD	litre	0.99	1.39		
	Fuel mobilization	FCM	litre	0.22	0.42		High: winter road usage
	Electricity	FCE	kW-h	0.17	0.19	0.49	Low and High:Yellowknife; Specified:diesel generator
Geo-Synthetics							
	geotextile	GST	m2	3.44			Supply and install
	geogrid	GSG	m2	5.75			
	liner, HDPE	GSHDPE	m2	7.95			Supply and install; large quantity
	liner, ES3	GSES3	m2	20.20			FOB Yellowknife
	geosynthetic installation	GSI	m2	3.16	14.00		Low:geotextile; High:ES3 or HDPE
	bentonite soil ammendment	GSBA	tonne	308.30	348.50		FOB Edmonton, add shipping & mixing
Grouting (/m3 of rock grouted)							
		grout	m3	236.55	286.75		High: cement, FOB Yellowknife
Labour & Equipment Rates							
	Site manager	sman	$/hr	125.00	152.00		
	Supervisor	super	$/hr	52.00	91.84		
	Registered engineer	eng	$/hr	95.00	220.00		
	Environmental coordinator	envco	$/hr	74.16	130.00		
	Evironmental technologist	envtech	$/hr	36.00			
	Electrician	elec	$/hr	74.00	95.00		
	Journeyman - various	journey	$/hr	44.00	71.79		
	Labour - skilled	lab-s	$/hr	41.00	49.60		
	Labour - unskilled	lab-us	$/hr	31.00	43.98		
	Equipment operator	oper	$/hr	41.00	65.00		
	Heavy duty mechanic	mech	$/hr	49.00	72.85		
	Water treatment plant operator	oper-wt	$/hr	41.00	59.86		
	Security / first aid	safety	$/hr	36.00	66.97		
	Administative staff	admin	$/hr	38.00	57.89		
	Equipment rates include operator and fuel						
	Loader - 4 cu.yd (3.06m3)	load-s	$/hr	175.00			
	Loader - 7 cu.yd (5.35m3)	load-l	$/hr	315.00			
	Excavator - 26.76-30.84 tonnes	exc-s	$/hr	190.00			
	Excavator - 68.95+tonnes	exc-l	$/hr	420.00			
	Grader	grad	$/hr	190.00			
	Dump truck off hwy 30-50 tonnes	truck-s	$/hr	225.00			
	Dump truck off hwy 55-75 tonnes	truck-l	$/hr	300.00			
	dozer, small	dozers	$/hr	205.00	260.00		
	dozer, large	dozerl	$/hr	490.00	565.00		
	smooth drum compactor	comp	$/hr	155.00			
	scooptram, 6 yd3 bucket	scoop	$/hr	170.00			
	flat bed truck with hiab	hiab	$/hr	155.00			
	fuel truck	ftruck	$/hr	150.00			
	water truck	wtruck	$/hr	58.00	150.00		
Mobilize Heavy Equipment							

Unit Cost Table (for refining unit costs see "Estimator" worksheet)

	Filter by unit					
Road access	MHER	kmtonne	3.40	10.25		
Air access	MHEA	kmtonne	12.00			cargo rate>500lb
Mobilize Camp						
Road access	MCR	each	50000.00			refurbish existing camp
Mobilize Workers						
flight	MW	each	4500.00	9100.00		Low:e.g. 8 passenger; High: Dash 7
Oil Removal						
oil removal	OR	litre	0.43	1.20		Low:waste oil heater; High: ship offsite
PCB Removal						
Remove from site	PCBR	litre	40.20	46.90		Low: shipping, handling & disposal from Yellowknife
Pipes, small (<6in dia.)						
remove/dispose on site	PSR	m	1.00	24.00		Low: remove/dispose on site; High: remove/re-use
supply	PSS	m	6.10	11.10		Low:supply; High:supply and ship
install	PSI	m	25.00			
Pipes, large (>6in dia.)						
remove/dispose on site	PLR	m	22.00	72.00		Low: remove/dispose on site; High: remove/re-use
supply	PLS	m	129.00	143.00		Low:supply; High:supply and ship
install	PLI	m	50.00			
Power Lines						
remove/dispose on site	POWR	m	25.50			
Process Chemicals						
Remove from site	PCR	kg	0.45	2.50		Low: shipping, handling & disposal from Yellowknife
Pumps						
Pump capital cost	PC	each	195000.00			
Pump shipping	PS	each	2500.00			
Pump operating cost	POC	m3	0.12			pump operating costs should be calculated based on pump capacity, fuel costs, etc.
Pump maintenance	PM	allow	25000.00			
Pump sand BackFill						
	PBF	m3	85.00	300.00		
Scarify - road/mine site						
	SCFY	ha	4300	6030	2150	
Shaft, Raise & Portal Closures						
Shaft & Raises	SR	m2	645.00	2132.00		Low:pre-cast concrete slabs, little site prep. Area=shaft+>1m all around
Portals	POR	m3	18.80	250.00	1200.00	Low:unit cost code SCS;High:excavate & backfill collapsed portal;Spec: installed pressure plug
Site Inspection Report						
	RPT	each	10000.00	20000.00		
SpillWay - Clear						
	SW	each	3000.00	7000.00		
Survey/Instrumentation						
	SI	each	1800.00	3600.00		2 person crew
Treatment Plant - Construct						
Small (< 1000 m3/d)	TPS	lump sum	9000000	15000000		
Large (> 1000 m3/d)	TPL	lump sum	15000000	46000000		
Constructed Wetland	CWTS	ha	200000	300000		
Treatment Plant - Operate						
	TPO	m3	0.35	2.00		
Treatment Chemicals						
ferric sulphate	ferric	kg	1.19			
ferrous sulphate	ferrous	kg	1.32			
lime	lime	kg	0.56			
hydrogen peroxide, 35%	hperox	kg	1.50			
Sodium Metabisulfate	Nametab	kg	1.18			
Caustic soda, 50%	caustic	kg	0.74			
Sulfuric acid, 93%	sulfuric	kg	0.31			
flocculant	flocc	kg	6.00			
copper sulphate	copper	kg				
shipping	shipping	kg	0.20			
Vegetation						
Hydroseed, Flat	VHF	ha	4000.00			
Hydroseed, Sloped	VHS	ha	4500.00			
Veg. blanket/erosion mat	VB	ha	13000.00			
Tree planting	VT	ha	2600.00	6000.00		
Wetland species	VW	ha			47.72	Specified= /m3, Wetland Growth Media Substrate mixed and installed (sand, biochar and fertilizer, woodchips)
Water Sampling/Analysis/Reporting						
	WS	each	7000.00	10000.00		
Winter Road						
Construction	WRC	km	2000.00	11500.00		
Usage	WRU	kmtonne	0.29			

Open Pit Name: **Tiriganiaq Pit 1** **Pit # *1***

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
CONTROL ACCESS									
Fence		m		#N/A	$0.00	$0	50%	$0	$0
Signs	One sign every 150 m	each	17	SH	$37.08	$630	50%	$315	$315
Berm at crest	Perimeter = 2523 m x 2.5 m² (1m high berm with 1,5H:1V slope and 1 m width	m3	6308	DRH	$2.40	$15 139	50%	$7 570	$7 570
Rock Barricade at ramp	Assuming 20 m width ramp and barricade length of 5 m (2m thick)	m3	200	DRH	$2.40	$480	50%	$240	$240
Other				#N/A	$0.00	$0	50%	$0	$0
STABILITY STUDY									
Conduct stability and setback study		allow		#N/A	$0.00	$0	50%	$0	$0
STABILIZE SLOPES									
Off-load crest, soil A		m3		#N/A	$0.00	$0	50%	$0	$0
Off-load crest, soil B		m3		#N/A	$0.00	$0	50%	$0	$0
Doze/trim overburden at crest		m3		#N/A	$0.00	$0	50%	$0	$0
Drill & blast pit crest		m3		#N/A	$0.00	$0	50%	$0	$0
Buttress slope		m3		#N/A	$0.00	$0	50%	$0	$0
Other				#N/A	$0.00	$0	50%	$0	$0
COVER/CONTOUR SLOPES									
Place fill, soil A		m3		#N/A	$0.00	$0	50%	$0	$0
Place fill, soil B		m3		#N/A	$0.00	$0	50%	$0	$0
Rip rap		m3		#N/A	$0.00	$0	50%	$0	$0
Vegetate slopes		ha		#N/A	$0.00	$0	50%	$0	$0
Vegetate pit floor		ha		#N/A	$0.00	$0	50%	$0	$0
Other				#N/A	$0.00	$0	50%	$0	$0
CONSTRUCT DIVERSION DITCHES									
Excavate ditches -soil		m3		#N/A	$0.00	$0		$0	$0
Excavate ditches -rock		m3		#N/A	$0.00	$0		$0	$0
Rip rap in channel base		m3		#N/A	$0.00	$0		$0	$0
CONSTRUCT SPILLWAY									
Excavate channel		m3		#N/A	$0.00	$0		$0	$0
Concrete		m3		#N/A	$0.00	$0		$0	$0
Rip rap		m3		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
RECLAIM QUARRIES									
Contour slopes		m3		#N/A	$0.00	$0		$0	$0
Place overburden		m3		#N/A	$0.00	$0		$0	$0
Vegetate		m3		#N/A	$0.00	$0		$0	$0
FLOOD PIT-Captital									
Remove stationary equipment (sump pumps)		each	1	PRH	$6 742.00	$6 742	50%	$3 371	$3 371
Remove dewatering pipeline		m		#N/A	$0.00	$0		$0	$0
Remove power lines		each		#N/A	$0.00	$0		$0	$0
Construct diversion ditches		m3		#N/A	$0.00	$0		$0	$0
-Ditch, mat'l A		m3		#N/A	$0.00	$0		$0	$0
-Ditch, mat'l B		m3		#N/A	$0.00	$0		$0	$0
Construct embankment/dam		m3		#N/A	$0.00	$0		$0	$0
Supply/install pump station and piping system	From ICRP Amaruq 2016, assuming 80% of the cost if for Pit 1	each	1	AEM	$400 000.00	$400 000	50%	$200 000	$200 000
Piping installation	5 km of pipes from freshwater intake to pits	m	5000	PLIL	$50.00	$250 000	50%	$125 000	$125 000
Supply/install pump		each		#N/A	$0.00	$0		$0	$0
Remove pump post-closure		each		#N/A	$0.00	$0		$0	$0
Remove piping post-closure		m		#N/A	$0.00	$0		$0	$0
FLOOD PIT-Annual Cost									
Operate pumps (power)		each		#N/A	$0.00	$0		$0	$0
Maintain pump/piping	2 skilled laborers x 12hrs days, 4 month/yr	ınhours	2304	MBK	$49.60	$114 278	50%	$57 139	$57 139
Annual Pump Servicing	2x Manufacturer Consultants x 12 hours day x 7 days/yr	$/h	134.4	MBK	$120.00	$16 128	50%	$8 064	$8 064
Pump Servicing Travel Allowance	Round Trip Fligth/person	visits	1.6	MBK	$4 000.00	$6 400	50%	$3 200	$3 200
Accommodations	120 days x 2 skilled labourers + 7 days x 2 Consultants	andays	203.2	ACCML	$100.00	$20 320	50%	$10 160	$10 160
Passive/biological additives		$/ha		#N/A	$0.00	$0		$0	$0
Passive additives purchase and shipping		tonne		#N/A	$0.00	$0		$0	$0
Water from Meliadine Lake	9.2Mm³/3 years	m3	3066666.7	MBK	$0.03	$81 267		$0	$81 267
					Annual pumping costs	$238 393			
Number of years of pump flooding		years	3						
					Total pumping costs	$715 179	50%	$357 590	$357 590
					Total	$1 388 171		$694 085	$694 085
					% of Total			50%	50%

Open Pit Name: **Tiriganiaq Pit 2** **Pit # 2**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
CONTROL ACCESS									
Fence		m		#N/A	$0.00	$0	50%	$0	$0
Signs	every 150 m	each	8	SH	$37.08	$297	50%	$148	$148
Berm at crest	Perimeter = 1134 m x 2.5 m² (1m high berm	m3	2835	DRH	$2.40	$6 804	50%	$3 402	$3 402
Rock Barricade at ramp	Assuming 20 m width ramp and barricade l	m3	200	DRH	$2.40	$480	50%	$240	$240
Other				#N/A	$0.00	$0		$0	$0
STABILITY STUDY									
Conduct stability and setback study		allow		#N/A	$0.00	$0		$0	$0
STABILIZE SLOPES									
Off-load crest, soil A		m3		#N/A	$0.00	$0		$0	$0
Off-load crest, soil B		m3		#N/A	$0.00	$0		$0	$0
Doze/trim overburden at crest		m3		#N/A	$0.00	$0		$0	$0
Drill & blast pit crest		m3		#N/A	$0.00	$0		$0	$0
Buttress slope		m3		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
COVER/CONTOUR SLOPES									
Place fill, soil A		m3		#N/A	$0.00	$0		$0	$0
Place fill, soil B		m3		#N/A	$0.00	$0		$0	$0
Rip rap		m3		#N/A	$0.00	$0		$0	$0
Vegetate slopes		ha		#N/A	$0.00	$0		$0	$0
Vegetate pit floor		ha		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
CONSTRUCT DIVERSION DITCHES									
Excavate ditches -soil		m3		#N/A	$0.00	$0		$0	$0
Excavate ditches -rock		m3		#N/A	$0.00	$0		$0	$0
Rip rap in channel base		m3		#N/A	$0.00	$0		$0	$0
CONSTRUCT SPILLWAY									
Excavate channel		m3		#N/A	$0.00	$0		$0	$0
Concrete		m3		#N/A	$0.00	$0		$0	$0
Rip rap		m3		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
RECLAIM QUARRIES									
Contour slopes		m3		#N/A	$0.00	$0		$0	$0
Place overburden		m3		#N/A	$0.00	$0		$0	$0
Vegetate		m3		#N/A	$0.00	$0		$0	$0
FLOOD PIT-Captital									
Remove stationary equipment (sump pumps)		each	1	PRH	$6 742.00	$6 742	50%	$3 371	$3 371
Remove dewatering pipeline		m		#N/A	$0.00	$0		$0	$0
Remove power lines		each		#N/A	$0.00	$0		$0	$0
Construct diversion ditches		m3		#N/A	$0.00	$0		$0	$0
-Ditch, mat'l A		m3		#N/A	$0.00	$0		$0	$0
-Ditch, mat'l B		m3		#N/A	$0.00	$0		$0	$0
Construct embankment/dam		m3		#N/A	$0.00	$0		$0	$0
Supply/install pump station and piping syste	From ICRP Amaruq 2016, assuming 20% o	each	1	AEM	$100 000.00	$100 000	50%	$50 000	$50 000
Piping installation	500 m additonal	m	500	PLIL	$50.00	$25 000	50%	$12 500	$12 500
Supply/install piping system		each	0	#N/A	$0.00	$0		$0	$0
Remove pump post-closure		each		#N/A	$0.00	$0		$0	$0
Remove pipeline post-closure		m		#N/A	$0.00	$0		$0	$0
FLOOD PIT-Annual Cost									
Operate pumps (power)		each		#N/A	$0.00	$0		$0	$0
Maintain pump/piping	2 skilled labourers x 12hrs days, 4 month/yr	hours	576	MBK	$49.60	$28 570	50%	$14 285	$14 285
Annual Pump Servicing	2x Manufacturer Consultants x 12 hours da	$/h	33.6	MBK	$120.00	$4 032	50%	$2 016	$2 016
Pump Servicing Travel Allowance	Round Trip Fligth/person	visits	0.4	MBK	$4 000.00	$1 600	50%	$800	$800
Accomodations	120 days x 2 skilled labourers + 7 days x 2 (	andays	50.8	ACCML	$100.00	$5 080	50%	$2 540	$2 540
Passive/biological additives		$/ha		#N/A	$0.00	$0		$0	$0
Passive additives purchase and shipping		tonne		#N/A	$0.00	$0		$0	$0
Water from Meliadine Lake	2.25Mm³/3 years	m3	750000	MBK	$0.03	$19 875	50%	$9 938	$9 938
					Annual pumping costs	$59 157	50%	$29 578	$29 578
Number of years of pump flooding		years	3						
					Total pumping costs	177 469.80 $	50%	$88 735	$88 735
					Total	$316 792		$158 396	$158 396
					% of Total			50%	50%

Tailings Impoundment Name: **Tailings Storage Facility** **Pond # *1***

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
CONTROL ACCESS									
Fence		m		#N/A	$0.00	$0		$0	$0
Signs		each		#N/A	$0.00	$0		$0	$0
Berm		m3		#N/A	$0.00	$0		$0	$0
Block roads		m3		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
STABILIZE EMBANKMENT(S)									
Toe buttress, drainage layer		m3		#N/A	$0.00	$0		$0	$0
Toe buttress, bulk fill		m3		#N/A	$0.00	$0		$0	$0
Rip rap		m3		#N/A	$0.00	$0		$0	$0
Vegetate		ha		#N/A	$0.00	$0		$0	$0
Raise crest		m3		#N/A	$0.00	$0		$0	$0
Flatten slopes		m3		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
COVER TAILINGS									
Grade/shape tailings surface		m3		#N/A	$0.00	$0		$0	$0
Liner bedding		m3		#N/A	$0.00	$0		$0	$0
Subgrade preparation - compact		m2		#N/A	$0.00	$0		$0	$0
Supply geotextile/geosynthetic		m2		#N/A	$0.00	$0		$0	$0
Install geotextile/geosynthetic		m2		#N/A	$0.00	$0		$0	$0
Soil cover	Area top of TSF = 15 400 m² x 0.5 m thick C	m3	77000	SB3L	$5.10	$392 700	50%	$196 350	$196 350
Rock cover	Area top of TSF = 15 400 m² x 2.5 m thick W	m3	385000	RB1L	$11.40	$4 389 000	50%	$2 194 500	$2 194 500
Vegetate		m2		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
BURY PAG ROCK									
Relocate PAG rock		m3		#N/A	$0.00	$0		$0	$0
Place cover over PAG rock		m3		#N/A	$0.00	$0		$0	$0
Raise crest of dam		m3		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
STABILIZE DECANT SYSTEM									
Excavate and replace		m3		#N/A	$0.00	$0		$0	$0
Plug/backfill with concrete or clay		m3		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
REMOVE TAILINGS DISCHARGE									
Cyclones		m3		#N/A	$0.00	$0		$0	$0
Pipe		m3		#N/A	$0.00	$0		$0	$0
Remove reclaim barge		allow		#N/A	$0.00	$0		$0	$0
CONSTRUCT DIVERSION DITCHES									
Excavate ditches -soil		m3		#N/A	$0.00	$0		$0	$0
Excavate ditches -rock		m3		#N/A	$0.00	$0		$0	$0
Rip rap in channel base		m3		#N/A	$0.00	$0		$0	$0
FLOOD TAILINGS									
Doze tailings to final contour		m3		#N/A	$0.00	$0		$0	$0
Raise crest of dam		m3		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
UPGRADE SPILLWAY									
Excavate channel, rock		m3		#N/A	$0.00	$0		$0	$0
Excavate channel, soil		m3		#N/A	$0.00	$0		$0	$0
Concrete		m3		#N/A	$0.00	$0		$0	$0
Rip rap		m3		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
CONSTRUCT SEEPAGE COLLECTION POND									
Excavate seepage collection pond		m3		#N/A	$0.00	$0		$0	$0
Doze & spread excavated material		m3		#N/A	$0.00	$0		$0	$0
Vegetate spread material		ha		#N/A	$0.00	$0		$0	$0
Bedding layer		m3		#N/A	$0.00	$0		$0	$0
Supply geomembrane		m2		#N/A	$0.00	$0		$0	$0
Install geomembrane		m2		#N/A	$0.00	$0		$0	$0
Erosion protection layer		m3		#N/A	$0.00	$0		$0	$0
INSTALL GROUNDWATER COLLECTION SYSTEM									
Excavate/install sumps		m3		#N/A	$0.00	$0		$0	$0
Install pumping wells		m3		#N/A	$0.00	$0		$0	$0
Install pumps/pipelines/power supply		LS		#N/A	$0.00	$0		$0	$0
SPECIALIZED ITEMS									
Install permanent instrumentation, supply &	au moins 5 ou un peu plus	each		5 MBK	$10 000.00	$50 000	50%	$25 000	$25 000
Install permanent instrumentation, drilling		each		#N/A	$0.00	$0			$0
TREAT SEEPAGE - see "Water Management" and "Water Treatment"									
TREAT SUPERNATANT									
Pump water		m3		#N/A	$0.00	$0		$0	$0
Equipment maintenance and parts		allow		#N/A	$0.00	$0		$0	$0
Supply reagents		tonne		#N/A	$0.00	$0		$0	$0
					Annual treatment costs	$0			
Number of years of treatment		years							
					Total treatment costs	$0			$0
					Total	$4 831 700		$2 415 850	$2 415 850
					% of Total			50%	50%

* for construction of passive treatment system refer to "Water Management"

Underground Mine Name **Tiriganiaq** **UG Mine # *1***

ACTIVITY/MATERIAL	Notes	Unit	Qty	Code	Unit Cost	Cost % Land		Land Cost	Water Cost
CONTROL ACCESS									
Fence		m		#N/A	$0.00	$0		$0	$0
Signs	One sign per portal	each	2	SH	$37.08	$74	50%	$37	$37
Block roads		m3		#N/A	$0.00	$0		$0	$0
Berm		m3		RB1H	$17.05	$0	100%	$0	$0
Remove the portal (TTOG STEEL)	cut, remove and dispose in landfill	m2	1980	BRS1L	$45.00	$89 100	50%	$44 550	$44 550
Remove the portal (concrete)	break, remove and dispose in landfill	m2	3300	BRCH	$65.00	$214 500	50%	$107 250	$107 250
Backfill portal #1 + Contour portal area	105m length with slope x 8m deep x 30m wic	m3	12 600	SB1H	$5.90	$74 340	50%	$37 170	$37 170
Backfill portal #2 + Contour portal area	116m length with slope x 15m deep x 30m w	m3	26 100	SB1H	$5.90	$153 990	50%	$76 995	$76 995
Cap bulkhead , pit portal		each		#N/A	$0.00	$0		$0	$0
Plug portal #2		m3		#N/A	$0.00	$0		$0	$0
Raises (Cap and building demolition)	4 raises total - Concrete	m2	4	SNC	$20 000.00	$80 000	50%	$40 000	$40 000
Cap shaft #2		m3		#N/A	$0.00	$0		$0	$0
Backfill adits		m3		#N/A	$0.00	$0		$0	$0
Backfill open stope		m3		#N/A	$0.00	$0		$0	$0
Concrete cap over open stope		m3		#N/A	$0.00	$0		$0	$0
Contour portal area		m3		#N/A	$0.00	$0		$0	$0
REMOVE HAZARDOUS MATERIALS									
Remove hazardous materials, U/G labor	2 laborers, 12hr/day, 3 months	hour	2 160	scoopl	$170.00	$367 200	50%	$183 600	$183 600
Remove/decontam. stationary & elect. equip		hour	72	mechl	$49.00	$3 528	50%	$1 764	$1 764
Remove/decontam. mobile equipment	off site * Barge	hour	1 248	mechl	$49.00	$61 152	50%	$30 576	$30 576
Remove misc. haz. mat & explosives		kg	250	SNC	$10.00	$2 500	50%	$1 250	$1 250
Other		total		SNC	$0.00	$0	50%	$0	$0
INSTALL BULKHEADS									
Bulkheads to control water flow		each		#N/A	$0.00	$0		$0	$0
Grout bulkhead		m3		#N/A	$0.00	$0		$0	$0
FLOOD MINE									
Supply/install pump		each		#N/A	$0.00	$0		$0	$0
Supply/install piping system		each		#N/A	$0.00	$0		$0	$0
Operate pumps to flood workings		m3		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
INSTALL GROUNDWATER COLLECTION SYSTEM									
Excavate/install sumps		m2		#N/A	$0.00	$0		$0	$0
Install pumping wells		m3		#N/A	$0.00	$0		$0	$0
Install pumps/pipelines/power supply		LS		#N/A	$0.00	$0		$0	$0
SPECIALIZED ITEMS									
Install water quality monitoring pipes		each		#N/A	$0.00	$0		$0	$0
Install permanent pumping system		each		#N/A	$0.00	$0		$0	$0
Install permanent instrumentation		each	5	MBK	$10 000.00	$50 000		$0	$50 000
					Total	$1 096 384		$523 192	$573 192
					% of Total			48%	52%

* Cost for barge

Rock Pile Name: **WRSF 1**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
STABILIZE SLOPES									
Flatten slopes with dozer		m3		#N/A	$0.00	$0		$0	$0
Flatten "bubble dump" areas		m3		#N/A	$0.00	$0		$0	$0
Divert runon, ditch mat'l A		m3		#N/A	$0.00	$0		$0	$0
Divert runon, ditch mat'l B		m3		#N/A	$0.00	$0		$0	$0
Toe buttress, drain mat'l		m3		#N/A	$0.00	$0		$0	$0
Toe buttress, fill mat'l A		m3		#N/A	$0.00	$0		$0	$0
Toe buttress, fill mat'l B		m3		#N/A	$0.00	$0		$0	$0
Grade WRSF 1	1.0 m over 50 % of WRSF 1 footprint (41.4 h	m3	207000	DRL	$1.05	$217 350	50%	$108 675	$108 675
COVER ROCK PILE									
Subgrade preparation - doze surface		m3		#N/A	$0.00	$0		$0	$0
Soil cover - excavate,haul,spread&compact		m3		#N/A	$0.00	$0		$0	$0
Rock cover - excavate,haul & spread		m3		#N/A	$0.00	$0		$0	$0
Excavate downslope drainage channel & chute		m3		#N/A	$0.00	$0		$0	$0
Rip rap drainage channel and chute		m3		#N/A	$0.00	$0		$0	$0
Vegetate		ha		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
VERY LOW PERMEABILITY COVER (in addition to above)									
Liner subgrade preparation - compact		m2		#N/A	$0.00	$0		$0	$0
Supply geomembrame		m2		#N/A	$0.00	$0		$0	$0
Install geomembrane		m2		#N/A	$0.00	$0		$0	$0
Protective cover - excavate,haul,spread&compact		m3		#N/A	$0.00	$0		$0	$0
Vegetate		ha		#N/A	$0.00	$0		$0	$0
Install infiltration/seepage instrumentation		allow		#N/A	$0.00	$0		$0	$0
CONSTRUCT DIVERSION DITCHES									
Excavate ditches -soil		m3		#N/A	$0.00	$0		$0	$0
Excavate ditches -rock		m3		#N/A	$0.00	$0		$0	$0
Rip rap in channel base		m3		#N/A	$0.00	$0		$0	$0
CONSTRUCT SEEPAGE COLLECTION POND									
Excavate seepage collection pond		m3		#N/A	$0.00	$0		$0	$0
Doze & spread excavated material		m3		#N/A	$0.00	$0		$0	$0
Vegetate spread material		ha		#N/A	$0.00	$0		$0	$0
Bedding layer		m3		#N/A	$0.00	$0		$0	$0
Supply geomembrane		m2		#N/A	$0.00	$0		$0	$0
Install geomembrane		m2		#N/A	$0.00	$0		$0	$0
Erosion protection layer		m3		#N/A	$0.00	$0		$0	$0
INSTALL GROUNDWATER COLLECTION SYSTEM									
Excavate/install sumps		m3		#N/A	$0.00	$0		$0	$0
Install pumping wells		m3		#N/A	$0.00	$0		$0	$0
Install pumps/pipelines/power supply		allow		#N/A	$0.00	$0		$0	$0
RELOCATE DUMPS									
Load, haul, dump or doze		m3		#N/A	$0.00	$0		$0	$0
Add lime		tonne		#N/A	$0.00	$0		$0	$0
Contour reclaimed area		ha		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
SPECIALIZED ITEMS									
Install permanent instrumentation		each	3	MBK	$10 000.00	$30 000	50%	$15 000	$15 000
Install permanent instrumentation, drilling		each		#N/A	$0.00	$0		$0	$0
TREAT ROCK PILE SEEPAGE - see "Water Treatment"									
HEAP LEACH SEEPAGE TREATMENT - Cyanide Detox									
Cyanide destruction water treatment pumping		m3		#N/A	$0.00	$0		$0	$0
Reagents		tonnes		#N/A	$0.00	$0		$0	$0
Electrician/mechanic to maintain treatment plant		allow		#N/A	$0.00	$0		$0	$0
Equipment maintenance and parts		allow		#N/A	$0.00	$0		$0	$0
				Annual treatment costs		$0			
Number of years of treatment		years							
				Total treatment costs		$0			$0
HEAP LEACH SEEPAGE TREATMENT - ARD/ML**									
Upgrade/modify pumping system - report to WTP		allow		#N/A	$0.00	$0			$0
					Total	$247 350		$123 675	$123 675
					% of Total			50%	50%

* For construction of passive treatment system refer to "Water Management". ARD/ML seepage treatment becomes post-closure water treatment cost

**Heap leach ARD/ML seepage treatment becomes post-closure water treatment cost

Rock Pile Name: **WRSF 2** ***1***

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
STABILIZE SLOPES									
Flatten slopes with dozer		m3		#N/A	$0.00	$0		$0	$0
Flatten "bubble dump" areas		m3		#N/A	$0.00	$0		$0	$0
Divert runon, ditch mat'l A		m3		#N/A	$0.00	$0		$0	$0
Divert runon, ditch mat'l B		m3		#N/A	$0.00	$0		$0	$0
Toe buttress, drain mat'l		m3		#N/A	$0.00	$0		$0	$0
Toe buttress, fill mat'l A		m3		#N/A	$0.00	$0		$0	$0
Toe buttress, fill mat'l B		m3		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
COVER ROCK PILE									
Subgrade preparation - doze surface		m3		#N/A	$0.00	$0		$0	$0
Soil cover - excavate,haul,spread&compact		m3		#N/A	$0.00	$0		$0	$0
Rock cover - excavate,haul & spread		m3		#N/A	$0.00	$0		$0	$0
Excavate downslope drainage channel & chute		m3		#N/A	$0.00	$0		$0	$0
Rip rap drainage channel and chute		m3		#N/A	$0.00	$0		$0	$0
Vegetate		ha		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
VERY LOW PERMEABILITY COVER (in addition to above)									
Liner subgrade preparation - compact		m2		#N/A	$0.00	$0		$0	$0
Supply geomembrame		m2		#N/A	$0.00	$0		$0	$0
Install geomembrane		m2		#N/A	$0.00	$0		$0	$0
Protective cover - excavate,haul,spread&compact		m3		#N/A	$0.00	$0		$0	$0
Vegetate		ha		#N/A	$0.00	$0		$0	$0
Install infiltration/seepage instrumentation		allow		#N/A	$0.00	$0		$0	$0
CONSTRUCT DIVERSION DITCHES									
Excavate ditches -soil		m3		#N/A	$0.00	$0		$0	$0
Excavate ditches -rock		m3		#N/A	$0.00	$0		$0	$0
Rip rap in channel base		m3		#N/A	$0.00	$0		$0	$0
CONSTRUCT SEEPAGE COLLECTION POND									
Excavate seepage collection pond		m3		#N/A	$0.00	$0		$0	$0
Doze & spread excavated material		m3		#N/A	$0.00	$0		$0	$0
Vegetate spread material		ha		#N/A	$0.00	$0		$0	$0
Bedding layer		m3		#N/A	$0.00	$0		$0	$0
Supply geomembrane		m2		#N/A	$0.00	$0		$0	$0
Install geomembrane		m2		#N/A	$0.00	$0		$0	$0
Erosion protection layer		m3		#N/A	$0.00	$0		$0	$0
INSTALL GROUNDWATER COLLECTION SYSTEM									
Excavate/install sumps		m3		#N/A	$0.00	$0		$0	$0
Install pumping wells		m3		#N/A	$0.00	$0		$0	$0
Install pumps/pipelines/power supply		allow		#N/A	$0.00	$0		$0	$0
RELOCATE DUMPS									
Load, haul, dump or doze		m3		#N/A	$0.00	$0		$0	$0
Add lime		tonne		#N/A	$0.00	$0		$0	$0
Contour reclaimed area		ha		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
SPECIALIZED ITEMS									
Install permanent instrumentation		each		3 MBK	$10 000.00	$30 000	50%	$15 000	$15 000
Install permanent instrumentation, drilling		each		#N/A	$0.00	$0		$0	$0
TREAT ROCK PILE SEEPAGE - see "Water Treatment"									
HEAP LEACH SEEPAGE TREATMENT - Cyanide Detox									
Cyanide destruction water treatment pumping		m3		#N/A	$0.00	$0		$0	$0
Reagents		tonnes		#N/A	$0.00	$0		$0	$0
Electrician/mechanic to maintain treatment plant		allow		#N/A	$0.00	$0		$0	$0
Equipment maintenance and parts		allow		#N/A	$0.00	$0		$0	$0
					Annual treatment costs	$0			
Number of years of treatment		years							
					Total treatment costs	$0			$0
HEAP LEACH SEEPAGE TREATMENT - ARD/ML**									
Upgrade/modify pumping system - report to WTP		allow		#N/A	$0.00	$0			$0
					Total	$30 000		$15 000	$15 000
					% of Total			50%	50%

* For construction of passive treatment system refer to "Water Management". ARD/ML seepage treatment becomes post-closure water treatment cost

**Heap leach ARD/ML seepage treatment becomes post-closure water treatment cost

Rock Pile Name: **WRSF 3** ***2***

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
STABILIZE SLOPES									
Flatten slopes with dozer		m3		#N/A	$0.00	$0		$0	$0
Flatten "bubble dump" areas		m3		#N/A	$0.00	$0		$0	$0
Divert runon, ditch mat'l A		m3		#N/A	$0.00	$0		$0	$0
Divert runon, ditch mat'l B		m3		#N/A	$0.00	$0		$0	$0
Toe buttress, drain mat'l		m3		#N/A	$0.00	$0		$0	$0
Toe buttress, fill mat'l A		m3		#N/A	$0.00	$0		$0	$0
Toe buttress, fill mat'l B		m3		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
COVER ROCK PILE									
Subgrade preparation - doze surface		m3		#N/A	$0.00	$0		$0	$0
Soil cover - excavate,haul,spread&compact		m3		#N/A	$0.00	$0		$0	$0
Rock cover - excavate,haul & spread		m3		#N/A	$0.00	$0		$0	$0
Excavate downslope drainage channel & chute		m3		#N/A	$0.00	$0		$0	$0
Rip rap drainage channel and chute		m3		#N/A	$0.00	$0		$0	$0
Vegetate		ha		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
VERY LOW PERMEABILITY COVER (in addition to above)									
Liner subgrade preparation - compact		m2		#N/A	$0.00	$0		$0	$0
Supply geomembrame		m2		#N/A	$0.00	$0		$0	$0
Install geomembrane		m2		#N/A	$0.00	$0		$0	$0
Protective cover - excavate,haul,spread&compact		m3		#N/A	$0.00	$0		$0	$0
Vegetate		ha		#N/A	$0.00	$0		$0	$0
Install infiltration/seepage instrumentation		allow		#N/A	$0.00	$0		$0	$0
CONSTRUCT DIVERSION DITCHES									
Excavate ditches -soil		m3		#N/A	$0.00	$0		$0	$0
Excavate ditches -rock		m3		#N/A	$0.00	$0		$0	$0
Rip rap in channel base		m3		#N/A	$0.00	$0		$0	$0
CONSTRUCT SEEPAGE COLLECTION POND									
Excavate seepage collection pond		m3		#N/A	$0.00	$0		$0	$0
Doze & spread excavated material		m3		#N/A	$0.00	$0		$0	$0
Vegetate spread material		ha		#N/A	$0.00	$0		$0	$0
Bedding layer		m3		#N/A	$0.00	$0		$0	$0
Supply geomembrane		m2		#N/A	$0.00	$0		$0	$0
Install geomembrane		m2		#N/A	$0.00	$0		$0	$0
Erosion protection layer		m3		#N/A	$0.00	$0		$0	$0
INSTALL GROUNDWATER COLLECTION SYSTEM									
Excavate/install sumps		m3		#N/A	$0.00	$0		$0	$0
Install pumping wells		m3		#N/A	$0.00	$0		$0	$0
Install pumps/pipelines/power supply		allow		#N/A	$0.00	$0		$0	$0
RELOCATE DUMPS									
Load, haul, dump or doze		m3		#N/A	$0.00	$0		$0	$0
Add lime		tonne		#N/A	$0.00	$0		$0	$0
Contour reclaimed area		ha		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
SPECIALIZED ITEMS									
Install permanent instrumentation		each		3 MBK	$10 000.00	$30 000	50%	$15 000	$15 000
Install permanent instrumentation, drilling		each		#N/A	$0.00	$0		$0	$0
TREAT ROCK PILE SEEPAGE - see "Water Treatment"									
HEAP LEACH SEEPAGE TREATMENT - Cyanide Detox									
Cyanide destruction water treatment pumping		m3		#N/A	$0.00	$0		$0	$0
Reagents		tonnes		#N/A	$0.00	$0		$0	$0
Electrician/mechanic to maintain treatment plant		allow		#N/A	$0.00	$0		$0	$0
Equipment maintenance and parts		allow		#N/A	$0.00	$0		$0	$0
					Annual treatment costs	$0			
Number of years of treatment		years							
					Total treatment costs	$0			$0
HEAP LEACH SEEPAGE TREATMENT - ARD/ML**									
Upgrade/modify pumping system - report to WTP		allow		#N/A	$0.00	$0			$0
					Total	$30 000		$15 000	$15 000
					% of Total			50%	50%

* For construction of passive treatment system refer to "Water Management". ARD/ML seepage treatment becomes post-closure water treatment cost

**Heap leach ARD/ML seepage treatment becomes post-closure water treatment cost

Chemicals/Soil Area Name:

Note: The procedures, equipment and packaging for clean up and removal of chemicals or contaminated soils are highly dependent on the nature of the chemicals and their existing state of containment. Government guidelines should be consulted on an individual chemical basis. Any estimate made here should be considered very rough unless specific evaluations have been conducted.

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
HAZARDOUS MATERIALS AUDIT									
Hazardous materials audit		mandays		#N/A	$0.00	$0		$0	$0
Phase 1 audit		each	1	MBK	$7 500.00	$7 500	50%	$3 750	$3 750
Phase 2 audit		each	1	MBK	$50 000.00	$50 000	50%	$25 000	$25 000
BUILDING DECONTAMINATION & CONSOLIDATION OF HAZARDOUS MATERIALS									
Environmental technician/coordinator		mandays		#N/A	$0.00	$0		$0	$0
Decontaminate: oil, fuel and glycol systems		mandays		#N/A	$0.00	$0		$0	$0
Decontaminate maintenance shop		h	140	journeyh	$71.79	$10 051	50%	$5 025	$5 025
Decontaminate power plant		h	140	journeyh	$71.79	$10 051	50%	$5 025	$5 025
Decontaminate bulk fuel storage		h	140	journeyh	$71.79	$10 051	50%	$5 025	$5 025
Decontaminate emulsion plant		h	36	journeyh	$71.79	$2 584	50%	$1 292	$1 292
Decontaminate offices/warehouse/accom		mandays		#N/A	$0.00	$0		$0	$0
Removal of asbestos siding on buildings		m2		#N/A	$0.00	$0		$0	$0
Removal of friable asbestos on equipment		m2		#N/A	$0.00	$0		$0	$0
HAZARDOUS MATERIALS REMOVAL									
Waste oils		litre	40000	ORL	$0.43	$17 200	50%	$8 600	$8 600
Waste fuel	Type 1, e.g. diesel dregs	litre	235910	ORL	$0.43	$101 441	50%	$50 721	$50 721
Waste batteries		each	1	MBK	$3 000.00	$3 000	50%	$1 500	$1 500
Mill and water treatment reagents		kg	339887	PCRH	$2.50	$849 718	50%	$424 859	$424 859
Assay & environmental lab reagents		kg	10000	pcrh	$2.50	$25 000	50%	$12 500	$12 500
Machine shop paints, solvents etc		litre	7500	EXPLO	$1.50	$11 250	50%	$5 625	$5 625
Glycol		kg	60000	PCRH	$2.50	$150 000	50%	$75 000	$75 000
Process reagents		kg		#N/A	$0.00	$0		$0	$0
Nuclear sources		allow		#N/A	$0.00	$0		$0	$0
Other hazardous materials		allow		#N/A	$0.00	$0		$0	$0
HAZARDOUS MATERIALS									
Transportation to disposal facility		allow		#N/A	$0.00	$0		$0	$0
Disposal fees		allow		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
CONTAMINATED SOILS									
Contam. soil investigation - Phase 1		each	1	MEL	$25 000.00	$25 000	50%	$12 500	$12 500
Contam. soil investigation - Phase 2		each	1	MEL	$100 000.00	$100 000	50%	$50 000	$50 000
CONTAMINATED SOIL REMOVAL									
Excavate, load, haul to biopile or: Excavate and transpo	landfarm	m3	700	SC4L	$9.30	$6 510	50%	$3 255	$3 255
Remediate on-site at biopile or: Manage hydrocarbon r	landfarm	m3	5000	CSRL	$47.00	$235 000	50%	$117 500	$117 500
Reagents/stabilizing agent		m2		#N/A	$0.00	$0	50%	$0	$0
Excavate and transport to offsite facility		m3	250		$1 000.00	$250 000	50%	$125 000	$125 000
Contour decontaminated area		m3		#N/A	$0.00	$0		$0	$0
CONTAMINATED SOIL VERY LOW PERMEABILITY COVER									
Supply geomembrame, HDPE, ES3, GCL		m2		#N/A	$0.00	$0		$0	$0
Upper and lower bedding layers		m3		#N/A	$0.00	$0		$0	$0
Install geomembrane, HDPE, ES3, GCL		m2		#N/A	$0.00	$0		$0	$0
Erosion protection layer		m3		#N/A	$0.00	$0		$0	$0
Vegetate		m2		#N/A	$0.00	$0		$0	$0
Install infiltration/seepage instrumentation		allow		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
OTHER									
				#N/A	$0.00	$0		$0	$0
					Total	$1 864 355		$932 178	$932 178
					% of Total			50%	50%

Building / Equip Name: **Meliadine** **Bldg / Equip #:** ***1***

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
DISPOSE MOBILE EQUIPMENT (surfa)									
Dispose and ship off-site		allow		#N/A	$0.00	$0		$0	$0
Dispose on-site		allow		#N/A	$0.00	$0		$0	$0
Decontaminate on-site	surface equipment only	anhours	1739	mechl	$49.00	$85 211	50%	$42 606	$42 606
REMOVE BUILDINGS - see note below									
Accomodation Complex	dorms, corridors, kitchen, laundry, dry, rec hall, ERT	m2	15915	BRS1L	$45.00	$716 175	50%	$358 088	$358 088
Main Building process plant	Assuming 5000 TPD plant	m2	148212	BRS1H	$65.00	$9 633 780	50%	$4 816 890	$4 816 890
Crusher and conveyor		m2	1524	BRS1L	$45.00	$68 564	50%	$34 282	$34 282
Tire Shop		m2	134	BRS1L	$45.00	$6 038	50%	$3 019	$3 019
Offices, Repair, Lab, Warehouse (MSB)	workers dry Offices, Multi Services Building	m2	21454	BRS1L	$45.00	$965 435	50%	$482 718	$482 718
Storage Facilites		m2		BRS1L	$45.00	$0	50%	$0	$0
Sewage water Treatment Facilities		m2	311	BRS1L	$45.00	$14 004	50%	$7 002	$7 002
Effluent water treatment facilities		m2	1182	BRS1L	$45.00	$53 171	50%	$26 586	$26 586
Saline water treatment facilities		m2	9767	BRS1L	$45.00	$439 514	50%	$219 757	$219 757
Potable water treatment facilities		m2	54	BRS1L	$45.00	$2 435	50%	$1 217	$1 217
Water and Wastewater Treatment Facilities - Pur	RO treatment plant, EWTP, SWTP, STP, WTP	each	5	SNC	$80 000.00	$400 000	50%	$200 000	$200 000
U/G Heating Plant		m2		BRS1L	$45.00	$0	50%	$0	$0
Emulsion Plant and garage		m2	851	BRS1L	$45.00	$38 301	50%	$19 151	$19 151
AN Storage Facility		m2		BRS1L	$45.00	$0	50%	$0	$0
Storage Facility at Laydown/Airstrip		m2		BRS1L	$45.00	$0	50%	$0	$0
Fuel tanks on-site		m2	3768	BRS1L	$45.00	$169 552	50%	$84 776	$84 776
Fuel Tanks Itivia		m2		BRS1L	$45.00	$0	50%	$0	$0
Reclaim pumps		m2		BRS1L	$45.00	$0	50%	$0	$0
Outfall & Diffuser		m2		BRS1L	$45.00	$0	50%	$0	$0
Airstrip lighting, navigation, electrician		mandays		BRS1L	$45.00	$0	50%	$0	$0
Airstrip lighting, navigation, mechanical		mandays		BRS1L	$45.00	$0	50%	$0	$0
Break foundation slabs		m2	25072	BRCS	$6.00	$150 434	50%	$75 217	$75 217
Batch Plant		m2	3013	BRS1L	$45.00	$135 584	50%	$67 792	$67 792
Power Plant		m2	9392	BRS1L	$45.00	$422 647	50%	$211 324	$211 324
Consolidate & dump boneyard debris		m3		BRS1L	$45.00	$0	50%	$0	$0
Paste Plant		m2	3630	BRS1L	$45.00	$163 350	50%	$81 675	$81 675
Guard House	Gate Trailer House	m2	37	BRS1L	$45.00	$1 652	50%	$826	$826
Itivia Harbour - Saline Water Tank		m2		BRS1L	$45.00	$0	50%	$0	$0
Itivia Floating Dock + Portable Crane		m2		BRS1L	$45.00	$0	50%	$0	$0
Incinerator Building		m2	533	BRS1L	$45.00	$23 997	50%	$11 999	$11 999
Mine Surface General	existing and future office, megadome, explos. plant	m2		BRS1L	$45.00	$0	50%	$0	$0
Maintenance Shop	Mechanical shops and Megadome	m2	6285	BRS1L	$45.00	$282 814	50%	$141 407	$141 407
Exploration Camp	Existing does not include fuel storage area	m2	4257	BRS1L	$45.00	$191 565	50%	$95 783	$95 783
Assay Lab/Core shack		m2	5705	BRS1L	$45.00	$256 725	50%	$128 363	$128 363
Raises Building/		m2	2156	BRS1L	$45.00	$97 033	50%	$48 516	$48 516
Saline effluent Itivia		m		#N/A	$0.00	$0	50%	$0	$0
Communication Tower		m2	247	BRS1L	$45.00	$11 136	50%	$5 568	$5 568
LANDFILL and landfarm									
Place rock coverfil	landfill 7750 m² (as-built), covered with 3.7 m WR	m3	28675	RR3L	$7.00	$200 725	50%	$100 363	$100 363
Place rock cover landfarm		m3		#N/A	$0.00	$0		$0	$0
Base, sides and cover of closure landfill		m3		RR3L	$7.00	$0		$0	$0
GRADE AND CONTOUR PADS									
Accomodation Complex		m3	11671.00	AEM	$8.47	$98 853	50%	$49 427	$49 427
Exploration Camp		m3	4682.70	AEM	$8.47	$39 662	50%	$19 831	$19 831
Process Facilities		m3		AEM	$8.47	$0	50%	$0	$0
Offices, Repair, Lab, Warehouse (MSB)		m3	4394.698	AEM	$8.47	$37 223	50%	$18 612	$18 612
Storage Facilites	Containers area	m3	51562	AEM	$8.47	$436 730	50%	$218 365	$218 365
Water and Wastewater Treatment Facilities		m3	2771.32	AEM	$8.47	$23 473	50%	$11 737	$11 737
U/G Heating Plant		m3		AEM	$8.47	$0	50%	$0	$0
Emulsion Plant and Garage		m3	482.60	AEM	$8.47	$4 088	50%	$2 044	$2 044
Main Building process plant		m3	13662.00	AEM	$8.47	$115 717	50%	$57 859	$57 859
Place rock cover		m3		AEM	$8.47	$0	50%	$0	$0
Vegetate		m3		AEM	$8.47	$0	50%	$0	$0
Itivia Harbour - Saline Water Tank		m3		AEM	$8.47	$0	50%	$0	$0
Guard House		m3	40.392	AEM	$8.47	$342	50%	$171	$171
Fuel tanks on-site		m3	888.13	AEM	$8.47	$7 522	50%	$3 761	$3 761
Fuel Tanks Itivia		m3		AEM	$8.47	$0	50%	$0	$0
Incinerator Building		m3	209.00	AEM	$8.47	$1 770	50%	$885	$885
Paste Plant		m3	726.00	AEM	$8.47	$6 149	50%	$3 075	$3 075
Power Plant		m3	2173.50	AEM	$8.47	$18 410	50%	$9 205	$9 205
Assay Lab		m3		AEM	$8.47	$0	50%	$0	$0
Maintenance Shop		m3	3606.90	AEM	$8.47	$30 550	50%	$15 275	$15 275
Mine Surface General		m3		AEM	$8.47	$0	50%	$0	$0
Communication Tower		m3	13.38	AEM	$8.47	$113	50%	$57	$57
Core shack		m3	1925.00	AEM	$8.47	$16 305	50%	$8 152	$8 152
Crusher and conveyor		m3	1676.02	AEM	$8.47	$14 196	50%	$7 098	$7 098
Raises Building/		m3	847.11	AEM	$8.47	$7 175	50%	$3 588	$3 588
Batch Plant		m3	1215.50	AEM	$8.47	$10 295	50%	$5 148	$5 148
Tire Shop		m3	77.00	AEM	$8.47	$652	50%	$326	$326
Ore Pad	Ore pad footprint based on GA	m3	103000.00	AEM	$8.47	$872 410	50%	$436 205	$436 205
PUNCTURE LINED SUMPS									
Puncture liner and place soil cover		m3		#N/A	$0.00	$0		$0	$0
RECLAIM ROADS									
Remove culverts	16 based on Water Management Plan	each	16	MBK	$4 000.00	$64 000	50%	$32 000	$32 000
Remove bridges		each		#N/A	$0.00	$0	50%	$0	$0
Scarify and install water breaks	About 15 km road on site, mean width about 12 m	ha	18	SCFYL	$4 300.00	$77 400	50%	$38 700	$38 700
Scarify airstriip		ha		#N/A	$0.00	$0		$0	$0
Scarify laydown areas		ha		#N/A	$0.00	$0		$0	$0
Vegetate		ha		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
SPECIALIZED ITEMS									
Dispose of misc. debris and laydown area refuse				#N/A	$0.00	$0		$0	$0
					Total	$16 412 878		$8 206 439	$8 206 439
					% of Total			50%	50%

Note: Unit costs are based on 3m high, single storey building. Scale larger building areas accordingly. E.g. (H m /3) * Foot print m2

Building / Equip Name: **ITIVIA + Road** **Bldg / Equip #:** **AWAR / ITIVIA**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
DISPOSE MOBILE EQUIPMENT									
Dispose and ship off-site		allow		#N/A	$0.00	$0		$0	$0
Dispose on-site		allow		#N/A	$0.00	$0		$0	$0
Decontaminate on-site		manhours		#N/A	$0.00	$0		$0	$0
REMOVE BUILDINGS - see note below									
Accomodation Complex	dorms, corridors, kitchen, laundry, dry, rec hall, ERT	m2		BRS1H	$65.00	$0		$0	$0
Process Facilities		m2		BRS1H	$65.00	$0		$0	$0
Offices, Repair, Lab, Warehouse		m2		BRS1H	$65.00	$0		$0	$0
Storage Facilites		m2		BRS1H	$65.00	$0		$0	$0
Water and Wastewater Treatment Facilities	RO treatment plant, EWTP, SWTP, STP, WTP	m2		BRS1H	$65.00	$0		$0	$0
Water and Wastewater Treatment Facilities	- Pumping systems	m3		#N/A	$0.00	$0		$0	$0
U/G Heating Plant		m2		BRS1H	$65.00	$0		$0	$0
Emulsion Plant		m2		BRS1H	$65.00	$0		$0	$0
AN Storage Facility		m2		BRS1H	$65.00	$0		$0	$0
Warehouse, Shops and Other		m2		BRS1H	$65.00	$0		$0	$0
Storage Facility at Laydown/Airstrip		m2		BRS1H	$65.00	$0		$0	$0
Fuel tanks on-site		m2		BRS1H	$65.00	$0		$0	$0
Fuel Tanks Itivia	3 tanks - 20ML and 13.5ML and 4ML	m2	4918	BRS1L	$45.00	$221 310	50%	$110 655	$110 655
Reclaim pumps		m2		BRS1H	$65.00	$0		$0	$0
Outfall & Diffuser		m2		BRS1H	$65.00	$0		$0	$0
Airstrip lighting, navigation, electrician		mandays		BRS1H	$65.00	$0		$0	$0
Airstrip lighting, navigation, mechanical		mandays		BRS1H	$65.00	$0		$0	$0
Break foundation slabs	about 1m below ground surface	m2	4918	BRCS	$6.00	$29 508	50%	$14 754	$14 754
Power Plant		m2		BRS1H	$65.00	$0		$0	$0
Consolidate & dump boneyard debris		m3		BRS1H	$65.00	$0		$0	$0
Paste Plant		m2		BRS1H	$65.00	$0		$0	$0
Guard House	Gate Trailer House	m2		BRS1H	$65.00	$0		$0	$0
Itivia Harbour - Saline Water Tank	salt water tank 15ML	m2	23.4	BRS1L	$45.00	$1 053	50%	$527	$527
Itivia Floating Dock + Portable Crane	Lump sum for reclamation	each	1	SNC	$50 000.00	$50 000		$0	$50 000
Incinerator Building		m2		BRS1H	$65.00	$0		$0	$0
Mine Surface General	existing and future office, megadome, explos. plant	m2		BRS1H	$65.00	$0		$0	$0
Maintenance Shop	Including Oil Separation Treatment System	m2		BRS1H	$65.00	$0		$0	$0
Exploration Camp	Existing does not include fuel storage area	m2		BRS1H	$65.00	$0		$0	$0
Assay Lab		m2		BRS1H	$65.00	$0		$0	$0
Raises Building		m2		BRS1H	$65.00	$0		$0	$0
Communication tower				#N/A	$0.00	$0		$0	$0
LANDFILL FOR DEMOLITION WASTE									
Place rock cover	WR over operation landfill	m3		#N/A	$0.00	$0		$0	$0
Place soil cover	Soil Cap - Landfill and Septic Field	m3		#N/A	$0.00	$0		$0	$0
Base, sides and cover of closure landfill		ha		#N/A	$0.00	$0		$0	$0
GRADE AND CONTOUR PADS									
Accomodation Complex		ha		#N/A	$0.00	$0		$0	$0
Exploration Camp									
Process Facilities		ha		#N/A	$0.00	$0		$0	$0
Offices, Repair, Lab, Warehouse		ha		#N/A	$0.00	$0		$0	$0
Storage Facilites	Laydown areas and material storage area	m3	66800	AEM	$8.47	$565 796	50%	$282 898	$282 898
Water and Wastewater Treatment Facilities		ha		#N/A	$0.00	$0		$0	$0
U/G Heating Plant		ha		#N/A	$0.00	$0		$0	$0
Emulsion Plant		ha		#N/A	$0.00	$0		$0	$0
Main Building process plant		ha		#N/A	$0.00	$0		$0	$0
Place rock cover		ha		#N/A	$0.00	$0		$0	$0
Vegetate		ha		#N/A	$0.00	$0		$0	$0
Itivia Harbour - Saline Water Tank		ha	23.400	AEM	$8.47	$198	50%	$99	$99
Guard House		ha		#N/A	$0.00	$0		$0	$0
Fuel tanks on-site		ha		#N/A	$0.00	$0		$0	$0
Fuel Tanks Itivia	Tank farm	m^3	16350.00	AEM	$8.47	$138 485	50%	$69 242	$69 242
Incinerator Building		ha		#N/A	$0.00	$0		$0	$0
Paste Plant		ha		#N/A	$0.00	$0		$0	$0
Power Plant		ha		#N/A	$0.00	$0		$0	$0
Assay Lab		ha		#N/A	$0.00	$0		$0	$0
Maintenance Shop		ha		#N/A	$0.00	$0		$0	$0
Mine Surface General		ha		#N/A	$0.00	$0		$0	$0
PUNCTURE LINED SUMPS									
Puncture liner and place soil cover		m3		#N/A	$0.00	$0		$0	$0
RECLAIM QUARRIES									
Drill and blast slopes to 1:1	18 quarries and borrow pits, including 3 from site	m3	14319	RB3H	$17.80	$254 878	50%	$127 439	$127 439
RECLAIM ROADS									
Remove culverts	8 x AWAR, 19 x Bypass	each	27	MBK	$4 000.00	$108 000	50%	$54 000	$54 000
Remove bridges	Meliadine river bridge and M5 bridge	each	2	MBK	$25 000.00	$50 000	50%	$25 000	$25 000
Scarify and install water breaks	23.8 km AWAR, 6.2 km Bypass, 6.5m width	ha	19.5	SCFYL	$4 300.00	$83 850	50%	$41 925	$41 925
Scarify airstriip		ha		#N/A	$0.00	$0		$0	$0
Scarify laydown areas		ha		#N/A	$0.00	$0		$0	$0
Vegetate		ha		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
SPECIALIZED ITEMS									
Dispose of misc. debris and laydown area refuse				#N/A	$0.00	$0		$0	$0
					Total	$1 503 078		$726 539	$776 539
					% of Total			48%	52%

Capital Expenditures and Short Term Water Treatment identified in 'Instructions' worksheet

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
BREACH DYKE EMBANKMENT						
Excavate breaches	D-CP1, D-CP5, D-CP6	m3	2407.2	SB1H	$5.90	$14 202
Contour water intake area		m3		#N/A	$0.00	$0
STABILIZE SEDIMENT PONDS/WATER MANAGEMENT PONDS						
Place soil cover		m3		#N/A	$0.00	$0
Doze & spread excavated material		m3		#N/A	$0.00	$0
Vegetate spread material		ha		#N/A	$0.00	$0
Rip rap in channel base		each		#N/A	$0.00	$0
Saline Ponds	berm of SP1 and berm of SP3	m3	6030	SB1L	$4.30	$25 929
P-area	Water Licence B			#N/A	$0.00	$0
REDIRECT RUNOFF/CONSTRUCT DIVERSION DITCHES						
Excavate ditches -soil		m3		#N/A	$0.00	$0
Excavate ditches -rock		m3		#N/A	$0.00	$0
Stabilize side slopes		m3		#N/A	$0.00	$0
Rip rap in channel base		m3		#N/A	$0.00	$0
BREACH DITCHES						
Excavate Diversion Berms	Remove completely Berm 1 and 3	m3	13017	SB1L	$4.30	$55 973
Removal berms of containment pond	Berm-CP3 and Berm-CP4	m3	128780	SB1L	$4.30	$553 754
Backfill & contour channels	8 Diversion Channels	m3	26781	SB1L	$4.30	$115 158
Install flow dissipation		m3		#N/A	$0.00	$0
Vegetate remainder of ditch		m2		#N/A	$0.00	$0
DECOMISSION FRESH WATER SUPPLY						
Breach embankment		m		#N/A	$0.00	$0
Remove pump	Infras CP1-CP5-CP6	each	3	SNC	$80 000.00	$240 000
Remove pipeline - Diffuser Meliadine Lake		m	390	PLRL	$22.00	$8 580
Effluent diffuser Meliadine Lake		each	1	MBK	$3 000.00	$3 000
Freshwater intake	remove pump	each	1	MBK	$3 000.00	$3 000
Remove pipeline - Saline effluent		m	778	PLRL	$22.00	$17 116
Saline water effluent (Itivia)		each	1	MBK	$3 000.00	$3 000
WATER CONTROL IN RECLAMATION QUARRY						
Install pumping system		LS		#N/A	$0.00	$0
Remove pumping system		LS		#N/A	$0.00	$0
REMOVE PIPELINES						
Remove piping on site	18,5 km length	m	18500	PLRL	$22.00	$407 000
Concrete plug deep pipes		m3		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
GROUNDWATER COLLECTION SYSTEM						
Excavate/install sumps		m3		#N/A	$0.00	$0
Install pumping wells		m3		#N/A	$0.00	$0
Install pumps/pipelines/power supply		LS		#N/A	$0.00	$0
CONSTRUCT CONTAMINATED WATER STORAGE POND						
Excavate pond		m3		#N/A	$0.00	$0
Doze & spread excavated material		m3		#N/A	$0.00	$0
Vegetate spread material		ha		#N/A	$0.00	$0
Bedding layer		m3		#N/A	$0.00	$0
Supply geomembrane		m2		#N/A	$0.00	$0
Install geomembrane		m2		#N/A	$0.00	$0
Erosion protection layer		m3		#N/A	$0.00	$0
CONSTRUCT PASSIVE TREATMENT SYSTEM (e.g. Constructed Wetland)						
Construct access roads		km		#N/A	$0.00	$0
Install HDPE piping system from collection pond		m		#N/A	$0.00	$0
Inter-cell flow structures		allow		#N/A	$0.00	$0
Install liners		m2		#N/A	$0.00	$0
Install growth media		m3		#N/A	$0.00	$0
Wetland vegetation		ha		#N/A	$0.00	$0
CONSTRUCT WATER TREATMENT PLANT						
Build treatment plant		LS		#N/A	$0.00	$0
Build sludge containment facility		LS		#N/A	$0.00	$0
SHORT TERM WATER TREATMENT*						
Annual water treatment cost, from "Water Treatment"						$0
					Total	$1 446 713

*Note: include water treatment cost from "Water Treatment" worksheet if treatment is considered short term and is not included in a particular component worksheet.

Long-Term / Post-Closure Water Treatment

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
ADDITION OF REAGENTS						
H2O2		kg		#N/A	$0.00	$0
lime		kg		#N/A	$0.00	$0
ferric sulphate		kg		#N/A	$0.00	$0
ferrous sulphate		kg		#N/A	$0.00	$0
flocculents		kg		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
LABOUR AND SUPPLIES						
Annual fuel		litres		#N/A	$0.00	$0
Annual power		kW-h		#N/A	$0.00	$0
Electrician/mechanic to maintain treatment plant		allow		#N/A	$0.00	$0
Equipment maintenance and parts		allow		#N/A	$0.00	$0
Misc. supplies, hoses, tools		allow		#N/A	$0.00	$0
Communications		allow		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
WATER MANAGEMENT						
Water Treatment (reagents, equip.)	CP1 volume at max water elev (normal condition)	m3	742075	AEM	$0.75	$556 556
Skilled laborer	1 labor x 12hr/day x 6 months/yr	manhou	2160	OPER-W	$41.00	$88 560
Annual Treatment Plant Servicing	2 consultants x 7days/year	manhou	168	MBK	$120.00	$20 160
Treatment Plant Servicing Travel Allowance	Round trip flight/person	visits	2	MBK	$4 000.00	$8 000
Camps Accomodations	30 days x 6 months + 7 days x 2 consultants	days	194	ACCML	$100.00	$19 400
WATER SAMPLING AND ANALYSES						
Sampling equipment		allow		#N/A	$0.00	$0
Analyses		allow		#N/A	$0.00	$0
Shipping to laboratory		allow		#N/A	$0.00	$0
Reporting		allow		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
SITE ACCESS						
Road maintenance (incl. snow removal)		allow		#N/A	$0.00	$0
Winter road tariff		allow		#N/A	$0.00	$0
Truck rental		allow		#N/A	$0.00	$0
Air support		allow		#N/A	$0.00	$0
				Annual water treatment costs		$692 676
Number of years of water treatment		years	3			
					Total	$2 078 029

Note: Short term water treattment is intended to be included in "Water Management", whereas long term, or post-closure, water treatment is included in "Post-Closure Monitoring and Maintenance"

Closure Monitoring & Maintenance:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
MONITORING & INSPECTIONS Active Closure						
Annual geotechnical inspection	1 eng, trans, rep, 5 days $150 h, accom	each	1	AEM	$16 000.00	$16 000
Annual Surface water sampling	Estimated cost from AEM	each	1	WSH	$42 997.00	$42 997
Groundwater sampling	AEM sampling cost list	each		WSH	$0.00	$0
Receiving/downstream water sampling		each		WSH	$0.00	$0
Monitoring program (Meliadine and AWAR)	AEM sampling cost list	each	1	AEM	$955 000.00	$955 000
Underground water		each	1	SNC	$0.00	$0
Regulatory costs*		each		#N/A	$0.00	$0
Site water monitoring (AEMP and SNP)		each		#N/A	$0.00	$0
- Active closure and flooding		each		#N/A	$0.00	$0
- Post pit flooding		each		#N/A	$0.00	$0
Air Quality Monitoring Program (AQMP)		each		#N/A	$0.00	$0
Wildlife Effects Monitoring Program (WEMP)		each		#N/A	$0.00	$0
Vegetation Monitoring		each	1	#N/A	$0.00	$0
Other				#N/A	$0.00	$0
COVER MAINTENANCE						
Repair erosion - infill gullies		allow		#N/A	$0.00	$0
Repair erosion - upgrade diversion ditches		allow		#N/A	$0.00	$0
Remove problem vegetation		allow		#N/A	$0.00	$0
Repair animal damage		allow		#N/A	$0.00	$0
Repair/upgrade access controls		allow		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
SPILLWAY MAINTENANCE						
Repair erosion		m3		#N/A	$0.00	$0
Clear spillway		each		#N/A	$0.00	$0
CWTS MAINTENANCE						
Maintain flow, restore vegetation		allow		#N/A	$0.00	$0
MAINTENANCE AND SURVEILLANCE						
Site care-taker	bi-weekly visits, 2 care-takers, 12hr/day, 5 months per year	ınhours	480	OPERH	$65.00	$31 200
Site vehicule and equipment		allow	1	AEM	$20 000.00	$20 000
Accomodation and site maintenance		mandays/ALLOWS	40	ACCMh	$175.00	$7 000
Subtotal, Annual post-closure costs						$1 072 197
Discount rate for calculation of net present value of post-closure cost, %				3.00%		
Number of years of post-closure activity				3	years	
Present Value of payment stream						$3 032 829

*Regulatory costs - annual reporting, management plans, progress reports etc.

Include water treatment cost from "Water Treatment" worksheet if treatment is considered long term, such as ARD/ML.

Closure Monitoring & Maintenance:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost

POST Closure Monitoring & Maintenance:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost	Unit Cost	Cost
MONITORING & INSPECTIONS						
Annual geotechnical inspection	1 eng, trans, rep, 5 days $150 h, accom	each	1	AEM	$16 000.00	$16 000
Annual Surface water sampling	Estimated cost from AEM	each	1	WSH	$42 927.00	$42 927
Groundwater sampling	AEM sampling cost list	each		WSH	$0.00	$0
Receiving/downstream water sampling		each		WSH	$0.00	$0
Monitoring program (Meliadine and AWAR)	AEM sampling cost list	each	1	AEM	$477 500.00	$477 500
Survey inspection		each		#N/A	$0.00	$0
Regulatory costs*		each		#N/A	$0.00	$0
Site water monitoring (AEMP and SNP)		each		#N/A	$0.00	$0
- Active closure and flooding		each		#N/A	$0.00	$0
- Post pit flooding		each		#N/A	$0.00	$0
Air Quality Monitoring Program (AQMP)		each		#N/A	$0.00	$0
Wildlife Effects Monitoring Program (WEMP)		each		#N/A	$0.00	$0
Vegetation Monitoring		each		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
COVER MAINTENANCE						
Repair erosion - infill gullies		allow		#N/A	$0.00	$0
Repair erosion - upgrade diversion ditches		allow		#N/A	$0.00	$0
Remove problem vegetation		allow		#N/A	$0.00	$0
Repair animal damage		allow		#N/A	$0.00	$0
Repair/upgrade access controls		allow		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
SPILLWAY MAINTENANCE						
Repair erosion		m3		#N/A	$0.00	$0
Clear spillway		each		#N/A	$0.00	$0
CWTS MAINTENANCE						
Maintain flow, restore vegetation		allow		#N/A	$0.00	$0
MAINTENANCE AND SURVEILLANCE						
Site care-taker	bi-weekly visits, 2 care-takers, 12hr/day, 5 months per year	ınhours	480	OPERH	$65.00	$31 200
Site vehicule and equipment		allow	1	AEM	$20 000.00	$20 000
Accomodation and site maintenance		mandays/ALLOWS	40	ACCMh	$175.00	$7 000
Subtotal, Annual post-closure costs						$594 627
Discount rate for calculation of net present value of post-closure cost, %				3.00%		
Number of years of post-closure activity				7	years	
Present Value of payment stream						$3 704 694

Total closure and post closure 10 years $6 737 523

*Regulatory costs - annual reporting, management plans, progress reports etc.
Include water treatment cost from "Water Treatment" worksheet if treatment is considered long term, such as ARD/ML.

Interim Care and Maintenance

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
INTERIM CARE & MAINTENANCE						
on-site caretaker		manmonths		#N/A	0	$0
extra personnel		manmonths		#N/A	0	$0
-electrician		manmonths		#N/A	0	$0
-mechanic		manmonths		#N/A	0	$0
annual fuel		litre		#N/A	0	$0
misc. supplies		allow		#N/A	0	$0
pick-up truck		each		#N/A	0	$0
small dozer		allow		#N/A	0	$0
small excavator		allow		#N/A	0	$0
snow machine		allow		#N/A	0	$0
communications		allow		#N/A	0	$0
SNP/AEMP water sampling & reporting		each		#N/A	0	$0
geotechnical assessment		each		#N/A	0	$0
interim water treatment				#N/A		$692 676
Maintenance, surveillance, monitoring and inspection-Active closure		each	1	#N/A		$1 072 197
				Annual	Interim C&M Cost	$1 764 873
Number of years of ICM		years	3		**Total**	5 294 619.75 $

Mobilization/Demobilization:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
MOBILIZE HEAVY EQUIPMENT						
Excavators		each		#N/A	0	$0
Barge to/from Rankin Inlet		each	3	AEM	1000000	$3 000 000
Dump trucks		each		#N/A	0	$0
Dozers		each		#N/A	0	$0
Demolition shears		each	1	#N/A	1000000	$1 000 000
Crane		each		#N/A	0	$0
Loader		each		#N/A	0	$0
Compactor		each		#N/A	0	$0
Light duty vehicles		each		#N/A	0	$0
MOBILIZE MISC. EQUIPMENT						
Pump shipping		each		#N/A	0	$0
Pipe shipping		m		#N/A	0	$0
Minor tools and equipment		allow		#N/A	0	$0
Truck tires		allow		#N/A	0	$0
Other				#N/A	0	$0
MOBILIZE CAMP						
Reclamation activities		allow		#N/A	0	$0
Long term reclamation activities (eg pump flooding)		allow		#N/A	0	$0
MOBILIZE WORKERS						
Reclamation activities - transport	26 workers, 4 trips/yr, 3 yr	each	312	AEM	1386	$432 432
Reclamation activities - travel time	26 workers, 4 trips/yr, 6h/trip, 3 yr	hour	1872	lab-usl	31	$58 032
Long term reclamation activities (eg pump flooding) - transport		each		#N/A	0	$0
Long term reclamation activities (eg pump flooding) - travel time		each		#N/A	0	$0
Monitoring Airfare		each		#N/A	0	$0
Rotations over reclamation period		manhours		#N/A	0	$0
Crew Rotations		each		#N/A	0	$0
WORKER ACCOMODATIONS						
Reclamation activities	Maintain camp for 26 workers, 180 days/yr, 3yr	andays	14040	ACCML	100	$1 404 000
Long term reclamation activities (eg pump flooding)		manmonths		#N/A	0	$0
MOBILIZE FUEL						
Fuel freight - reclamation activities		litre		#N/A	0	$0
Fuel freight - long term reclamation activities		litre		#N/A	0	$0
Fuel freight accomodations		litre		#N/A	0	$0
WINTER ROAD						
Construction and operation		km		#N/A	0	$0
Limited winter use		km		#N/A	0	$0
Winter road tarriff		km		#N/A	0	$0
DEMOBILIZE HEAVY EQUIPMENT						
Excavators		km		#N/A	0	$0
Mobile equipment		km	12235	MHERH	10.25	$125 409
Dump trucks		km		#N/A	0	$0
Seacans	Estimated 6000 to be the maximal capacity on site, 50 % of which remains at the site for closure	km	90000	MHERH	10.25	$922 500
Dozers		km		#N/A	0	$0
Demolition shears		km	30	MHERH	10.25	$308
Crane		km		#N/A	0	$0
Loader		km		#N/A	0	$0
Compactor		each		#N/A	0	$0
Light duty vehicles		km		#N/A	0	$0
Other		km		#N/A	0	$0
DEMOBILIZE CAMP						
		allow		#N/A	0	$0
DEMOBILIZE WORKERS						
crew travel time		mandays		#N/A	0	$0
crew transportation		each		#N/A	0	$0
WINTER ROAD						
Construction and operation		km		#N/A	0	$0
Limited winter use		km		#N/A	0	$0
Winter road tarriff		km		#N/A	0	$0
					Total	**$6 942 680**

Appendix Q

Infrastructures As-Built and Design

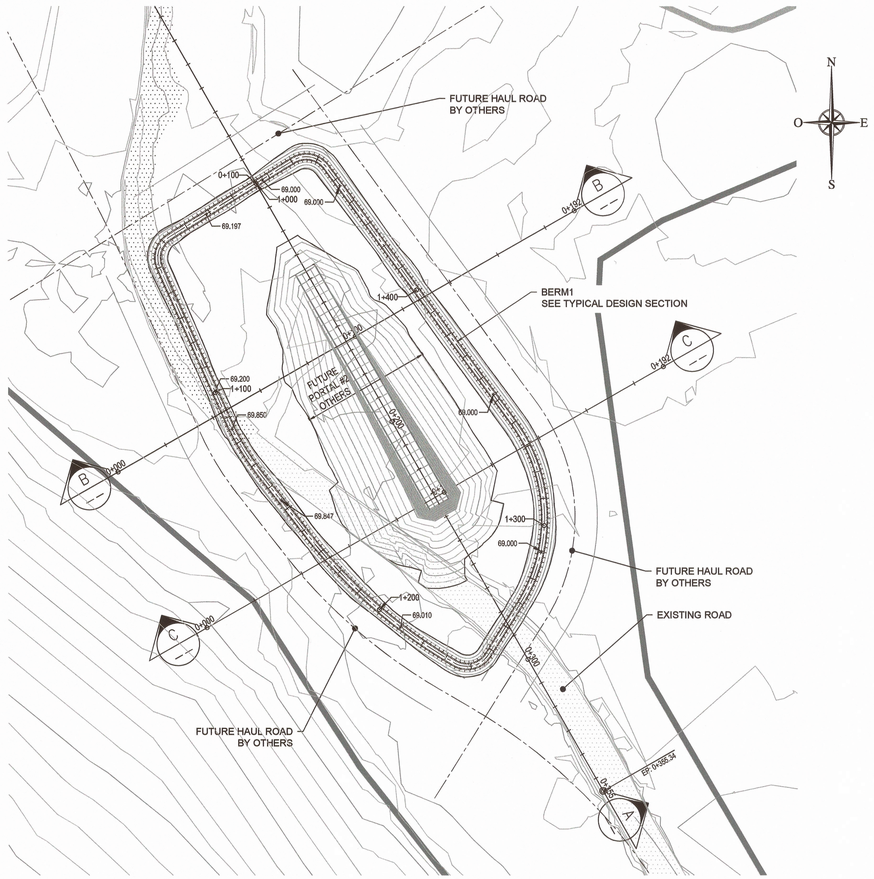
Appendix Q

Infrastructures As-Built and Design

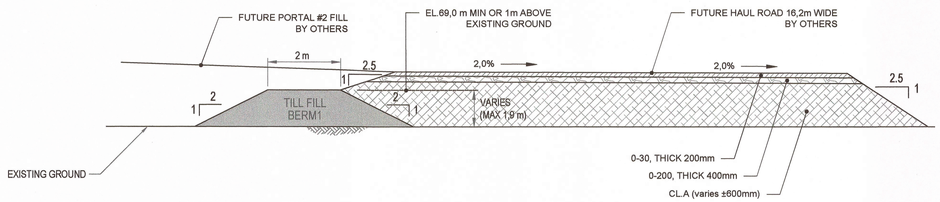
Berm 1

NO. DESSIN
DRAWING NO. 65-695-230-219&220_R0

FORMAT ARCHD

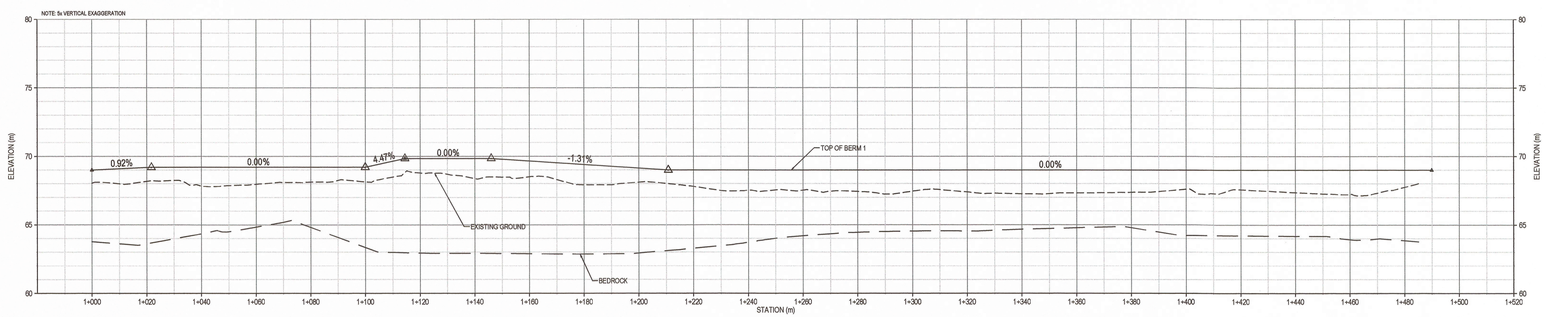


PLAN / VIEW
SCALE 1:1000



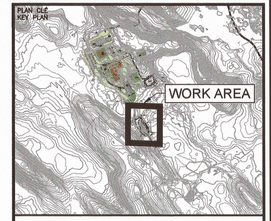
TYPICAL DESIGN SECTION - BERM1
N.T.S.

QUANTITIES CONSTRUCTION CHART *	
BERM1	
MATERIAL	QUANTITIES
SELECTED UNFROZEN TILL FILL	3260 m³
* MATERIAL QUANTITIES ARE ESTIMATED IN-PLACE QUANTITIES	



PROFILE OF BERM 1 ALONG
CENTRELINE
HOR. SCALE : 1:1000
VERT. SCALE : 1:200

PLAN CLÉ
KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

POUR CONSTRUCTION
FOR CONSTRUCTION
AGNICO EAGLE
DATE : 2017-02-17

CETTE INFORMATION EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET NE DOIT ÊTRE RETOURNÉE SUR DEMANDE. SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE REPRODUCTION DE COPIE(S) À AUTRE FIN QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES. © AGNICO EAGLE LTÉE

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPYING WHATSOEVER, TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. © AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
–	–
–	–
–	–
–	–
–	–
–	–

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2017-02-17	ISSUED FOR CONSTRUCTION	P.H.	J.A.	
A	2017-02-13	ISSUED FOR COMMENTS	P.H.	J.A.	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES INC.
O/A TETRA TECH
Signature
Date 2017-02-17
PERMIT NUMBER: P 1029
NTNU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
J.M.I.F. ALARIE
LICENSEE
2017/02/17

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
695 –WATER MANAGEMENT
230 – GENERAL EARTH WORKS
BERM #1
LAYOUT PLAN AND PROFILE

DESSINÉ PAR / DRAWN BY	PATRICK HAMEL	DATE 2017-02-17
VERIFIÉ PAR / CHECKED BY	MÉLANIE YIP WOON SUN	2017-02-17
APPROUVÉ PAR / APPROVED BY	JOSÉE ALARIE	2017-02-17
ÉCHELLE / SCALE	AS INDICATED	DATE 2016-09-15
NO. DESSIN / DRAWING NO.	65-695-230-219	
NO. PROJET / PROJECT NO.	6515/28920	REVISION 0 / FEUILLE / SHT 1 / 1

AE-CART-ARCH D

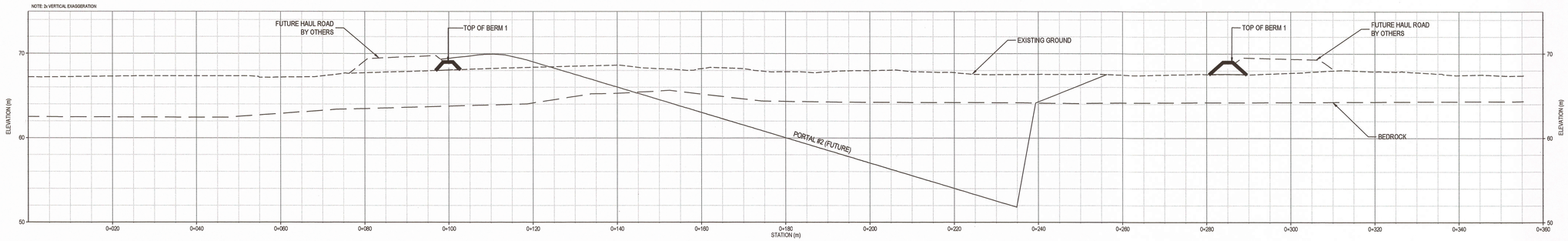
P:\28920\DESSIN\CIV-INFRA\DESSINS DE TRAVAIL\AUTOCAD\65-695-230-219&220_R0.dwg-2013-02-19 14:03:29

FILE NO. 65-695-230-219&220_R0.dwg

NO. DESSIN
DRAWING NO. 65-695-230-219&220_R0

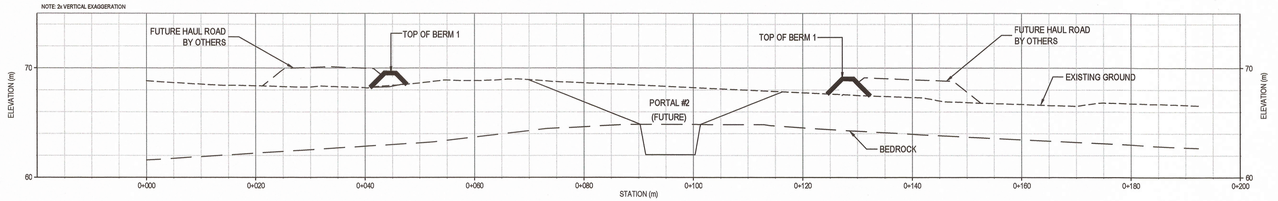
FORMAT ARCHD

NOTE: 2x VERTICAL EXAGGERATION



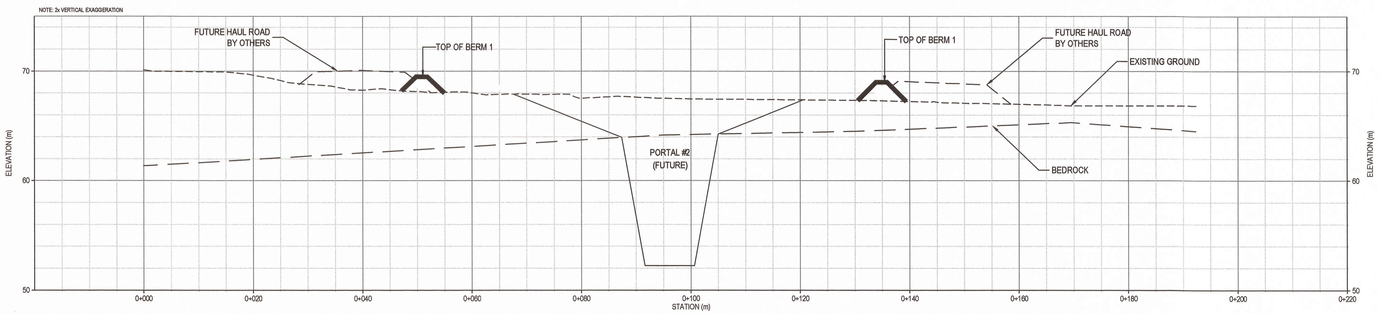
CROSS-SECTION A
HOR. SCALE : 1:500
VERT. SCALE : 1:250

NOTE: 2x VERTICAL EXAGGERATION



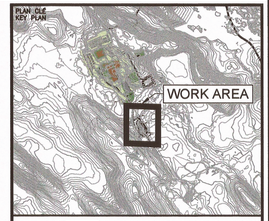
CROSS-SECTION B
HOR. SCALE : 1:500
VERT. SCALE : 1:250

NOTE: 2x VERTICAL EXAGGERATION



CROSS-SECTION C
HOR. SCALE : 1:500
VERT. SCALE : 1:250

PLAN-CLÉ
KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

POUR CONSTRUCTION
FOR CONSTRUCTION
AGNICO EAGLE
DATE : 2017-02-17

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE DISSÉMINATION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES. © AGNICO EAGLE LTÉE.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST, WITHOUT WRITTEN PERMISSION, ANY COPIES TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. © AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
–	–
–	–
–	–
–	–
–	–
–	–

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2017-02-17	ISSUED FOR CONSTRUCTION	P.H.	J.A.	
A	2017-02-13	ISSUED FOR COMMENTS	P.H.	J.A.	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
P/A TETRA TECH
Signature
Date 2017-02-17
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
J.M.I.F. ALARIE
LICENSEE
2017/02/17

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
695 –WATER MANAGEMENT
230 – GENERAL EARTH WORKS
BERM #1
CROSS-SECTIONS

DESSINÉ PAR / DRAWN BY	PATRICK HAMEL	DATE 2017-02-17
VÉRIFIÉ PAR / CHECKED BY	MÉLANIE YIP WOON SUN	2017-02-17
APPROUVÉ PAR / APPROVED BY	JOSÉE ALARIE	2017-02-17
ÉCHELLE / SCALE	AS INDICATED	DATE 2016-09-15

NO. DESSIN / DRAWING NO. 65-695-230-220

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6515/28920	0	1 / 1

AE-GART-ARCH D

P:\28920\DESSIN\CIV-INFRA\DESSINS DE TRAVAIL\AUTOCAD\65-695-230-219&220_R0.dwg-2013-02-19 14:03:29

FILE NO. 65-695-230-219&220_R0.dwg

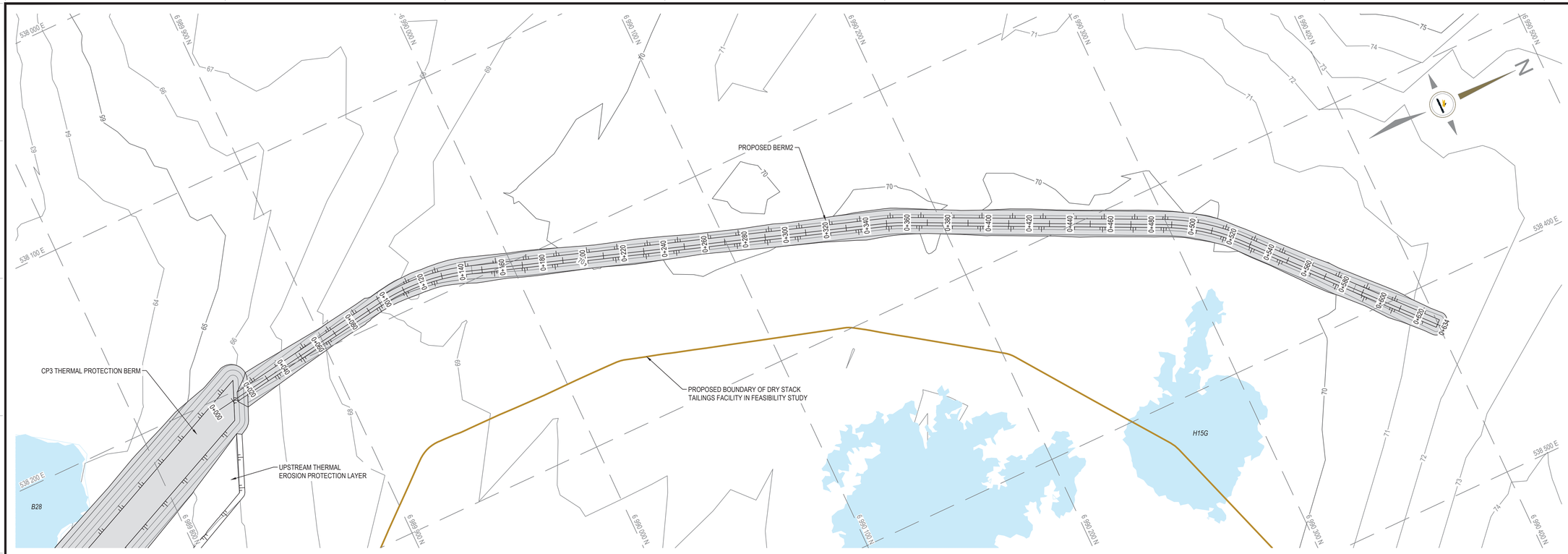
Appendix Q

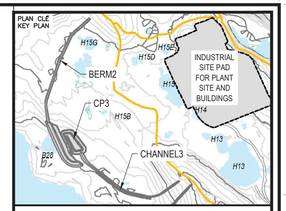
Infrastructures As-Built and Design

Berm 2

NO. DESSIN
DRAWING NO. 65-695-230-245

FORMAT ARCHD





BERM2 LAYOUT POINTS		
STATION	NORTHING	EASTING
0+000	6 989 837.76	538 205.54
0+010	6 989 847.64	538 204.03
0+020	6 989 857.53	538 202.53
0+030	6 989 867.42	538 201.02
0+040	6 989 877.30	538 199.52
0+050	6 989 887.19	538 198.02

BERM2 LAYOUT POINTS		
STATION	NORTHING	EASTING
0+060	6 989 897.07	538 196.51
0+070	6 989 906.96	538 195.01
0+080	6 989 916.85	538 193.50
0+090	6 989 926.73	538 192.00
0+100	6 989 936.63	538 190.58
0+110	6 989 946.61	538 189.98

BERM2 LAYOUT POINTS		
STATION	NORTHING	EASTING
0+120	6 989 956.60	538 190.39
0+130	6 989 966.49	538 191.78
0+140	6 989 976.20	538 194.16
0+150	6 989 985.70	538 197.28
0+160	6 989 995.19	538 200.45
0+170	6 990 004.67	538 203.62

BERM2 LAYOUT POINTS		
STATION	NORTHING	EASTING
0+180	6 990 014.16	538 206.79
0+190	6 990 023.64	538 209.96
0+200	6 990 033.13	538 213.12
0+210	6 990 042.61	538 216.29
0+220	6 990 052.10	538 219.46
0+230	6 990 061.58	538 222.63

BERM2 LAYOUT POINTS		
STATION	NORTHING	EASTING
0+240	6 990 071.07	538 225.80
0+250	6 990 080.55	538 228.97
0+260	6 990 090.04	538 232.14
0+270	6 990 099.52	538 235.31
0+280	6 990 109.00	538 238.47
0+290	6 990 118.49	538 241.64

BERM2 LAYOUT POINTS		
STATION	NORTHING	EASTING
0+300	6 990 127.97	538 244.81
0+310	6 990 137.46	538 247.98
0+320	6 990 146.94	538 251.15
0+330	6 990 156.43	538 254.32
0+340	6 990 165.91	538 257.49
0+350	6 990 175.39	538 260.68

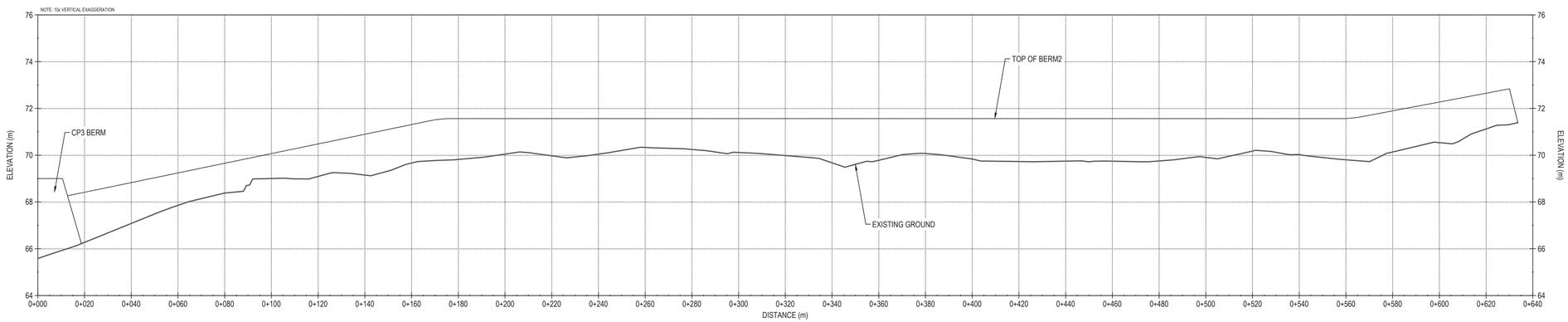
BERM2 LAYOUT POINTS		
STATION	NORTHING	EASTING
0+360	6 990 184.61	538 264.55
0+370	6 990 193.64	538 268.84
0+380	6 990 202.67	538 273.14
0+390	6 990 211.70	538 277.43
0+400	6 990 220.73	538 281.72
0+410	6 990 229.76	538 286.02

BERM2 LAYOUT POINTS		
STATION	NORTHING	EASTING
0+420	6 990 238.79	538 290.31
0+430	6 990 247.83	538 294.60
0+440	6 990 256.86	538 298.90
0+450	6 990 265.89	538 303.19
0+460	6 990 274.92	538 307.48
0+470	6 990 283.95	538 311.78

BERM2 LAYOUT POINTS		
STATION	NORTHING	EASTING
0+480	6 990 292.98	538 316.07
0+490	6 990 301.98	538 320.43
0+500	6 990 310.60	538 325.50
0+510	6 990 318.66	538 331.41
0+520	6 990 326.08	538 338.10
0+530	6 990 332.87	538 345.44

BERM2 LAYOUT POINTS		
STATION	NORTHING	EASTING
0+540	6 990 339.54	538 352.90
0+550	6 990 346.21	538 360.35
0+560	6 990 352.87	538 367.80
0+570	6 990 359.54	538 375.25
0+580	6 990 366.21	538 382.71
0+590	6 990 372.88	538 390.16

BERM2 LAYOUT POINTS		
STATION	NORTHING	EASTING
0+600	6 990 379.54	538 397.61
0+610	6 990 386.21	538 405.06
0+620	6 990 392.88	538 412.52
0+630	6 990 399.55	538 419.97



BERM2 PROFILE
SCALE: H-1:1000 V-1:100

NOTES GÉNÉRALES / GENERAL NOTES

1. ASSUMED CONSTRUCTION SCHEDULE FOR CHANNEL3 FALL / WINTER 2018.
2. ASSUMED GEOTEXTILE THAT MEETS MATERIAL SPECIFICATION WILL BE AVAILABLE AT SITE FOR CHANNEL3 CONSTRUCTION.
3. MATERIAL PLACEMENT AND FOUNDATION PREPARATION SHOULD BE IN ACCORDANCE WITH THE REQUIREMENTS OF GEOTECHNICAL CONSTRUCTION / MATERIAL SPECIFICATIONS (TETRA TECH 2018).

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date June 21, 2018
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2018-06-21
AGNICO EAGLE

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES. © AGNICO EAGLE LTD.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST, WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. © AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
--	--
--	--
--	--
--	--
--	--
--	--

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2018-06-21	ISSUED FOR CONSTRUCTION	HX	WTH	
A	2018-05-29	ISSUED FOR REVIEW	HX	WTH	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER H.20A LICENSEE WTH(N) 2018
REGISTERED PROFESSIONAL ENGINEER W.T. HORNE LICENSEE N.W.T. 2018

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

BERM2
LAYOUT PLAN

DESSINÉ PAR / DRAWN BY	EL	DATE 2018-06-21
VÉRIFIÉ PAR / CHECKED BY	HX	2018-06-21
APPROUVÉ PAR / APPROVED BY	WTH	2018-06-21
ÉCHELLE / SCALE	1:1000	DATE 2018-06-21
NO. DESSIN / DRAWING NO.	65-695-230-245	
NO. PROJET / PROJECT NO.	6515	REVISION 0
FEUILLE / SHT	10 / 13	

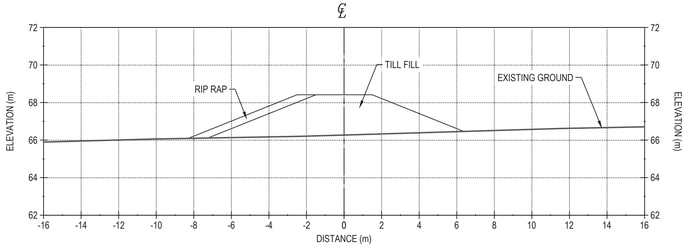
AE-CART-ARCH D

Q:\Edmonton\Engineering\E141\Projects_MELIADINE\CP3_CP4 Detailed Design\CP3\65-695-230-245.dwg-2013-02-19 14:03:29

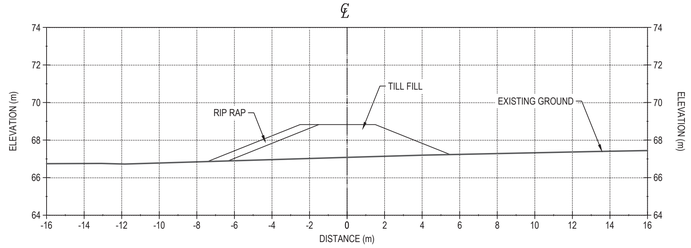
FILE NO. 65-695-230-245.dwg

NO. DESSIN
DRAWING NO. 65-695-230-246

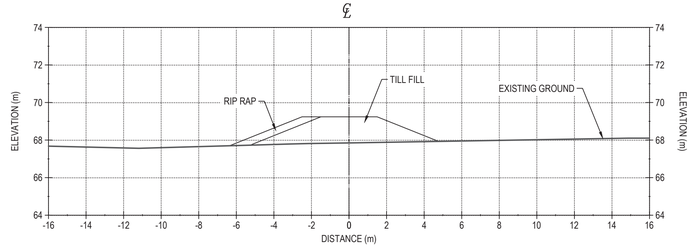
FORMAT ARCHD



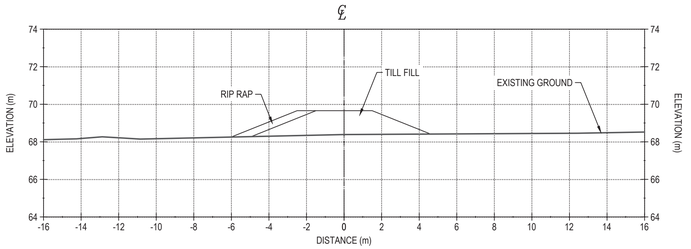
STATION 0+020



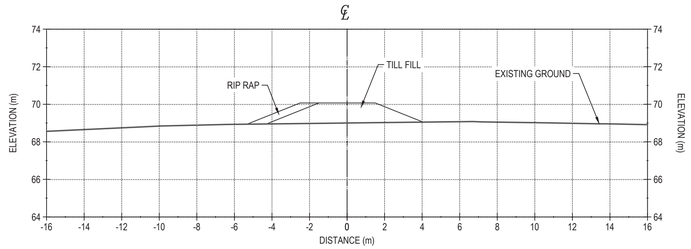
STATION 0+040



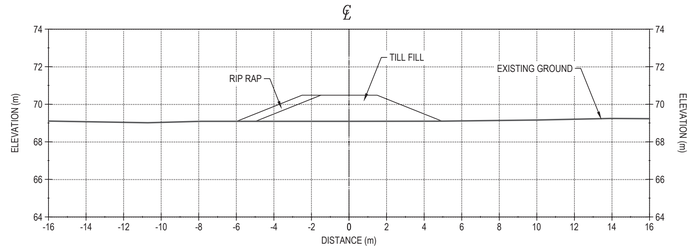
STATION 0+060



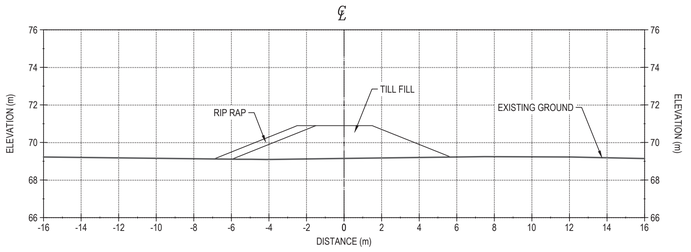
STATION 0+080



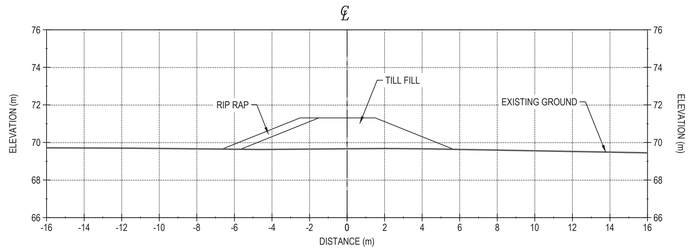
STATION 0+100



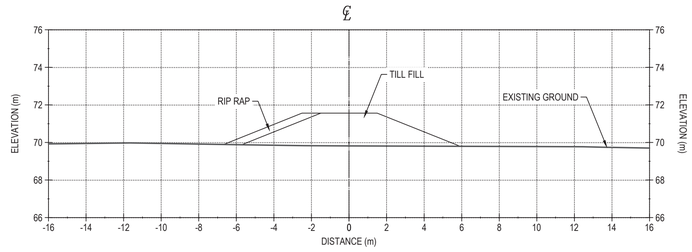
STATION 0+120



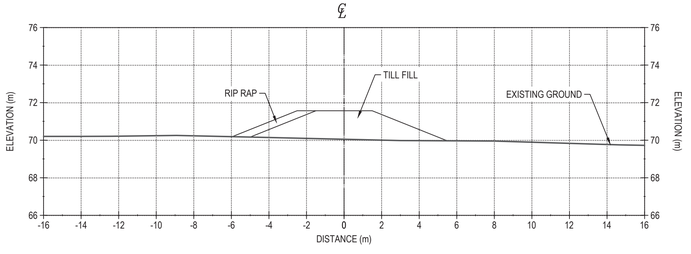
STATION 0+140



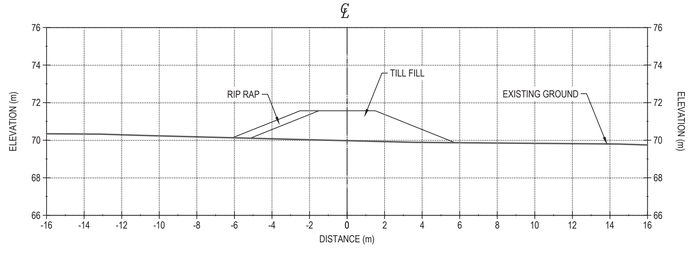
STATION 0+160



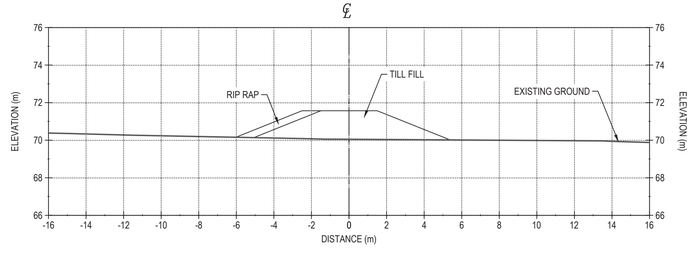
STATION 0+180



STATION 0+200

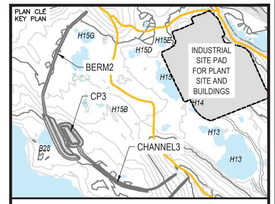


STATION 0+220



STATION 0+240

PLAN CLÉ
KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

1. ASSUMED CONSTRUCTION SCHEDULE FOR CHANNEL3 FALL / WINTER 2018.
2. ASSUMED GEOTEXTILE THAT MEETS MATERIAL SPECIFICATION WILL BE AVAILABLE AT SITE FOR CHANNEL3 CONSTRUCTION.
3. MATERIAL PLACEMENT AND FOUNDATION PREPARATION SHOULD BE IN ACCORDANCE WITH THE REQUIREMENTS OF GEOTECHNICAL CONSTRUCTION / MATERIAL SPECIFICATIONS (TETRA TECH 2018).

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date June 21, 2018
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2018-06-21
AGNICO EAGLE

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES. (C) AGNICO EAGLE LTÉE.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST, WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. (C) AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
--	--
--	--
--	--
--	--
--	--
--	--

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2018-06-21	ISSUED FOR CONSTRUCTION	HX	WTH	
A	2018-05-29	ISSUED FOR REVIEW	HX	WTH	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER H.J.A. LICENSEE NT/NU — 21.06.18
REGISTERED PROFESSIONAL ENGINEER W.T. HORNE LICENSEE N.W.T. — 21.06.18

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

BERM2 DESIGN SECTIONS
(1 of 3)

DESSINÉ PAR / DRAWN BY	EL	DATE 2018-06-21
VÉRIFIÉ PAR / CHECKED BY	HX	2018-06-21
APPROUVÉ PAR / APPROVED BY	WTH	2018-06-21
ÉCHELLE / SCALE	1:150	DATE 2018-06-21

NO. DESSIN / DRAWING NO. 65-695-230-246-1

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6515	0	11 / 13

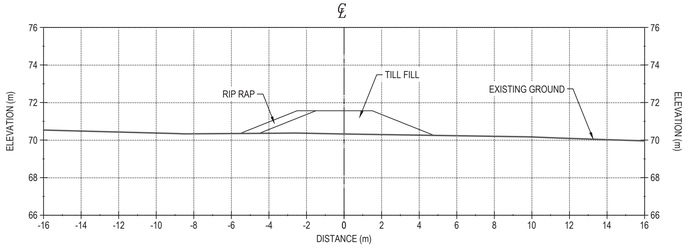
AE-CART-ARCH D

Q:\Edmonton\Engineering\E141\Projects_MELIADINE\CP3_CP4 Detailed Design\CP3\65-695-230-246.dwg-2013-02-19 14:03:29

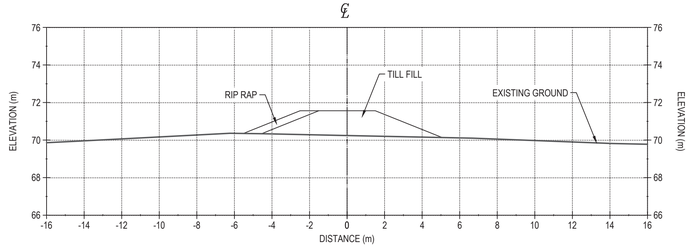
FILE NO. 65-695-230-246.dwg

NO. DESSIN
DRAWING NO. 65-695-230-246

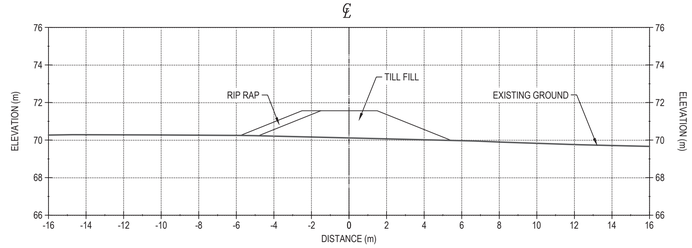
FORMAT ARCHD



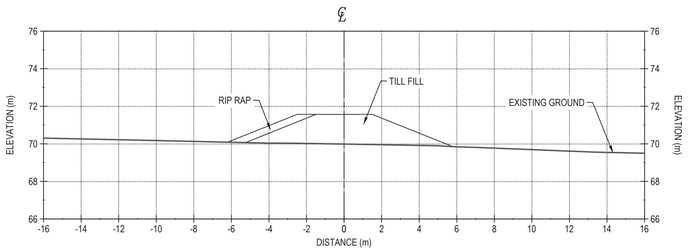
STATION 0+260



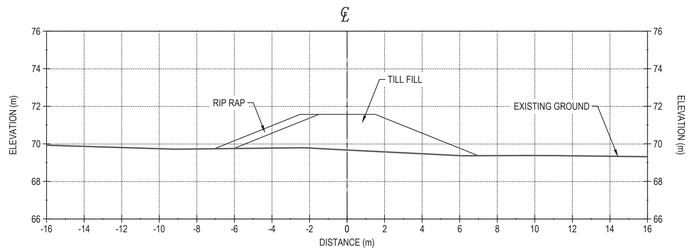
STATION 0+280



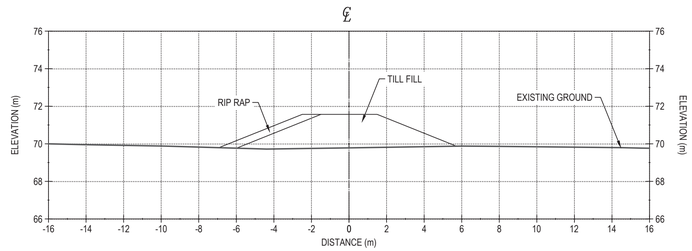
STATION 0+300



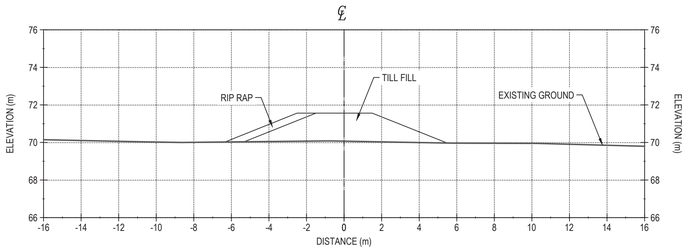
STATION 0+320



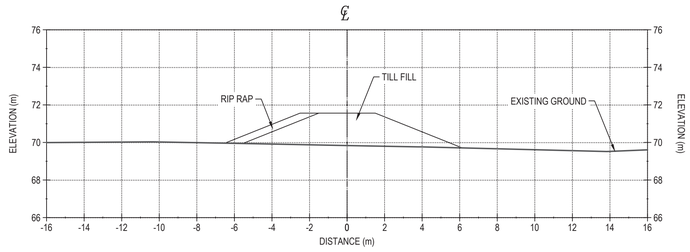
STATION 0+340



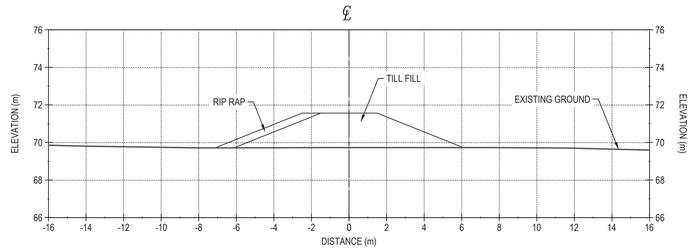
STATION 0+360



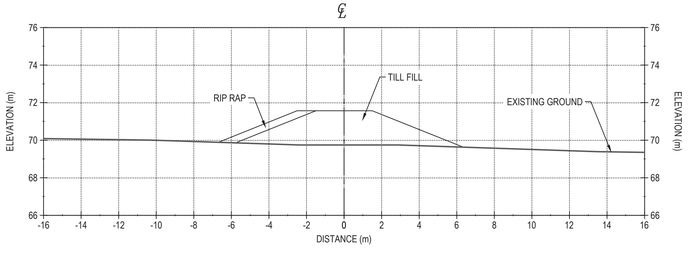
STATION 0+380



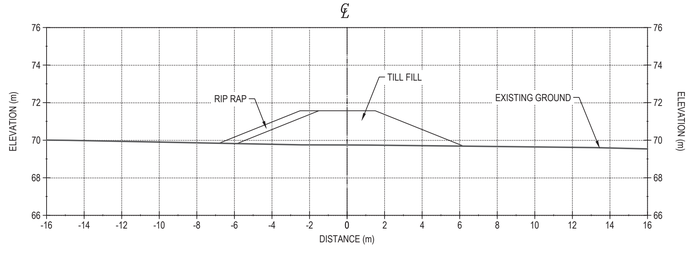
STATION 0+400



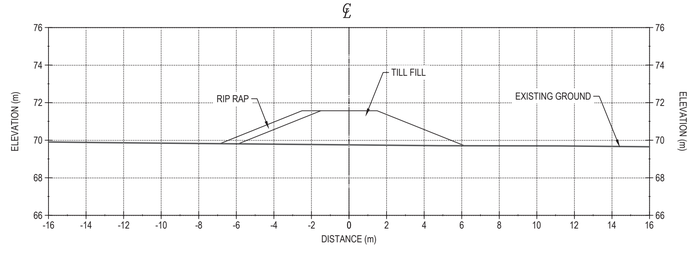
STATION 0+420



STATION 0+440

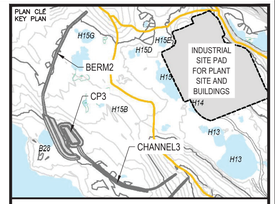


STATION 0+460



STATION 0+480

PLAN CLÉ
KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

1. ASSUMED CONSTRUCTION SCHEDULE FOR CHANNEL3 FALL / WINTER 2018.
2. ASSUMED GEOTEXTILE THAT MEETS MATERIAL SPECIFICATION WILL BE AVAILABLE AT SITE FOR CHANNEL3 CONSTRUCTION.
3. MATERIAL PLACEMENT AND FOUNDATION PREPARATION SHOULD BE IN ACCORDANCE WITH THE REQUIREMENTS OF GEOTECHNICAL CONSTRUCTION / MATERIAL SPECIFICATIONS (TETRA TECH 2018).

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date June 21, 2018
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2018-06-21
AGNICO EAGLE

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES. (C) AGNICO EAGLE LTÉE.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST, WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. (C) AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
--	--
--	--
--	--
--	--
--	--
--	--

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2018-06-21	ISSUED FOR CONSTRUCTION	HX	WTH	
A	2018-05-29	ISSUED FOR REVIEW	HX	WTH	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER H.JIA LICENSEE NT/NU — June 21, 2018
REGISTERED PROFESSIONAL ENGINEER W.T. HORNE LICENSEE N.W.T. — June 21, 2018

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

BERM2 DESIGN SECTIONS
(2 of 3)

DESSINÉ PAR / DRAWN BY	EL	DATE 2018-06-21
VÉRIFIÉ PAR / CHECKED BY	HX	2018-06-21
APPROUVÉ PAR / APPROVED BY	WTH	2018-06-21
ÉCHELLE / SCALE	1:150	DATE 2018-06-21

NO. DESSIN / DRAWING NO. 65-695-230-246-2

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6515	0	12 / 13

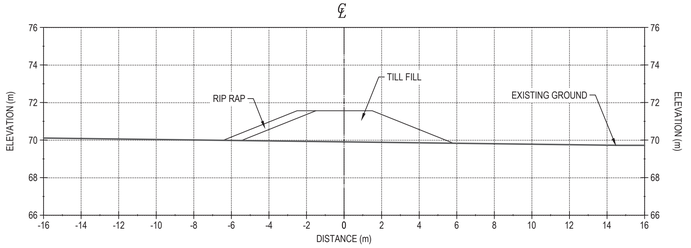
AE-CART-ARCH D

Q:\Edmonton\Engineering\E141\Projects_MELIADINE\CP3_CP4 Detailed Design\CP3\65-695-230-246.dwg-2013-02-19 14:03:29

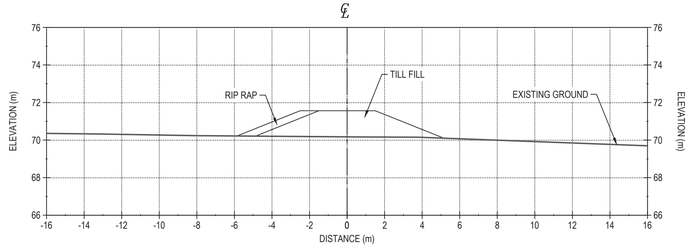
FILE NO. 65-695-230-246.dwg

NO. DESSIN
DRAWING NO. 65-695-230-246

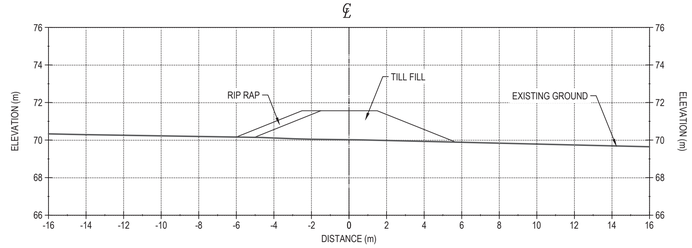
FORMAT ARCHD



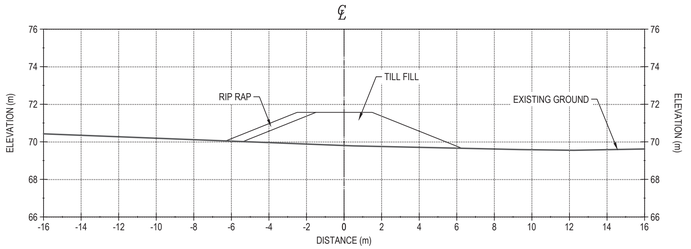
STATION 0+500



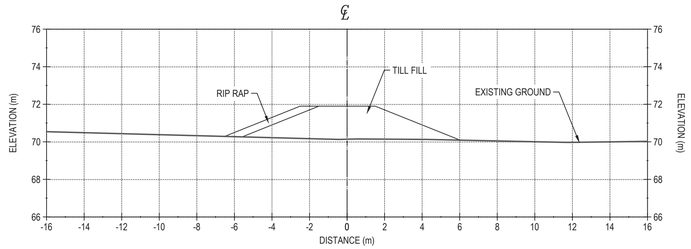
STATION 0+520



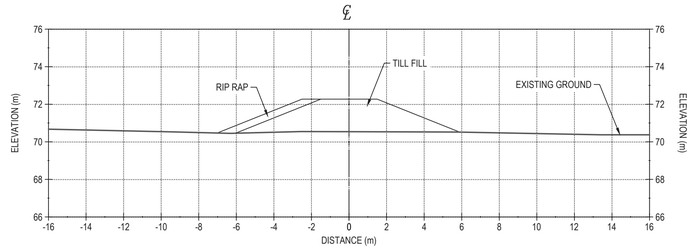
STATION 0+540



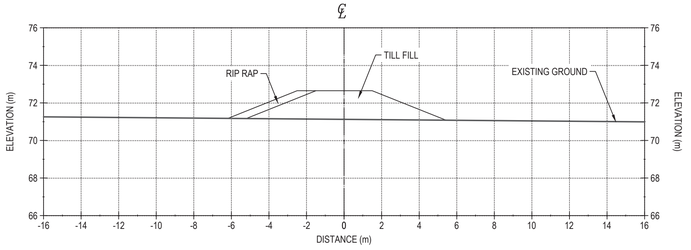
STATION 0+560



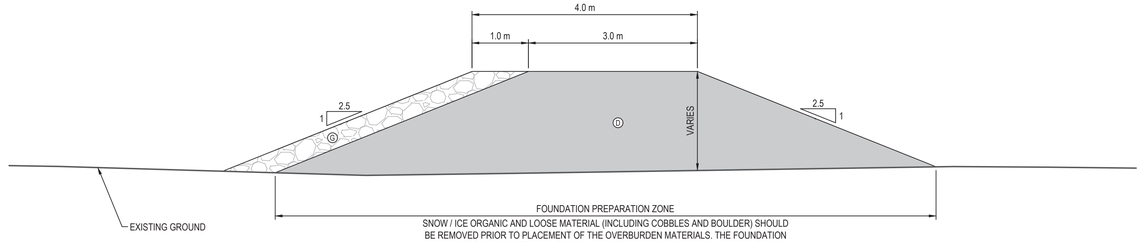
STATION 0+580



STATION 0+600

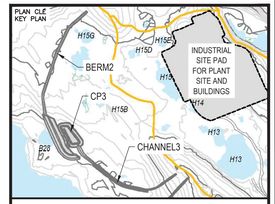


STATION 0+620



	ITEM	UNITS	ESTIMATED IN-PLACE QUANTITY
D	EXCAVATED OVERBURDEN TILL FILL (300 mm MINUS)	m³	7,060
G	RIP RAP	m³	970

PLAN CLÉ
KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

1. ASSUMED CONSTRUCTION SCHEDULE FOR CHANNEL3 FALL / WINTER 2018.
2. ASSUMED GEOTEXTILE THAT MEETS MATERIAL SPECIFICATION WILL BE AVAILABLE AT SITE FOR CHANNEL3 CONSTRUCTION.
3. MATERIAL PLACEMENT AND FOUNDATION PREPARATION SHOULD BE IN ACCORDANCE WITH THE REQUIREMENTS OF GEOTECHNICAL CONSTRUCTION / MATERIAL SPECIFICATIONS (TETRA TECH 2018).

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date June 21, 2018
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

POUR CONSTRUCTION
FOR CONSTRUCTION
AGNICO EAGLE
DATE : 2018-06-21

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES. (C) AGNICO EAGLE LTÉE.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST, WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. (C) AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
--	--
--	--
--	--
--	--
--	--
--	--

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2018-06-21	ISSUED FOR CONSTRUCTION	HX	WTH	
A	2018-05-29	ISSUED FOR REVIEW	HX	WTH	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER — W.T. HORNE — LICENSEE — N.W.T. — 2018

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

BERM2 DESIGN SECTIONS
(3 of 3)

DESSINÉ PAR DRAWN BY	EL	DATE 2018-06-21
VÉRIFIÉ PAR CHECKED BY	HX	2018-06-21
APPROUVÉ PAR APPROVED BY	WTH	2018-06-21
ÉCHELLE SCALE	1:150	DATE 2018-06-21

NO. DESSIN DRAWING NO. 65-695-230-246-3

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHT
6515	0	13 / 13

AE-CART-ARCH D

Q:\Edmonton\Engineering\E141\Projects_MELIADINE\CP3_CP4 Detailed Design\CP3\65-695-230-246.dwg-2013-02-19 14:03:29

FILE NO. 65-695-230-246.dwg

Appendix Q

Infrastructures As-Built and Design

Berm 3

NO. DESSIN DRAWING NO. 65-695-230-214-216_R1

0 50 100 150 200 250 300mm

FORMAT ARCH D

BERM3 LAYOUT POINTS ALONG CENTRELINE		
POINT #	NORTHING	EASTING
1	6988681.369	539899.476
2	6988545.911	539858.719
3	6988540.463	539877.963
4	6988535.015	539897.207
5	6988529.567	539916.450
6	6988524.119	539935.694
7	6988518.671	539954.938
8	6988513.223	539974.181
9	6988507.775	539993.425
10	6988502.327	540012.669
11	6988496.879	540031.912
12	6988491.431	540051.156
13	6988485.983	540070.400
14	6988480.535	540089.644
15	6988475.087	540108.887
16	6988469.639	540128.131
17	6988464.510	540146.248

POINT #1 POINT #2 POINT #3 POINT #4 POINT #5 POINT #6 POINT #7 POINT #8 POINT #9 POINT #10 POINT #11 POINT #12 POINT #13 POINT #14 POINT #15 POINT #16 POINT #17

STATION 0+000 STATION 0+020 STATION 0+040 STATION 0+060 STATION 0+080 STATION 0+100 STATION 0+120 STATION 0+140 STATION 0+160 STATION 0+180 STATION 0+200 STATION 0+220 STATION 0+240 STATION 0+260 STATION 0+280 STATION 0+300 STATION 0+320

BERM3 KEY TRENCH

CENTRELINE OF BERM 3

BERM3

BH16-12

CHANNEL5

PROPOSED D-CP5

E 540 000

N 6 988 500

N O E S

0 25m
Scale: 1:500 @24"x36"

BERM3 SITE LAYOUT PLAN VIEW

NOTE: 10x VERTICAL EXAGGERATION

TOP OF BERM3 (CLASS A ESKER MATERIAL)

TOP OF UNIFROZEN TILL

BERM3 KEY TRENCH
(DETERMINED DURING CONSTRUCTION)

ORIGINAL GROUND

ELEVATION (m) 70 68 66 64 62

STATION (m) 0+020 0+040 0+060 0+080 0+100 0+120 0+140 0+160 0+180 0+200 0+220 0+240 0+260 0+280 0+300 0+320

0 25m
Scale: 1:500 @24"x36"

PROFILE OF BERM3 ALONG CENTRELINE

PLAN D'E KEY PLAN

A13 A12 BERM3 A11

NOTES GÉNÉRALES / GENERAL NOTES

NOTES:
1. ASSUMING BERM3 WILL BE CONSTRUCTED IN OCTOBER AND EARLY NOVEMBER 2016
2. ASSUMING SELECTED UNFROZEN TILL FILL THAT MEETS MATERIAL SPECIFICATIONS WILL BE AVAILABLE AT THE SITE FOR BERM3 CONSTRUCTION

LEGEND

BOREHOLE

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE DATE : 2017-12-06

INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE. SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIES À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES.
© AGNICO EAGLE LTÉE
THE INFORMATION HEREIN IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO, DIVERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED.
© AGNICO EAGLE LTD

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2017-12-06	ISSUED FOR AS-BUILT	D.P.	J.A.	
0	2016-09-20	ISSUED FOR CONSTRUCTION	EL	GZ	
A	2016-09-15	ISSUED FOR REVIEW	DBD	GZ	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date
PERMIT NUMBER: P 1029
NTNU Association of Professional Engineers and Geoscientists

J.M.LP. KLARE
LICENSEE
2017-12-07

TITRE / TITLE

AGNICO EAGLE MEL ADINE GOLD PROJECT

BERM3 LAYOUT PLAN AND PROFILE

DESSINÉ PAR DRAWN BY	DBD	DATE 2016-09-20
VÉRIFIÉ PAR CHECKED BY	GZ	2016-09-20
APPROUVÉ PAR APPROVED BY	KJ	2016-09-20
ÉCHELLE SCALE		DATE 2016-09-20
NO. DESSIN DRAWING NO.	65-695-230-214	
NO. PROJET PROJECT NO.	6515	REVISION 1
		FEUILLE / SHT 1 / 3

AE-GMT-ARCH D

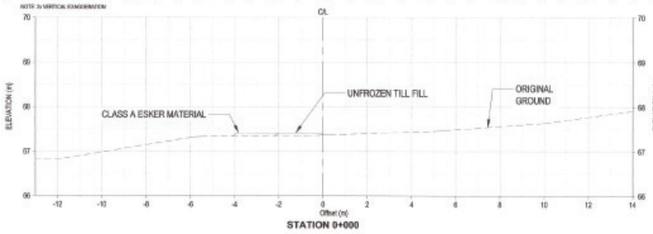
P:\6500\DESSIN\GN-MINE\DESSINS DE RÉFÉRENCE\Berm3\65-695-230-214-216_R1.dwg

FILE NO. 65-695-230-214-216_R1.dwg

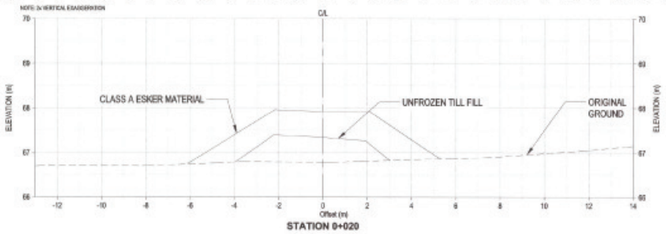
NO. DESSIN
DRAWING NO. 65-695-230-214-216_R1

0 50 100 150 200 250 300mm

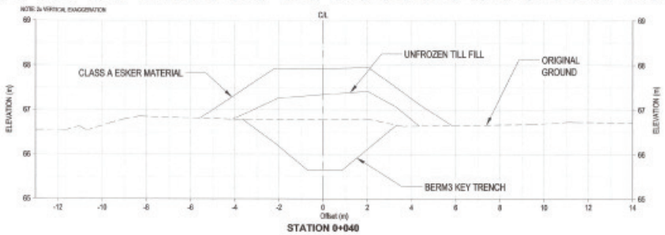
FORMAT ARCH D



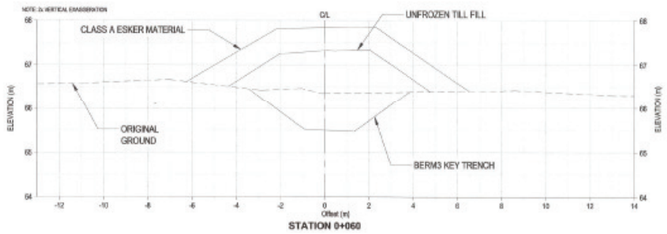
STATION 0+000



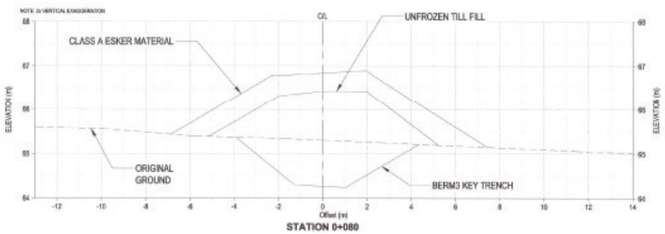
STATION 0+020



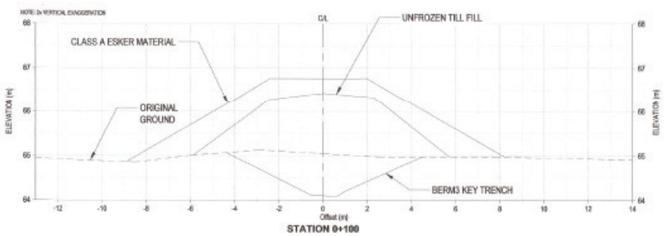
STATION 0+040



STATION 0+060



STATION 0+080

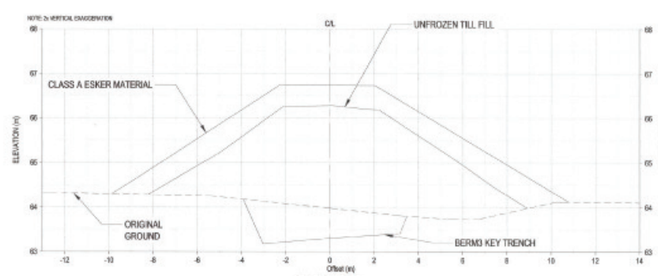


STATION 0+100

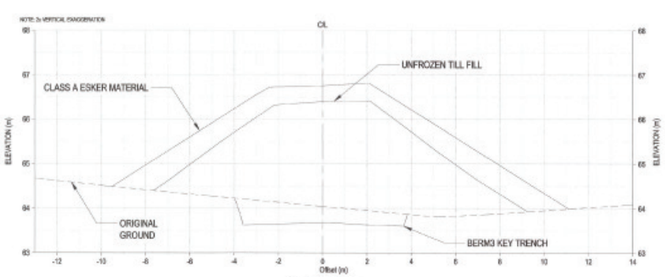
STATION 0+120

STATION 0+140

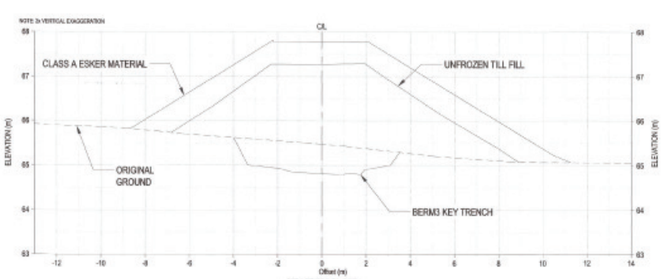
STATION 0+160



STATION 0+180



STATION 0+200



STATION 0+220

0 5m
Scale: 1:125 @ 24"x36"

PLAN CLE
KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE. SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION OU COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES.
© AGNICO EAGLE LTÉE.
THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPIES TRANSMITTAL TO OTHERS, AND ANY USE OTHER THAT FOR WHICH IT IS LOANED ARE PROHIBITED.
© AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG.

AGNICO EAGLE

REV	DATE	DESCRIPTION	PAR/BY	APP	CLIENT
1	2016-12-06	ISSUED FOR AS-BUILT	DJK	JA	
0	2016-09-20	ISSUED FOR CONSTRUCTION	GL	GZ	
A	2016-09-15	ISSUED FOR REVIEW	DBB	GZ	

REVISIONS

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2017-12-06

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date
PERMIT NUMBER: P 1029
NTAU Association of Professional Engineers and Geoscientists

J.M.I.P. ALLARE
LICENSEE
2019-12-05

TITRE / TITLE

AGNICO EAGLE MEL!ADINE GOLD PROJECT

BERM3 DESIGN SECTIONS

DESSINÉ PAR DRAWN BY	DBB	DATE 2016-09-20
VÉRIFIÉ PAR CHECKED BY	GZ	2016-09-20
APPROUVÉ PAR APPROVED BY	KJ	2016-09-20
ÉCHELLE SCALE		DATE 2016-09-20

NO. DESSIN
DRAWING NO. 65-695-230-215

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHT
6515	1	2 / 3

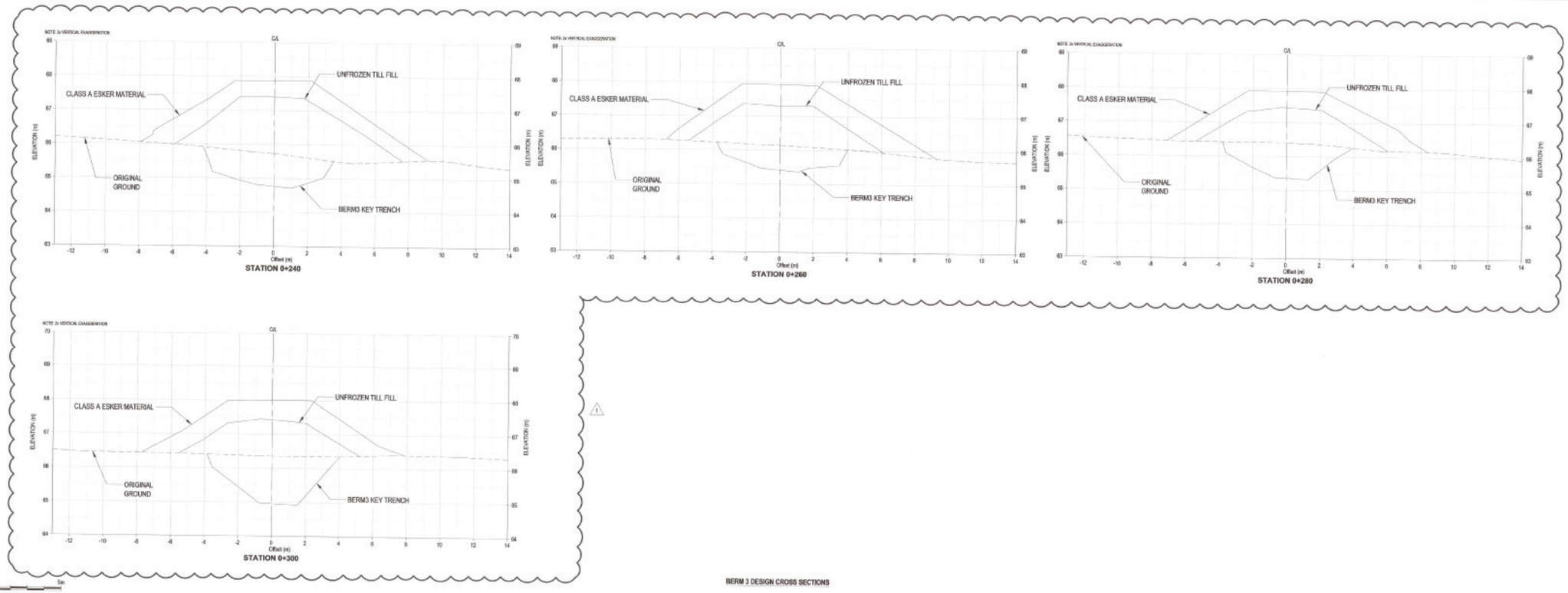
AC-CART-ARCH D

P:\2015\01\DESSIN\01-INFRA\DESSINS DE REFERENCE\Berm3\65-695-230-214-216_R1.dwg

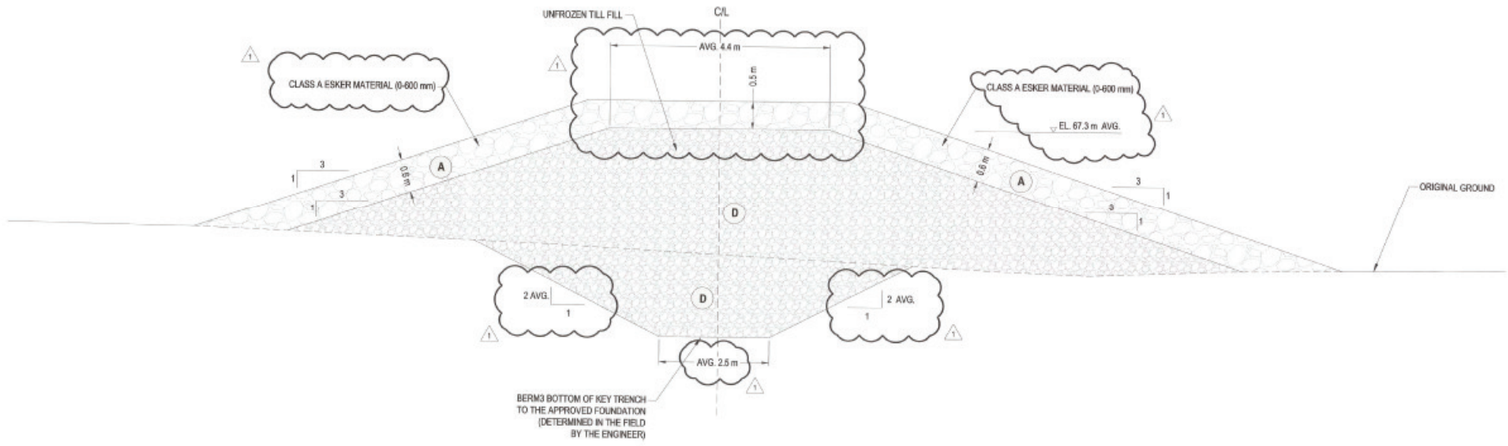
FILE NO. 65-695-230-214-216_R1.dwg

NO. DESSIN / DRAWING NO. 65-695-230-214-216_R1

FORMAT ARCH D



BERM 3 DESIGN CROSS SECTIONS



BERM3 TYPICAL DESIGN CROSS SECTION

⚠1 AS-BUILT IN-PLACE QUANTITIES FOR BERM3 CONSTRUCTION		
ITEM	QUANTITIES	NOTES
TOTAL EXCAVATION	1,420 cu.m.	EXCAVATION IN UNFROZEN CONDITION
SELECTED UNFROZEN TILL FILL (TYPE D)	5,212 cu.m.	0-300 mm, NON-ORGANIC SANDY/GRAVELLY TILL WITH 20% TO 60% FINES (<0.075 mm)
CLASS A ESKER MATERIAL (TYPE A)	2,470 cu.m.	0-600 mm

PLAN CLÉ
KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2017-12-06

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE. SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIES À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÉVUE SONT INTERDITES.
© AGNICO EAGLE LTÉE
THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD AND MUST BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPYING, SUBMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED.
© AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG.
–	–
–	–
–	–
–	–
–	–

AGNICO EAGLE

REV.	DATE	DESCRIPTION	ENG/DES	APP.	CLIENT
1	2017-12-06	ISSUED FOR AS-BUILT	D.R.	J.A.	
0	2016-09-20	ISSUED FOR CONSTRUCTION	EL	GZ	
A	2016-09-15	ISSUED FOR REVIEW	DRD	GZ	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date
PERMIT NUMBER: P 1029
NTNU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
J.M.L.P. ALAIN
LICENCE
2017-12-06

TITRE / TITLE
AGNICO EAGLE MEL IADINE GOLD PROJECT
BERM 3 TYPICAL AND DESIGN SECTIONS

DESSINÉ PAR / DRAWN BY	DRD	DATE 2016-09-20
VÉRIFIÉ PAR / CHECKED BY	GZ	2016-09-20
APPROUVÉ PAR / APPROVED BY	KJ	2016-09-20
ÉCHELLE / SCALE		DATE 2016-09-20

NO. DESSIN / DRAWING NO. 65-695-230-216

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6515	1	3 / 3

AE-DART-ARCH D

P:\1880\20\DESIGN\GW-MINE\DESSINS DE REFERENCE\Berm3\65-695-230-214-216_R1.dwg

FILE NO. 65-695-230-214-216_R1.dwg

Appendix Q

Infrastructures As-Built and Design

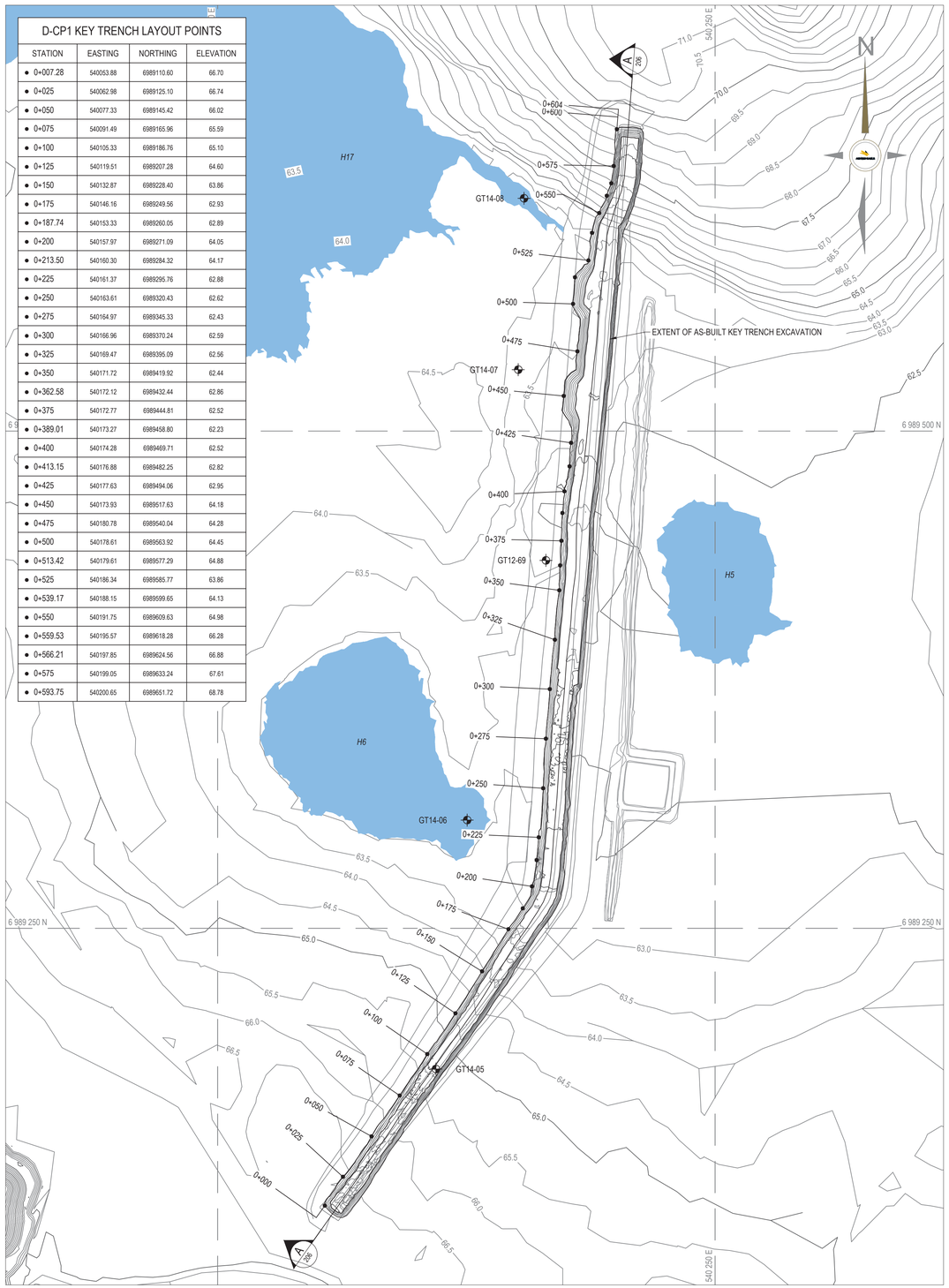
D-CP1

NO. DESSIN
DRAWING NO. 65-685-230-205_R2

FORMAT ARCHD

D-CP1 KEY TRENCH LAYOUT POINTS

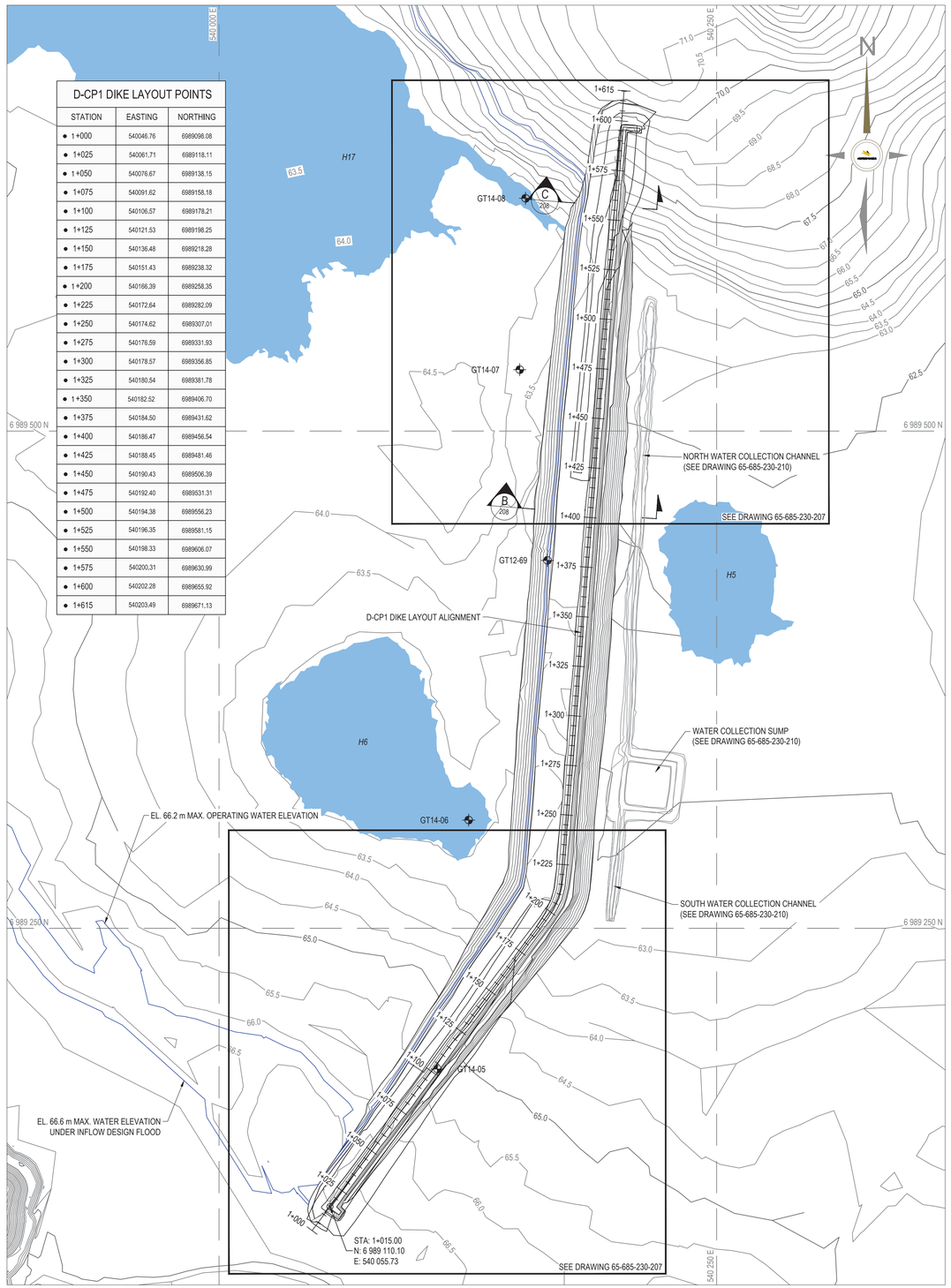
STATION	EASTING	NORTHING	ELEVATION
0+007.28	540053.88	6989110.60	66.70
0+025	540062.98	6989125.10	66.74
0+050	540077.33	6989145.42	66.02
0+075	540091.49	6989165.96	65.59
0+100	540105.33	6989186.76	65.10
0+125	540119.51	6989207.28	64.60
0+150	540132.87	6989228.40	63.86
0+175	540146.16	6989249.56	62.93
0+187.74	540153.33	6989260.05	62.89
0+200	540157.97	6989271.09	64.05
0+213.50	540160.30	6989284.32	64.17
0+225	540161.37	6989295.76	62.88
0+250	540163.61	6989320.43	62.62
0+275	540164.97	6989345.33	62.43
0+300	540166.96	6989370.24	62.59
0+325	540169.47	6989395.09	62.56
0+350	540171.72	6989419.92	62.44
0+362.58	540172.12	6989432.44	62.86
0+375	540172.77	6989444.81	62.52
0+389.01	540173.27	6989458.80	62.23
0+400	540174.28	6989469.71	62.52
0+413.15	540176.88	6989482.25	62.82
0+425	540177.63	6989494.06	62.95
0+450	540173.93	6989517.63	64.18
0+475	540180.78	6989540.04	64.28
0+500	540178.61	6989563.92	64.45
0+513.42	540179.61	6989577.29	64.88
0+525	540186.34	6989585.77	63.86
0+539.17	540188.15	6989599.65	64.13
0+550	540191.75	6989609.63	64.98
0+559.53	540195.57	6989618.28	66.28
0+566.21	540197.85	6989624.56	66.88
0+575	540199.05	6989633.24	67.61
0+593.75	540200.65	6989651.72	68.78



D-CP1 KEY TRENCH PLAN VIEW
SCALE: 1:1250

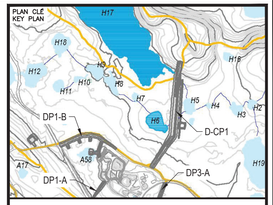
D-CP1 DIKE LAYOUT POINTS

STATION	EASTING	NORTHING
1+000	540046.76	6989098.08
1+025	540061.71	6989118.11
1+050	540076.67	6989138.15
1+075	540091.62	6989158.18
1+100	540106.57	6989178.21
1+125	540121.53	6989198.25
1+150	540136.48	6989218.28
1+175	540151.43	6989238.32
1+200	540166.39	6989258.35
1+225	540172.64	6989282.09
1+250	540174.62	6989307.01
1+275	540176.59	6989331.93
1+300	540178.57	6989356.85
1+325	540180.54	6989381.78
1+350	540182.52	6989406.70
1+375	540184.50	6989431.62
1+400	540186.47	6989456.54
1+425	540188.45	6989481.46
1+450	540190.43	6989506.39
1+475	540192.40	6989531.31
1+500	540194.38	6989556.23
1+525	540196.35	6989581.15
1+550	540198.33	6989606.07
1+575	540200.31	6989630.99
1+600	540202.28	6989655.92
1+615	540203.49	6989671.13



D-CP1 PLAN VIEW
SCALE: 1:1250

PLAN CLÉ
KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

LEGEND

BOREHOLE

0 50m
Scale: 1:1,250

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date Oct 19, 2017
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2017-10-19

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES. © AGNICO EAGLE LTÉE.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. © AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
—	—
—	—
—	—
—	—
—	—
—	—

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
2	2017-10-19	ISSUED FOR RECORD	WTH	NG	
1	2016-09-26	ISSUED FOR CONSTRUCTION	GZ	KJ	
0	2016-08-15	ISSUED FOR CONSTRUCTION	GZ	KJ	
B	2016-08-11	ISSUED FOR REVIEW	GZ	KJ	
A	2016-08-05	ISSUED FOR REVIEW	GZ	KJ	

REVISIONS

ASSOCIATION OF PROFESSIONAL ENGINEERS AND GEOSCIENTISTS OF THE NWT — W.T. HORNE — LICENSEE — NWT — 2017
ASSOCIATION OF PROFESSIONAL ENGINEERS AND GEOSCIENTISTS OF THE NWT/NU — G. ZHANG — LICENSEE — NWT/NU — 2017

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

D-CP1 AS-BUILT
KEY TRENCH AND DIKE LAYOUT PLAN

DESSINÉ PAR / DRAWN BY	EL	DATE 2017-10-06
VERIFIÉ PAR / CHECKED BY	WTH	2017-10-06
APPROUVÉ PAR / APPROVED BY	NG	2017-10-06
ÉCHELLE / SCALE	1:1250	DATE 2017-10-06
NO. DESSIN / DRAWING NO.	65-685-230-205	
NO. PROJET / PROJECT NO.	6515	REVISION 2
		FEUILLE / SHT 2 / 12

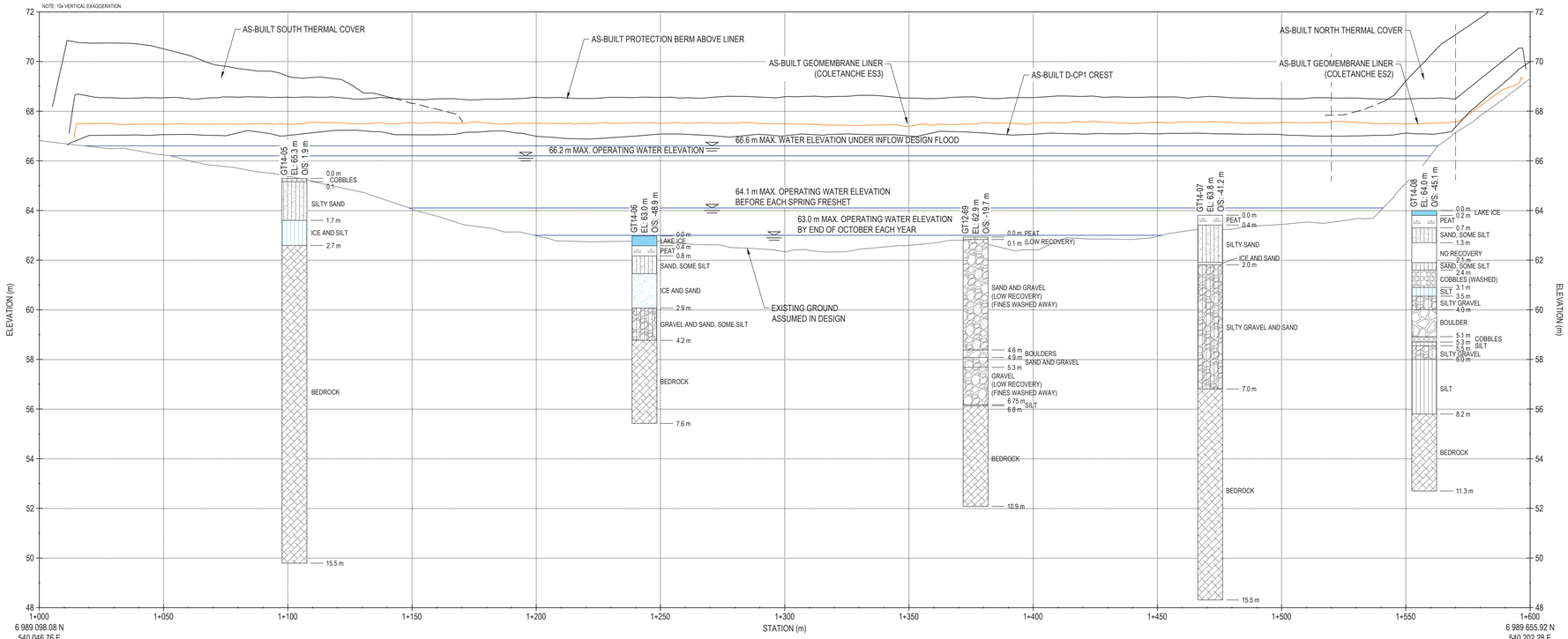
AE-CART-ARCH D

Q:\Edmonton\Engineering\E141\Projects_MELIADINE\As-Built D-CP1\65-685-230-205_R2.dwg-2017-10-05 16:25:48

FILE NO. 65-685-230-205_R2.dwg

NO. DESSIN
DRAWING NO. 65-685-230-206_R2

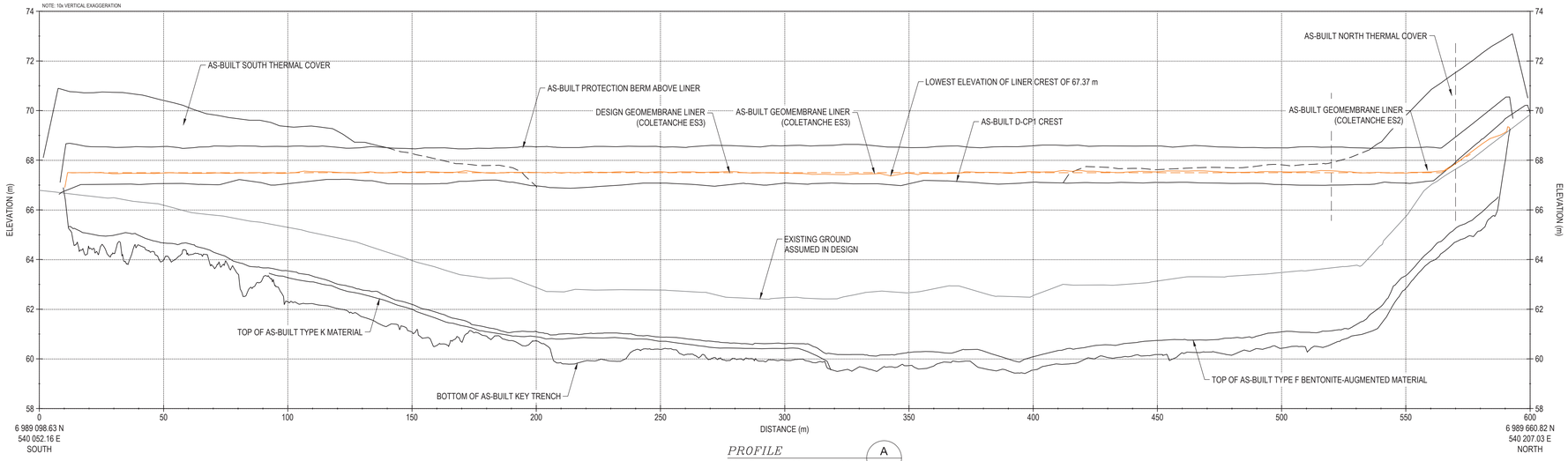
FORMAT ARCHD



LEGEND

- LAKE ICE
- PEAT
- SAND / ICE RICH SAND
- GRAVEL AND SAND
- GRAVEL
- SILT / ICE RICH SILT
- COBBLES
- BOULDERS
- BEDROCK
- NO RECOVERY

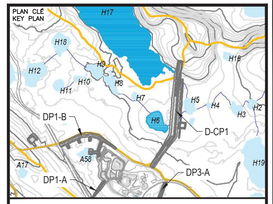
D-CP1 PROFILE
SCALE: H-1:1000 V-1:100



PROFILE
SCALE: H-1:1000 V-1:100

A
205

PLAN CLÉ
KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date Oct 19, 2017
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2017-10-19

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES. (C) AGNICO EAGLE LTÉE.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST, WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. (C) AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
--	--
--	--
--	--
--	--
--	--
--	--

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
2	2017-10-19	ISSUED FOR RECORD	WTH	NG	
1	2016-09-26	ISSUED FOR CONSTRUCTION	GZ	KJ	
0	2016-08-15	ISSUED FOR CONSTRUCTION	GZ	KJ	
B	2016-08-11	ISSUED FOR REVIEW	GZ	KJ	
A	2016-08-05	ISSUED FOR REVIEW	GZ	KJ	

REVISIONS

PROFESSIONAL ENGINEER — W.T. HORNE — LICENSEE — N.W.T. — 2017
PROFESSIONAL ENGINEER — G. ZHANG — LICENSEE — NWT/NU — 2017

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

D-CP1 AS-BUILT PROFILES

DESSINÉ PAR / DRAWN BY	EL	DATE 2017-10-06
VERIFIÉ PAR / CHECKED BY	WTH	2017-10-06
APPROUVÉ PAR / APPROVED BY	NG	2017-10-06
ÉCHELLE / SCALE	1:1000	DATE 2017-10-06
NO. DESSIN / DRAWING NO.	65-685-230-206	
NO. PROJET / PROJECT NO.	6515	REVISION 2 / FEUILLE / SHT 3 / 12

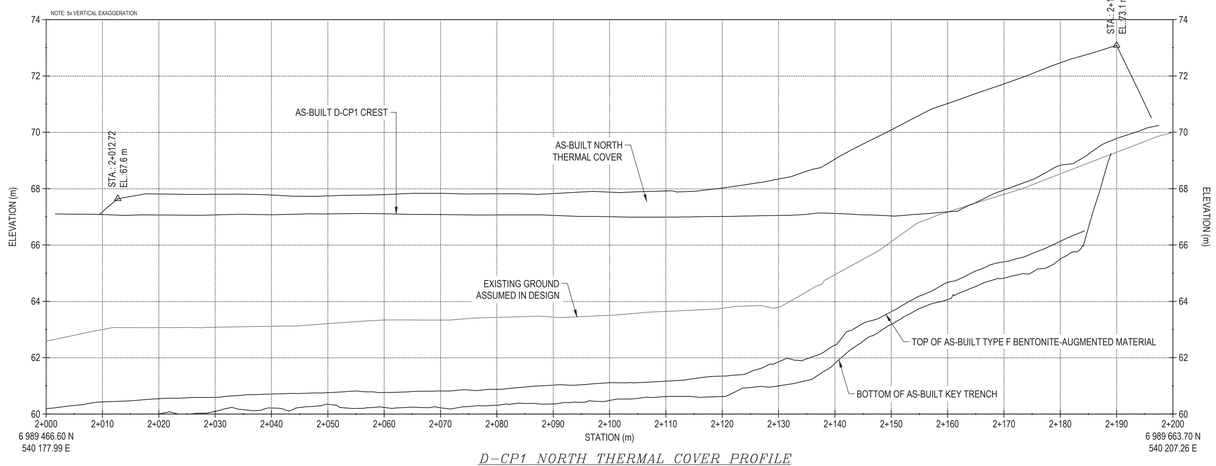
AE-CART-ARCH D

Q:\Edmonton\Engineering\E141\Projects_MELIADINE\As-Built D-CP1\65-685-230-206_R2.dwg-2017-10-19 15:22:01

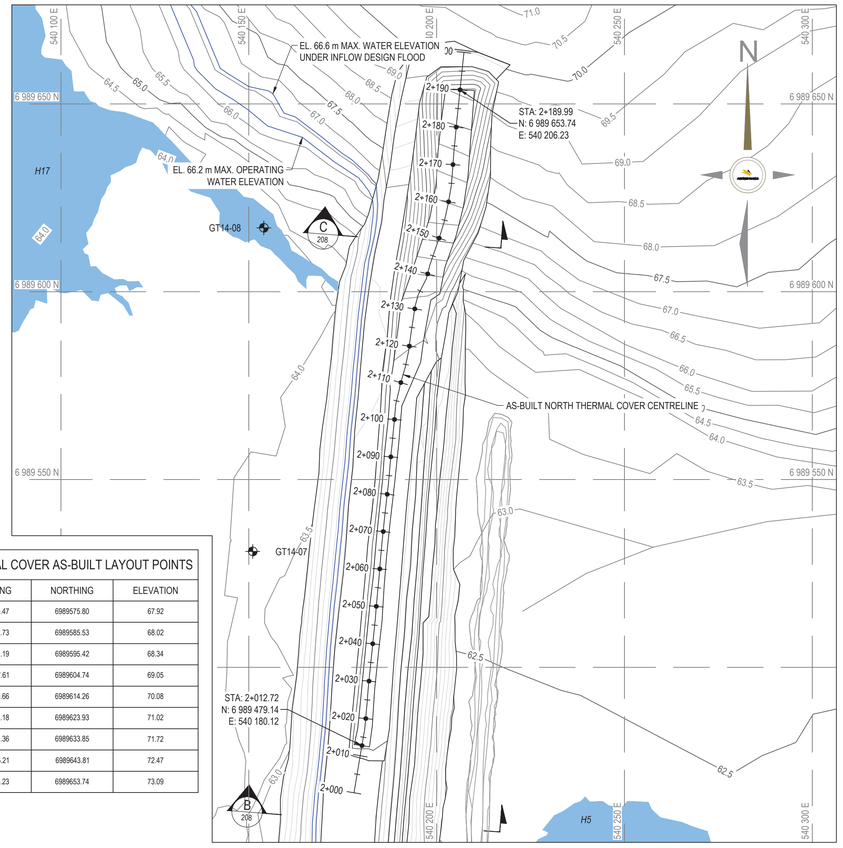
FILE NO. 65-685-230-206_R2.dwg

NO. DESSIN
DRAWING NO. 65-685-230-207_R2

FORMAT ARCHD



D-CP1 NORTH THERMAL COVER PROFILE
SCALE: H-1:500 V-1:100



D-CP1 NORTH THERMAL COVER
SCALE: 1:750

D-CP1 NORTH THERMAL COVER AS-BUILT LAYOUT POINTS			
STATION	EASTING	NORTHING	ELEVATION
• 2+012.72	540180.12	6989479.14	67.64
• 2+020	540181.14	6989486.34	67.81
• 2+030	540181.99	6989496.31	67.80
• 2+040	540183.00	6989506.25	67.77
• 2+050	540183.95	6989516.21	67.74
• 2+060	540184.86	6989526.17	67.79
• 2+070	540185.78	6989536.12	67.84
• 2+080	540186.85	6989546.07	67.82
• 2+090	540187.81	6989556.02	67.82
• 2+100	540188.79	6989565.97	67.87

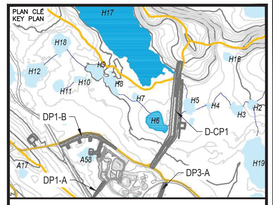
D-CP1 NORTH THERMAL COVER AS-BUILT LAYOUT POINTS			
STATION	EASTING	NORTHING	ELEVATION
• 2+110	540190.47	6989575.80	67.92
• 2+120	540192.73	6989585.53	68.02
• 2+130	540194.19	6989595.42	68.34
• 2+140	540197.61	6989604.74	69.05
• 2+150	540200.66	6989614.26	70.08
• 2+160	540203.18	6989623.93	71.02
• 2+170	540204.36	6989633.85	71.72
• 2+180	540205.21	6989643.81	72.47
• 2+189.99	540206.23	6989653.74	73.09

D-CP1 SOUTH THERMAL COVER AS-BUILT LAYOUT POINTS			
STATION	EASTING	NORTHING	ELEVATION
• 3+009.28	540056.25	6989105.00	70.89
• 3+010	540056.68	6989105.58	70.88
• 3+020	540062.64	6989113.60	70.72
• 3+030	540068.27	6989121.87	70.74
• 3+040	540073.91	6989130.13	70.66
• 3+050	540079.64	6989138.32	70.45
• 3+060	540085.16	6989146.66	70.19
• 3+070	540090.64	6989155.02	69.85
• 3+080	540096.26	6989163.29	69.69
• 3+090	540102.05	6989171.44	69.61
• 3+100	540107.81	6989179.62	69.37
• 3+110	540114.07	6989187.40	69.37
• 3+120	540119.91	6989195.51	69.26
• 3+130	540125.24	6989203.97	68.72

D-CP1 SOUTH THERMAL COVER AS-BUILT LAYOUT POINTS			
STATION	EASTING	NORTHING	ELEVATION
• 3+140	540130.91	6989212.20	68.54
• 3+150	540136.38	6989220.57	68.31
• 3+160	540141.19	6989229.33	68.10
• 3+170	540146.00	6989238.09	67.89
• 3+180	540151.63	6989246.36	67.82
• 3+190	540157.19	6989254.67	67.77
• 3+196.17	540160.46	6989259.90	67.50

D-CP1 SOUTH THERMAL COVER
SCALE: 1:750

D-CP1 SOUTH THERMAL COVER PROFILE
SCALE: H-1:500 V-1:100



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

LEGEND

BOREHOLE

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date Oct 19, 2017
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2017-10-19

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES. (C) AGNICO EAGLE LTÉE

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. (C) AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
–	–
–	–
–	–
–	–
–	–
–	–

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
2	2017-10-19	ISSUED FOR RECORD	WTH	NG	
1	2016-09-26	ISSUED FOR CONSTRUCTION	GZ	KJ	
0	2016-08-15	ISSUED FOR CONSTRUCTION	GZ	KJ	
B	2016-08-11	ISSUED FOR REVIEW	GZ	KJ	
A	2016-08-05	ISSUED FOR REVIEW	GZ	KJ	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER W.T. HORNE LICENSEE N.W.T. — REGISTERED PROFESSIONAL ENGINEER G. ZHANG LICENSEE NWT/NU

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

D-CP1 AS-BUILT THERMAL COVER
LAYOUT PLAN AND PROFILES

DESSINÉ PAR / DRAWN BY	EL	DATE 2017-10-06
VERIFIÉ PAR / CHECKED BY	WTH	2017-10-06
APPROUVÉ PAR / APPROVED BY	NG	2017-10-06
ÉCHELLE / SCALE	AS SHOWN	DATE 2017-10-06

NO. DESSIN / DRAWING NO. 65-685-230-207

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6515	2	4 / 12

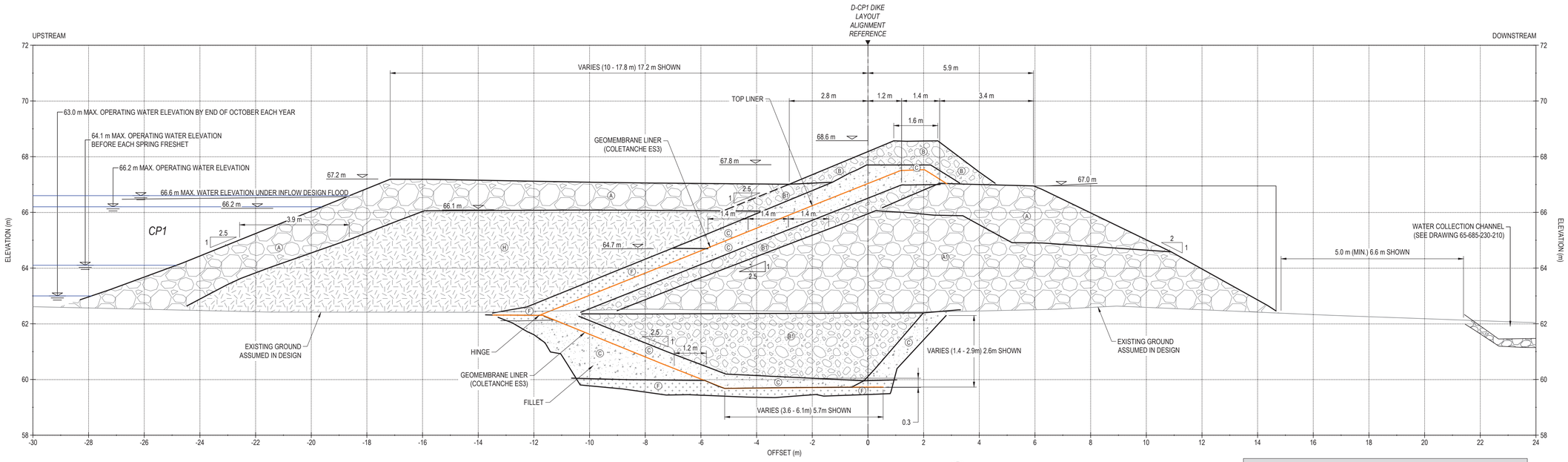
AE-CART-ARCH D

Q:\Edmonton\Engineering\E141\Projects_MELIADINE\As-Built D-CP1\65-685-230-207_R2.dwg-2017-10-05 16:25:56

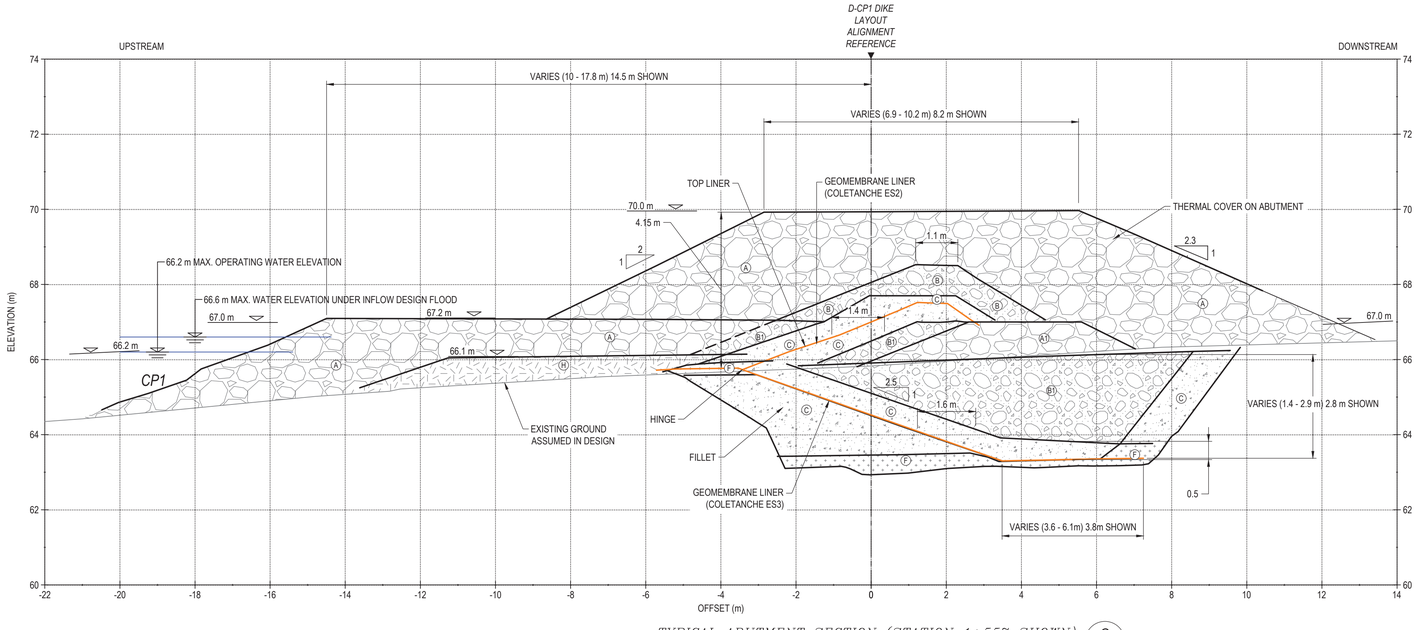
FILE NO. 65-685-230-207_R2.dwg

NO. DESSIN
DRAWING NO. 65-685-230-208_R0

FORMAT ARCHD



TYPICAL SECTION (STATION 1+402 SHOWN)
SCALE: 1:75
B
205



TYPICAL ABUTMENT SECTION (STATION 1+557 SHOWN)
SCALE: 1:75
C
205

ESTIMATED IN-PLACE MATERIAL QUANTITIES FOR CONSTRUCTION OF D-CP1

	ITEM	UNIT	AS-BUILT QUANTITY [a]
(A)	RUN-OF-MINE ROCKFILL (600 mm MINUS) IN DIKE UPSTREAM AND FOR THERMAL COVER	m³	24,896
(A1)	RUN-OF-MINE ROCKFILL (600 mm MINUS) IN DIKE DOWNSTREAM	m³	18,347
(B)	TRANSITION ROCKFILL (150 mm MINUS)	m³	2,690
(B1)	TRANSITION ROCKFILL (150 mm MINUS)	m³	10,274
(C)	GRANULAR FILL OR ESKER SAND (20 mm MINUS)	m³	12,930
(F)	BENTONITE-AUGMENTED MATERIAL	m³	4,256
(H)	ESKER SAND AND GRAVEL (75 mm MINUS)	m³	14,961
(K)	NEARLY-SATURATED BACKFILL (20 mm MINUS)	m³	1,127
	GEOMEMBRANE LINER (COLETANCHE ES3) (INCLUDING PORTION OF ES2)	m³	14,874
	KEY TRENCH EXCAVATION	m³	23,018

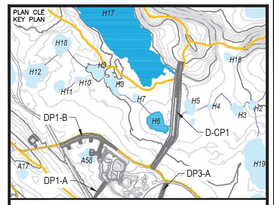
[a] MATERIAL QUANTITIES WERE BASED ON SURVEY DATA PROVIDED BY AGNICO EAGLE ON AUGUST 2017

NOTE

THE DESIGN MINIMUM LINER CREST ELEVATION WAS 67.50 m.
THE DESIGN MINIMUM LINER CREST ELEVATION IS 67.37 m.

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date Oct 19, 2017
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PLAN CLÉ
KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

LEGEND

- (A) RUN-OF-MINE ROCKFILL (600 mm MINUS) IN DIKE UPSTREAM AND FOR THERMAL COVER
- (A1) RUN-OF-MINE ROCKFILL (600 mm MINUS) IN DIKE DOWNSTREAM
- (B) TRANSITION ROCKFILL (150 mm MINUS)
- (B1) TRANSITION ROCKFILL (150 mm MINUS)
- (C) GRANULAR FILL OR ESKER SAND (20 mm MINUS)
- (F) BENTONITE-AUGMENTED MATERIAL (MIXTURE OF BENTONITE AND TYPE C MATERIAL)
- (H) ESKER SAND AND GRAVEL (75 mm MINUS)
- (K) NEARLY-SATURATED BACKFILL (20 mm MINUS)

DASHED LINES REFER TO NO AS-BUILT DATA BUT ESTIMATED BASED ON FIELD VISUAL OBSERVATION

COLETANCHE ES2 LINER WAS USED FOR ABOVE ORIGINAL GROUND PORTION OF THE LINER FOR STATIONS 1+520 TO 1+570

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2017-10-19

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE. SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE, SONT INTERDITES. (C) AGNICO EAGLE LTÉE.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. (C) AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
--	--
--	--
--	--
--	--
--	--
--	--

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
2	2017-10-19	ISSUED FOR RECORD	WTH	NG	
1	2016-09-26	ISSUED FOR CONSTRUCTION	GZ	KJ	
0	2016-08-15	ISSUED FOR CONSTRUCTION	GZ	KJ	
B	2016-08-11	ISSUED FOR REVIEW	GZ	KJ	
A	2016-08-05	ISSUED FOR REVIEW	GZ	KJ	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER W.T. HORNE LICENSEE N.W.T. 14.19

REGISTERED PROFESSIONAL ENGINEER G. ZHANG LICENSEE N.W.T/NU 14.19

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

D-CP1 AS-BUILT
TYPICAL SECTIONS AND QUANTITIES

DESSINÉ PAR DRAWN BY	EL	DATE	2017-09-22
VERIFIÉ PAR CHECKED BY	WTH		2017-09-22
APPROUVÉ PAR APPROVED BY	NG		2017-09-22
ÉCHELLE SCALE	1:75	DATE	2017-09-22
NO. DESSIN DRAWING NO.	65-685-230-208		
NO. PROJET PROJECT NO.	6515	REVISION	2
		FEUILLE / SHT	5 / 9

AE-CART-ARCH D

Q:\Edmonton\Engineering\E141\Projects_MELIADINE\4a-Built D-CP1\65-685-230-208_R0.dwg-2017-10-19 16:22:36

FILE NO. 65-685-230-208_R0.dwg

Appendix Q

Infrastructures As-Built and Design

D-CP5

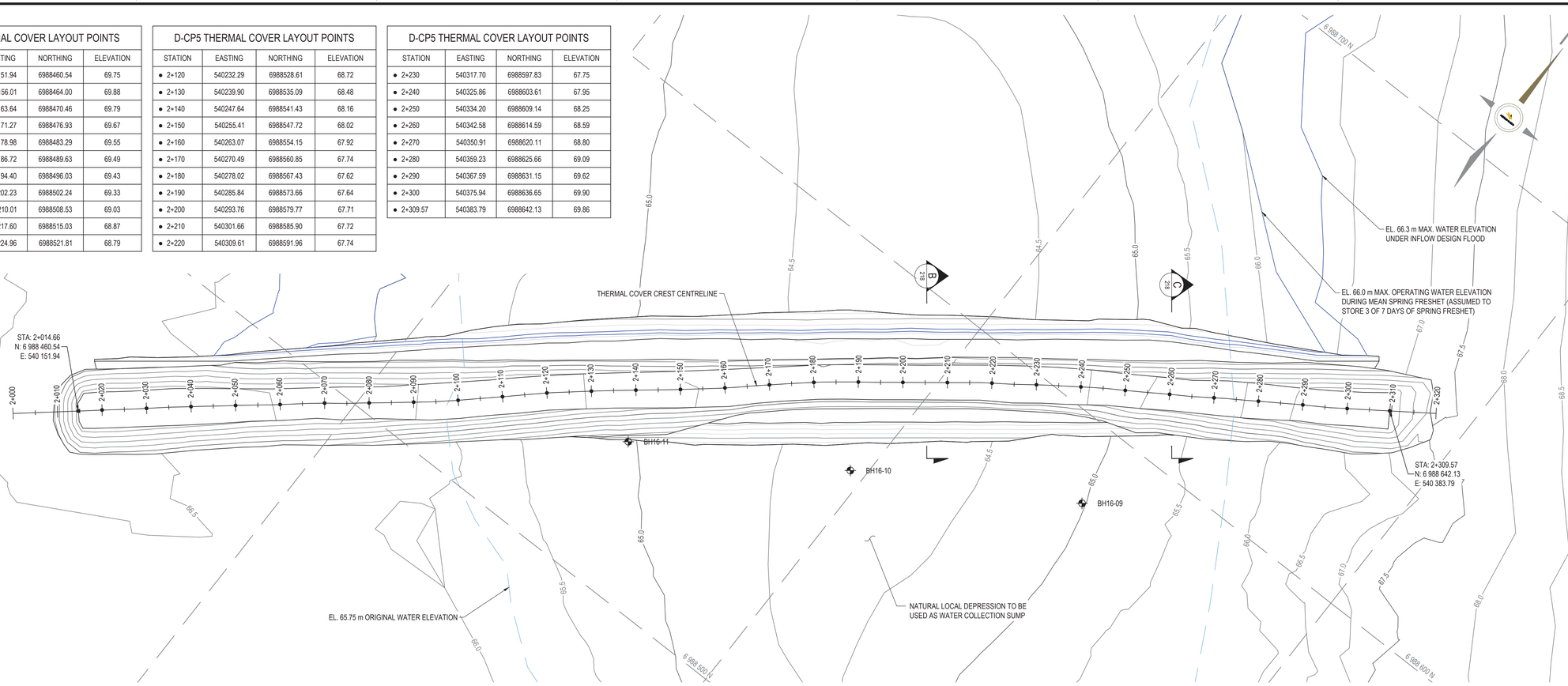
NO. DESSIN
DRAWING NO. 65-685-230-217_R1

FORMAT ARCHD

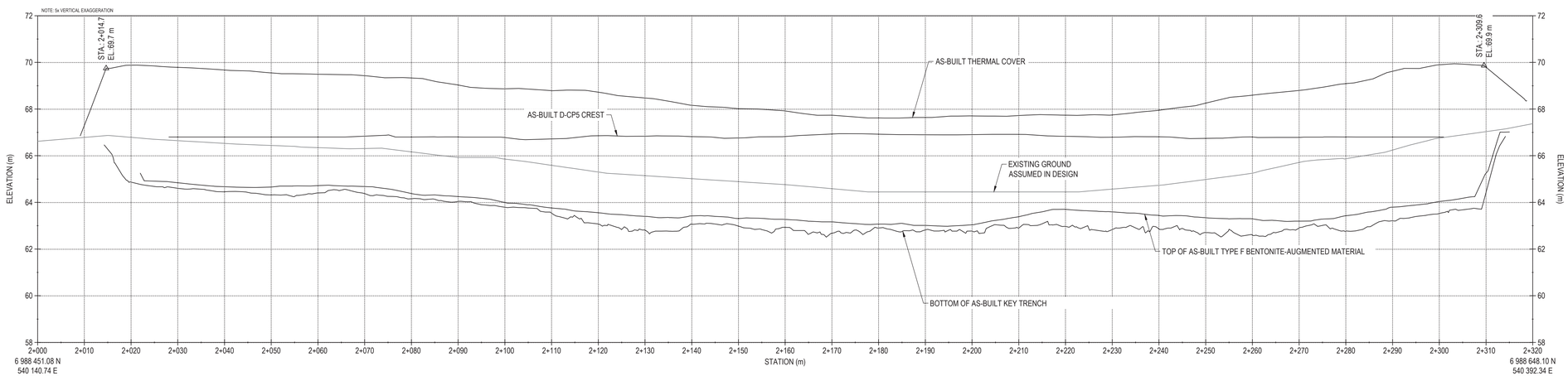
D-CP5 THERMAL COVER LAYOUT POINTS			
STATION	EASTING	NORTHING	ELEVATION
• 2+014.66	540151.94	6988460.54	69.75
• 2+020	540156.01	6988464.00	69.88
• 2+030	540163.64	6988470.46	69.79
• 2+040	540171.27	6988476.93	69.67
• 2+050	540178.98	6988483.29	69.55
• 2+060	540186.72	6988489.63	69.49
• 2+070	540194.40	6988496.03	69.43
• 2+080	540202.23	6988502.24	69.33
• 2+090	540210.01	6988508.53	69.03
• 2+100	540217.60	6988515.03	68.87
• 2+110	540224.96	6988521.81	68.79

D-CP5 THERMAL COVER LAYOUT POINTS			
STATION	EASTING	NORTHING	ELEVATION
• 2+120	540232.29	6988528.61	68.72
• 2+130	540239.90	6988535.09	68.48
• 2+140	540247.64	6988541.43	68.16
• 2+150	540255.41	6988547.72	68.02
• 2+160	540263.07	6988554.15	67.92
• 2+170	540270.49	6988560.85	67.74
• 2+180	540278.02	6988567.43	67.62
• 2+190	540285.84	6988573.66	67.64
• 2+200	540293.76	6988579.77	67.71
• 2+210	540301.66	6988585.90	67.72
• 2+220	540309.61	6988591.96	67.74

D-CP5 THERMAL COVER LAYOUT POINTS			
STATION	EASTING	NORTHING	ELEVATION
• 2+230	540317.70	6988597.83	67.75
• 2+240	540325.86	6988603.61	67.95
• 2+250	540334.20	6988609.14	68.25
• 2+260	540342.58	6988614.59	68.59
• 2+270	540350.91	6988620.11	68.80
• 2+280	540359.23	6988625.66	69.09
• 2+290	540367.59	6988631.15	69.62
• 2+300	540375.94	6988636.65	69.90
• 2+309.57	540383.79	6988642.13	69.86

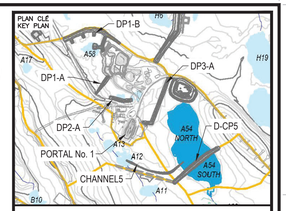


D-CP5 THERMAL COVER PLAN
SCALE: H-1:500



D-CP5 THERMAL COVER PROFILE
SCALE: H-1:500 V-1:100

PLAN CLÉ
KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

LEGEND

BOREHOLE

0 25m
Scale: 1:500

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date Oct 19, 2017
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2017-10-19

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES. © AGNICO EAGLE LTÉE.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST, WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. © AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
—	—
—	—
—	—
—	—
—	—
—	—

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2017-10-19	ISSUED FOR RECORD	WTH	NG	
0	2016-08-15	ISSUED FOR CONSTRUCTION	GZ	KJ	
A	2016-08-10	ISSUED FOR REVIEW	GZ	KJ	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER W.T. HORNE LICENSEE N.W.T. 2017-10-19

REGISTERED PROFESSIONAL ENGINEER G. ZHANG LICENSEE NWT/NU 2017-10-19

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

D-CP5 AS-BUILT THERMAL COVER
LAYOUT PLAN AND PROFILES

DESSINÉ PAR / DRAWN BY	EL	DATE 2016-08-15
VÉRIFIÉ PAR / CHECKED BY	GZ	2016-08-15
APPROUVÉ PAR / APPROVED BY	GZ	2016-08-15
ÉCHELLE / SCALE	1:500	DATE 2016-08-15

NO. DESSIN / DRAWING NO. 65-685-230-217

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6515	1	4 / 9

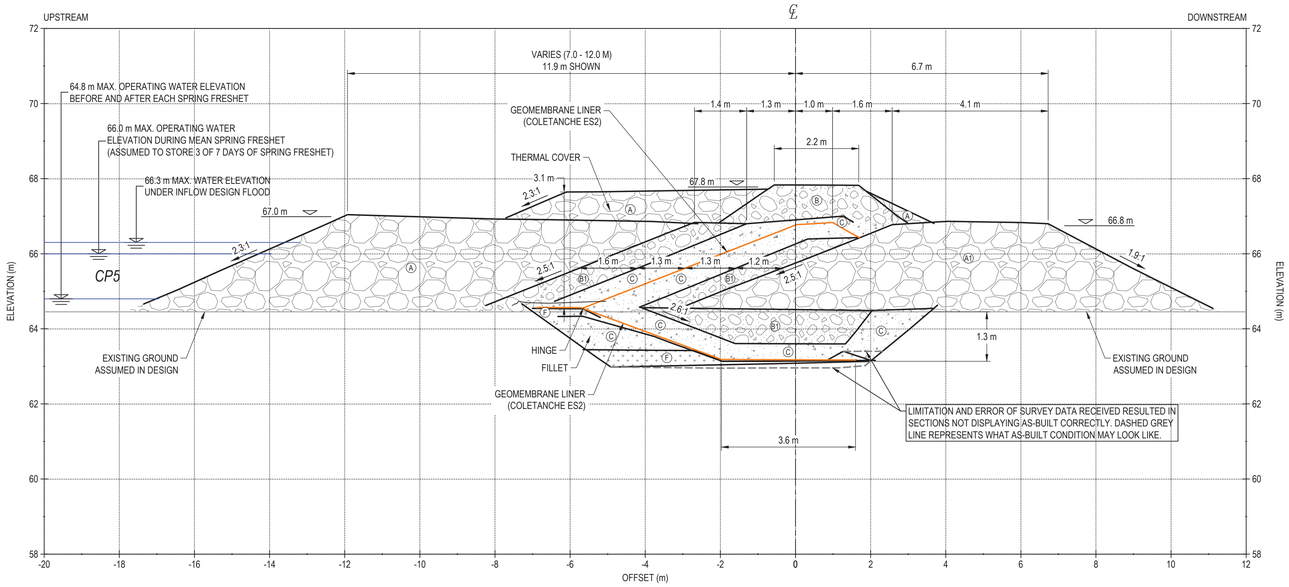
AE-CART-ARCH D

Q:\Edmonton\Engineering\E141\Projects_MELIADINE\As-Built D-CP5\65-685-230-217_R1.dwg-2017-10-19 13:46:48

FILE NO. 65-685-230-217_R1.dwg

NO. DESSIN
DRAWING NO. 65-685-230-218_R1

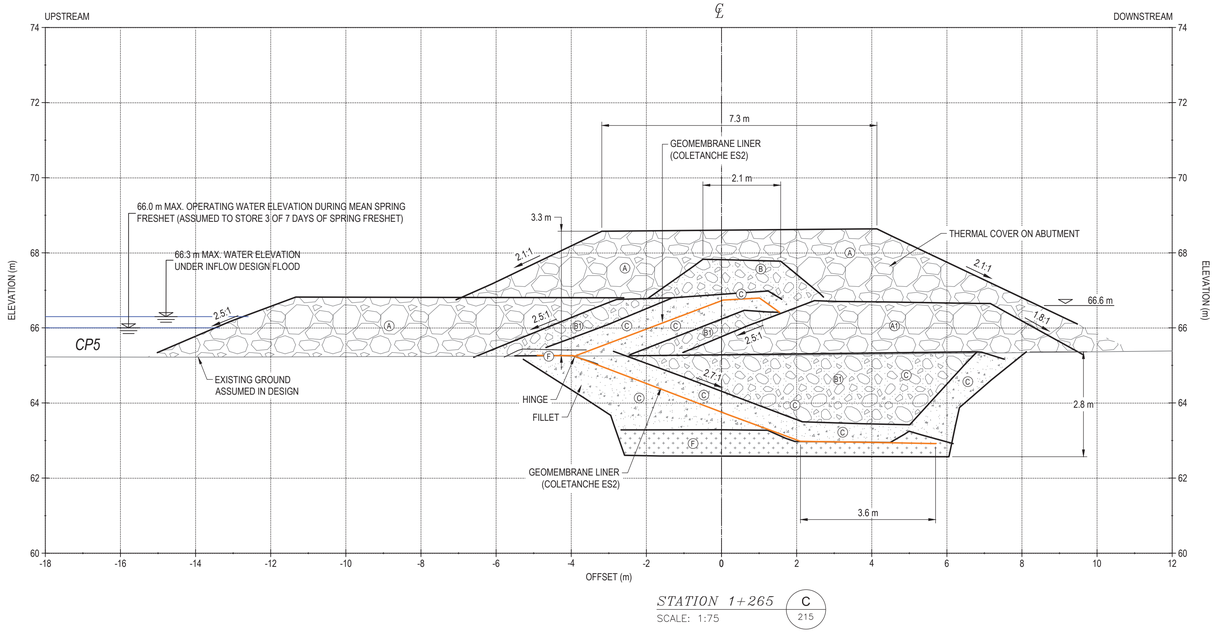
FORMAT ARCHD



STATION 1+210 (B / 215)
SCALE: 1:75

ESTIMATED IN-PLACE MATERIAL QUANTITIES FOR CONSTRUCTION OF D-CP5			
	ITEM	UNIT	AS-BUILT QUANTITY [a]
(A)	RUN-OF-MINE ROCKFILL (600 mm MINUS) IN DIKE UPSTREAM AND FOR THERMAL COVER	m³	10,029
(A1)	RUN-OF-MINE ROCKFILL (600 mm MINUS) IN DIKE DOWNSTREAM	m³	3,137
(B)/(B1)	TRANSITION ROCKFILL (150 mm MINUS)	m³	3,971
(C)	GRANULAR FILL OR ESKER SAND (20 mm MINUS)	m³	4,096
(F)	BENTONITE-AUGMENTED MATERIAL	m³	979
	GEOMEMBRANE LINER (COLETANCHE ES2)	m²	4437
	KEY TRENCH EXCAVATION	m³	5788

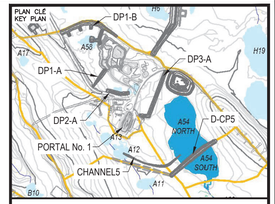
[a] MATERIAL QUANTITIES WERE BASED ON SURVEY DATA PROVIDED BY AGNICO EAGLE ON AUGUST 2017



STATION 1+265 (C / 215)
SCALE: 1:75

NOTE

THE DESIGN MINIMUM LINER CREST ELEVATION WAS 66.80 m.
THE DESIGN MINIMUM LINER CREST ELEVATION IS 66.72 m.



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date Oct 19, 2017
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2017-10-19

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES. (C) AGNICO EAGLE LTÉE

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST, WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. (C) AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
--	--
--	--
--	--
--	--
--	--
--	--

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2017-10-19	ISSUED FOR RECORD	WTH	NG	
0	2016-08-15	ISSUED FOR CONSTRUCTION	GZ	KJ	
A	2016-08-10	ISSUED FOR REVIEW	GZ	KJ	

REVISIONS

PROFESSIONAL ENGINEER W. T. HORNE LICENSEE N.W.T. 2017
PROFESSIONAL ENGINEER G. ZHANG LICENSEE NWT/NU 2017

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

D-CP5 AS-BUILT
TYPICAL SECTIONS AND QUANTITIES

DESSINÉ PAR / DRAWN BY	EL	DATE 2016-08-15
VÉRIFIÉ PAR / CHECKED BY	GZ	2016-08-15
APPROUVÉ PAR / APPROVED BY	GZ	2016-08-15
ÉCHELLE / SCALE	1:75	DATE 2016-08-15
NO. DESSIN / DRAWING NO.	65-685-230-218	
NO. PROJET / PROJECT NO.	6515	REVISION 1
		FEUILLE / SHT 5 / 9

AE-CART-ARCH D

Q:\Edmonton\Engineering\E141\Projects_MELIADINE\As-Built D-CP5\65-685-230-218_R1.dwg-2017-10-20 13:41:59

FILE NO. 65-685-230-218_R1.dwg

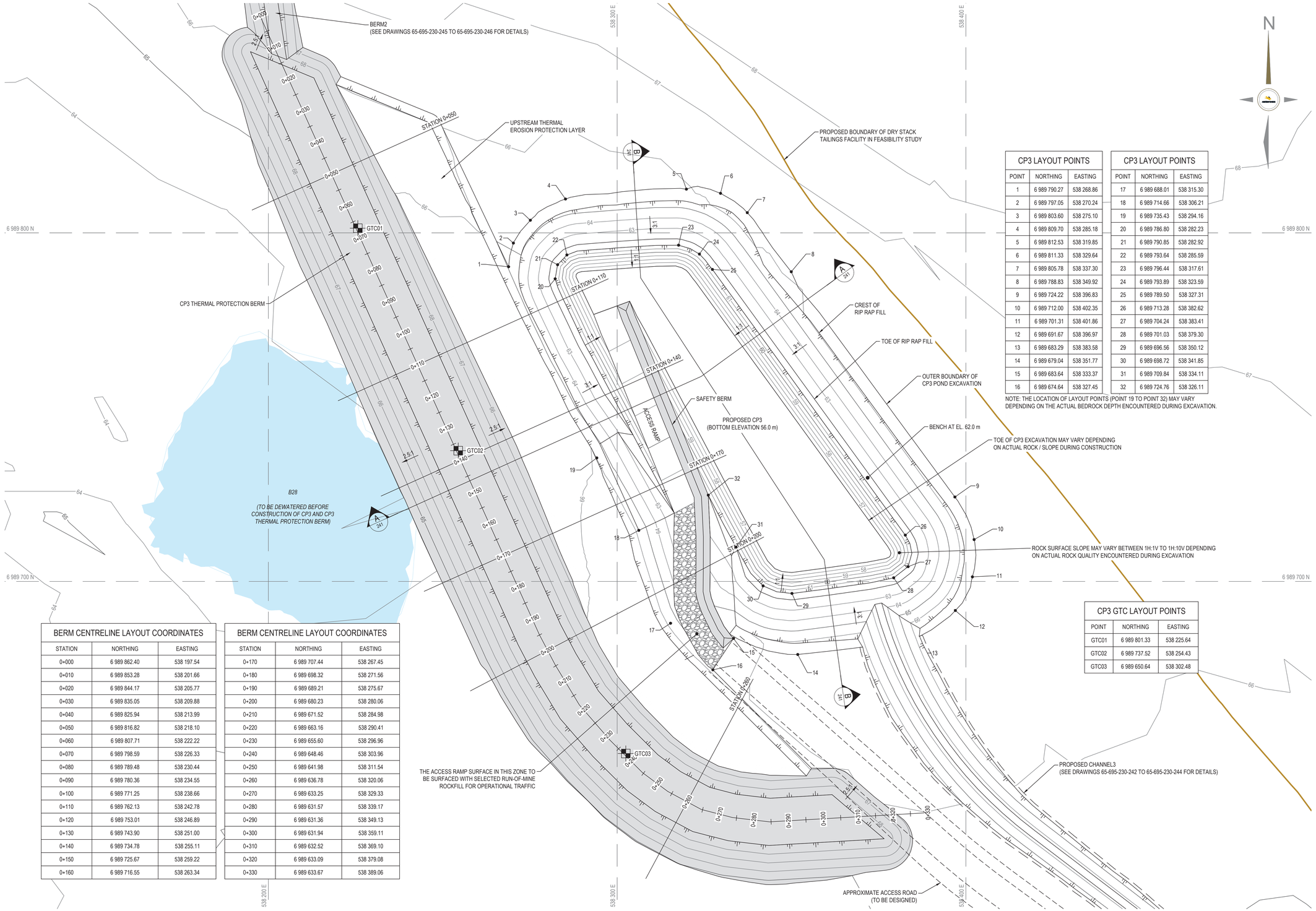
Appendix Q

Infrastructures As-Built and Design

CP3-berm

NO. DESSIN
DRAWING NO. 65-695-230-238

FORMAT ARCHD



CP3 LAYOUT POINTS		
POINT	NORTHING	EASTING
1	6 989 790.27	538 268.86
2	6 989 797.05	538 270.24
3	6 989 803.60	538 275.10
4	6 989 809.70	538 285.18
5	6 989 812.53	538 319.85
6	6 989 811.33	538 329.64
7	6 989 805.78	538 337.30
8	6 989 788.83	538 349.92
9	6 989 724.22	538 396.83
10	6 989 712.00	538 402.35
11	6 989 701.31	538 401.86
12	6 989 691.67	538 396.97
13	6 989 683.29	538 383.58
14	6 989 679.04	538 351.77
15	6 989 683.64	538 333.37
16	6 989 674.64	538 327.45

CP3 LAYOUT POINTS		
POINT	NORTHING	EASTING
17	6 989 688.01	538 315.30
18	6 989 714.66	538 306.21
19	6 989 735.43	538 294.16
20	6 989 786.80	538 282.23
21	6 989 790.85	538 282.92
22	6 989 793.64	538 285.59
23	6 989 796.44	538 317.61
24	6 989 793.89	538 323.59
25	6 989 789.50	538 327.31
26	6 989 713.28	538 382.62
27	6 989 704.24	538 383.41
28	6 989 701.03	538 379.30
29	6 989 696.56	538 350.12
30	6 989 696.72	538 341.85
31	6 989 709.84	538 334.11
32	6 989 724.76	538 326.11

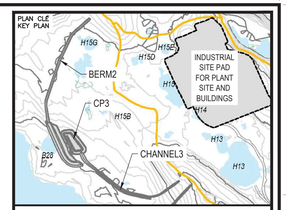
NOTE: THE LOCATION OF LAYOUT POINTS (POINT 19 TO POINT 32) MAY VARY DEPENDING ON THE ACTUAL BEDROCK DEPTH ENCOUNTERED DURING EXCAVATION.

CP3 GTC LAYOUT POINTS		
POINT	NORTHING	EASTING
GTC01	6 989 801.33	538 225.64
GTC02	6 989 737.52	538 254.43
GTC03	6 989 650.64	538 302.48

BERM CENTRELINE LAYOUT COORDINATES		
STATION	NORTHING	EASTING
0+000	6 989 862.40	538 197.54
0+010	6 989 853.28	538 201.66
0+020	6 989 844.17	538 205.77
0+030	6 989 835.05	538 209.88
0+040	6 989 825.94	538 213.99
0+050	6 989 816.82	538 218.10
0+060	6 989 807.71	538 222.22
0+070	6 989 798.59	538 226.33
0+080	6 989 789.48	538 230.44
0+090	6 989 780.36	538 234.55
0+100	6 989 771.25	538 238.66
0+110	6 989 762.13	538 242.78
0+120	6 989 753.01	538 246.89
0+130	6 989 743.90	538 251.00
0+140	6 989 734.78	538 255.11
0+150	6 989 725.67	538 259.22
0+160	6 989 716.55	538 263.34

BERM CENTRELINE LAYOUT COORDINATES		
STATION	NORTHING	EASTING
0+170	6 989 707.44	538 267.45
0+180	6 989 698.32	538 271.56
0+190	6 989 689.21	538 275.67
0+200	6 989 680.23	538 280.06
0+210	6 989 671.52	538 284.98
0+220	6 989 663.16	538 290.41
0+230	6 989 655.60	538 296.96
0+240	6 989 648.46	538 303.96
0+250	6 989 641.98	538 311.54
0+260	6 989 636.78	538 320.06
0+270	6 989 633.25	538 329.33
0+280	6 989 631.57	538 339.17
0+290	6 989 631.36	538 349.13
0+300	6 989 631.94	538 359.11
0+310	6 989 632.52	538 369.10
0+320	6 989 633.09	538 379.08
0+330	6 989 633.67	538 389.06

PLAN CLÉ
KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

1. ASSUMED CONSTRUCTION SCHEDULE WINTER 2018 / 2019
2. ASSUMED OPERATION SCHEDULE STARTING TO STORE WATER FROM FRESHET OF 2019.
3. POND DESIGN CAPACITY IS BASED ON STORING 3 OUT OF 7 FRESHET WATER UNDER 1:100 WET YEAR CONDITION.
4. THE MAXIMUM ALLOWABLE OPERATING WATER LEVEL IS AT ELEVATION 63.0 m UNDER THE DESIGN IDF CONDITION.
5. MATERIAL PLACEMENT AND FOUNDATION PREPARATION SHOULD BE IN ACCORDANCE WITH THE REQUIREMENTS OF GEOTECHNICAL CONSTRUCTION / MATERIAL SPECIFICATIONS (TETRA TECH 2018).

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date June 21, 2018
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

POUR CONSTRUCTION
FOR CONSTRUCTION
AGNICO EAGLE
DATE : 2018-06-21

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES. © AGNICO EAGLE LTÉE.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST, WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. © AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
—	—
—	—
—	—
—	—
—	—
—	—

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2018-06-21	ISSUED FOR CONSTRUCTION	HX	WTH	
A	2018-05-29	ISSUED FOR REVIEW	HX	WTH	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER — H. XIA — LICENSEE — NWT/NU — 2018
REGISTERED PROFESSIONAL ENGINEER — W.T. HORNE — LICENSEE — N.W.T. — 2018

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

CP3 AND CP3 THERMAL PROTECTION BERM
LAYOUT PLAN

DESSINÉ PAR / DRAWN BY	EL	DATE 2018-06-21
VÉRIFIÉ PAR / CHECKED BY	HX	2018-06-21
APPROUVÉ PAR / APPROVED BY	WTH	2018-06-21
ÉCHELLE / SCALE	1:500	DATE 2018-06-21

NO. DESSIN / DRAWING NO. 65-695-230-238

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6515	0	1 / 13

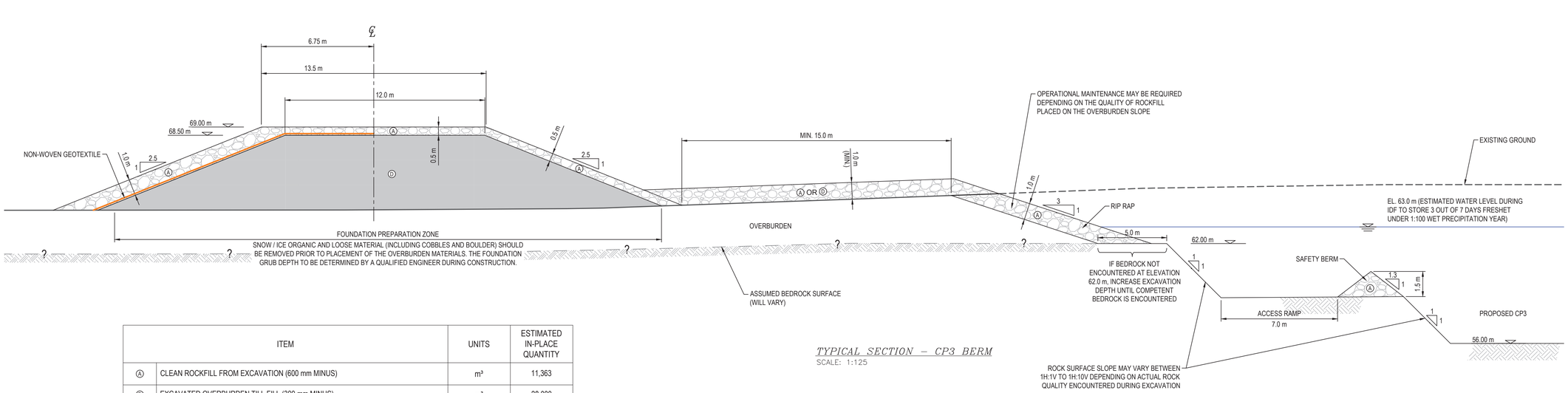
AE-CART-ARCH D

Q:\Edmonton\Engineering\E141\Projects_MELIADINE\CP3_CP4 Detailed Design\CP3\65-695-230-238.dwg-2013-02-19 14:03:29

FILE NO. 65-695-230-238.dwg

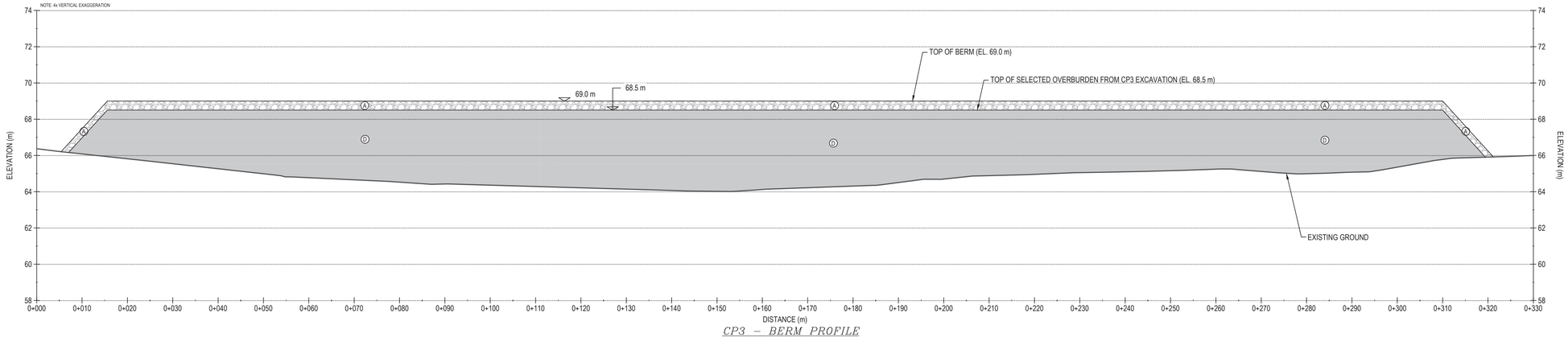
NO. DESSIN
DRAWING NO. 65-695-230-239

FORMAT ARCHD



TYPICAL SECTION – CP3 BERM
SCALE: 1:125

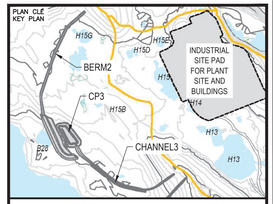
	ITEM	UNITS	ESTIMATED IN-PLACE QUANTITY
Ⓐ	CLEAN ROCKFILL FROM EXCAVATION (600 mm MINUS)	m³	11,363
Ⓓ	EXCAVATED OVERBURDEN TILL FILL (300 mm MINUS)	m³	28,000
	NON-WOVEN GEOTEXTILE	m²	5,250
	TOTAL CP3 EXCAVATION VOLUME (CONSIDERING 25% BULK FACTOR)	m³	70,112
	ESTIMATED OVERBURDEN EXCAVATION VOLUME (CONSIDERING 25% BULK FACTOR)	m³	28,687
	ESTIMATED ROCK EXCAVATION VOLUME (CONSIDERING 25% BULK FACTOR)	m³	41,425



CP3 – BERM PROFILE
SCALE: H-1:500 V-1:125

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2018-06-21
AGNICO EAGLE

PLAN CLÉ
KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

1. ASSUMED CONSTRUCTION SCHEDULE WINTER 2018 / 2019
2. ASSUMED OPERATION SCHEDULE STARTING TO STORE WATER FROM FRESHET OF 2019.
3. POND DESIGN CAPACITY IS BASED ON STORING 3 OUT OF 7 FRESHET WATER UNDER 1:100 WET YEAR CONDITION.
4. THE MAXIMUM ALLOWABLE OPERATING WATER LEVEL IS AT ELEVATION 63.0 m UNDER THE DESIGN IDF CONDITION.
5. MATERIAL PLACEMENT AND FOUNDATION PREPARATION SHOULD BE IN ACCORDANCE WITH THE REQUIREMENTS OF GEOTECHNICAL CONSTRUCTION / MATERIAL SPECIFICATIONS (TETRA TECH 2018).

LEGEND

Ⓐ CLEAN ROCKFILL FROM EXCAVATION (600 mm MINUS)
Ⓓ OVERBURDEN FROM EXCAVATION (300 mm MINUS)

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date June 21, 2018
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES. (C) AGNICO EAGLE LTÉE.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST, WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. (C) AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
--	--
--	--
--	--
--	--
--	--
--	--

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2018-06-21	ISSUED FOR CONSTRUCTION	HX	WTH	
A	2018-05-29	ISSUED FOR REVIEW	HX	WTH	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER — W.T. HORNE — LICENSEE — NWT — 2018
REGISTERED PROFESSIONAL ENGINEER — W.T. HORNE — LICENSEE — N.W.T — 2018

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

CP3 TYPICAL SECTION AND
CP3 THERMAL PROTECTION BERM PROFILE

DESSINÉ PAR DRAWN BY	EL	DATE 2018-06-21
VÉRIFIÉ PAR CHECKED BY	HX	2018-06-21
APPROUVÉ PAR APPROVED BY	WTH	2018-06-21
ÉCHELLE SCALE	AS SHOWN	DATE 2018-06-21
NO. DESSIN DRAWING NO.	65-695-230-239	
NO. PROJET PROJECT NO.	6515	REVISION 0
		FEUILLE / SHT 2 / 13

AE-CART-ARCH D

Q:\Edmonton\Engineering\E141\Projects_MELIADINE\CP3_CP4 Detailed Design\CP3\65-695-230-239.dwg-2013-02-19 14:03:29

FILE NO. 65-695-230-239.dwg

Appendix Q

Infrastructures As-Built and Design

CP4-berm

NO. DESSIN
DRAWING NO. 65-695-230-247

FORMAT ARCHD

BERM CENTRELINE LAYOUT COORDINATES		
STATION	NORTHING	EASTING
0+000	6 988 887.18	539 126.07
0+010	6 988 879.47	539 119.70
0+020	6 988 871.77	539 113.33
0+030	6 988 864.06	539 106.96
0+040	6 988 856.35	539 100.58
0+050	6 988 848.65	539 094.21
0+060	6 988 840.94	539 087.84
0+070	6 988 833.23	539 081.47
0+080	6 988 825.53	539 075.10
0+090	6 988 817.82	539 068.72
0+100	6 988 810.11	539 062.35
0+110	6 988 802.41	539 055.98
0+120	6 988 794.70	539 049.61
0+130	6 988 786.99	539 043.23

BERM CENTRELINE LAYOUT COORDINATES		
STATION	NORTHING	EASTING
0+140	6 988 779.29	539 036.86
0+150	6 988 771.58	539 030.49
0+160	6 988 763.87	539 024.12
0+170	6 988 756.17	539 017.74
0+180	6 988 748.46	539 011.37
0+190	6 988 740.75	539 005.00
0+200	6 988 733.05	538 998.63
0+210	6 988 725.34	538 992.25
0+220	6 988 717.63	538 985.88
0+230	6 988 709.93	538 979.51
0+240	6 988 702.22	538 973.14
0+250	6 988 694.51	538 966.76
0+260	6 988 686.81	538 960.39

CP4 GTC LAYOUT POINTS		
POINT	NORTHING	EASTING
GTC05	6 988 856.35	539 100.58
GTC06	6 988 810.11	539 062.35
GTC07	6 988 756.17	539 017.74

CP4 LAYOUT POINTS		
POINT	NORTHING	EASTING
1	6 988 758.20	539 106.93
2	6 988 764.17	539 115.89
3	6 988 767.63	539 131.19
4	6 988 765.57	539 142.28
5	6 988 760.11	539 150.91
6	6 988 695.66	539 206.22
7	6 988 683.48	539 211.61
8	6 988 674.03	539 213.18
9	6 988 658.62	539 209.68
10	6 988 640.63	539 202.63
11	6 988 625.15	539 189.27
12	6 988 617.26	539 179.70
13	6 988 612.74	539 167.42
14	6 988 610.59	539 150.81
15	6 988 617.03	539 133.05
16	6 988 627.36	539 120.45
17	6 988 649.65	539 105.54

CP4 LAYOUT POINTS		
POINT	NORTHING	EASTING
18	6 988 665.21	539 079.14
19	6 988 672.40	539 066.32
20	6 988 667.64	539 045.94
21	6 988 683.28	539 050.44
22	6 988 691.83	539 073.65
23	6 988 698.06	539 072.31
24	6 988 712.22	539 073.52
25	6 988 719.99	539 076.68
26	6 988 676.77	539 126.97
27	6 988 688.46	539 111.97
28	6 988 699.34	539 096.84
29	6 988 701.99	539 094.50
30	6 988 706.70	539 093.79
31	6 988 710.20	539 094.87
32	6 988 742.77	539 120.82
33	6 988 744.73	539 124.22
34	6 988 745.21	539 128.16

CP4 LAYOUT POINTS		
POINT	NORTHING	EASTING
35	6 988 743.64	539 131.95
36	6 988 673.70	539 183.47
37	6 988 663.67	539 186.41
38	6 988 653.20	539 184.05
39	6 988 647.74	539 179.29
40	6 988 640.07	539 165.01
41	6 988 640.12	539 157.88
42	6 988 642.91	539 150.62
43	6 988 656.96	539 133.63
44	6 988 668.49	539 119.74
45	6 988 646.18	539 170.83
46	6 988 644.78	539 156.17
47	6 988 654.93	539 160.40
48	6 988 706.36	539 097.77
49	6 988 741.25	539 127.63
50	6 988 663.67	539 182.41

NOTE: THE LOCATION OF LAYOUT POINTS (POINT 26 TO POINT 50) MAY VARY DEPENDING ON THE ACTUAL BEDROCK DEPTH ENCOUNTERED DURING EXCAVATION.

B7

B8

(TO BE DEWATERED BEFORE CONSTRUCTION OF CP4 AND CP4 THERMAL PROTECTION BERM)

B9 (TO BE DEWATERED)

CP4 THERMAL PROTECTION BERM

PROPOSED CHANNEL4 (SEE DRAWINGS 65-695-230-251 TO 65-695-230-253 FOR DETAILS)

PROPOSED FOOTPRINT OF WASTE ROCK AND OVERBURDEN STORAGE FACILITY 1 (WRSF1)

OUTER BOUNDARY OF CP4 POND EXCAVATION

CREST OF RIP RAP FILL

BENCH AT EL. 60.0 m

TOE OF RIP RAP FILL

PROPOSED CP4 (BOTTOM ELEVATION 56.0 m)

SAFETY BERM

ACCESS RAMP

UPSTREAM THERMAL EROSION PROTECTION LAYER

THE ACCESS RAMP SURFACE IN THIS ZONE TO BE SURFACED WITH SELECTED RUN-OF-MINE ROCKFILL FOR OPERATIONAL TRAFFIC

CP4 ACCESS ROAD (TO BE DESIGNED BY OTHERS)

STATION 0+080

STATION 0+120

STATION 0+150

STATION 0+180

STATION 0+200

2.5:1

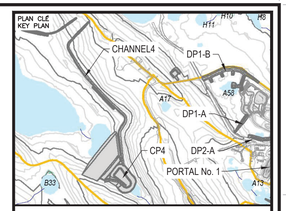
3:1

5:1

538 900 E | 539 000 E | 539 100 E | 539 200 E | 539 300 E

6 988 900 N | 6 988 800 N | 6 988 700 N | 6 988 600 N

N



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

1. ASSUMED CONSTRUCTION SCHEDULE WINTER 2018 / 2019
2. ASSUMED OPERATION SCHEDULE STARTING TO STORE WATER FROM FRESHET OF 2019.
3. POND DESIGN CAPACITY IS BASED ON STORING 3 OUT OF 7 FRESHET WATER UNDER 1:100 WET YEAR CONDITION.
4. THE MAXIMUM ALLOWABLE OPERATING WATER LEVEL IS AT ELEVATION 63.0 m UNDER THE DESIGN IDF CONDITION.
5. MATERIAL PLACEMENT AND FOUNDATION PREPARATION SHOULD BE IN ACCORDANCE WITH THE REQUIREMENTS OF GEOTECHNICAL CONSTRUCTION / MATERIAL SPECIFICATIONS (TETRA TECH 2018).

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date June 21, 2018
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

POUR CONSTRUCTION
FOR CONSTRUCTION
AGNICO EAGLE
DATE : 2018-06-21

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES. (C) AGNICO EAGLE LTÉE.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST, WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. (C) AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
--	--
--	--
--	--
--	--
--	--
--	--

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2018-06-21	ISSUED FOR CONSTRUCTION	HX	WTH	
A	2018-05-29	ISSUED FOR REVIEW	HX	WTH	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER H.XIA LICENSEE NWT/NU — 2018

REGISTERED PROFESSIONAL ENGINEER W.T. HORNE LICENSEE N.W.T. — 2018

TITRE / TITLE

AGNICO EAGLE MELIADINE GOLD PROJECT

CP4 AND CP4 THERMAL PROTECTION BERM LAYOUT PLAN

DESSINÉ PAR / DRAWN BY	EL	DATE 2018-06-21
VERIFIÉ PAR / CHECKED BY	HX	2018-06-21
APPROUVÉ PAR / APPROVED BY	WTH	2018-06-21
ÉCHELLE / SCALE	1:750	DATE 2018-06-21

NO. DESSIN / DRAWING NO. 65-695-230-247

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6515	0	1 / 9

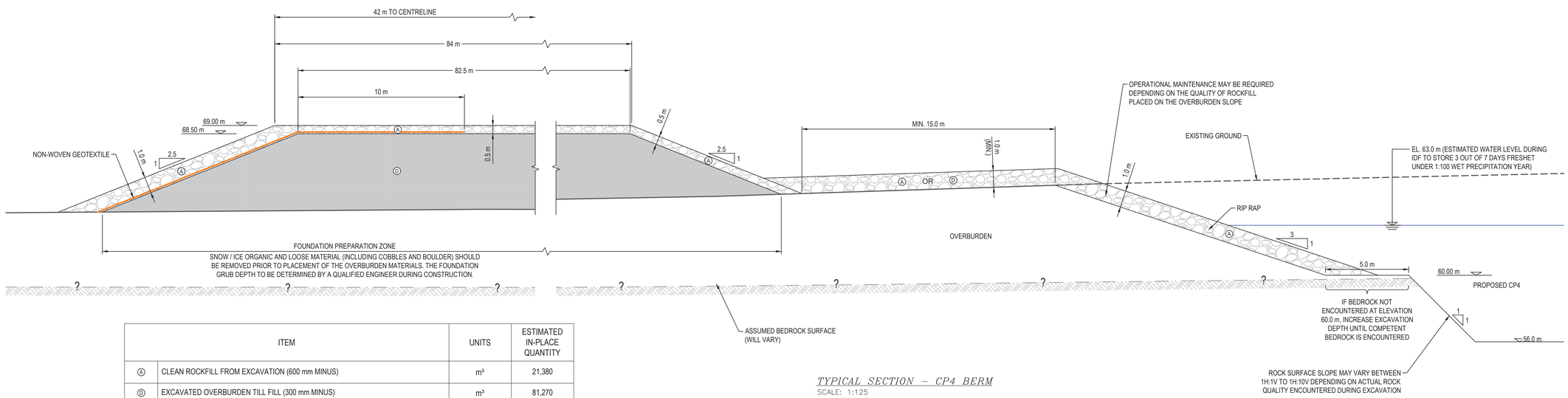
AE-CART-ARCH D

Q:\Edmonton\Engineering\E141\Projects_MELIADINE\CP3_CP4 Detailed Design\CP4\65-695-230-247.dwg-2013-02-19 14:03:29

FILE NO. 65-695-230-247.dwg

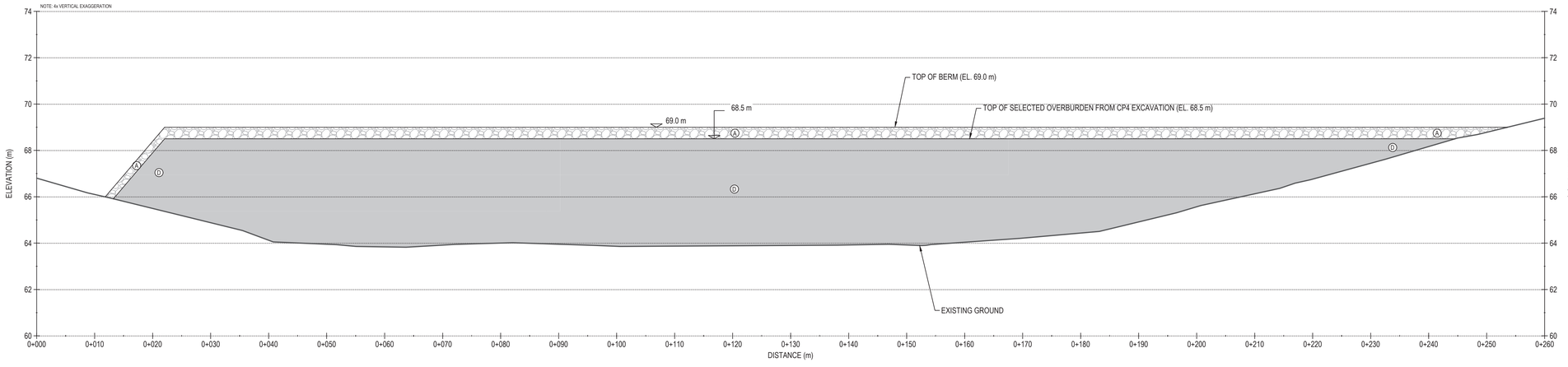
NO. DESSIN
DRAWING NO. 65-695-230-248

FORMAT ARCHD



TYPICAL SECTION – CP4 BERM
SCALE: 1:125

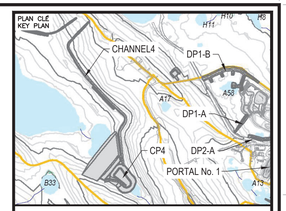
	ITEM	UNITS	ESTIMATED IN-PLACE QUANTITY
Ⓐ	CLEAN ROCKFILL FROM EXCAVATION (600 mm MINUS)	m³	21,380
Ⓓ	EXCAVATED OVERBURDEN TILL FILL (300 mm MINUS)	m³	81,270
	NON-WOVEN GEOTEXTILE	m²	5,900
	TOTAL CP4 EXCAVATION VOLUME (CONSIDERING 25% BULK FACTOR)	m³	103,143
	ESTIMATED OVERBURDEN EXCAVATION VOLUME (CONSIDERING 25% BULK FACTOR)	m³	81,643
	ESTIMATED ROCK EXCAVATION VOLUME (CONSIDERING 25% BULK FACTOR)	m³	21,500



CP4 – BERM PROFILE
SCALE: H-1:400 V-1:100

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2018-06-21
AGNICO EAGLE

PLAN CLÉ
KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

1. ASSUMED CONSTRUCTION SCHEDULE WINTER 2018 / 2019
2. ASSUMED OPERATION SCHEDULE STARTING TO STORE WATER FROM FRESHET OF 2019.
3. POND DESIGN CAPACITY IS BASED ON STORING 3 OUT OF 7 FRESHET WATER UNDER 1:100 WET YEAR CONDITION.
4. THE MAXIMUM ALLOWABLE OPERATING WATER LEVEL IS AT ELEVATION 63.0 m UNDER THE DESIGN IDF CONDITION.
5. MATERIAL PLACEMENT AND FOUNDATION PREPARATION SHOULD BE IN ACCORDANCE WITH THE REQUIREMENTS OF GEOTECHNICAL CONSTRUCTION / MATERIAL SPECIFICATIONS (TETRA TECH 2018).

LEGEND

Ⓐ CLEAN ROCKFILL FROM EXCAVATION (600 mm MINUS)
Ⓓ OVERBURDEN FROM EXCAVATION (300 mm MINUS)

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date June 21, 2018
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉ SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES. (C) AGNICO EAGLE LTÉE.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST, WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. (C) AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
--	--
--	--
--	--
--	--
--	--
--	--

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2018-06-21	ISSUED FOR CONSTRUCTION	HX	WTH	
A	2018-05-29	ISSUED FOR REVIEW	HX	WTH	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER H. XIA LICENSEE NT/NU 2018
REGISTERED PROFESSIONAL ENGINEER W.T. HORNE LICENSEE N.W.T. 2018

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

CP4 TYPICAL SECTION AND
CP4 THERMAL PROTECTION BERM PROFILE

DESSINÉ PAR / DRAWN BY	EL	DATE 2018-06-21
VÉRIFIÉ PAR / CHECKED BY	HX	2018-06-21
APPROUVÉ PAR / APPROVED BY	WTH	2018-06-21
ÉCHELLE / SCALE	AS SHOWN	DATE 2018-06-21
NO. DESSIN / DRAWING NO.	65-695-230-248	
NO. PROJET / PROJECT NO.	6515	REVISION 0
		FEUILLE / SHT 2 / 9

AE-CART-ARCH D

Q:\Edmonton\Engineering\E141\Projects_MELIADINE\CP3_CP4 Detailed Design\CP4\65-695-230-248.dwg-2013-02-19 14:03:29

FILE NO. 65-695-230-248.dwg

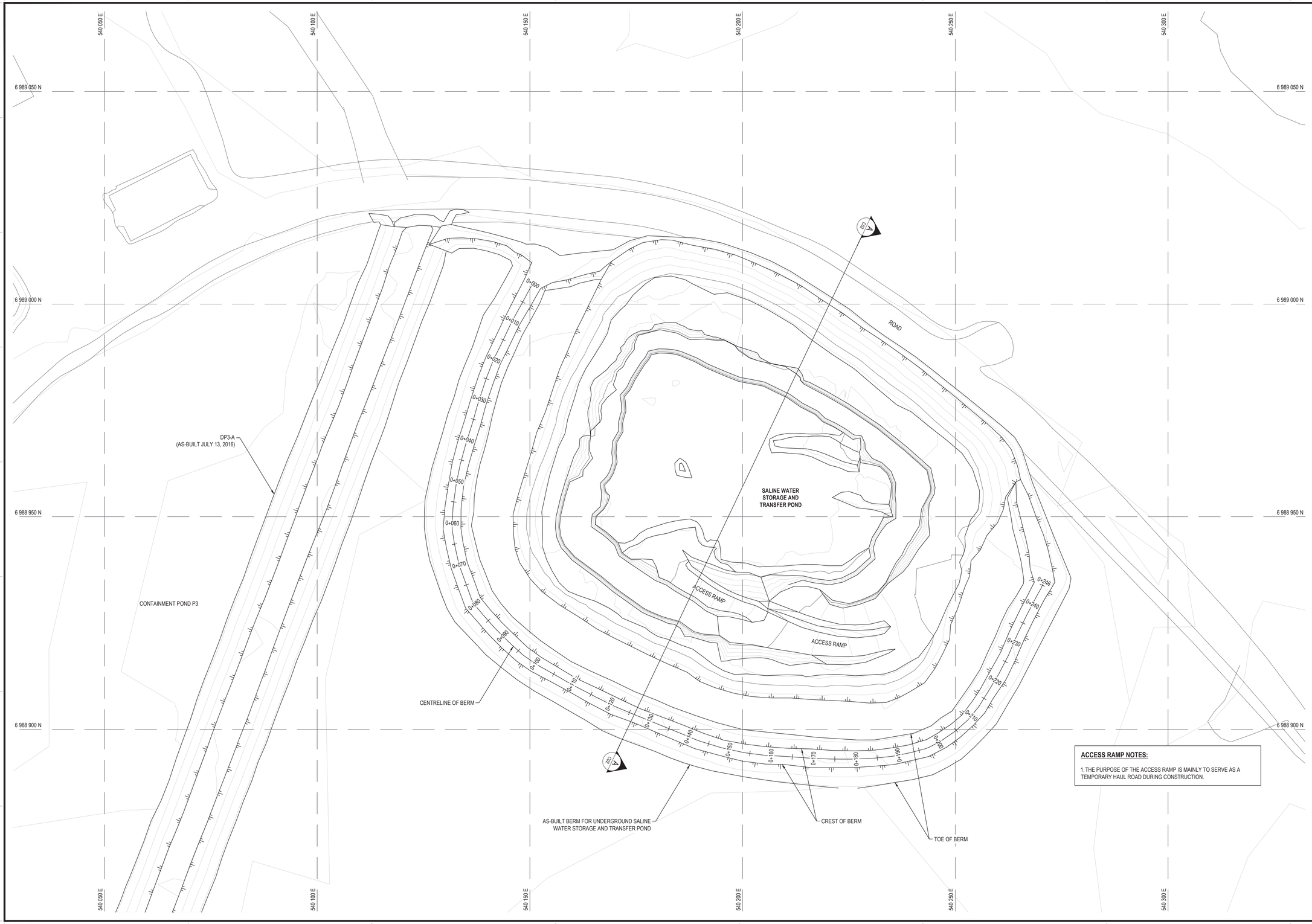
Appendix Q

Infrastructures As-Built and Design

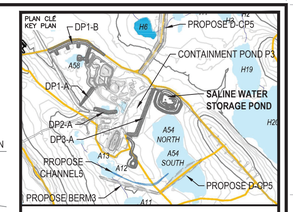
Saline Pond #1 and berm

NO. DESSIN
DRAWING NO. 65-695-230-223

FORMAT ARCHD



PLAN CLÉ
KEY PLAN



TETRA TECH EBA

NOTES GÉNÉRALES / GENERAL NOTES

- AS-BUILT SURVEY PROVIDED BY AGNICO EAGLE ON NOVEMBER 28, 2016.

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date Feb. 2 / 2017
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2017-02-02

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉ SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÉTE SONT INTERDITES. © AGNICO EAGLE LTÉE.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST, WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. © AGNICO EAGLE LTD.

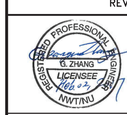
DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

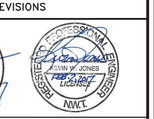
TITRE / TITLE	# DWG
—	—
—	—
—	—
—	—
—	—
—	—

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2017-02-02	ISSUED FOR RECORD	EL	GZ	
A	2016-12-21	ISSUED FOR REVIEW	EL	GZ	

REVISIONS





TITRE / TITLE

AGNICO EAGLE MELIADINE GOLD PROJECT

AS-BUILT PLAN FOR SALINE WATER STORAGE/TRANSFER POND AND BERM

DESSINÉ PAR / DRAWN BY	EL	DATE 2017-02-02
VERIFIÉ PAR / CHECKED BY	GZ	2017-02-02
APPROUVÉ PAR / APPROVED BY	KJ	2017-02-02
ÉCHELLE / SCALE	1:400	DATE 2017-02-02

NO. DESSIN / DRAWING NO. 65-695-230-223

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6515	0	1 / 6

ACCESS RAMP NOTES:

1. THE PURPOSE OF THE ACCESS RAMP IS MAINLY TO SERVE AS A TEMPORARY HAUL ROAD DURING CONSTRUCTION.

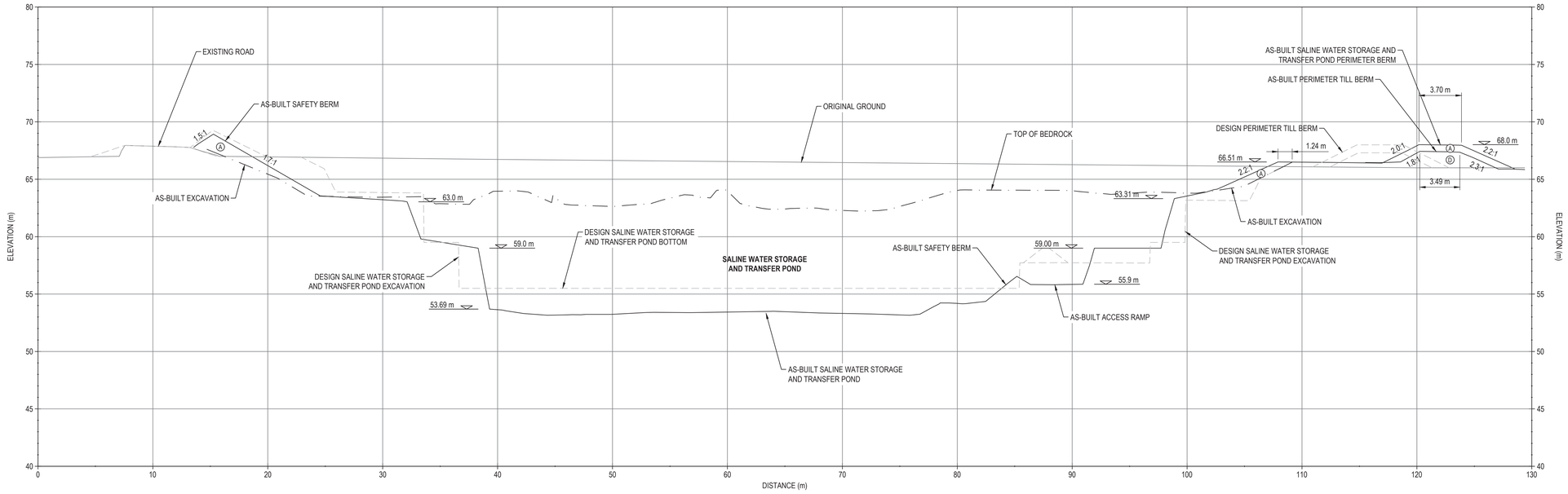
AE-CART-ARCH D

Q:\Edmonton\Engineering\E141\Projects\E14103230_Block007_Meliadine Detail Design\Modelling\Production Drawings\Saltwater Storage Pond and Berm\As-Built\Saline Water Storage Pond_As-Built.dwg-2013-02-19 14:03:29

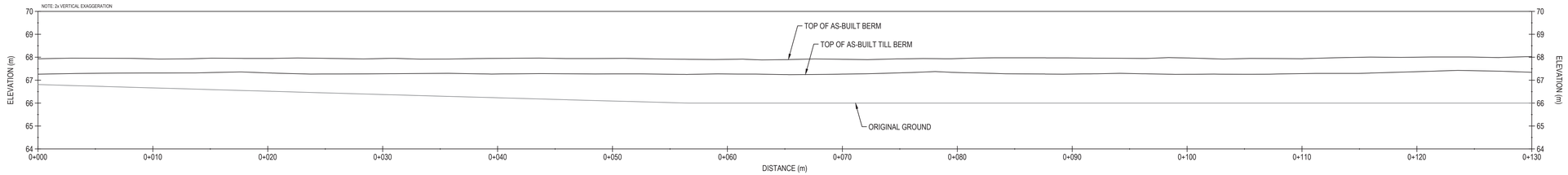
FILE NO. Saline Water Storage Pond_As-Built.dwg

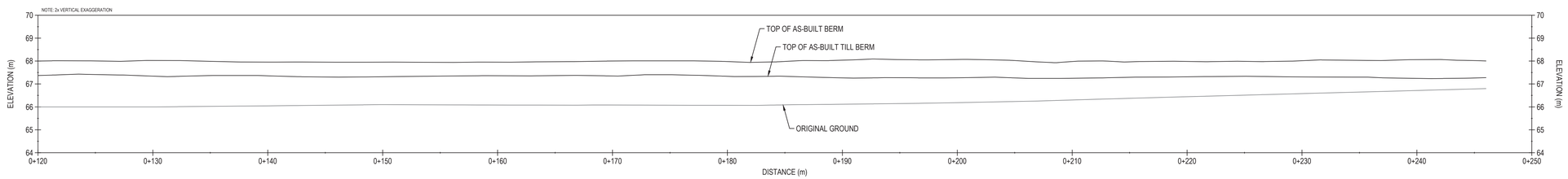
NO. DESSIN
DRAWING NO. 65-695-230-224

FORMAT ARCHD

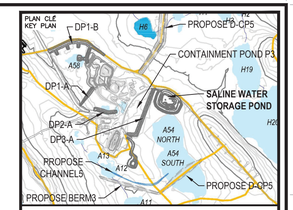


SECTION A C01
SCALE: H-1:200





AS-BUILT SALINE WATER STORAGE/TRANSFER POND - BERM PROFILE
SCALE: H-1:200 V-1:100



TETRA TECH EBA

NOTES GÉNÉRALES / GENERAL NOTES

- AS-BUILT SURVEY PROVIDED BY AGNICO EAGLE ON NOVEMBER 28, 2016.

LEGEND

Ⓐ RUN-OF-MINE ROCKFILL (600 mm MINUS)

Ⓓ SELECTED UNFROZEN TILL FILL (300 mm MINUS)

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date Feb. 2 / 2017
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE DATE : 2017-02-02

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES. (C) AGNICO EAGLE LTD.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST, WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED.
(C) AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
--	--
--	--
--	--
--	--
--	--
--	--

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
0	2017-02-02	ISSUED FOR RECORD	EL	GZ	
A	2016-12-21	ISSUED FOR REVIEW	EL	GZ	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER G. ZHANG LICENSEE NWT/NU

REGISTERED PROFESSIONAL ENGINEER KEVIN W. JONES PERMIT TO PRACT LICENCE NWT

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

AS-BUILT BERM PROFILE AND SECTION
FOR SALINE WATER STORAGE/TRANSFER
POND AND BERM

DESSINÉ PAR / DRAWN BY	EL	DATE 2017-02-02
VÉRIFIÉ PAR / CHECKED BY	GZ	2017-02-02
APPROUVÉ PAR / APPROVED BY	KJ	2017-02-02
ÉCHELLE / SCALE	1:200	DATE 2017-02-02
NO. DESSIN / DRAWING NO.	65-695-230-224	
NO. PROJET / PROJECT NO.	6515	REVISION 0
		FEUILLE / SHT 2 / 6

AE-CART-ARCH D

Q:\Edmonton\Engineering\E141\Projects\E14103230_Block007_Meliadine Detail Design\Modelling\Production Drawings\Saltwater Storage Pond and Berm\As-Built\Saline Water Storage Pond_As-Built.dwg-2013-02-19 14:03:29

FILE NO. Saline Water Storage Pond_As-Built.dwg

Appendix Q

Infrastructures As-Built and Design

Effluent Water Treatment Plant (EWTP)

PIPERACK & RELATIVE

NO. DESSIN DRAWING NO 65-693-2 0-200_R4

FORMAT ARCH D

eau
Reactif
Air
Sump pump

As Built
2017-11-03
2017-11-08

compresseur

FINAL WATER TREATMENT PLANT – PLAN VIEW

POUR CONSTRUCTION
AGNICO EAGLE DATE 2017-06-21

WSP
1075 AV. DE BEAUREGARD, MAGOG, QUÉBEC, CANADA J1X 2X7
TEL: 819 823-4474 | TÉLÉC: 819 574-4151 | WWW.WSP-CPLUS.COM
Ref. 151-06440-10

NOTES GÉNÉRALES / GENERAL NOTES

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
–	–
–	–
–	–
–	–
–	–
–	–

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
4	2017-06-21	GENERAL REVISION FOR MINES BUILDING	V.T.	B.F.	
3	2017-04-28	BUILDING REVISION	V.T.	B.F.	
2	2017-03-24	ISSUED FOR CONSTRUCTION	I.G.	B.F.	
1	2017-03-03	GENERAL REVISION, AFTER INFC	V.T.	B.F.	
0	2016-12-13	ISSUED FOR TENDER	I.G.	B.F.	

REVISIONS

TITRE / TITLE
AGNICO EAGLE – MEADOWBANK DIVISION
693 – FINAL WATER TREATMENT PLANT
210– GENERAL ARRANGEMENT
PLAN VIEW

DESSINÉ PAR / DRAWN BY	STEVEN PERRON	DATE 2015-11-30
VÉRIFIÉ PAR / CHECKED BY	STEVEN PERRON	2015-12-02
APPROUVÉ PAR / APPROVED BY	BERTRAND FORTIN, ing	2015-12-02
ÉCHELLE / SCALE	INDICATED	DATE 2015-11-20
NO. DESSIN / DRAWING NO	65-693-210-200	
NO. PROJET / PROJECT NO	6515	REVISION 4
		FEUILLE / SHT 1 / 1

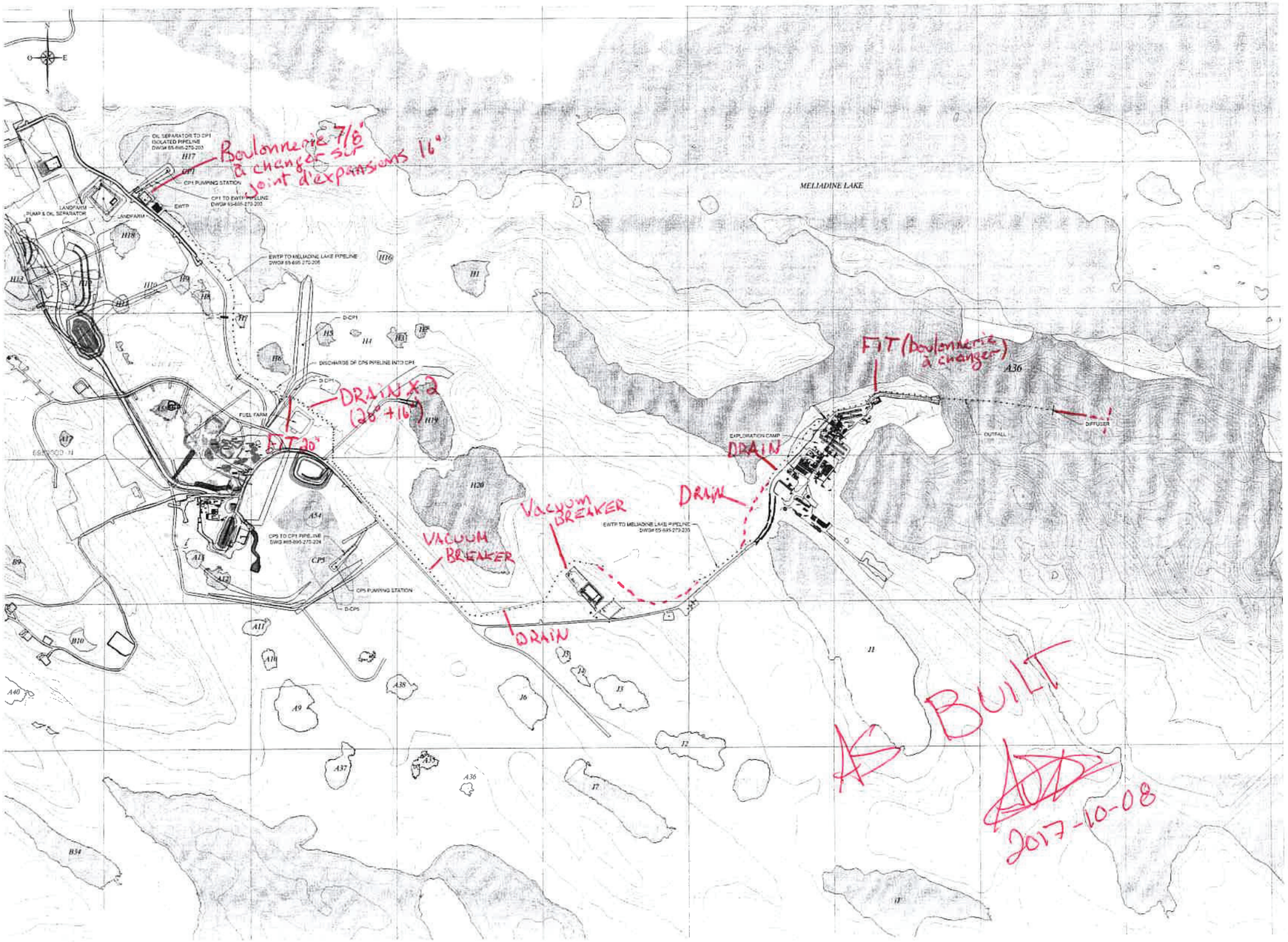
AC-CART-ARCH D

P:\...\65-693-210-200_R4.dwg 2017-06-21 11:18:18

FILE NO. 65-693-210-200_R4.dwg

NO. DESSIN / DRAWING NO: 65-695-270-200

FORMAT ANSI E



HDPE PIPELINES – GENERAL VIEW 2017
SCALE: 1:5000

PLAN CLE
KEY PLAN

NOTES GÉNÉRALES / GENERAL NOTES

1. FOR EACH PIPELINE, A 4m ZONE SHALL BE GRADED AND FREE OF BOULDERS AND SHARP ROCKS TO AVOID DAMAGES TO THE PIPE AS IT WANDERS WITH TEMPERATURE VARIATIONS
2. PIPES SHALL BE ANCHORED EVERY 30m WITH EARTHERN FILL (EXCEPT FOR OTHER SECTIONS SPECIFICALLY DETAILED) AND SHALL BE SNAKED BETWEEN EACH ANCHOR POINTS. SEE DETAIL #11 ON DWG #65-695-270-206 SH.3
3. SEE INSTALLATION SPECIFICATIONS #65-895-265-018-265-SPT-003 #65-895-265-018-265-SOW-001

PERMIT TO PRACTICE
TETRA TECH (QUÉBEC) INC.
Signature
Date 2017 10 11
PERMIT NUMBER: P 1026
Association of Professional Engineers and Geoscientists

POUR CONSTRUCTION
FOR CONSTRUCTION
AGNICO EAGLE
DATE 2017/07/11

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TYPE / TITLE	# DWG
-	-
-	-
-	-
-	-
-	-

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
2	2017/07/11	FOR CONSTRUCTION	S.C.	G.B.	N.M/B.A
1	2017/06/22	FOR TENDER (CONSTRUCTION)	S.C.	G.B.	N.M/B.A
0	2016/11/30	FOR TENDER (SUPPLY)	M.C.	G.B.	N.M/B.A

REVISIONS

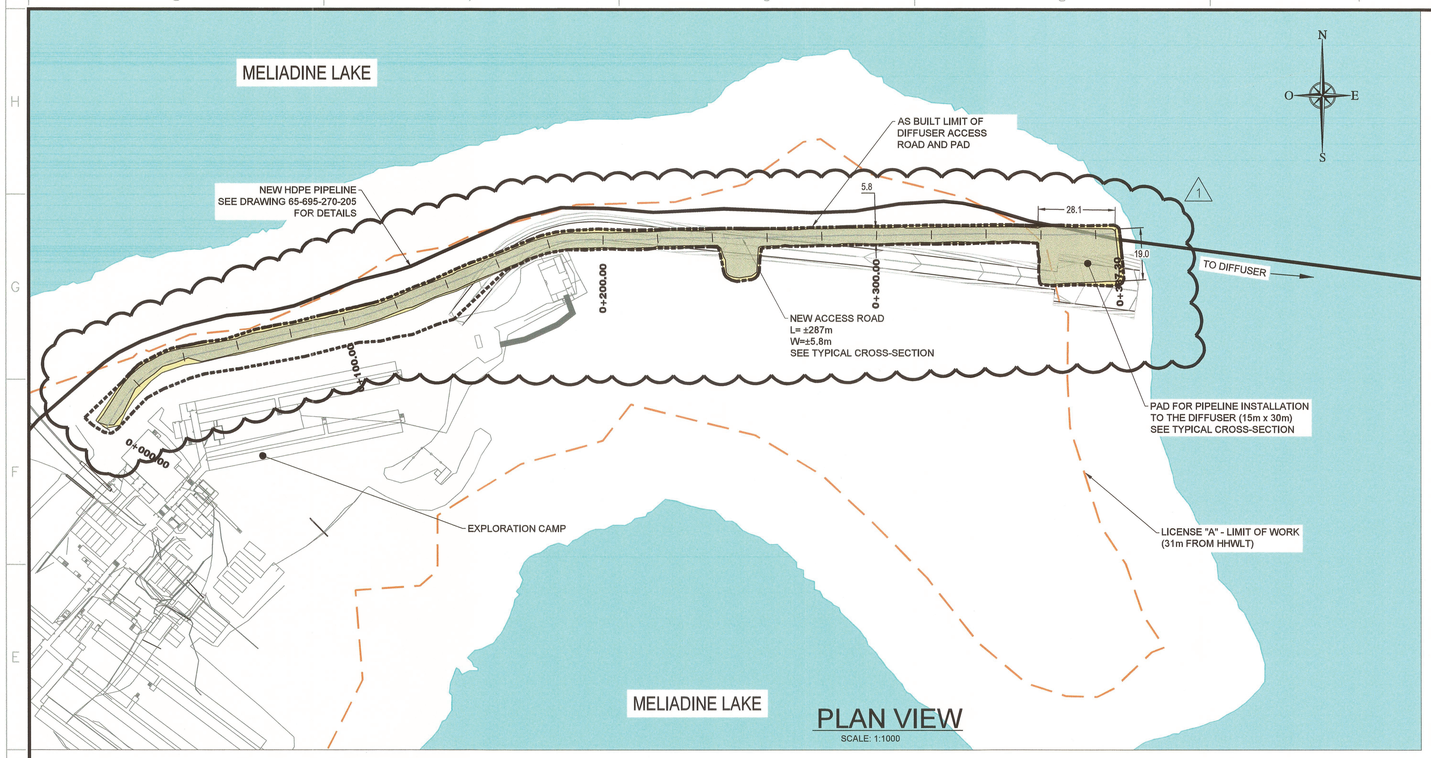
TETRA TECH
PROJECT No.: E14102230 | OWNER No.: 65-695-270-200

TITRE / TITLE
AGNICO EAGLE – MELIADINE
WATER MANAGEMENT
HDPE PIPELINES – GENERAL ARRANGEMENT
2017 – CONSTRUCTION PLAN

DESSINÉ PAR / DRAWN BY	MARIO C.	DATE 2016/11/30
VÉRIFIÉ PAR / CHECKED BY	BENOIT T	2017/06/22
APPROUVÉ PAR / APPROVED BY	ORPHE B.	2017/06/22
ÉCHELLE / SCALE	SHOWN	DATE 2017/06/22

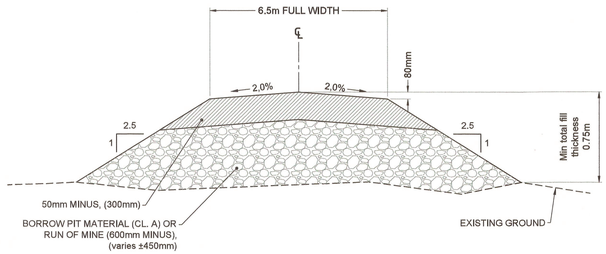
NO. DESSIN DRAWING NO. 65-417-230-223_R1 (AS BUILT)

FORMAT ARCHD



PLAN VIEW

SCALE: 1:1000



TYPICAL CROSS SECTION
TEMPORARY SERVICE ROAD AND PAD

SCALE NTS

Quantity construction chart*
Temporary Diffuser Access Road and Pad
*Theoretical measure in place quantities

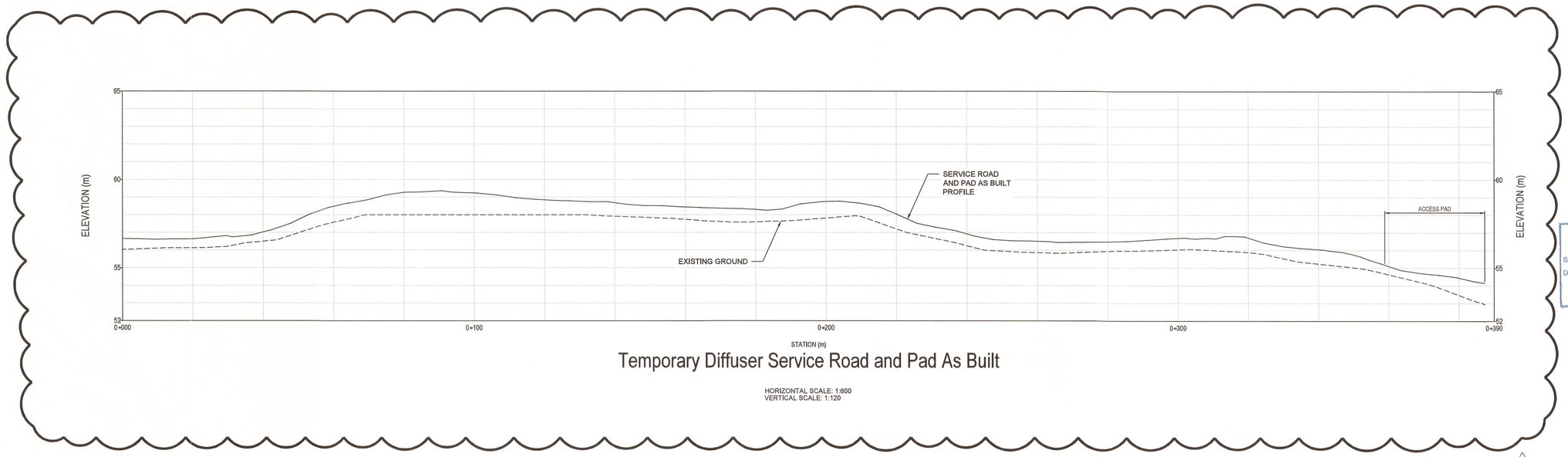
	Thickness (mm)	Required (m³)
50mm MINUS	300	587
Run of Mine or Borrow Pit Material (CL. A)	±450	3011
Total	-	3598

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2018-09-14

TETRA TECH

FINAL ISSUE
AFTER CONSTRUCTION

SOME ANNOTATIONS HAVE BEEN ADDED TO THE DRAWING ISSUED FOR CONSTRUCTION IN ORDER TO INCORPORATE THE INFORMATIONS RECIEVED. IN THIS PROJECT, TETRATECH HADN'T DONE ANY FIELD SUPERVISION AT THE CONSTRUCTION SITE.

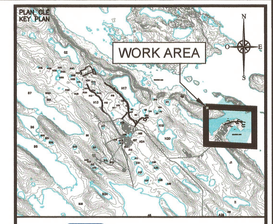


Temporary Diffuser Service Road and Pad As Built

HORIZONTAL SCALE: 1:600
VERTICAL SCALE: 1:120

1

PLAN DE LOCALISATION
KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

GENERAL NOTE:
1. EXISTING GROUND DTM PROVIDED BY AEM.
2. ALL UNITS ARE IN METERS.
3. ELEVATIONS IN DRAWING PROVIDE FINISHED GRADE ELEVATIONS AT THE TOP OF THE SURFACE GRAVEL LAYER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY, SECURITY AND SLOPES OF ALL EXCAVATIONS/ BACKFILL AND SHALL ABIDE BY ALL RELEVANT STANDARDS AND REGULATIONS. THE STABILITY, DEWATERING AND MAINTENANCE OF ALL EXCAVATIONS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
5. GRANULAR MATERIAL SHALL BE PLACED IN LIFTS NOT EXCEEDING 300mm AND COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY. BORROW PIT OR RUN OF MINE MATERIAL 600mm MINUS SHALL BE PLACED IN LIFTS NOT EXCEEDING 600mm AND COMPACTED TO A MINIMUM OF 90% OF MAXIMUM DRY DENSITY. MOISTURE CONDITIONING MAY BE REQUIRED PRIOR TO COMPACTION.

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE. TOUTE AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES. © AGNICO EAGLE LTÉE

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD, AND MUST BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPYING, TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. © AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
RELEVÉ TQC 2016	65-000-210-200
--	--
--	--
--	--
--	--
--	--

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2018-09-14	ISSUE FOR AS BUILT	M.S.	J.A.	
0	2017-06-14	ISSUED FOR CONSTRUCTION	C.M.	J.A.	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date 2018-09-18
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
J.M.I.F. ALARIE
LICENSEE
2018-09-18

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
417 – ROADS, YARDS, FENCES, AND OTHER
230 – GENERAL EARTH WORKS
MELIADINE LAKE DIFFUSER TEMPORARY SERVICE ROAD
PLAN AND PROFILE VIEW

DESSINÉ PAR DRAWN BY	CHRISTOPHER MORIN	DATE 2017-04-26
VERIFIÉ PAR CHECKED BY	SOLÈNE MOREAU	2017-04-26
APPROUVÉ PAR APPROVED BY	JOSÉE ALARIE	2017-04-26
ÉCHELLE SCALE	AS SHOWN	DATE 2016-04-26
NO. DESSIN DRAWING NO.	65-417-230-223	
NO. PROJET PROJECT NO.	6515/28920	REVISION 1 / FEUILLE / SHT 1 / 1

AE-CART-ARCH D

P:\28920\DESSIN\CIV-INFRA\DESSINS DE TRAVAIL\AUTOCAD\65-417-230-223_R1 (AS BUILT).dwg-2013-02-19 14:03:29

FILE NO. 65-417-230-223_R1 (AS BUILT).dwg

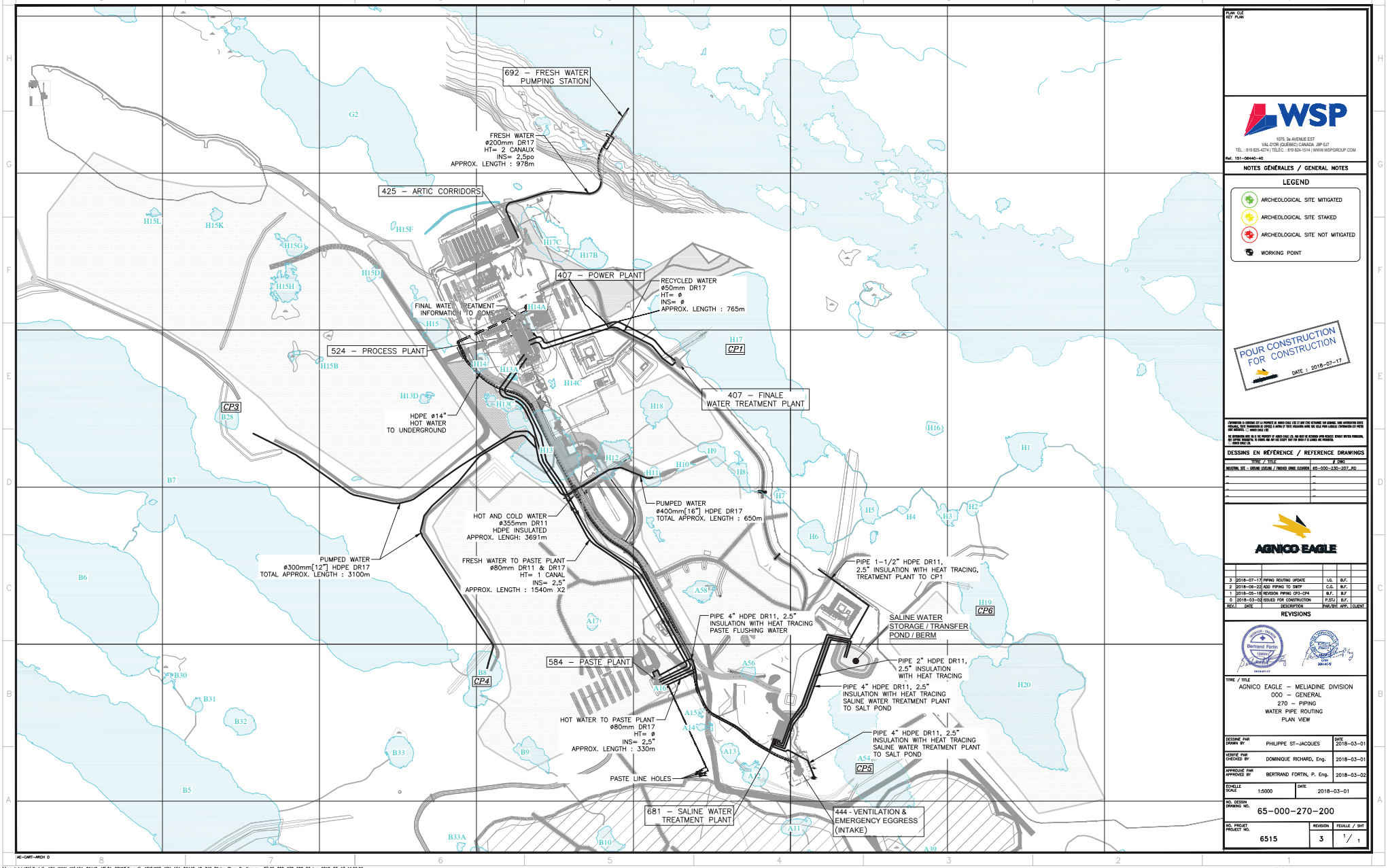
Appendix Q

Infrastructures As-Built and Design

Saline Water Treatment Plant (SWTP)

NO. DESSIN DRAWING NO. 65-000-270-200_R2_XREF

FORMAT ARCH D



PLAN CLÉ
KEY PLAN

WSP
1075, 3e AVENUE EST
VAL-D'OR (QUÉBEC) CANADA J9P 0J7
TÉL. : 819 825-4274 | TÉLÉC. : 819 824-1514 | WWW.WSPGROUP.COM
Réf. 151-06440-40

NOTES GÉNÉRALES / GENERAL NOTES

LEGEND

- ARCHEOLOGICAL SITE MITIGATED
- ARCHEOLOGICAL SITE STAKED
- ARCHEOLOGICAL SITE NOT MITIGATED
- WORKING POINT

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2018-07-17

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET NE DOIT ÊTRE REPRODUITE OU UTILISÉE, SOUS AUCUNE FORME ORIGINALE, SANS L'AUTORISATION ÉCRITE D'AGNICO EAGLE LTÉE.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE REPRODUCED UPON REQUEST, WITHOUT WRITTEN PERMISSION, IN ANY FORM WHATSOEVER. © AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
INDUSTRIAL SITE – GROUND LEVELING / FINISHED GRADE ELEVATION	65-000-230-207_RD

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
3	2018-07-17	PIPING ROUTING UPDATE	LG.	B.F.	
2	2018-06-22	ADD PIPING TO SWTP	C.G.	B.F.	
1	2018-05-18	REVISION PIPING CP3-CP4	B.F.	B.F	
0	2018-03-02	ISSUED FOR CONSTRUCTION	P.STJ	B.F.	

REVISIONS

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
000 – GENERAL
270 – PIPING
WATER PIPE ROUTING
PLAN VIEW

DESSINÉ PAR DRAWN BY	PHILIPPE ST-JACQUES	2018-03-01
VERIFIÉ PAR CHECKED BY	DOMINIQUE RICHARD, Eng.	2018-03-01
APPROUVÉ PAR APPROVED BY	BERTRAND FORTIN, P. Eng.	2018-03-02
ÉCHELLE SCALE	1:5000	DATE 2018-03-01

NO. DESSIN DRAWING NO. 65-000-270-200

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHT
6515	3	1 / 1

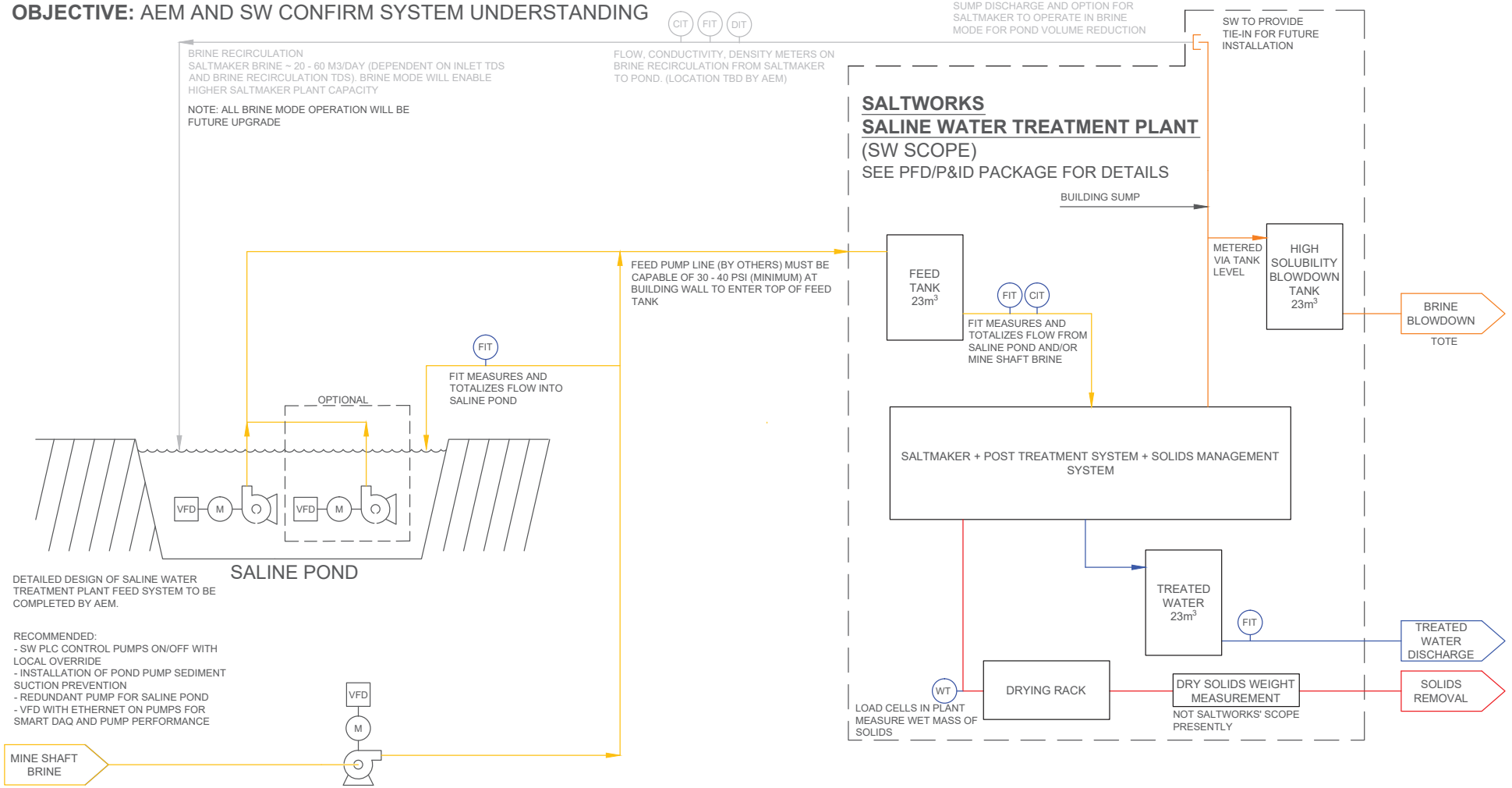
AE-CART-ARCH D

\\cvvdc1dst01\Projet_1\5X-XXXX-XX\151-06440-40\01-COMM\Envoyé_AEM\WSP-AEM-151-06440-40-749 (Water Pipes Routing rev. 3)\65-000-270-200_R3.dwg-2018-07-17 11:55:26

FILE NO. 65-000-270-200_R3.dwg

AGNICO EAGLE - SALTWORKS: SALINE WATER TREATMENT PLANT INTEGRATION PFD

OBJECTIVE: AEM AND SW CONFIRM SYSTEM UNDERSTANDING



Saltworks
13800 Steveston Hwy
Richmond, BC, Canada, V6W 1A8
Tel: 604.628.6508 Fax: 604.676.2463
www.saltworkstech.com

DRAWING STATUS: DRAWING STATUS

THIS DOCUMENT EMBODIES DESIGNS AND INFORMATION THAT ARE PROPRIETARY TO SALTWORKS. IT IS TO BE USED ONLY FOR THE PURPOSE AND BY THE ENTITY FOR WHICH IT WAS ORIGINALLY SUPPLIED. THE DOCUMENT MAY NOT BE DUPLICATED OR DISCLOSED TO OTHER PERSON OR ENTITY, OR USED FOR MANUFACTURE OF THE ITEM IN PART OR IN WHOLE WITHOUT THE PRIOR WRITTEN PERMISSION OF SALTWORKS.

DO NOT SCALE DRAWING

LTR	DATE	DESCRIPTION	REV. BY:
1	26-SEP-2017	INITIAL DRAFT	XX
2	06-OCT-2017	UPDATED PER AEM COMMENTS	XX
3	30-OCT-2017	UPDATED PER AEM COMMENTS	ML

TITLE: AEM INTEGRATION PFD			
PROJECT: SALTMAKER GEN III		CUSTOMER: AGNICO EAGLE MINES	REVISION: 3
PREPARED BY: XX	DATE: 26-SEP-2017	DWG. NO: SW_EN_SM_GEN III_PID_DWG_INTEGRATPFD	
CHECKED BY:	DATE:	JOB/CO NO: (JOB NO.)	
APPROVED BY: APPROVED BY	DATE: APPROVED DATE	SHEET: # OF #	

Appendix Q

Infrastructures As-Built and Design

Sewage Treatment Plant (STP)

VALVE SYMBOLS

N.OPEN	N.CLOSED	
		BALL
		V-BALL
		BUTTERFLY
		DIAPHRAGM
		GATE
		GLOBE
		NEEDLE
		PLUG
		SAMPLE/DRAIN
		CHECK
		BACKFLOW PREVENTER
		3-WAY, 4-WAY
		PRESSURE REGULATING
		BACK PRESSURE REGULATING
		FLOW CONTROL
		2-WAY SOLENOID
		3-WAY SOLENOID
		4-WAY SOLENOID
		AIR RELEASE
		VACUUM BREAKER
		PRESSURE RELEASE
		SLUICE GATE/WEIR

VALVE ACTUATOR SYMBOLS

- PNEUMATIC (FAIL LAST POSITION)
- PNEUMATIC FAIL CLOSE
- PNEUMATIC FAIL OPEN
- ELECTRIC
- DIAPHRAGM
- POSITIONER (ANY ACTUATOR TYPE)
- HAND OVERRIDE (ANY ACTUATOR TYPE)
- TRAVEL STOPS (ANY ACTUATOR TYPE)

FLOWMETER SYMBOLS

INTEGRAL	CLOSE COUPLED	REMOTE	
			MAGNETIC
			PADDLE
			VORTEX
			DP/ORIFICE
			ROTAMETER
			THERMAL

INSTRUMENTATION SYMBOLS

LOCALLY MOUNTED	IN CONTROL PANEL	DESCRIPTION
		DISCRETE INSTRUMENT
		PRIMARY PLC OR DCS SHARED CONTROL
		SECONDARY PLC OR DCS SHARED CONTROL
		COMPUTER FUNCTION

INSTRUMENT FUNCTIONS

- K — SIGNAL PROCESSING FUNCTION
- A/M — AUTO/MANUAL
- Σ — ADDITION/SUMMATION
- Δ — DIFFERENTIAL
- INTERLOCK LOGIC FUNCTION
- AVERAGING

INSTRUMENT CONNECTIONS

- THREADED
- SOCKETWELD
- WELDED

PIPING SYMBOLS

- FLANGED CONNECTION
- BLIND FLANGE
- QUICK DISCONNECT VICTAULIC
- QUICK DISCONNECT CAMLOK
- CAPPED PIPE END
- UNION
- EXPANSION/FLEXIBLE/ ISOLATION JOINT
- THREADED CONNECTION
- DOUBLE CONTAINMENT
- x" INSULATION THICKNESS — INSULATION
- x" INSULATION THICKNESS — HEAT TRACING E=ELECTRIC S=STEAM G=GLYCOL
- DRAIN OUTLET
- REDUCER ECCENTRIC REDUCER

PIPING ABBREVIATIONS

316 SS	316 STAINLESS STEEL
304 SS	304 STAINLESS STEEL
316L SS	LOW CARBON 316 STAINLESS STEEL
304L SS	LOW CARBON 304 STAINLESS STEEL
CPVC	CHLORINATED POLYVINYL CHLORIDE
CS	CARBON STEEL
DI	DUCTILE IRON
HDPE	HIGH-DENSITY POLYETHYLENE
PE	POLYETHYLENE
PVC	POLYVINYL CHLORIDE
RLCS	RUBBER LINED CARBON STEEL
SCH.	SCHEDULE
SDR	STANDARD DIMENSION RATIO
CML	CEMENT MORTAR LINED

LINE SYMBOLOGY

- MAIN PROCESS LINE
- SECONDARY PROCESS LINE
- PROCESS LINE, BY OTHERS
- COMM LINK (EX. PLC TO HMI)
- COMM LINK (EX. PLC TO DCS)
- ELECTRIC WIRING
- PNEUMATIC LINE
- LINE JUMPER
- PIPE DISCONTINUATION
- FLOW DIRECTION ARROWS
- 4" 316 SS SCH.10 — LINES SIZE/ MATERIAL IDENTIFIER
- SKID BOUNDARY — SKID BY H_2O Innovation / BY OTHERS
- REVISION
- LINES TO/FROM OTHER SHEETS: DESCRIPTION — C01-0001 SHT 1 — DESTINATION

PUMP SYMBOLS

- CENTRIFUGAL
- CHEMICAL METERING
- DIAPHRAGM
- POSITIVE DISPLACEMENT
- VACUUM
- SUBMERSIBLE OR FLOATING
- VERTICAL TURBINE
- PERISTALTIC/HOSE

MISCELLANEOUS EQUIPMENT SYMBOLS

- CARTRIDGE FILTER HOUSING
- AUTOMATIC STRAINER
- SILENCER
- MIXER
- STATIC MIXER
- RESIN TRAP
- MOTOR
- EDUCTOR OR VENTURI
- Y STRAINER
- CONICAL OR TEMPORARY STRAINER
- PULSATION DAMPENER
- DIAPHRAGM
- FLOW ORIFICE
- AIR COMPRESSOR
- RUPTURE DISK (PRESSURE)
- RUPTURE DISK (VACUUM)
- SPECTACLE BLIND (NORMALLY OPEN, NORMALLY CLOSED)
- INJECTION QUILL
- FILTER
- REFRIGERATED AIR DRYER
- TANK
- MMF TANK
- IMMERSED HEATER
- IN-LINE HEATER
- ULTRASONIC LEVEL TRANSMITTER
- FLOAT-STYLE LEVEL TRANSMITTER
- CHEMICAL CONTAINMENT
- CALIBRATION COLUMN
- MEMBRANE
- UV STERILIZER
- DIFFUSERS: COARSE BUBBLE
- FINE BUBBLE
- POSITIVE DISPLACEMENT BLOWER
- REGENERATIVE BLOWER
- CENTRIFUGAL BLOWER
- TURBOCHARGER
- BIO-WHEEL
- MANWAY

FLOW INSTRUMENTS

FAH	FLOW ALARM HIGH
FAL	FLOW ALARM LOW
FCV	FLOW CONTROL VALVE
FE	FLOW ELEMENT
FI	FLOW INDICATOR
FIC	FLOW INDICATING CONTROLLER
FIT	FLOW INDICATING TRANSMITTER
FR	FLOW RECORDING
FSH	FLOW SWITCH HIGH
FSL	FLOW SWITCH LOW
FV	FLOW CONTROL OR ON/OFF VALVE
FQ	FLOW TOTALIZER
FX	ELEMENT CONTROLLED BY FLOW
FY	FLOW SIGNAL CONVERT, I/P, OR SOLN

PRESSURE INSTRUMENTS

PAH	PRESSURE ALARM HIGH
PAL	PRESSURE ALARM LOW
PC	PRESSURE CONTROLLER
PCV	SELF REG PRESS CONTROL VALVE
PDH	DIFFERENTIAL PRESSURE HIGH
PDI	DIFFERENTIAL PRESSURE INDICATOR
PDIT	DIFF PRESS INDICATING TRANSMITTER
PDSH	DIFFERENTIAL PRESS SWITCH HIGH
PG	PRESSURE GAUGE
PI	PRESSURE INDICATOR
PIC	PRESSURE INDICATING CONTROLLER
PIT	PRESSURE INDICATING TRANSMITTER
PSH	PRESSURE SWITCH HIGH
PSL	PRESSURE SWITCH LOW
PSV	SELF REG PRESS SAFETY VALVE
PT	PRESSURE TRANSMITTER
PX	ELEMENT CONTROLLED BY PRESSURE
PY	PRESS SIGNAL CONVERT, I/P, OR SOLN
PSLH	PRESSURE SWITCH LOW HIGH

LEVEL INSTRUMENTS

LAH	LEVEL ALARM HIGH
LAL	LEVEL ALARM LOW
LCV	SELF REG LEVEL CONTROL VALVE
LE	LEVEL ELEMENT
LG	LEVEL GAUGE
LI	LEVEL INDICATOR
LIC	LEVEL INDICATING CONTROLLER
LIT	LEVEL INDICATING TRANSMITTER
LSH	LEVEL SWITCH HIGH
LSL	LEVEL SWITCH LOW
LT	LEVEL TRANSMITTER
LV	LEVEL CONTROL OR ON/OFF VALVE
LX	ELEMENT CONTROLLED BY LEVEL
LY	LEVEL SIGNAL CONVERT, I/P, OR SOLN

TEMPERATURE INSTRUMENTS

TAH	TEMPERATURE ALARM HIGH
TAL	TEMPERATURE ALARM LOW
TC	TEMPERATURE CONTROLLER
TE	TEMPERATURE ELEMENT
TG	TEMPERATURE GAUGE
TI	TEMPERATURE INDICATOR
TIC	TEMP INDICATING CONTROLLER
TIT	TEMP INDICATING TRANSMITTER
TSH	TEMPERATURE SWITCH HIGH
TSL	TEMPERATURE SWITCH LOW
TT	TEMPERATURE TRANSMITTER
TV	TEMP CONTROL OR ON/OFF VALVE
TX	ELEMENT CONTROLLED BY TEMP
TY	TEMP SIGNAL CONVERT, I/P, OR SOLN

ELECTRICAL ABBREVIATIONS

JB	JUNCTION BOX
MCP	MAIN CONTROL PANEL
RIO	REMOTE I/O PANEL
PP	POWER PANEL
VFD	VARIABLE FREQUENCY DRIVE
HOA	HAND-OFF-AUTO

ANALYTICAL INSTRUMENTS

AAH	ANALYTICAL ALARM HIGH
AAL	ANALYTICAL ALARM LOW
AE	ANALYTICAL ELEMENT
AI	ANALYTICAL INDICATOR
AIC	ANAL INDICATING CONTROLLER
AIT	ANAL INDICATING TRANSMITTER
ASH	ANALYTICAL SWITCH HIGH
ASL	ANALYTICAL SWITCH LOW
AT	ANALYTICAL TRANSMITTER
AX	ELEMENT CONTROLLED BY ANALYTICAL
AY	ANALYTICAL SIGNAL CONVERT, I/P, OR SOL

MISCELLANEOUS INSTRUMENTS

HS	HAND SWITCH
HI	HAND SWITCH POSITION INDICATOR
II	CURRENT INDICATOR
QQI	TOTALIZER INDICATOR
SC	SPEED CONTROLLER
SI	SPEED INDICATOR
YA	MOTOR ALARM
YC	MOTOR CONTROL
YI	MOTOR ON/OFF INDICATOR
ZIC	SWITCH CLOSE INDICATOR
ZIO	SWITCH OPEN INDICATOR
ZSC	POSITION SWITCH CLOSED
ZSO	POSITION SWITCH OPEN
ZT	POSITION TRANSMITTER
ZI	POSITION INDICATOR

VALVES & EQUIPMENT

AC	AIR COMPRESSOR
ARV	AIR RELEASE VALVE
AS	AIR SUPPLY
B	BLOWER
BT	BULK TOTE
CBD	COARSE BUBBLE DIFFUSER
CV	CHECK VALVE
ED	EDUCTOR
F	FILTER
FBD	FINE BUBBLE DIFFUSER
FL	FAIL LAST (DEFAULT IF NOT SHOWN)
FC	FAIL CLOSED
FO	FAIL OPEN
FQG	CALIBRATION COLUMN
H	HEATER
HCV	HAND CONTROL VALVE
HTR	HEATER
HV	HAND VALVE
M	MOTOR
MX	MIXER
P	PUMP
RT	RESIN TRAP
ST	SPILL TANK
STR	STRAINER
T	TANK
UV	ULTRAVIOLET
HV	HAND VALVE
MV	MULTI FUNCTION VALVE

OTHER ABBREVIATIONS

CAP	CAPACITANCE
CIP	CLEAN-IN-PLACE
COND	CONDUCTIVITY
DO2	DISSOLVED OXYGEN
ESP	EMERGENCY STOP
IA	INSTRUMENT AIR
I/P	CURRENT TO PNEUMATIC CONVERTER
ORP	OXIDATION REDUCTION POTENTIAL
pH	HYDROGEN ION
RES	RESISTIVITY
RTD	RESISTANCE TEMP DETECTOR
SOL	SOLENOID
SP	SET POINT
uS	MICROSIEMENS
MIT	MEMBRANE INTEGRITY TEST

REGISTERED PROFESSIONAL ENGINEER — R. DESGAGNÉ — LICENSEE — NT/NU — 12/06/2017

NOTE:
THE INFORMATION, SPECIFICATIONS AND DATA SHOWN ON THIS PRINT ARE FURNISHED BY AND ARE TO REMAIN THE PROPERTY OF H_2O INNOVATION.

THE PURPOSE OF THIS DOCUMENT IS TO FACILITATE THE INSTALLATION, MAINTENANCE AND OPERATION OF THE EQUIPMENT REPRESENTED BY SAID PRINT. NO OTHER USE OF THIS DOCUMENT SHALL BE MADE WITHOUT EXPRESS WRITTEN CONSENT FROM H_2O INNOVATION.

DRAWING REVISION

REV	DATE (DD/MM/YYYY)	REVISION DESCRIPTION	DRAWN	CHKD	ENG	APPVD
06	02/12/2016	REVISED AS INSTALLED	M.P.	R.D.	H.C.	R.D.
05	21/09/2016	REVISED AS BUILT	M.P.	H.S.	H.C.	R.D.
04	08/02/2016	REVISED AS PER COMMENT	M.P.	H.S.	H.C.	H.C.
03	25/07/2016	REVISED AS PER COMMENT	M.P.	H.S.	H.C.	H.C.
01	11/07/2016	CHANGE SUMP TANK BALL TO GATE VALVE,SOLENOID TO ELECTRIC VALVE,TURBIDITY METER TO 120V	M.P.	H.S.	H.C.	H.C.

h2o innovation — knowledge to share, du savoir à partager

UNLESS NOTED OTHERWISE
INTERPRETATION ANSI Y14.5
TOLERANCES
FRACTIONS ±1/64
DECIMALS .0 X ±0.030
.0 XX ±0.010
.0 XXX ±0.005
ANGLES ±0.5°
HOLE SIZES ±1/64
HOLE CENTERS ±1/32
DO NOT SCALE PRINTS

MELIADINE STP

216 M3/DAY

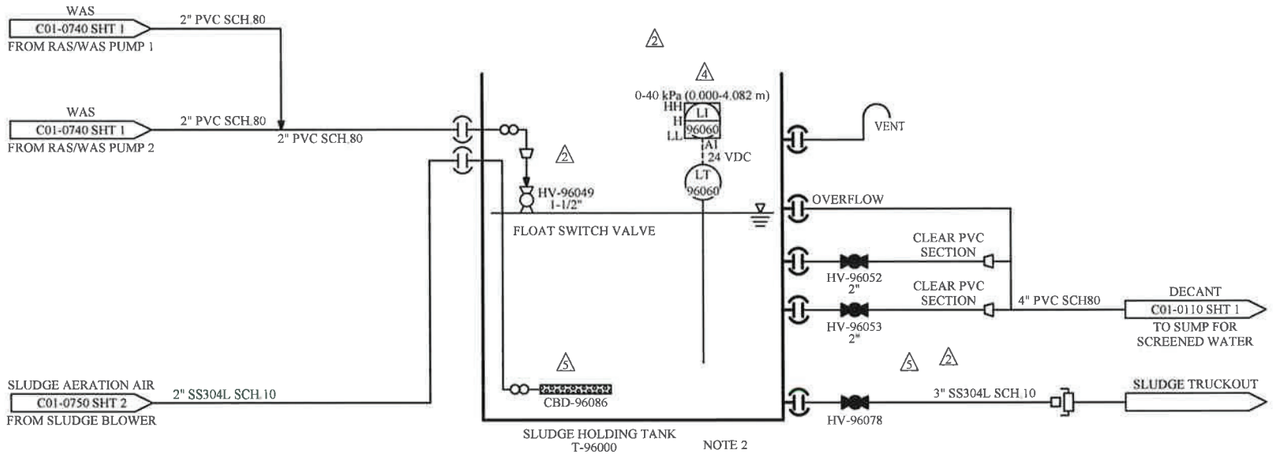
TITLE: PROCESS AND INSTRUMENTION DIAGRAMS LEGEND

SCALE: N/A

DRAWING NUMBER: U65875--C01-0001

SHEET: 1 of 1

REVISION: 06



NOTES:

1. ALL COMPONANTS GOING INTO RIO 101.
2. SLUDGE HOLDING TANK WITH COVER.
3. ALL VENT TO OUTSIDE.

NOTE:
THE INFORMATION, SPECIFICATIONS AND DATA SHOWN ON THIS PRINT ARE FURNISHED BY AND ARE TO REMAIN THE PROPERTY OF H_2O INNOVATION.

THE PURPOSE OF THIS DOCUMENT IS TO FACILITATE THE INSTALLATION, MAINTENANCE AND OPERATION OF THE EQUIPMENT REPRESENTED BY SAID PRINT. NO OTHER USE OF THIS DOCUMENT SHALL BE MADE WITHOUT EXPRESS WRITTEN CONSENT FROM H_2O INNOVATION.

DRAWING REVISION

REV	DATE (DD/MM/YYYY)	REVISION DESCRIPTION	DRAWN	CHKD	ENG	APPVD
06	02/12/2016	REVISED AS INSTALLED	M.P.	R.D.	H.C.	R.D.
05	21/09/2016	REVISED AS BUILT	M.P.	H.S.	H.C.	R.D.
04	08/02/2016	REVISED AS PER COMMENT	M.P.	H.S.	H.C.	H.C.
03	25/07/2016	REVISED AS PER COMMENT	M.P.	H.S.	H.C.	H.C.
01	11/07/2016	CHANGE SUMP TANK BALL TO GATE VALVE,SOLENOID TO ELECTRIC VALVE,TURBIDITY METER TO 120V	M.P.	H.S.	H.C.	H.C.

h2o innovation
knowledge to share du savoir à partager

UNLESS NOTED OTHERWISE
INTERPRETATION ANSI Y14.5
TOLERANCES
FRACTIONS ±1/64"
DECIMALS .X ±0.030
.XXX ±0.015
ANGLES ±0.5°
HOLE SIZES ±1/64"
HOLE CENTERS ±1/32"
DO NOT SCALE PRINTS

MELIADINE STP

216 M3/DAY

TITLE:
SLUDGE HANDLING SYSTEM
PROCESS & INSTRUMENTATION DIAGRAM

SCALE:	DRAWING NUMBER:	REVISION
N/A	U65875-C01-0960	06
	SHEET: 1 of 1	

Appendix Q

Infrastructures As-Built and Design

Fresh Water Treatment Plant (FWTP)

VALVE SYMBOLS

N.OPEN N.CLOSED

- BALL
- V-BALL
- BUTTERFLY
- DIAPHRAGM
- GATE
- GLOBE
- NEEDLE
- PLUG
- SAMPLE/DRAIN
- CHECK
- BACKFLOW PREVENTER
- INJECTION QUILL
- 3-WAY, 4-WAY
- PRESSURE REGULATING
- BACK PRESSURE REGULATING
- FLOW CONTROL
- 2-WAY SOLENOID
- 3-WAY SOLENOID
- 4-WAY SOLENOID
- AIR RELEASE
- VACUUM BREAKER
- PRESSURE RELEASE
- SLUICE GATE/WEIR

VALVE ACTUATOR SYMBOLS

- PNEUMATIC (FAIL LAST POSITION)
- F.C. PNEUMATIC FAIL CLOSE
- F.O. PNEUMATIC FAIL OPEN
- ELECTRIC
- DIAPHRAGM
- POSITIONER (ANY ACTUATOR TYPE)
- HAND OVERRIDE (ANY ACTUATOR TYPE)
- TRAVEL STOPS (ANY ACTUATOR TYPE)

FLOWMETER SYMBOLS

- ROTAMETER
- ROTAMETER W/ INTEGRAL NEEDLE VALVE
- THERMAL

INTEGRAL REMOTE

- MAGNETIC
- PADDLE
- VORTEX
- DP/ORIFICE

INSTRUMENTATION SYMBOLS

LOCALLY MOUNTED	IN CONTROL PANEL	DESCRIPTION
X nnnnn	X nnnnn	DISCRETE INSTRUMENT
	X nnnnn	PRIMARY PLC OR DCS SHARED CONTROL
	X nnnnn	SECONDARY PLC OR DCS SHARED CONTROL
	X nnnnn	COMPUTER FUNCTION

INSTRUMENT FUNCTIONS

- K SIGNAL PROCESSING FUNCTION
- A/M AUTO/MANUAL
- Σ ADDITION/SUMMATION
- Δ DIFFERENTIAL
- INTERLOCK LOGIC FUNCTION
- AVERAGING

INSTRUMENT CONNECTIONS

THREADED SOCKETWELD WELDED

PIPING CONNECTIONS & SYMBOLS

- FLANGE
- QUICK DISCONNECT HOSE/TUBE
- THREADED CONNECTION
- EXPANSION/FLEXIBLE/ ISOLATION JOINT
- UNION
- GROOVED COUPLING
- BLIND FLANGE
- DOUBLE CONTAINMENT
- CAPPED END
- REDUCER
- X" INSULATION THICKNESS INSULATION
- ECCENTRIC REDUCER
- X" INSULATION THICKNESS HEAT TRACING E=ELECTRIC S=STEAM G=GLYCOL
- DRAIN OUTLET

PIPING ABBREVIATIONS

316 SS	316 STAINLESS STEEL
304 SS	304 STAINLESS STEEL
316L SS	LOW CARBON 316 STAINLESS STEEL
304L SS	LOW CARBON 304 STAINLESS STEEL
CPVC	CHLORINATED POLYVINYL CHLORIDE
CS	CARBON STEEL
DI	DUCTILE IRON
HDPE	HIGH-DENSITY POLYETHYLENE
PE	POLYETHYLENE
PVC	POLYVINYL CHLORIDE
RLCS	RUBBER LINED CARBON STEEL
SCH.	SCHEDULE
SDR	STANDARD DIMENSION RATIO

LINE SYMBOLOGY

- MAIN PROCESS LINE
- SECONDARY PROCESS LINE
- PROCESS LINE, BY OTHERS
- COMM LINK (EX. PLC TO HMI)
- COMM LINK (EX. PLC TO DCS)
- ELECTRIC WIRING
- PNEUMATIC LINE
- LINE JUMPER
- PIPE DISCONTINUATION
- FLOW DIRECTION ARROWS
- 4" 316 SS SCH.10 LINES SIZE/ MATERIAL IDENTIFIER
- SKID BOUNDARY — NOT BY H_2O Innovation — SKID BY H_2O Innovation
- REVISION
- LINES TO/FROM OTHER SHEETS DESCRIPTION C01-0001 SHT 1 DESTINATION

PUMP SYMBOLS

- CENTRIFUGAL
- CHEMICAL METERING
- DIAPHRAGM
- POSITIVE DISPLACEMENT
- VACUUM
- SUBMERSIBLE OR FLOATING
- VERTICAL TURBINE
- PERISTALTIC/HOSE

MISCELLANEOUS EQUIPMENT SYMBOLS

- CARTRIDGE FILTER HOUSING
- AUTOMATIC STRAINER
- SILENCER
- MOTORIZED MIXER
- STATIC MIXER
- RESIN TRAP
- MOTOR
- EDUCTOR OR VENTURI
- Y STRAINER
- CONICAL OR TEMPORARY STRAINER
- PULSATION DAMPENER
- DIAPHRAGM
- FLOW ORIFICE
- RUPTURE DISK (PRESSURE)
- RUPTURE DISK (VACUUM)
- SPECTACLE BLIND (NORMALLY OPEN, NORMALLY CLOSED)
- COARSE BUBBLE DIFFUSER
- FINE BUBBLE DIFFUSER
- FILTER
- TURBOCHARGER
- MANWAY
- TANK
- IMMERSED HEATER
- IN-LINE HEATER
- ULTRASONIC LEVEL TRANSMITTER
- FLOAT-STYLE LEVEL SWITCH
- CHEMICAL CONTAINMENT ST-nnnnn
- CALIBRATION COLUMN
- MEMBRANE
- UV STERILIZER
- AIR COMPRESSOR
- POSITIVE DISPLACEMENT BLOWER
- REGENERATIVE BLOWER
- CENTRIFUGAL BLOWER
- REFRIGERATED AIR DRYER
- FLOW CHAMBER
- BIO-WHEEL

FLOW INSTRUMENTS

FAH	FLOW ALARM HIGH
FAL	FLOW ALARM LOW
FCV	FLOW CONTROL VALVE
FE	FLOW ELEMENT
FI	FLOW INDICATOR
FIC	FLOW INDICATING CONTROLLER
FIT	FLOW INDICATING TRANSMITTER
FR	FLOW RECORDING
FSH	FLOW SWITCH HIGH
FSL	FLOW SWITCH LOW
FV	FLOW CONTROL OR ON/OFF VALVE
FQ	FLOW TOTALIZER
FY	FLOW SIGNAL CONVERT, I/P, OR SOLN

PRESSURE INSTRUMENTS

PAH	PRESSURE ALARM HIGH
PAL	PRESSURE ALARM LOW
PC	PRESSURE CONTROLLER
PCV	SELF REG PRESS CONTROL VALVE
PDH	DIFFERENTIAL PRESSURE HIGH
PDI	DIFFERENTIAL PRESSURE INDICATOR
PDIT	DIFF PRESS INDICATING TRANSMITTER
PDSH	DIFFERENTIAL PRESS SWITCH HIGH
PG	PRESSURE GAUGE
PI	PRESSURE INDICATOR
PIC	PRESSURE INDICATING CONTROLLER
PIT	PRESSURE INDICATING TRANSMITTER
PSH	PRESSURE SWITCH HIGH
PSL	PRESSURE SWITCH LOW
PSV	SELF REG PRESS SAFETY VALVE
PT	PRESSURE TRANSMITTER
PY	PRESS SIGNAL CONVERT, I/P, OR SOLN
PSLH	PRESSURE SWITCH LOW HIGH

LEVEL INSTRUMENTS

LAH	LEVEL ALARM HIGH
LAL	LEVEL ALARM LOW
LCV	SELF REG LEVEL CONTROL VALVE
LE	LEVEL ELEMENT
LG	LEVEL GAUGE
LI	LEVEL INDICATOR
LIC	LEVEL INDICATING CONTROLLER
LIT	LEVEL INDICATING TRANSMITTER
LSH	LEVEL SWITCH HIGH
LSL	LEVEL SWITCH LOW
LT	LEVEL TRANSMITTER
LV	LEVEL CONTROL OR ON/OFF VALVE
LY	LEVEL SIGNAL CONVERT, I/P, OR SOLN

TEMPERATURE INSTRUMENTS

TAH	TEMPERATURE ALARM HIGH
TAL	TEMPERATURE ALARM LOW
TC	TEMPERATURE CONTROLLER
TE	TEMPERATURE ELEMENT
TG	TEMPERATURE GAUGE
TI	TEMPERATURE INDICATOR
TIC	TEMP INDICATING CONTROLLER
TIT	TEMP INDICATING TRANSMITTER
TSH	TEMPERATURE SWITCH HIGH
TSL	TEMPERATURE SWITCH LOW
TT	TEMPERATURE TRANSMITTER
TV	TEMP CONTROL OR ON/OFF VALVE
TY	TEMP SIGNAL CONVERT, I/P, OR SOLN

ELECTRICAL ABBREVIATIONS

JB	JUNCTION BOX
MCP	MAIN CONTROL PANEL
RIO	REMOTE I/O PANEL
PP	POWER PANEL
VFD	VARIABLE FREQUENCY DRIVE
HOA	HAND-OFF-AUTO

ANALYTICAL INSTRUMENTS

AAH	ANALYTICAL ALARM HIGH
AAL	ANALYTICAL ALARM LOW
AE	ANALYTICAL ELEMENT
AI	ANALYTICAL INDICATOR
AIC	ANAL INDICATING CONTROLLER
AIT	ANAL INDICATING TRANSMITTER
ASH	ANALYTICAL SWITCH HIGH
ASL	ANALYTICAL SWITCH LOW
AT	ANALYTICAL TRANSMITTER
AY	ANALYTICAL SIGNAL CONVERT, I/P, OR SOL

MISCELLANEOUS INSTRUMENTS

HS	HAND SWITCH
HI	HAND SWITCH POSITION INDICATOR
II	CURRENT INDICATOR
QQI	TOTALIZER INDICATOR
SC	SPEED CONTROLLER
SI	SPEED INDICATOR
YA	MOTOR ALARM
YC	MOTOR CONTROL
YI	MOTOR ON/OFF INDICATOR
ZI	POSITION INDICATOR
ZIC	SWITCH CLOSE INDICATOR
ZIO	SWITCH OPEN INDICATOR
ZSC	POSITION SWITCH CLOSED
ZSO	POSITION SWITCH OPEN
ZT	POSITION TRANSMITTER
ZY	POSITIONER

VALVES & EQUIPMENT

AC	AIR COMPRESSOR
ARV	AIR RELEASE VALVE
AS	AIR SUPPLY
B	BLOWER
BT	BULK TOTE
CBD	COARSE BUBBLE DIFFUSER
CV	CHECK VALVE
ED	EDUCTOR
F	FILTER
FBD	FINE BUBBLE DIFFUSER
FL	FAIL LAST (DEFAULT IF NOT SHOWN)
FC	FAIL CLOSED
FO	FAIL OPEN
FQG	CALIBRATION COLUMN
H	HEATER
HCV	HAND CONTROL VALVE
HTR	HEATER
HV	HAND VALVE
M	MOTOR
MX	MIXER
P	PUMP
RT	RESIN TRAP
ST	SPILL TANK
STR	STRAINER
T	TANK
UV	ULTRAVIOLET
HV	HAND VALVE
MV	MULTI FUNCTION VALVE

OTHER ABBREVIATIONS

CAP	CAPACITANCE
CIP	CLEAN-IN-PLACE
COND	CONDUCTIVITY
DO_2	DISSOLVED OXYGEN
ESP	EMERGENCY STOP
IA	INSTRUMENT AIR
I/P	CURRENT TO PNEUMATIC CONVERTER
ORP	OXIDATION REDUCTION POTENTIAL
pH	HYDROGEN ION
RES	RESISTIVITY
RTD	RESISTANCE TEMP DETECTOR
SOL	SOLENOID
SP	SET POINT
uS	MICROSIEMENS

REGISTERED PROFESSIONAL ENGINEER R. DESGAGNÉ LICENSEE NT/NU

15/06/2017

NOTE:
THE INFORMATION, SPECIFICATIONS AND DATA SHOWN ON THIS PRINT ARE FURNISHED BY AND ARE TO REMAIN THE PROPERTY OF H_2O INNOVATION.

THE PURPOSE OF THIS DOCUMENT IS TO FACILITATE THE INSTALLATION, MAINTENANCE AND OPERATION OF THE EQUIPMENT REPRESENTED BY SAID PRINT. NO OTHER USE OF THIS DOCUMENT SHALL BE MADE WITHOUT EXPRESS WRITTEN CONSENT FROM H_2O INNOVATION

DRAWING REVISION

REV	DATE (DD/MM/YYYY)	REVISION DESCRIPTION	DRAWN	CHKD	ENG	APPVD
04	14/06/2017	AS INSTALLED	M.P.	M.B.	R.D.	A.M.
03	09/08/2016	AS BUILT	M.P.	S.B.	R.D.	A.M.
02	25/07/2016	REVISED AS PER COMMENTS	M.P.	S.B.	R.D.	A.M.
01	29/06/2016	AS PER COMMENTS	M.P.	S.B.	R.D.	A.M.
00	13/06/2016	INITIAL RELEASE	M.P.	S.B.	R.D.	A.M.

h2o innovation — knowledge to share, du savoir à partager

UNLESS NOTED OTHERWISE
INTERPRETATION ANSI Y14.5
TOLERANCES
FRACTIONS ±1/64
DECIMALS 0.X ±0.100
0.XX ±0.010
0.XXX ±0.005
ANGLES ±0.5°
HOLE SIZES ±0.01"
HOLE CENTERS ±0.02"
DO NOT SCALE PRINTS

MELIADINE

WTP CONTAINERIZED UNIT

TITLE: PROCESS AND INSTRUMENTION DIAGRAMS LEGEND

SCALE: N/A

DRAWING NUMBER: P65873-C01-0001 SHEET: 1 of 1

REVISION 04

CONTINUED
NOTE 2

RAW WATER

M 120V
FV-10001
2" PVC SCH.80

TREATED WATER
C01-0910 SHT1
FROM CHLORINE
SENSOR BLEED LINE

VENT

FILTERED WATER
C01-0400 SHT 1
FROM TURBIDITY SENSOR

RAW WATER
STORAGETANK
T-10000

HH 0-2.00m
H LI LX
L 10060 10001
LL
AI

LT
10060
24 VDC

HV-10060

2" PVC SCH.80

HV-10250A

HV-10228A
1/2"

M
P-10200A

CV-10251A

HV-10252A

0-1000kPa
HH PI
H 10259
AI

0-690kPa
PG PT
10254 10259
24 VDC

20 m3/h
HH FI FX
H 10274 10276
L
LL
AI

FIT 24 VDC
10274
M

M 120V
FV-10299

HCV-10276

RAW WATER
C01-0400 SHT 1
TO CARTRIDGE FILTERS

3" PVC SCH.80
HV-10078

M
HV-10250B
HV-10228B
1/2"
RAW WATER PUMPS
P-10200B
CV-10251B
HV-10252B

RAW WATER
TO FIRE PUMP

6" PVC SCH.80

DRAIN/OVERFLOW

LEH HH
11068
DI
LE
10068
120 V

NOTE 3

NOT BY H_2O Innovation — BY H_2O Innovation

CONTINUED

REGISTERED PROFESSIONAL ENGINEER
R. DESGAGNÉ
LICENSEE
NT/NU
15/06/2017

START FLT RUN HOA
YC YA YI HS
DO DI DI
M 600V
TYPICAL PUMP MOTOR

HOA
VHSC VHSO
DO DO
M 120 VAC, 1 PH, 60 Hz
TYPICAL ELECTRIC VALVE

NOTES:

1. ALL SIGNALS GOING INTO MCP-101.
2. EQUIPEMENT TO BE PLACED IN CONTAINER #1.
3. WATER LEAK DETECTOR

NOTE:
THE INFORMATION, SPECIFICATIONS AND DATA SHOWN ON THIS PRINT ARE FURNISHED BY AND ARE TO REMAIN THE PROPERTY OF H_2O INNOVATION.

THE PURPOSE OF THIS DOCUMENT IS TO FACILITATE THE INSTALLATION, MAINTENANCE AND OPERATION OF THE EQUIPMENT REPRESENTED BY SAID PRINT. NO OTHER USE OF THIS DOCUMENT SHALL BE MADE WITHOUT EXPRESS WRITTEN CONSENT FROM H_2O INNOVATION.

DRAWING REVISION

REV	DATE (DD/MM/YYYY)	REVISION DESCRIPTION	DRAWN	CHKD	ENG	APPVD
04	14/06/2017	AS INSTALLED	M.P.	M.B.	R.D.	A.M.
03	09/08/2016	AS BUILT	M.P.	S.B.	R.D.	A.M.
02	25/07/2016	REVISED AS PER COMMENTS	M.P.	S.B.	R.D.	A.M.
01	29/06/2016	AS PER COMMENTS	M.P.	S.B.	R.D.	A.M.
00	13/06/2016	INITIAL RELEASE	M.P.	S.B.	R.D.	A.M.

h2o innovation
knowledge to share, du savoir à partager

UNLESS NOTED OTHERWISE
INTERPRETATION ANSI Y14.5
TOLERANCES
FRACTIONS
DECIMALS .X ±0.030
.XXX ±0.015
ANGLES ±0.5°
HOLE SIZES
HOLE CENTERS
DO NOT SCALE PRINTS

MELIADINE

WTP CONTAINERIZED UNIT

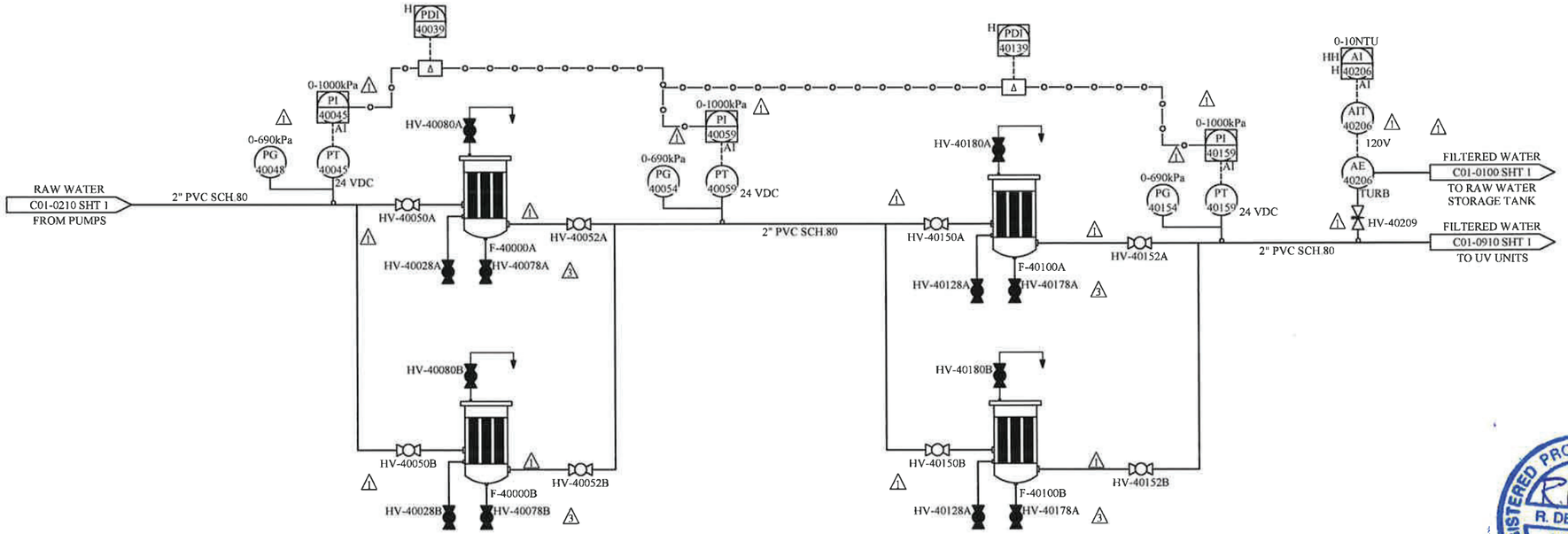
TITLE:
RAW WATER FEED SYSTEM
PROCESS & INSTRUMENTATION DIAGRAM

SCALE: N/A
DRAWING NUMBER: P65873-C01-0100
SHEET: 1 of 1
REVISION: 04

CONTINUES

CONTINUES

NOTE 2 ⚠1



5 MICRONS CARTRIDGE FILTERS

1 MICRON CARTRIDGE FILTERS

REGISTERED PROFESSIONAL ENGINEER
R. DESCAGNÉ
LICENSEE
NT/NU
15/06/2017

CONTINUES

NOT BY H_2O Innovation

BY H_2O Innovation

CONTINUES

NOTES:

1. ALL SIGNALS GOING INTO MCP-101.
2. EQUIPEMENT TO BE PLACED IN CONTAINER #1. ⚠

NOTE:
THE INFORMATION, SPECIFICATIONS AND DATA SHOWN ON THIS PRINT ARE FURNISHED BY AND ARE TO REMAIN THE PROPERTY OF H_2O INNOVATION.

THE PURPOSE OF THIS DOCUMENT IS TO FACILITATE THE INSTALLATION, MAINTENANCE AND OPERATION OF THE EQUIPMENT REPRESENTED BY SAID PRINT. NO OTHER USE OF THIS DOCUMENT SHALL BE MADE WITHOUT EXPRESS WRITTEN CONSENT FROM H_2O INNOVATION.

DRAWING REVISION

REV	DATE (DD/MM/YYYY)	REVISION DESCRIPTION	DRAWN	CHKD	ENG	APPVD
04	14/06/2017	AS INSTALLED	M.P.	M.B.	R.D.	A.M.
03	09/08/2016	AS BUILT	M.P.	S.B.	R.D.	A.M.
02	25/07/2016	REVISED AS PER COMMENTS	M.P.	S.B.	R.D.	A.M.
01	29/06/2016	AS PER COMMENTS	M.P.	S.B.	R.D.	A.M.
00	13/06/2016	INITIAL RELEASE	M.P.	S.B.	R.D.	A.M.

h2o innovation
knowledge to share, du savoir à partager

UNLESS NOTED OTHERWISE
INTERPRETATION ANSI Y14.5
TOLERANCES
FRACTIONS ±1/32
DECIMALS .0 X ±0.030
.0 XX ±0.015
ANGLES ±0.5°
HOLE SIZES ±1/64
HOLE CENTERS ±1/32
DO NOT SCALE PRINTS

MELIADINE

WTP CONTAINERIZED UNIT

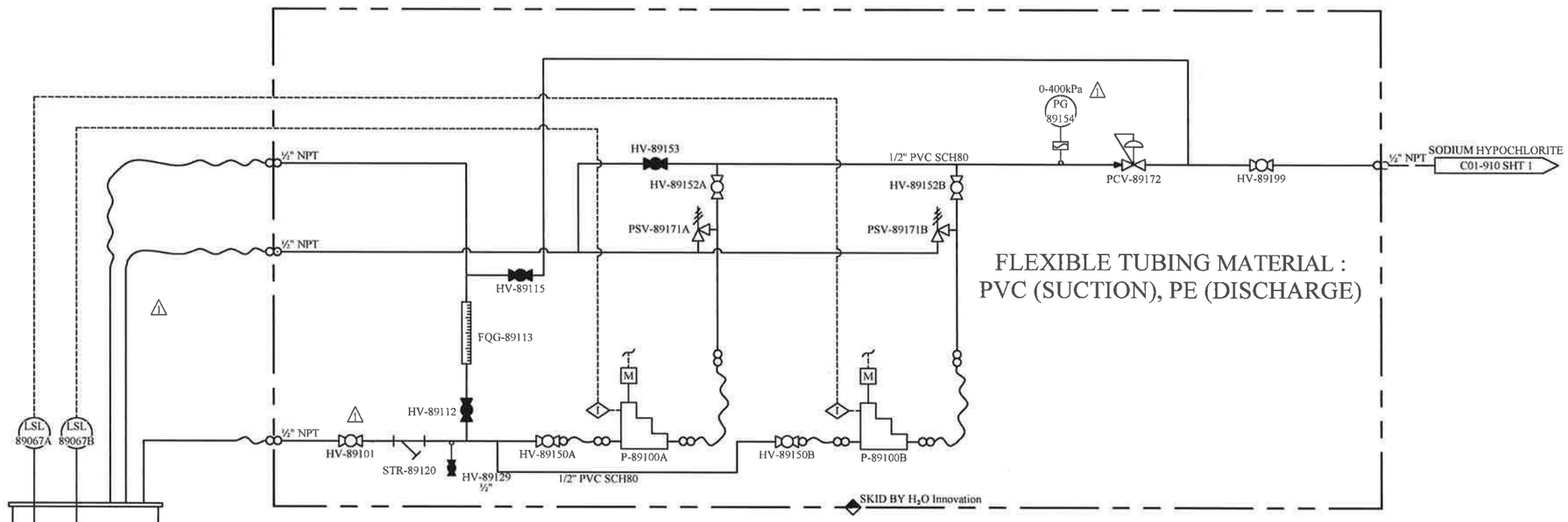
TITLE:
CARTRIDGE FILTERS
PROCESS & INSTRUMENTATION DIAGRAM

SCALE: N/A

DRAWING NUMBER: P65873-C01-0400

SHEET: 1 of 1

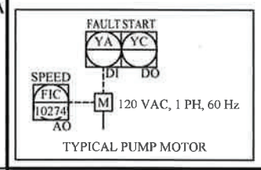
REVISION 04



FLEXIBLE TUBING MATERIAL :
PVC (SUCTION), PE (DISCHARGE)

SODIUM HYPOCHLORITE, 12 % DOSING SYSTEM

NOTE 2 ⚠



TYPICAL PUMP MOTOR

REGISTERED PROFESSIONAL ENGINEER
R. DESGAGNÉ
LICENSEE
NT/NU
15/06/2017

NOTES:

1. ALL SIGNALS GOING INTO MCP-101.
2. EQUIPEMENT TO BE PLACED IN CONTAINER #1. ⚠

NOTE:
THE INFORMATION, SPECIFICATIONS AND DATA SHOWN ON THIS PRINT ARE FURNISHED BY AND ARE TO REMAIN THE PROPERTY OF H_2O INNOVATION.

THE PURPOSE OF THIS DOCUMENT IS TO FACILITATE THE INSTALLATION, MAINTENANCE AND OPERATION OF THE EQUIPMENT REPRESENTED BY SAID PRINT. NO OTHER USE OF THIS DOCUMENT SHALL BE MADE WITHOUT EXPRESS WRITTEN CONSENT FROM H_2O INNOVATION.

DRAWING REVISION

REV	DATE (DD/MM/YYYY)	REVISION DESCRIPTION	DRAWN	CHKD	ENG	APPVD
04	14/06/2017	AS INSTALLED	M.P.	M.B.	R.D.	A.M.
03	09/08/2016	AS BUILT	M.P.	S.B.	R.D.	A.M.
02	25/07/2016	REVISED AS PER COMMENTS	M.P.	S.B.	R.D.	A.M.
01	29/06/2016	AS PER COMMENTS	M.P.	S.B.	R.D.	A.M.
00	13/06/2016	INITIAL RELEASE	M.P.	S.B.	R.D.	A.M.

h2o innovation
knowledge to share.du savoir à partager

UNLESS NOTED OTHERWISE
INTERPRETATION ANSI Y14.5
TOLERANCES
FRACTIONS ±1/64"
DECIMALS 0 X ±0.030
0 XX ±0.015
ANGLES ±0.5°
HOLE SIZES ±1/64"
HOLE CENTERS ±1/32"
DO NOT SCALE PRINTS

MELIADINE

WTP CONTAINERIZED UNIT

TITLE:
DOSING SKIDS - DUPLEX SOLENOID
PROCESS & INSTRUMENTATION DIAGRAM

SCALE:	DRAWING NUMBER:	REVISION
N/A	P65873-C01-0800 SHEET: 1 of 1	04

CONTINUED

FILTERED WATER
C01-0400 SHT 1
FROM FILTRATION SYSTEM

2" PVC SCH.80

INTENSITY AI 91000A AI
UV CONTROLLER 120 VAC, 1PH, 60Hz
UV COMM CENTER
FAULT YA 91000A DI
S
1" 316SS SCH.10
FV-91053A
1" PVC SCH80
HV-91052A
UV-91000A
1" 316SS SCH.10
HV-91050A

INTENSITY AI 91000B AI
UV CONTROLLER 120 VAC, 1PH, 60Hz
UV COMM CENTER
FAULT YA 91000B DI
S
1" 316SS SCH.10
FV-91053B
1" PVC SCH80
HV-91052B
UV-91000B
1" 316SS SCH.10
HV-91050B

INTENSITY AI 91000C AI
UV CONTROLLER 120 VAC, 1PH, 60Hz
UV COMM CENTER
FAULT YA 91000C DI
S
1" 316SS SCH.10
FV-91053C
1" PVC SCH80
HV-91052C
NOTE 2
UV-91000C
1" 316SS SCH.10
HV-91050C

INTENSITY AI 91000D AI
UV CONTROLLER 120 VAC, 1PH, 60Hz
½" PVC SCH80
UV COMM CENTER
FAULT YA 91000D DI
S
1" 316SS SCH.10
FV-91053D
1" PVC SCH80
HV-91052D
UV-91000D
1" 316SS SCH.10
HV-91050D

SODIUM HYPOCHLORITE
C01-0800 SHT 1
FROM DOSING PUMPS

CONTINUED

NOTE 4

2" PVC SCH.80
IQ-89197
MX-91083

0-5 ppm HH H L LL AI 91093 AI
4-9 pH HH H L LL AI 91090 AI
AIT 91093 24 VDC
AE 91093 Cl2
AE 91090 pH
HV-91077
TREATED WATER
C01-0100 SHT 1
TO RAW WATER STORAGE TANKS
NOTE 3

0-1 L/min
FI 91094
0-50°C TI 91058 AI
TT 91058
HV-91099
NOTE 1

TREATED WATER
C01-0990 SHT 1
TO TREATED WATER STORAGE TANKS

NOT BY H_2O Innovation
SKID BY H_2O Innovation

NOTES:

1. TEMPORARY CONNECTION FOR COMMISSIONING
2. ALL SIGNALS GOING INTO MCP-101.
3. ¼" OD TUBING BETWEEN INSTRUMENT LINE AND RAW WATER TANK.
4. EQUIPMENT TO BE PLACED IN CONTAINER #1

REGISTERED PROFESSIONAL ENGINEER
R. DESCAGNÉ
LICENSEE
NT/NU
15/06/2017

NOTE:
THE INFORMATION, SPECIFICATIONS AND DATA SHOWN ON THIS PRINT ARE FURNISHED BY AND ARE TO REMAIN THE PROPERTY OF H_2O INNOVATION.

THE PURPOSE OF THIS DOCUMENT IS TO FACILITATE THE INSTALLATION, MAINTENANCE AND OPERATION OF THE EQUIPMENT REPRESENTED BY SAID PRINT. NO OTHER USE OF THIS DOCUMENT SHALL BE MADE WITHOUT EXPRESS WRITTEN CONSENT FROM H_2O INNOVATION.

DRAWING REVISION

REV	DATE (DD/MM/YY)	REVISION DESCRIPTION	DRAWN	CHKD	ENG	APPVD
04	14/06/2017	AS INSTALLED	M.P.	M.B.	R.D.	A.M.
03	09/08/2016	AS BUILT	M.P.	S.B.	R.D.	A.M.
02	25/07/2016	REVISED AS PER COMMENTS	M.P.	S.B.	R.D.	A.M.
01	29/06/2016	AS PER COMMENTS	M.P.	S.B.	R.D.	A.M.
00	13/06/2016	INITIAL RELEASE	M.P.	S.B.	R.D.	A.M.

h2O innovation
knowledge to share, du savoir à partager

UNLESS NOTED OTHERWISE
INTERPRETATION ANSI Y14.5
TOLERANCES
FRACTIONS ±⅛"
DECIMALS 0.X ±0.030
0.XX ±0.015
0.XXX ±0.01
ANGLES ±0.5°
HOLE SIZES ±⅛"
HOLE CENTERS ±⅛"
DO NOT SCALE PRINTS

MELIADINE

WTP CONTAINERIZED UNIT

TITLE:
UV TREATMENT UNITS
PROCESS & INSTRUMENTATION DIAGRAM

SCALE: N/A
DRAWING NUMBER: P65873-C01-0910
SHEET: 1 of 1
REVISION: 04

TREATED WATER
C01-0910 SHT 1
FROM UV UNITS

2" PVC SCH.80

VENT

TREATED WATER STORAGETANK T-99000

NOTE 1

HH
H
L
LL
LI 99259
AI
0-2.00m
LT 99259
24 VDC

HV-99259

4" PVC SCH.80
HV-99078

HV-99250A
3" PVC SCH.80
HV-99228A 1/2"
P-99200A
CV-99251A
HV-99252A

HYDROPNEUMATIC TANK T-99300

HV-99301 1-1/4"

3" PVC SCH.80

0-600kPa
PI 99259
PX 99200
0-690kPa
PG 99254
PT 99259
24 VDC
0-45 m3/Hr
FI 99274
FIT 99274
24 VDC

NOTE 3

NOTE 4

TREATED WATER
TO EMERGENCY SHOWER

HV-99277 1/2"

HV-99299

TREATED WATER
TO DISTRIBUTION

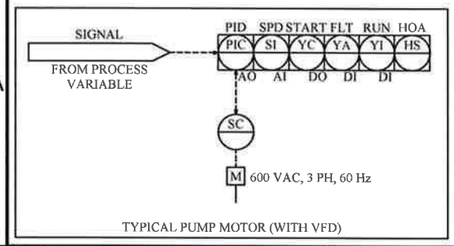
3" PVC SCH.80
HV-99250B
HV-99228B 1/2"
TREATED WATER DISTRIBUTION PUMPS P-99200B
CV-99251B
HV-99252B

LEH 99068
HH
DI
LE 99068
120 V

NOTE 5

DRAIN/OVERFLOW

BY OTHERS
BY H_2O Innovation



TYPICAL PUMP MOTOR (WITH VFD)

NOTES:

1. 5 TANKS IN SERIES LINKED TOGETHER
2. ALL SIGNALS GOING INTO MCP-101.
3. EQUIPMENT TO BE PLACED IN CONTAINER #2.
4. EQUIPMENT TO BE PLACED IN CONTAINER #1.
5. WATER LEAK DETECTOR

NOTE:
THE INFORMATION, SPECIFICATIONS AND DATA SHOWN ON THIS PRINT ARE FURNISHED BY AND ARE TO REMAIN THE PROPERTY OF H_2O INNOVATION.

THE PURPOSE OF THIS DOCUMENT IS TO FACILITATE THE INSTALLATION, MAINTENANCE AND OPERATION OF THE EQUIPMENT REPRESENTED BY SAID PRINT. NO OTHER USE OF THIS DOCUMENT SHALL BE MADE WITHOUT EXPRESS WRITTEN CONSENT FROM H_2O INNOVATION.

DRAWING REVISION

REV	DATE (DD/MM/YYYY)	REVISION DESCRIPTION	DRAWN	CHKD	ENG	APPVD
04	14/06/2017	AS INSTALLED	M.P.	M.B.	R.D.	A.M.
03	09/08/2016	AS BUILT	M.P.	S.B.	R.D.	A.M.
02	25/07/2016	REVISED AS PER COMMENTS	M.P.	S.B.	R.D.	A.M.
01	29/06/2016	AS PER COMMENTS	M.P.	S.B.	R.D.	A.M.
00	13/06/2016	INITIAL RELEASE	M.P.	S.B.	R.D.	A.M.

h2o innovation
knowledge to share, du savoir à partager

UNLESS NOTED OTHERWISE
INTERPRETATION ANSI Y14.5
TOLERANCES
FRACTIONS ±1/64
DECIMALS .X ±0.030
.XX ±0.015
.XXX ±0.5
ANGLES ±0.5°
HOLE SIZES ±1/64
HOLE CENTERS ±1/64
DO NOT SCALE PRINTS

MELIADINE

WTP CONTAINERIZED UNIT

TITLE:
TREATED WATER DISTRIBUTION SYSTEM
PROCESS & INSTRUMENTATION DIAGRAM

SCALE: N/A
DRAWING NUMBER: P65873-C01-0990
SHEET: 1 of 1
REVISION: 04

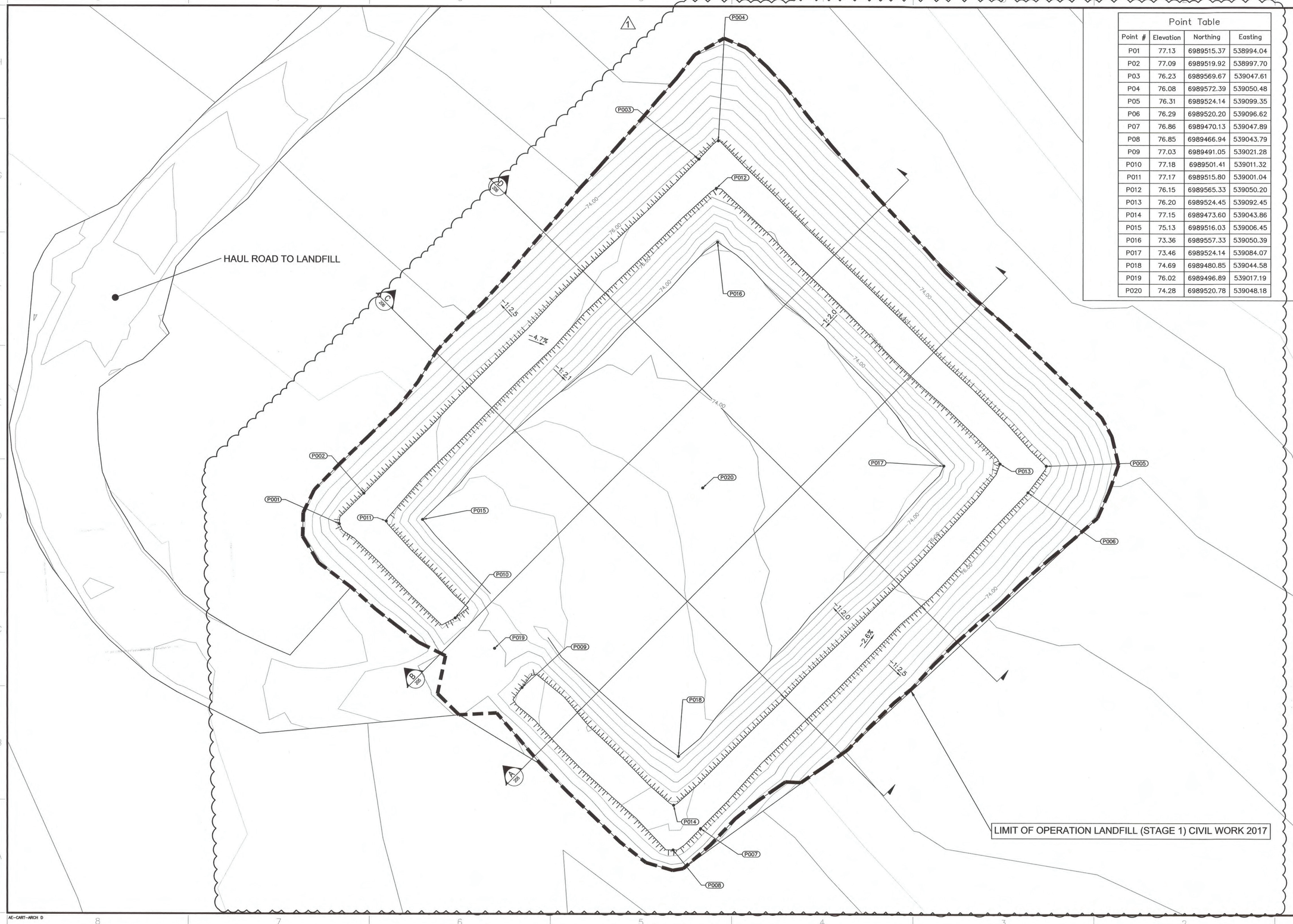
Appendix Q

Infrastructures As-Built and Design

Landfill

NO. DESSIN
DRAWING NO. 65-697-230-204T0206_R1

FORMAT ARCHD



Point Table			
Point #	Elevation	Northing	Easting
P01	77.13	6989515.37	538994.04
P02	77.09	6989519.92	538997.70
P03	76.23	6989569.67	539047.61
P04	76.08	6989572.39	539050.48
P05	76.31	6989524.14	539099.35
P06	76.29	6989520.20	539096.62
P07	76.86	6989470.13	539047.89
P08	76.85	6989466.94	539043.79
P09	77.03	6989491.05	539021.28
P010	77.18	6989501.41	539011.32
P011	77.17	6989515.80	539001.04
P012	76.15	6989565.33	539050.20
P013	76.20	6989524.45	539092.45
P014	77.15	6989473.60	539043.86
P015	75.13	6989516.03	539006.45
P016	73.36	6989557.33	539050.39
P017	73.46	6989524.14	539084.07
P018	74.69	6989480.85	539044.58
P019	76.02	6989496.89	539017.19
P020	74.28	6989520.78	539048.18

PLAN CLÉ
KEY PLAN

TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE DATE : 2017-12-01

L'INFORMATION ICI CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE. SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES. © AGNICO EAGLE LTÉE

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPYING, TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. © AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
–	–
–	–
–	–
–	–
–	–
–	–

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2017-12-01	ISSUED AS-BUILT	CM	JA	
0	2017-02-08	ISSUED FOR CONSTRUCTION	GZ	KJ	
A	2017-01-23	ISSUED FOR REVIEW	GZ	KJ	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date 2017-12-01
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

PROFESSIONAL ENGINEER
J.M.F. ALARIE
LICENSEE
2017-12-01

TITRE / TITLE

AGNICO EAGLE – MEL IADINE DIVISION
697 – LANDFILL
230 – GENERAL EARTH WORKS
OPERATION LANDFILL (STAGE 1)
LAYOUT PLAN

DESSINÉ PAR / DRAWN BY	EL	DATE 2017-01-23
VERIFIÉ PAR / CHECKED BY	GZ	2017-01-23
APPROUVÉ PAR / APPROVED BY	KJ	2017-01-23
ÉCHELLE / SCALE	1:250	DATE 2017-01-23

NO. DESSIN / DRAWING NO. 65-697-230-204

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6515 / 28920	1	1 / 1

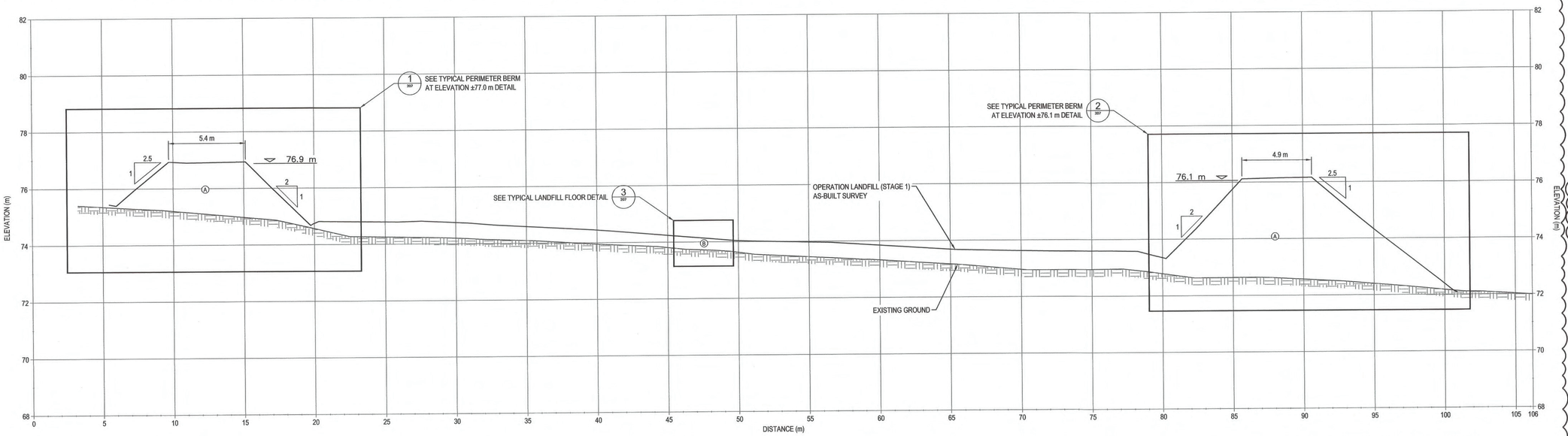
AE-CART-ARCH D

P:\28920\DESSIN\CIV-INFRA\DESSINS DE TRAVAIL\AUTOCAD\65-697-230-204to206_R1.dwg-2013-02-19 14:03:29

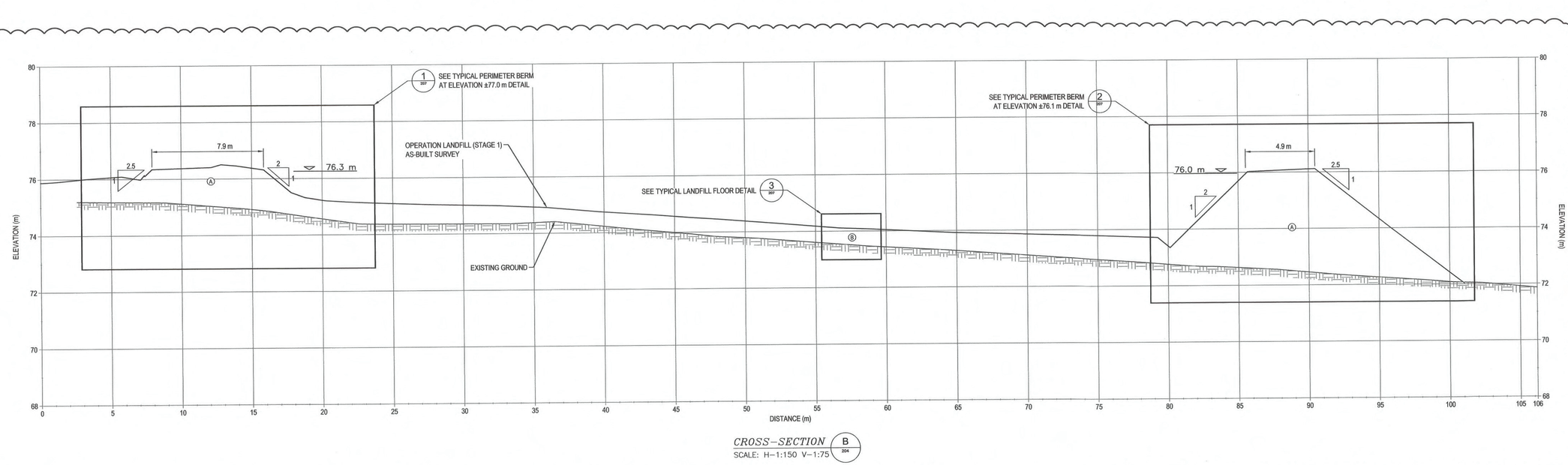
FILE NO. 65-697-230-204to206_R1.dwg

NO. DESSIN
DRAWING NO. 65-697-230-204TO206_R1

FORMAT ARCHD

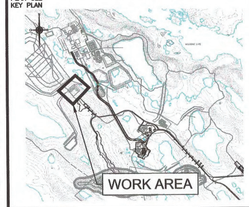


CROSS-SECTION A 204
SCALE: H-1:150 V-1:75



CROSS-SECTION B 204
SCALE: H-1:150 V-1:75

PLAN CLÉ
KEY PLAN



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

LEGEND

Ⓐ ESKER GRANULAR FILL (CL. A) (600mm MINUS)

Ⓑ GRANULAR FILL (50mm MINUS)

1

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2017-12-01

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE. SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE REPRODUCTION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST FOURNIE SONT INTERDITES. © AGNICO EAGLE LTÉE

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPYING, TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. © AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
--	--
--	--
--	--
--	--
--	--
--	--
--	--

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2017-12-01	ISSUED AS-BUILT	CM	JA	
0	2017-02-08	ISSUED FOR CONSTRUCTION	GZ	KJ	
A	2017-01-23	ISSUED FOR REVIEW	GZ	KJ	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date 2017-12-01
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
J.M.I.F. ALARIE
LICENSEE
2017-12-01

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
697 – LANDFILL
230 – GENERAL EARTH WORKS
OPERATION LANDFILL (STAGE 1)
CROSS SECTIONS A-A AND B-B

DESSINÉ PAR / DRAWN BY	EL	DATE 2017-01-23
VÉRIFIÉ PAR / CHECKED BY	GZ	2017-01-23
APPROUVÉ PAR / APPROVED BY	KJ	2017-01-23
ÉCHELLE / SCALE	AS SHOWN	DATE 2017-01-23

NO. DESSIN / DRAWING NO. 65-697-230-205

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6515 / 28920	1	1 / 1

AE-CART-ARCH D

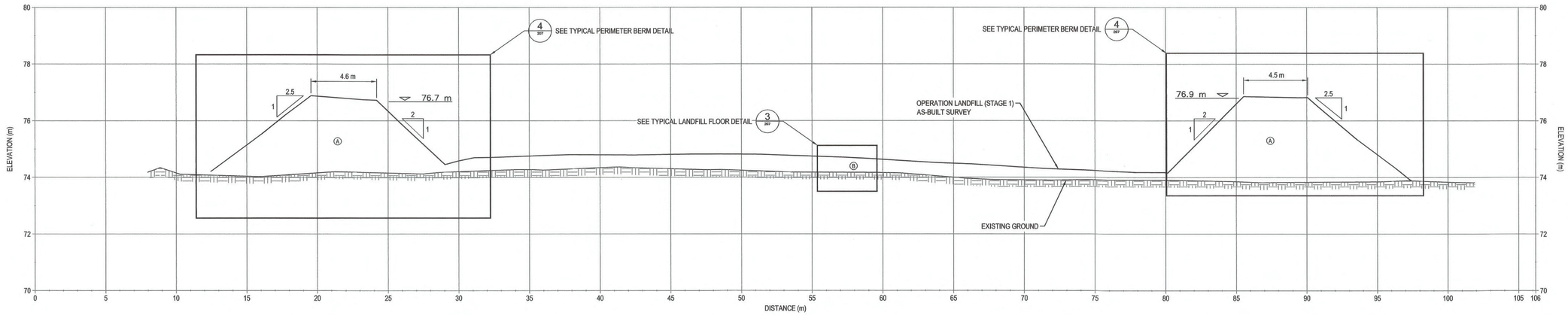
P:\28920\DESSIN\CIV-INFRA\DESSINS DE TRAVAIL\AUTOCAD\65-697-230-204to206_R1.dwg-2013-02-19 14:03:29

FILE NO. 65-697-230-204to206_R1.dwg

NO. DESSIN
DRAWING NO. 65-697-230-204T0206_R1

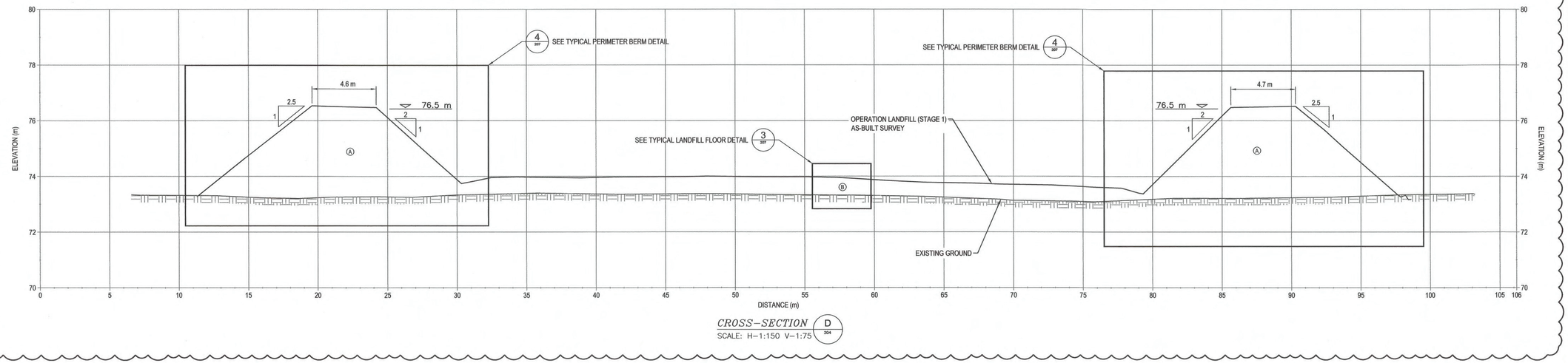
FORMAT ARCHD

1



CROSS-SECTION C 204
SCALE: H-1:150 V-1:75

1



CROSS-SECTION D 204
SCALE: H-1:150 V-1:75

PLAN CLÉ
KEY PLAN

TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

LEGEND

Ⓐ ESKER GRANULAR FILL (CL. A) (600mm MINUS)

Ⓑ GRANULAR FILL (50mm MINUS)

1

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2017-12-01

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES. © AGNICO EAGLE LTÉE.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST, WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. © AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
–	–
–	–
–	–
–	–
–	–
–	–
–	–

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2017-12-01	ISSUED AS-BUILT	CM	JA	
0	2017-02-06	ISSUED FOR CONSTRUCTION	GZ	KJ	
A	2017-01-23	ISSUED FOR REVIEW	GZ	KJ	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date 2017-12-21
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

ASSOCIATION OF PROFESSIONAL ENGINEERS AND GEOSCIENTISTS
J.M.F. ALARIE
LICENSEE
2017-12-01

TITRE / TITLE

AGNICO EAGLE – MELIADINE DIVISION
697 – LANDFILL
230 – GENERAL EARTH WORKS
OPERATION LANDFILL (STAGE 1)
CROSS SECTIONS C-C AND D-D

DESSINÉ PAR / DRAWN BY	EL	DATE 2017-01-23
VÉRIFIÉ PAR / CHECKED BY	GZ	2017-01-23
APPROUVÉ PAR / APPROVED BY	KJ	2017-01-23
ÉCHELLE / SCALE	AS SHOWN	DATE 2017-01-23

NO. DESSIN / DRAWING NO. 65-697-230-206

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6515 / 28920	1	1 / 1

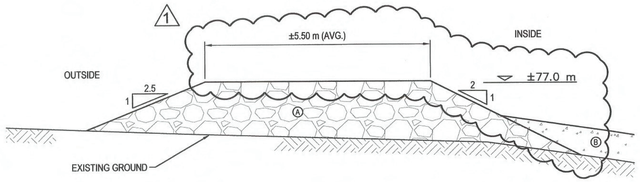
AE-CART-ARCH D

P:\28920\DESSIN\GN-INFRA\DESSINS DE TRAVAIL\AUTOCAD\65-697-230-204to206_R1.dwg-2013-02-19 14:03:29

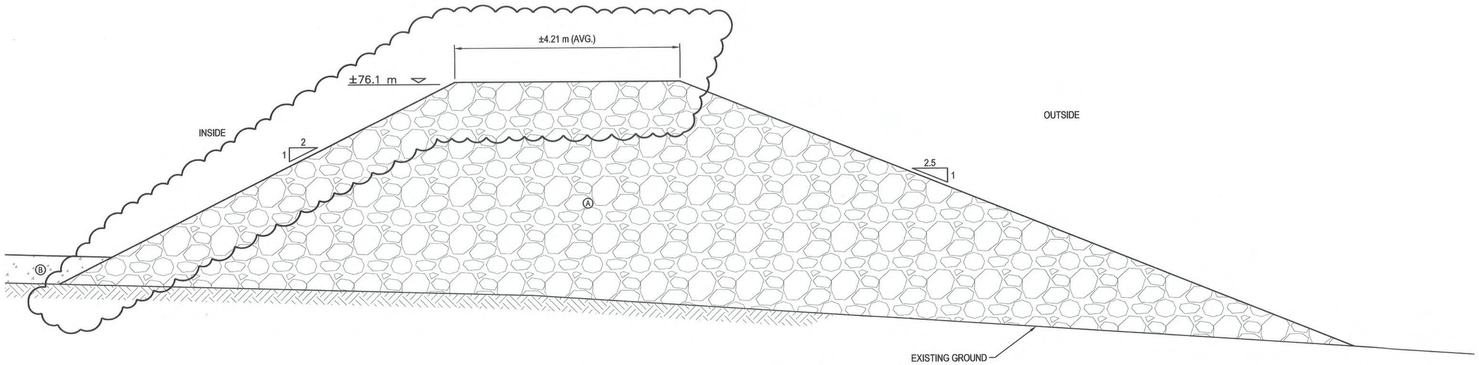
FILE NO. 65-697-230-204to206_R1.dwg

NO. DESSIN
DRAWING NO. 65-697-230-204T0206_R1

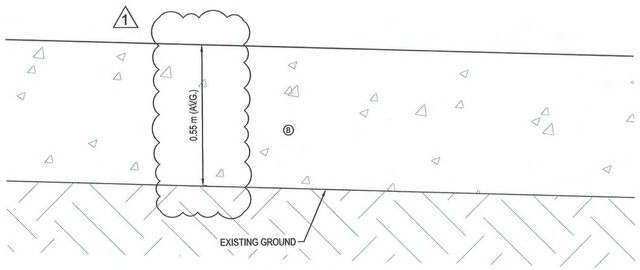
FORMAT ARCHD



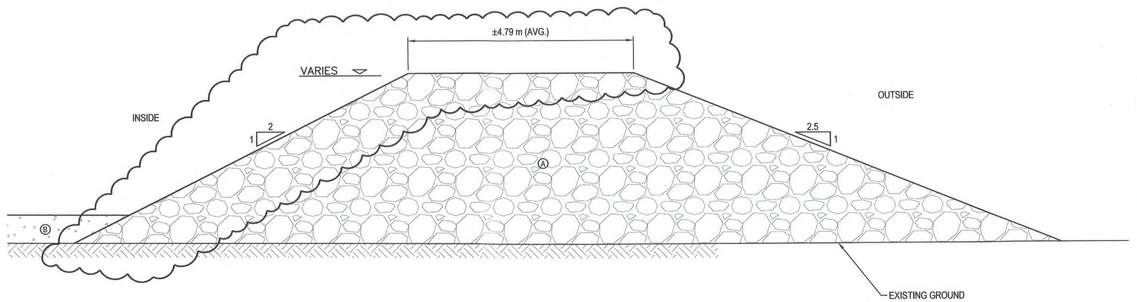
TYPICAL PERIMETER BERM AT ELEVATION ±77.0 m (1/205)
NTS



TYPICAL PERIMETER BERM AT ELEVATION ±76.1 m (2/205)
NTS



TYPICAL LANDFILL FLOOR (3/205)
NTS



TYPICAL PERIMETER BERM (4/206)
NTS

1

ESTIMATED IN-PLACE MATERIAL QUANTITIES FOR CONSTRUCTION OF OPERATION LANDFILL STAGE 1			
ITEM		UNIT	ESTIMATED IN-PLACE QUANTITY
A	EKSER GRANULAR FILL (600mm MINUS)	m³	9,750
B	GRANULAR FILL (50mm MINUS)	m³	1,649

IT SHOULD BE NOTED THAT THE ACTUAL QUANTITIES COULD BE DIFFERENT FROM THE ESTIMATED DUE TO THE FOLLOWING REASONS:

- ORIGINAL GROUND CONDITIONS / ELEVATIONS MAY BE DIFFERENT FROM THE TOPOGRAPHIC DATA USED FOR THE DESIGN.
- THE FIELD OBSERVATIONS DURING CONSTRUCTION MAY LEAD TO DESIGN AND CONSTRUCTION RELATED MODIFICATIONS, WHICH MAY IN TURN AFFECT THE QUANTITIES.
- THE ORIGINAL GROUND MAY SETTLE DURING CONSTRUCTION.

PLAN CLÉ
KEY PLAN

TETRA TECH

1 NOTES GÉNÉRALES / GENERAL NOTES

LEGEND

- (A) ESKER GRANULAR FILL (CL. A) (600mm MINUS)
- (B) GRANULAR FILL (50mm MINUS)

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2017-12-01

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÉVUE SONT INTERDITES. © AGNICO EAGLE LTÉE.

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS, AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. © AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
—	—
—	—
—	—
—	—
—	—
—	—

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2017-12-01	ISSUED AS-BUILT	CM	JA	
0	2017-02-08	ISSUED FOR CONSTRUCTION	GZ	KJ	
A	2017-01-23	ISSUED FOR REVIEW	GZ	KJ	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date 2017-12-01
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
J.M.I.F. ALARIE
LICENSEE
2017-12-01

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
697 – LANDFILL
230 – GENERAL EARTH WORKS
OPERATION LANDFILL (STAGE 1)
TYPICAL DETAILS AND MATERIAL QUANTITIES

DESSINÉ PAR / DRAWN BY	EL	DATE 2017-01-23
VERIFIÉ PAR / CHECKED BY	GZ	2017-01-23
APPROUVÉ PAR / APPROVED BY	KJ	2017-01-23
ÉCHELLE / SCALE	AS SHOWN	DATE 2017-01-23

NO. DESSIN / DRAWING NO. 65-697-230-207

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6515 / 28920	1	1 / 1

AE-CART-ARCH D

P:\28920\DESSIN\CIV-INFRA\DESSINS DE TRAVAIL\AUTOCAD\65-697-230-204to206_R1.dwg-2013-02-19 14:03:29

FILE NO. 65-697-230-204to206_R1.dwg

Appendix Q

Infrastructures As-Built and Design

Landfarm

NO. DESSIN
DRAWING NO. 65-696-230-201

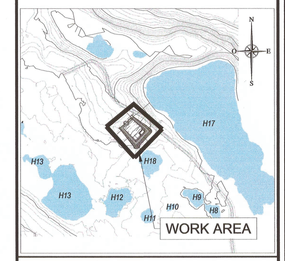
0 50 100 150 200 250 300mm

FORMAT ARCHD

FINISHED GRADE POINT TABLE

Point #	Elevation	Northing	Easting	Description
1	74.44	6989938.56	539495.47	INSIDE CORNER
2	74.49	6989900.75	539458.24	INSIDE CORNER
3	72.49	6989849.26	539511.04	INSIDE CORNER
4	72.50	6989888.69	539548.38	INSIDE CORNER
5	72.50	6989894.59	539541.32	SUMP CORNER
6	72.50	6989883.59	539527.99	SUMP CORNER
7	72.49	6989872.13	539533.50	SUMP CORNER
8	75.09	6989941.32	539495.37	BERM CREST
9	74.53	6989947.54	539494.94	BERM CREST
10	74.70	6989924.76	539471.58	BERM CREST
11	73.35	6989931.01	539468.02	BERM CREST
12	73.21	6989921.83	539458.98	BERM CREST
13	74.65	6989918.88	539466.98	BERM CREST
14	75.12	6989900.69	539456.88	BERM CREST
15	74.57	6989901.09	539450.10	BERM CREST
16	75.01	6989840.79	539510.94	BERM CREST
17	74.47	6989832.99	539510.95	BERM CREST
18	75.08	6989888.42	539557.78	BERM CREST
19	74.50	6989889.40	539565.12	BERM CREST
20	73.43	6989898.35	539539.83	FILTER CREST
21	73.32	6989897.87	539540.21	FILTER CREST
22	73.34	6989880.63	539523.79	FILTER CREST
23	73.35	6989880.64	539522.83	FILTER CREST
24	73.00	6989870.13	539532.86	FILTER CREST
25	73.01	6989869.61	539532.20	FILTER CREST

PLAN CLÉ
KEY PLAN



NOTES GÉNÉRALES / GENERAL NOTES

TEL QUE CONSTRUIT
AS BUILT
DATE : 2018-02-02
AGNICO EAGLE

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES.
© AGNICO EAGLE LTÉE
THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPYING, TRANSMITTAL TO OTHERS AND ANY USE (EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED.
© AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
2	2018-02-02	ISSUED AS-BUILT - GENERAL REVISION	CM	JA	
1	2017-06-01	RE-ISSUED FOR CONSTRUCTION	EL	GZ	
0	2017-02-08	ISSUED FOR CONSTRUCTION	EP	GZ	
A	2017-01-16	ISSUED FOR REVIEW	EP	GZ	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH CANADA INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date 2018-02-01
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
J.M.I.F. ALARIE
LICENSEE
2018-02-02

AGNICO EAGLE MELIADINE GOLD PROJECT

LANDFARM
LAYOUT PLAN

DESSINÉ PAR / DRAWN BY	EP	DATE 2017-01-16
VÉRIFIÉ PAR / CHECKED BY	GZ	2017-01-16
APPROUVÉ PAR / APPROVED BY		
ÉCHELLE / SCALE	1:300	DATE 2017-01-16
NO. DESSIN / DRAWING NO.	65-696-230-201	
NO. PROJET / PROJECT NO.	6515	REVISION 2
		FEUILLE / SHT. 2 / 6

AE-CART-ARCH D

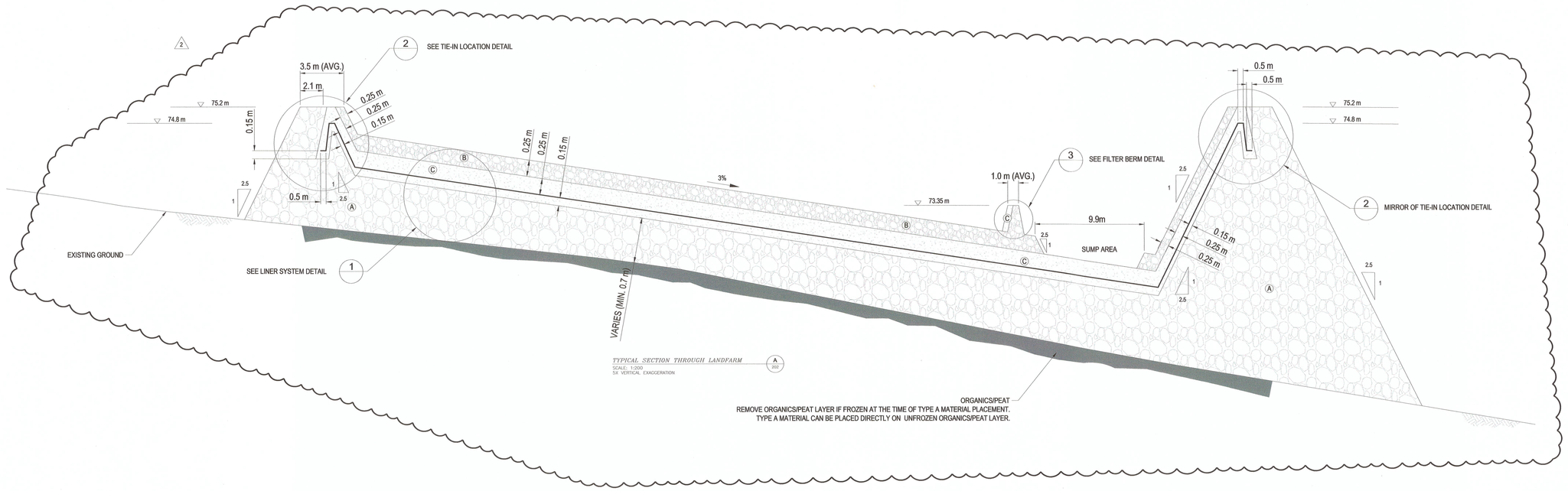
P:\28920\DESSIN\CIV-INFRA\DESSINS DE TRAVAIL\AUTOCAD\65-696-230-201to205_R2.dwg

FILE NO. 65-696-230-201to205_R2.dwg

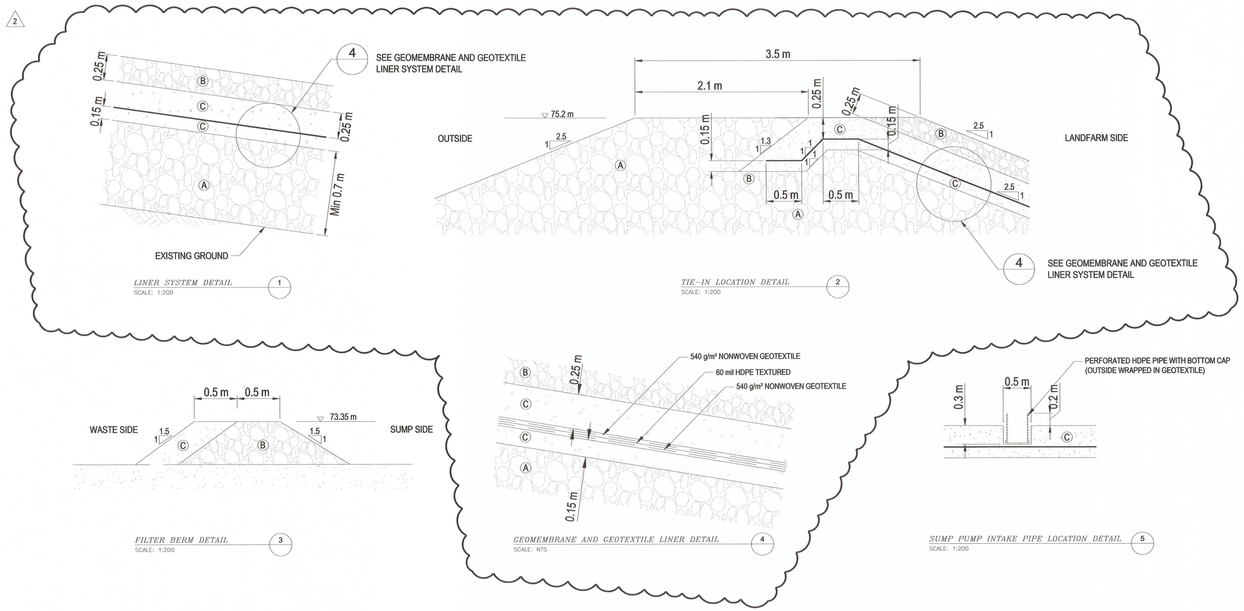
NO. DESSIN
DRAWING NO. 65-696-230-201

0 50 100 150 200 250 300mm

FORMAT ARCHD



TYPICAL SECTION THROUGH LANDFARM A 202
SCALE: 1:200
5X VERTICAL EXAGGERATION



LINER SYSTEM DETAIL 1
SCALE: 1:200

TIE-IN LOCATION DETAIL 2
SCALE: 1:200

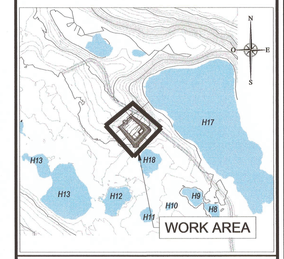
FILTER BERM DETAIL 3
SCALE: 1:200

GEOMEMBRANE AND GEOTEXTILE LINER DETAIL 4
SCALE: NTS

SUMP PUMP INTAKE PIPE LOCATION DETAIL 5
SCALE: 1:200

QUANTITIES CONSTRUCTION CHART		
LANDFARM		
MATERIAL		QUANTITIES
A	600mm MINUS CL. A Esker Material	18 193 m³
B	Transition Rockfill (200mm MINUS)	1 491 m³
C	Granular Fill (30mm MINUS)	2 759 m³
	HDPE Geomembrane	6 131 m²
	Non-woven Geotextile	12 262 m²

PLAN CLÉ
KEY PLAN



NOTES GÉNÉRALES / GENERAL NOTES

(A) ESKER CL. A MATERIAL (600 mm MINUS)
(B) TRANSITION ROCKFILL (200 mm MINUS)
(C) GRANULAR FILL (30 mm MINUS)

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2018-02-02

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES.
© AGNICO EAGLE LTÉE.
THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED.
© AGNICO EAGLE LTD.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG

AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
2	2018-02-02	ISSUED AS-BUILT	CM	JA	
1	2017-06-01	RE-ISSUED FOR CONSTRUCTION	EL	GZ	
0	2017-02-08	ISSUED FOR CONSTRUCTION	EP	GZ	
A	2017-01-16	ISSUED FOR REVIEW	EP	GZ	

REVISIONS

PERMIT TO PRACTICE
TETRA TECH INDUSTRIES, INC.
O/A TETRA TECH
Signature
Date 2018-02-01
PERMIT NUMBER: P 1029
NT/NU Association of Professional Engineers and Geoscientists

PROFESSIONAL ENGINEER
J.M.I.F. ALARIE
LICENSEE
2018-02-02

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

LANDFARM
TYPICAL DESIGN SECTION, DETAILS, AND QUANTITIES

DESSINÉ PAR / DRAWN BY	EP	DATE 2017-01-16
VÉRIFIÉ PAR / CHECKED BY	GZ	2017-01-16
APPROUVÉ PAR / APPROVED BY		
ÉCHELLE / SCALE	1:200	DATE 2017-01-16

NO. DESSIN / DRAWING NO. 65-696-230-202

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT.
6515	2	3 / 6

AE-CART-ARCH D

P:\28920\DESSIN\CIV-INFRA\DESSINS DE TRAVAIL\AUTOCAD\65-696-230-201to205_R2.dwg

FILE NO. 65-696-230-201to205_R2.dwg

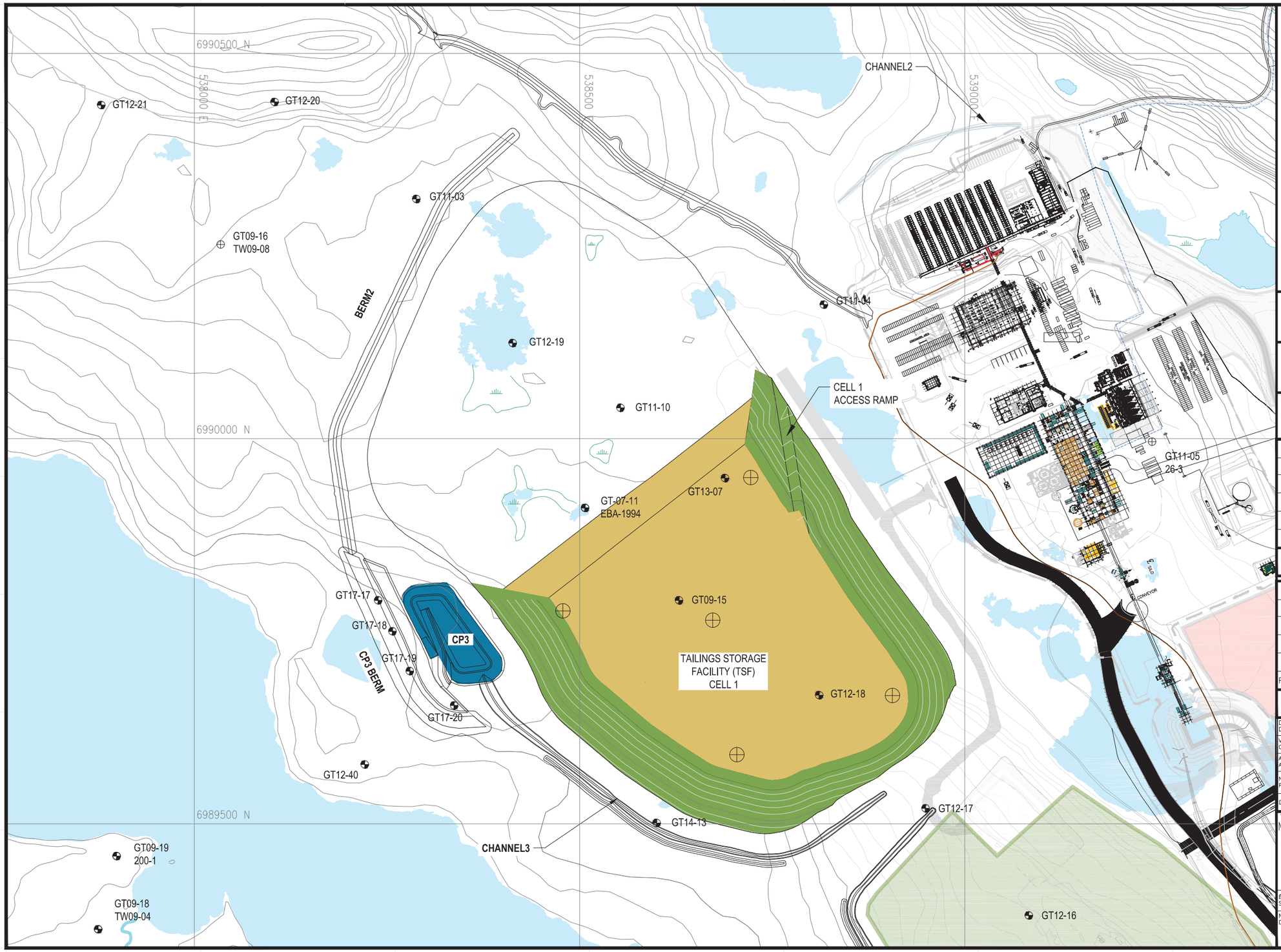
Appendix Q

Infrastructures As-Built and Design

Tailings Storage Facility (TSF)

NO. DESSIN
DRAWING NO.

FORMAT ANSI B–11x17



LEGEND

- WASTE ROCK
- ORE
- TAILINGS
- WATER COLLECTION POND
- BOREHOLE
- PROPOSED GROUND TEMPERATURE CABLE LOCATION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date Nov. 14, 2018
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PROFESSIONAL ENGINEER — G. ZHANG — LICENSEE — NWT/NU

AGNICO EAGLE

TETRA TECH

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 11/14/2018

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE. TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES.
© AGNICO EAGLE LTÉE

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPYING, TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED.
© AGNICO EAGLE LTD.

–	–
–	–
–	–
–	–
–	–
TITRE / TITLE	# DWG

DESSINS EN RÉFÉRENCE/REFERENCE DRAWINGS

REV	DESCRIPTION	DATE	PAR BY
0	ISSUED FOR CONSTRUCTION	2018–11–14	
B	ISSUED FOR REVIEW	2018–11–06	
A	ISSUED FOR REVIEW	2018–11–05	

REVISIONS

DESSINÉ PAR / DRAWN BY	EL/EP	DATE 2018–11–14
VÉRIFIÉ PAR / CHECKED BY	GZ/WTH	2018–11–14
APPROUVÉ PAR / APPROVED BY		
No. PROJET / PROJECT NO.		
DATE		

TITRE / TITLE
MELIADINE TAILINGS STORAGE FACILITY DESIGN

YEAR 2

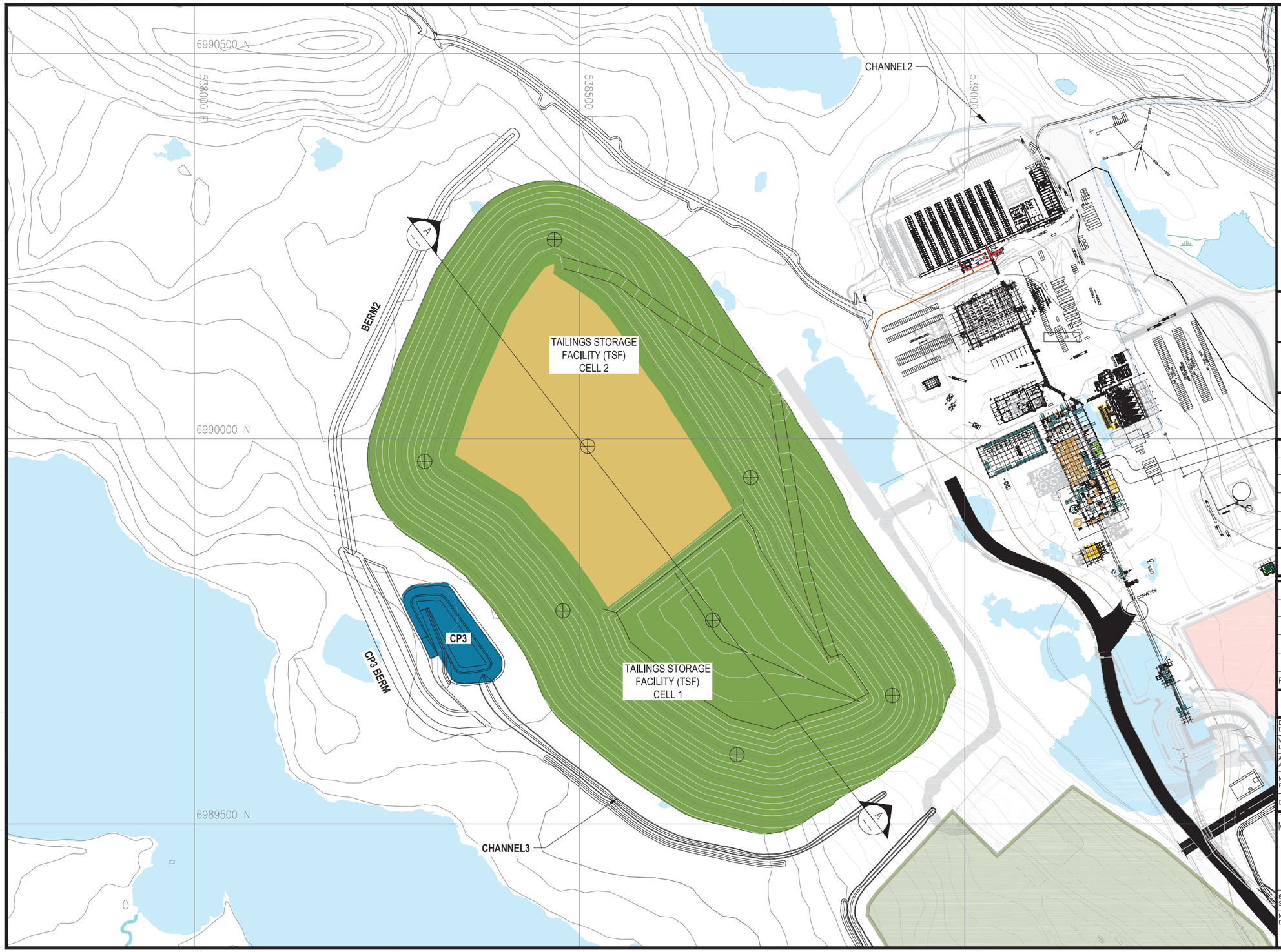
ÉCHELLE/ SCALE	FICHIER / FILE .DWG		
No. DESSIN/ DRAWING NO.		REVISION	FEUILLE/SHT
6515–583–163–002		0	2 / 8

AE–CART–ANSI B

Q:\Edmonton\Engineering\E141\Projects_MELIADINE\2018 TSF & WRSF1\Figure 2.dwg–2013–02–19 14:03:29

NO. DESSIN
DRAWING NO.

FORMAT ANSI B–11x17



LEGEND

- WASTE ROCK
- ORE
- TAILINGS
- WATER COLLECTION POND
- PROPOSED GROUND TEMPERATURE CABLE LOCATION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date Nov. 14, 2018
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
G. ZHANG
LICENSEE
NWT/NU

AGNICO EAGLE

TETRA TECH

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 11/14/2018

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE, SANS AUTORISATION ÉCRITE PRÉALABLE. TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES.
© AGNICO EAGLE LTÉE

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED.
© AGNICO EAGLE LTD.

–	–
–	–
–	–
–	–
–	–
TITRE / TITLE	# DWG

DESSINS EN RÉFÉRENCE/REFERENCE DRAWINGS

REV	DESCRIPTION	DATE	PAR BY
0	ISSUED FOR CONSTRUCTION	2018–11–14	
B	ISSUED FOR REVIEW	2018–11–06	
A	ISSUED FOR REVIEW	2018–11–05	

REVISIONS

DESSINÉ PAR / DRAWN BY	EL/EP	DATE	2018–11–14
VÉRIFIÉ PAR / CHECKED BY	GZ/WTH		2018–11–14
APPROUVÉ PAR / APPROVED BY			
No. PROJET / PROJECT NO.			
DATE			

TITRE / TITLE
MELIADINE TAILINGS STORAGE FACILITY DESIGN

YEAR 7

ÉCHELLE/ SCALE
FICHIER / FILE .DWG

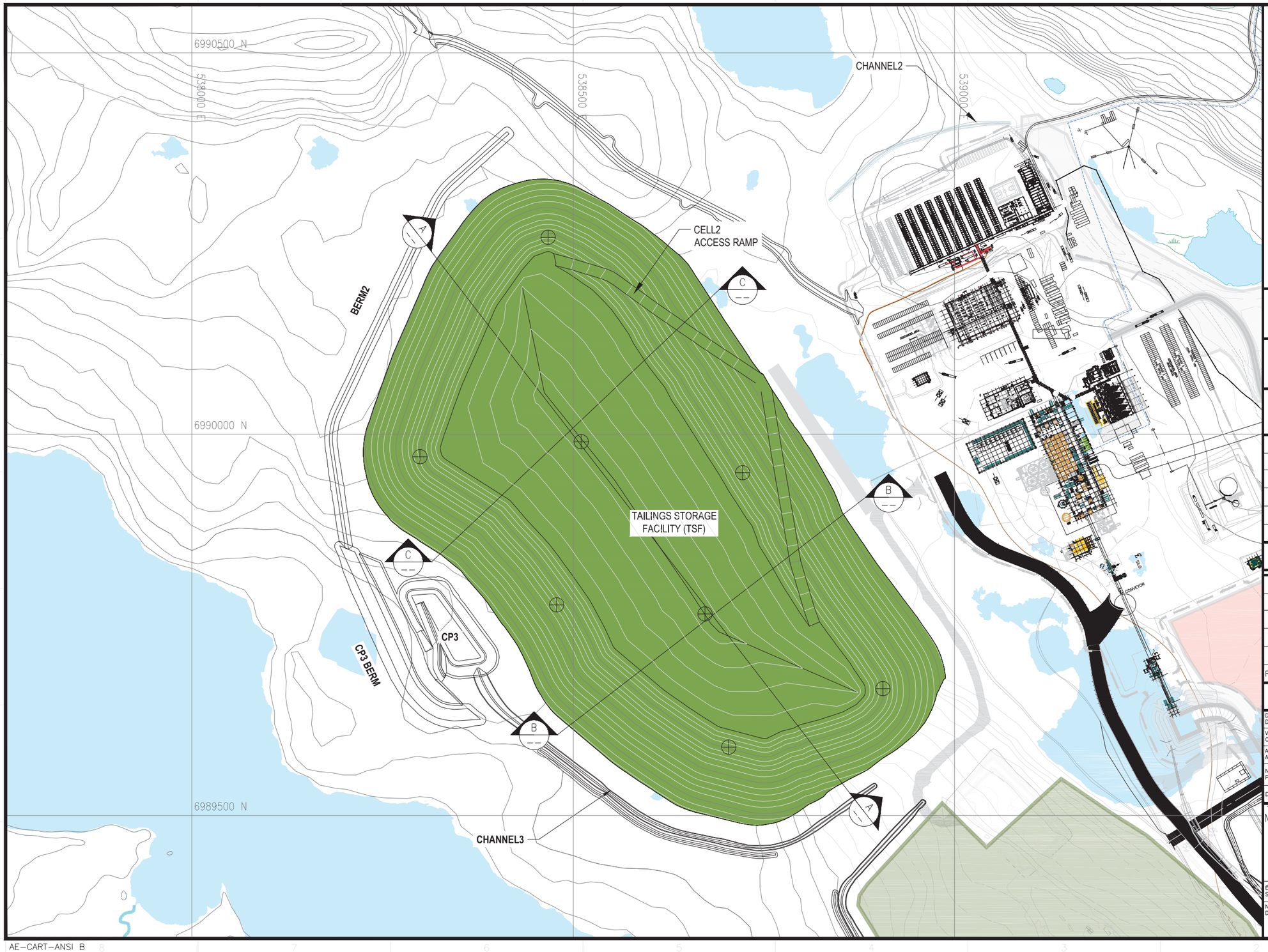
No. DESSIN/ DRAWING NO.: 6515–583–163–003
REVISION: 0
FEUILLE/SHT: 3 / 8

AE–CART–ANSI B

Q:\Edmonton\Engineering\E141\Projects_MELIADINE\2018 TSF & WRSF1\Figure 3.dwg–2013–02–19 14:03:29

NO. DESSIN
DRAWING NO.

FORMAT ANSI B–11x17



LEGEND

- WASTE ROCK
- ORE
- TAILINGS
- PROPOSED GROUND TEMPERATURE CABLE LOCATION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date Nov. 14, 2018
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
G. ZHANG
LICENSEE
NWT/NU

AGNICO EAGLE

TETRA TECH

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 11/14/2018

L'INFORMATION CI-CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTÉE ET DOIT ÊTRE RETOURNÉE SUR DEMANDE. SANS AUTORISATION ÉCRITE PRÉALABLE, TOUTE TRANSMISSION DE COPIE(S) À AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRÊTÉE SONT INTERDITES.
© AGNICO EAGLE LTÉE

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED.
© AGNICO EAGLE LTD.

TITRE / TITLE	# DWG

DESSINS EN RÉFÉRENCE/REFERENCE DRAWINGS

REV	DESCRIPTION	DATE	PAR BY
0	ISSUED FOR CONSTRUCTION	2018–11–14	
B	ISSUED FOR REVIEW	2018–11–06	
A	ISSUED FOR REVIEW	2018–11–05	

REVISIONS

DESSINÉ PAR / DRAWN BY	EL/EP	DATE 2018–11–14
VÉRIFIÉ PAR / CHECKED BY	GZ/WTH	2018–11–14
APPROUVÉ PAR / APPROVED BY		
No. PROJET / PROJECT NO.		
DATE		

TITRE / TITLE
MELIADINE TAILINGS STORAGE FACILITY DESIGN

CLOSURE

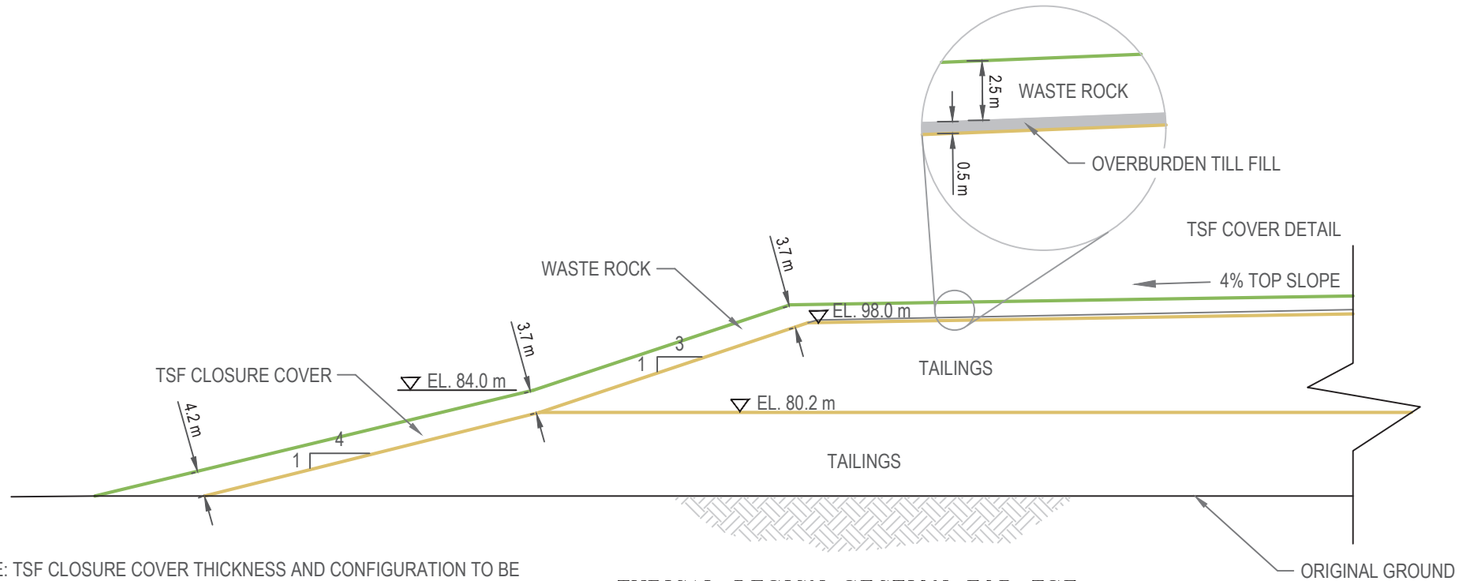
ÉCHELLE/ SCALE	FICHIER / FILE .DWG		
No. DESSIN/ DRAWING NO.		REVISION	FEUILLE/SHT
6515–583–163–004		0	4 / 8

AE–CART–ANSI B

Q:\Edmonton\Engineering\E141\Projects_MELIADINE\2018 TSF & WRSF1\Figure 4.dwg–2013–02–19 14:03:29

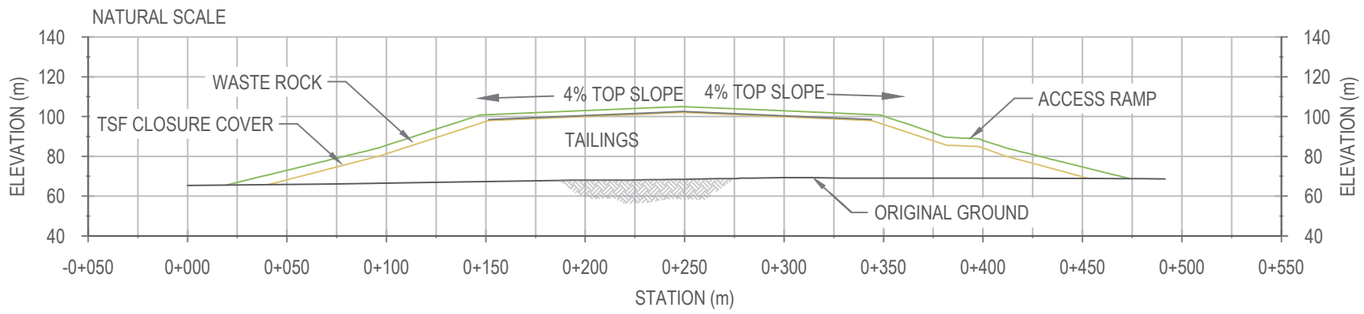
NO. DESSIN
DRAWING NO.

FORMAT ANSI B–11x17

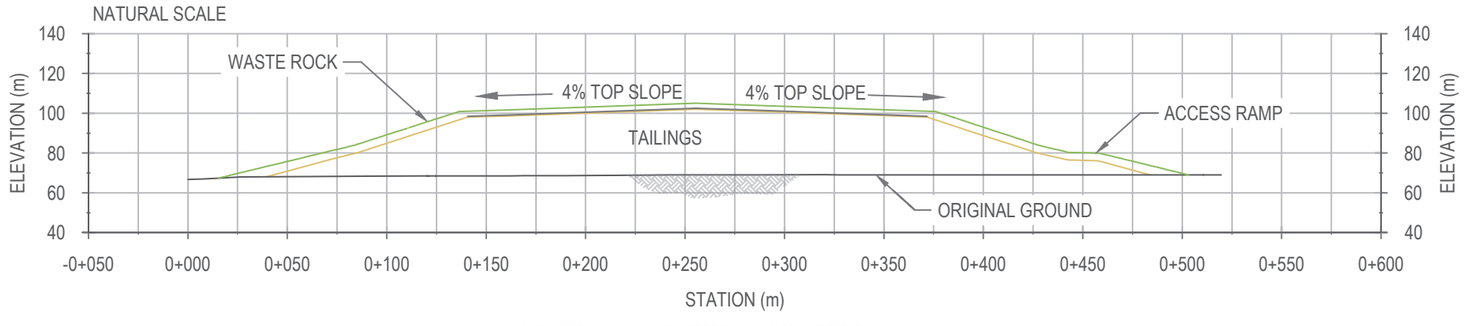


NOTE: TSF CLOSURE COVER THICKNESS AND CONFIGURATION TO BE FINALIZED DURING THE DEVELOPMENT OF THE FINAL CLOSURE COVER DESIGN PENDING PERFORMANCE MONITORING OF DRY STACKED TAILINGS FACILITY DURING OPERATION.

TYPICAL DESIGN SECTION FOR TSF



SECTION B–B THROUGH CELL 1



SECTION C–C THROUGH CELL 2

NOTES:

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date Nov. 14, 2018
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
G. ZHANG
LICENSEE
NWT/NU

AGNICO EAGLE

TETRA TECH

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 11/14/2018

L'INFORMATION CI-CONTENUE EST LA PROPRIETE DE AGNICO EAGLE LTEE ET DOIT ETRE RETOURNEE SUR DEMANDE. SANS AUTORISATION ECRITE PREALABLE, TOUTE TRANSMISSION DE COPIE(S) A AUTRUI ET TOUTE UTILISATION AUTRE QUE CELLE POUR LAQUELLE L'INFORMATION EST PRETEE SONT INTERDITES.
© AGNICO EAGLE LTEE

THE INFORMATION HERE ON IS THE PROPERTY OF AGNICO EAGLE LTD. AND MUST BE RETURNED UPON REQUEST. WITHOUT WRITTEN PERMISSION, ANY COPYING TRANSMITTAL TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED.
© AGNICO EAGLE LTD.

–	–
–	–
–	–
–	–
–	–
TITRE / TITLE	# DWG

DESSINS EN RÉFÉRENCE/REFERENCE DRAWINGS

REV	DESCRIPTION	DATE	PAR BY
0	ISSUED FOR CONSTRUCTION	2018–11–14	
B	ISSUED FOR REVIEW	2018–11–06	
A	ISSUED FOR REVIEW	2018–11–05	

REVISIONS

DESSINÉ PAR / DRAWN BY	EP	DATE	2018–11–14
VÉRIFIÉ PAR / CHECKED BY	GZ/WTH		2018–11–14
APPROUVÉ PAR / APPROVED BY			
No. PROJET / PROJECT NO.			
DATE			

TITRE / TITLE
MELIADINE TAILINGS STORAGE FACILITY DESIGN

TYPICAL DESIGN SECTION OF TSF AND
SECTIONS B–B AND C–C THROUGH CELLS 1 AND 2

ÉCHELLE/ SCALE	FICHIER / FILE	
	.DWG	

No. DESSIN/ DRAWING NO.	REVISION	FEUILLE/SHT
6515–583–163–005	0	5 / 9

AE–CART–ANSI B

Q:\Edmonton\Engineering\E141\Projects_MELIADINE\2018 TSF & WRSF1\Figure 5.dwg

SNC·LAVALIN
5400, des Galeries Blvd, suite 450
Quebec (Quebec) G2K 2B4
418-321-5500 - 418-621-8887