AGNICO EAGLE

MELIADINE GOLD PROJECT

Mine Waste Management Plan

DECEMBER 2018
VERSION 4
6513-MPS-09

ᓇᐃᓈᖅᓯᒪᔪᖅ

ᐊᓃᑦᑯᑦ ᑕᓯᕐᔪᐊᕐᒥᑦ ᒎᑐᒧᑦ ᐅᔾᕋᓐᓂᐊᕐᕕᓕᕆᕙᓪᓕᐊᔪᑦ (ᐱᓕᕆᐊᖅ), 25 ᑮᓛᒥᑕᒥᒃ ᐅᐊᓐᓇᖓᓂᑦ ᐅᖓᓯᒃᑎᒋᔪᖅ ᑲᖏᖅᖠᓂᕐᒥᑦ, ᐊᒻᒪ 80 ᑮᓛᒥᑕᒥᒃ ᓂᒋᖅᐸᓯᐊᓂᑦ ᐱᖓᓐᓇᖅᐸᓯᐊᓂᑦ ᐅᖓᓯᒃᑎᒋᔪᖅ ᐃᒡᓗᓕᒫᕐᔪᐊᒥᑦ ᕿᕙᓪᓕᕐᒥᑦ ᓄᓇᕗᒻᒥᑦ. ᐅᔾᕋᓐᓂᐊᕐᕕᖕᒧᑦ ᐸᕐᓇᐅᑕᐅᔪᖅ ᐅᒃᑯᐃᖓᔪᒥᒃ ᐊᒻᒪ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐅᔾᕋᓐᓂᐊᕐᕖᕐᓂᐊᖅᑐᖅ ᐱᕙᓪᓕᐊᓂᕐᒧᑦ ᑎᓕᓂᐊᖅ-ᒥᑦ ᒎᑐᓂᒃ ᐱᓂᕐᒧᑦ, ᒪᕐᕉᓐᓂᒃ ᐅᒃᑯᐃᖓᔫᓐᓂᒃ ᓄᓇᒥᑦ (ᑎᓕᓂᐊᖅ Pit 1 ᐊᒻᒪ ᑎᓕᓂᐊᖅ Pit 2) ᐊᒻᒪ ᐊᑕᐅᓯᖅ ᓄᓇᐅᑉ ᐃᓗᐊᓂᑦ ᐅᔾᕋᓐᓂᐊᕐᓂᖅ.

ᓯᑕᒪᐅᓕᖓᔪᖅ ᐱᕙᓪᓕᐊᓂᖓ ᑎᓕᓂᐊᑉ: ᓯᑕᒪᐃᑦ ᐅᑭᐅᑦ ᐅᖓᑎᐊᕐᔪᐊᓄᑦ ᓴᓇᔾᐅᓂᖓ (Q4 ᐅᑭᐅᖅ -5-ᒥᑦ ᐅᑭᐅᖅ -1-ᒧᑦ), 8-ᓄᑦ ᐅᑭᐅᓄᑦ ᐅᔾᕋᓐᓂᐊᕐᕕᒃ ᐊᐅᓖᕐᑐᓂ (ᐅᑭᐅᖅ 1-ᒥᑦ ᐅᑭᐅᖅ 8-ᒧᑦ), ᐱᖓᓱᑦ ᐅᑭᐅᓂᒃ ᐅᒃᑯᐊᖅᐸᓪᓕᐊᑐᑦ (ᐅᑭᐅᖅ 9-ᒥᑦ ᐅᑭᐅᖅ 11 ᒧᑦ), ᐊᒻᒪ ᐅᒃᑯᐊᖅᓯᒪᓕᖅᑎᓪᓗᒍ (ᐅᑭᐅᖅ 11-ᒥᑦ ᐅᖓᑖᓄᑦ). 14.9 ᒥᓕᔮ ᑖᓂᒃ ᐅᔭᖅᑲᓂᒃ ᐱᓂᐊᖅᑐᑦ. ᐅᔭᖅᑲᐃᑦ ᐱᔭᐅᔪᑦ ᓯᖃᓪᓕᖅᑎᖅᑕᐅᓂᐊᖅᑐᑦ 8-ᓄᑦ ᐅᑭᐅᓪᓗᐊᓄᑦ ᐅᔾᕋᓐᓂᐊᕐᓂᐅᑉ ᐊᐅᓖᕐᓂᕆᔾᖓᓂᑦ 3,000 ᑖᓂᒃ ᐅᓪᓗᑕᒦᑦ (tpd) ᐅᑭᐅᖅ 1-ᒥᑦ ᐅᑭᐅᖅ 3-ᒧᑦ ᐊᒻᒪ 5,000 tpd- ᓂᒃ ᐅᑭᐅᖅ 4-ᒥᑦ ᐅᑭᐅᖅ 8-ᒧᑦ.

ᐊᒃᑕᑰᖅᑕᐅᔪᑦ ᐅᔭᖅᑲᐃᑦ ᐅᖓᑕᐅᑎᔪᓪᓗ ᓄᓇᒃᑰᕈᑎᒃᑯᑦ ᐊᒡᔭᖅᑕᐅᓂᐊᖅᑐᑦ ᐅᔭᖅᑲᓄᑦ ᐊᒃᑕᑰᓯᕖᖑᑦ (WRSFs) ᑕᐃᑲᓃᓗᑎᒃ ᑭᓯᐊᓂ ᐅᔾᕋᓐᓂᐊᕐᓂᖅ ᓄᖅᑲᖅᐸᑦ, ᐊᒡᔭᖅᑐᖃᑦᑕᕐᓗᒋᑦ ᒪᓕᒡᓗᒋᑦ ᐊᕙᒻᒧᒐᕐᓂᕐᒧᑦ ᐊᑐᖅᑕᐅᖃᑦᑕᖅᑐᖅ. ᖃᓄᐃᖓᓂᐅᔪᑦ ᓄᓇᐅᑉ ᖃᓄᐃᖓᓂᖓᓄᑦ ᐆᒃᑐᕋᐃᓂᕐᓄᑦ ᓇᒧᓇᐃᖅᓯᔪᖅ ᐊᒃᑕᑯᐃᑦ ᐅᔭᖅᑲᐃᑦ ᐅᖓᑕᐅᑎᔪᓪᓗ ᐋᓯᑦᓕᐅᖏᑦᑑᓂᖏᓐᓄᑦ (NPAG); ᑕᒪᕐᒥᒃ ᐅᔭᖅᑲᐃᑦ ᐊᒃᑕᑰᖅᑕᐅᔪᑦ ᐅᖓᑕᐅᑎᔪᓪᓗ ᓴᕈᔾᙳᒋᑦᑑᓂᖏᓐᓂᒃ. ᐱᖓᓱᐃᑦ ᐃᓂᐅᔪᑦ ᐃᓕᑕᕆᔭᐅᓯᒪᔪᑦ WRSFs-ᖑᓂᖏᓐᓄᑦ. ᐅᒃᑯᐊᖅᑕᐅᒋᐊᕐᓂᐊᖅᑐᑦ WRSFs ᐱᔪᓐᓇᖅᓯᒍᑎᒃ ᐃᓚᒋᔭᐅᔪᑦ ᐅᑎᖅᑎᑦᑎᕆᕙᓪᓕᐊᓂᕐᒧᑦ. WRSFs ᖃᓕᖅᑕᐅᓃᖏᑦᑐᑦ ᐊᒻᒪ ᐱᐳᖅᑐᓕᖅᑐᖅᑕᐅᖏᓪᓗᑎᒃ ᐊᒻᒪ ᖃᓄᐃᑑᓂᖏᑦᑕ ᓇᓃᓂᖏᓐᓄᑦ ᐱᒋᐊᖃᔾᔭᖏᑦᑐᑦ ᒪᓕᒡᓗᒍ ᐅᒃᑯᐊᖅᐸᓪᓕᐊᓂᕐᒧᑦ ᐸᕐᓇᐅᑎ. ᐆᓇᕐᓂᕐᒥᒃ ᐆᒃᑐᕋᐅᑏᑦ ᐃᓕᔭᐅᓂᐊᖅᑐᑦ WRSFs-ᒥᑦ ᖃᐅᔨᒋᐊᖃᑦᑕᕐᓂᕐᒧᑦ ᖁᐅᙳᐃᓇᐅᔭᖅᑐᖅᑖᖅᐸᓪᓕᐊᓂᖅ.

ᑲᑎᖓᒋᑦ 14.9 Mt ᕿᒪᒃᑎᑦᑐᙵᕐᓂᐊᖅᑐᑦ, 10.9 Mt-ᑐᐊᑦ ᕿᒪᒃᑎᑐᑦ ᑐᖅᑯᖅᑕᐅᓯᒪᕝᕕᖑᐊᖅᑕᐅᓂᐊᖅᑐᑦ (TSF)-ᒧᑦ ᐸᓂᖅᑐᓂᑦ ᕿᒪᒃᑎᑦᑐᓄᑦ, ᐊᒥᐊᑯᐃᓪᓕ 4.0 Mt ᐃᓕᔭᐅᓗᑎᒃ ᓄᓇᐅᑉ ᐊᑖᓄᑦ ᐅᔾᕋᓐᓂᐊᕐᕕᖓᒥᑦ ᕿᑰᓗᒍ. ᕿᒪᒃᑎᑦᑐᙳᖅᑐᑦ ᐃᓱᒪᒋᔭᐅᔪᑦ ᐋᓯᑦᓕᐅᖏᑦᑑᓂᖏᓐᓄᑦ (NPAG). TSF ᐱᖓᓲᓕᖓᔪᑦ, ᐊᑕᐅᓯᐅᑕᕐᓗᒋᑦ ᐱᓕᕆᐊᖑᓂᐊᖅᑐᑦ ᐅᒃᑯᐊᖅᐸᓪᓕᐊᓂᕐᒧᑦ ᐅᔾᕋᓐᓂᐊᕐᓂᖅ ᐊᐅᓖᖅᑎᓪᓗᒍ. ᖃᓕᓂᓕᖕᓂᑦ ᐅᖓᑕᐅᑎᔪᑦ ᐊᒻᒪ ᐊᒃᑕᑰᖅᑕᐅᔪᑦ ᐅᔭᖅᑲᐃᑦ ᐊᑐᖅᑕᐅᓂᐊᖅᑐᑦ TSF ᐅᒃᑯᐊᖅᑕᐅᓂᖓᓄᑦ. ᒪᓂᒪᔪᓂᑦ ᐆᒃᑐᕋᐃᓂᕐᒧᑦ ᖃᓄᐃᖓᓂᐅᔪᑦ ᐊᒻᒪ ᒪᓕᒃᑯᒋᑦ ᐸᓂᖅᑐᑦ ᕿᒪᒃᑎᑐᑦ ᖃᓄᐃᖓᓂᖓ, ᑎᓕᓂᐊᕐᒥᑦ ᕿᒪᒃᑎᑐᑦ ᐋᓯᑦᓕᐅᖅᑑᔾᔭᖏᑦᑐᑦ, ᓴᕙᓐᓂᓪᓘᓃᑦ ᐊᓂᐊᔪᖃᕐᓗᑎᒃ ᐊᑯᓂᐅᔪᒥᑦ ᑕᑭᓂᕐᒥᑦ.

WRSFs ᐊᒻᒪ TSF ᐋᕿᒃᑕᐅᓚᐅᖅᑐᑦ ᐊᒻᒪ ᐊᑐᖅᑕᐅᓗᑎᒃ ᒥᑮᑰᖅᑎᓐᓂᕐᒧᑦ ᐊᒃᑐᖅᓯᓂᐅᔪᖅ ᐊᕙᑎᒧᑦ ᐊᒻᒪ ᐃᓱᒪᒋᐸᒍᑦ ᓄᓇᒥᒃ ᖃᐅᔮᓴᐃᓅᑦ ᐊᒻᒪ ᓄᓇᐅᑉ ᖃᓄᐃᓕᐅᕐᓂᕋᓗᖓᑕ ᐊᔪᙱᓐᓇᖓᓄᑦ. ᑰᒃᑑᑉ ᖄᖓ ᐊᒻᒪ ᐊᓂᐊᔪᖅ ᐃᒪᖅ ᑐᖅᑯᖅᓯᒪᕝᕕᖓᓂᑦ ᓯᑉᐳᒃᑯᑦ ᐊᓯᐊᒎᖅᑎᑕᐅᓂᐊᖅᑐᑦ ᐊᒻᒪ ᑲᑎᑕᐅᓗᑎᒃ ᐃᒪᕐᓄᑦ ᑲᑎᖅᓯᐃᕕᖓᓂᑦ (Cps). ᐃᒪᐅᑉ ᖃᓄᐃᓐᓂᖓ ᑎᑭᐅᑎᙵᕆᐸᑦ ᑯᕕᔪᓄᑦ ᐋᕿᐅᒪᔪᒥᒃ ᒪᓕᒃᓱᒍ ᐃᒪᕐᒧᑦ ᓚᐃᓴᓯᒥᑦ ᐱᔭᕆᐊᖅᑲᕐᓂᖅ, ᑲᑎᑕᐅᔪᖅ ᐃᒪᖅ ᐱᓕᕆᐊᖑᓂᐊᖅᑐᖅ ᐃᒪᓕᕆᕝᕕᖓᒥᑦ (WTP)-ᒥᑦ ᑯᕕᑎᑕᐅᓂᐊᖂᕐᑐᓂ ᓯᓚᒧᑦ.

EXECUTIVE SUMMARY

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 open pits (Tiriganiaq Pit 1 and Tiriganiaq Pit 2) and one underground mine.

There are four phases to the development of Tiriganiaq: 3.5 years construction (Q4 Year -5 to Q2 Year -1), 8.5 years mine operation (Q2 Year 1 to Year 8), 3 years closure (Year 9 to Year 11), and post-closure (Year 11 forward). Approximately 14.9 million tonnes (Mt) of ore will be produced. The produced ore will be milled over approximately 8 years of mine life at a rate of 3,000 tonnes per day (tpd) in Year 1 to Year 3 and 5,000 tpd in Year 4 to Year 8.

Waste rock and overburden will be trucked to the waste rock storage facilities (WRSFs) until the end of mine operation, with distribution according to an operation schedule. Results of geochemical testing indicate that the produced waste rock and overburden is non-potentially acid generating (NPAG); both the waste rock and overburden are considered non-metal leaching. Three areas have been identified as the WRSFs. Closure of the WRSFs will begin when practical as part of the progressive reclamation program. The WRSFs will not be covered and vegetated and no additional re-grading activity will be required under the closure plan. Thermistors will be installed within the WRSFs to monitor permafrost development.

Of the total 14.9 Mt of tailings produced, about 10.9 Mt of tailings will be placed in the tailings storage facility (TSF) as dry stack tailings, while the remaining 4.0 Mt will be backfilled to the underground mine as cemented paste backfill. The produced tailings are considered to be non-acid generating (NAG). The TSF consists of two cells, which will be operated one by one to facilitate progressive closure during mine operation. A layer of overburden and waste rock will be used for the TSF closure. From the available testing results and based on the dry stack tailings design, the Tiriganiaq tailings will not pose an acid generation problem, nor a metal leaching problem in the long-term.

The WRSFs and TSF were designed and will be operated to minimize the impact on the environment and to consider geotechnical and geochemical stability. The surface runoff and seepage water from the storage facilities will be diverted via channels and collected in the water collection ponds (CPs). If the water quality does not meet the discharge criteria as per the Type A Water Licence 2AM-MEL1631 requirement, the collected water will be treated accordingly prior to being discharged to the outside environment.

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Tables in Text

APPENDIX A • FIGURES

DOCUMENT CONTROL

Version	Date	Section	Page	Revision	Author
1	April 2015			First draft version of Mine Waste Management Plan as Supporting Document for Type A Water Licence Application, submitted to Nunavut Water Board for review and approval	Tetra Tech EBA Inc.
2	June 2016	1.1, 1.2,	1-2	Update to reflect issuance of the Type A Water Licence.	Golder Associates Ltd.
		1.3	12-15	Removal of original Section 1.3 as was specifically linked to the application.	
		3.3	22-24	Update to reflect receipt of Type A Water Licence	
		5.5, 6.1, 9.1, 9.2	34-35; 37-38	The Plan updated to comply with Part B Section 13, and Part F Sections 12, and20 of the Type A Water Licence 2AM-MEL1631 and commitments made during the licensing process.	
3	March 2017			General update of the plan	Environment, Engineering and Mine Departments
4	March 2018			Minor revisions	Environment, Engineering Departments
5	December 2018	All	All	Plan update in response to approved TSF Design Report (6515-583-163-REP-001)	Environment Department
		1.3	11,14	Update of production timeline	
		3.1, 3.2	20-23	Update of tailing quantities	
		4.1, 4.3, 4.4	24, 27-28	Update of closure cover material values	
		4.2	29	Inclusion of temporary waste rock stockpile for	
		5.2, 5.4	30-32	construction of saline pond 2 (Figure 4.1.1; Tables 4.1.1, 4.1.2, 4.1.3)	
		5.5, 5.6	33-35	Update of TSF design, parameters and schedule Update of tailings placement plan dimensions	
		6.1	36-38	within each cell of TSF Update of Water Management based on on TSF design report (6515-583-163-REP-001) and	
		7	43	infrastructure updates	
		8.2	46-47	Minor dust management revision Updates to closure plan based on approved TSF	
		9.2	50-52	design report (6515-583-163-REP-001) Monitoring program update based on Type A Water Licence 2AM-MEL1631 requirements and	
		Appendix A		TSF design report (6515-583-163-REP-001) Figs 1.2, 5.1, 5.4 updated. Add Figs 5.2, 5.3	

ACRONYMS

ABA	Acid Base Accounting
Agnico Eagle	Agnico Eagle Mines Limited
ARD	Acid Rock Drainage
ML	Metal Leaching
CP	Collection Pond
CRA	Commercial, Recreational, and Aboriginal
DFO	Department of Fisheries and Oceans Canada
EWTP	Effluent Water Treatment Plant
FEIS	Final Environmental Impact Statement
HCT	Humidity Cell Test
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
MEND	Mining Environment Neutral Drainage
MDMER	Metal and Diamond Mining Effluent Regulations
NAG	Non-Acid Generating
NLCA	Nunavut Land Claims Agreement
NPAG	Non-Potential Acid Generating
NPR	Net Potential Ratio
NWB	Nunavut Water Board
NWR	Nunavut Water Regulations
NWNSRTA	Nunavut Waters and Nunavut Surface Rights Tribunal Act
PAG	Potential Acid Generating
PGA	Peak Ground Acceleration
Project	Meliadine Gold Project
RO	Reverse Osmosis
SWTP	Saline Water Treatment Plant
SFE	Shake Flask Extraction
TSF	Tailings Storage Facility
WRSF	Waste Rock Storage Facility
WTP	Water Treatment Plant
WRTP	Waste Rock Transfer Pad

UNITS

%	percent
°C	degrees Celsius
°C/m	degrees Celsius per meter
cm/s	centimetre per second
ha	hectare
kPa	kilopascal
km	kilometre(s)
L	liter(s)
m	metre
mg	milligram
m/s	metre per second
mm	millimetre
mm/h	millimetre per hour
m^2/year	square metre(s) per year
m^3	cubic metre(s)
Mm^3	million cubic metre(s)
t	tonne
t/m^3	tonne per cubic metre
Mt	million tonne(s)
µm	micrometre

SECTION 1 • INTRODUCTION

Agnico Eagle Mines Limited (Agnico Eagle) is developing the Meliadine Gold Project (Project), located approximately 25 kilometres (km) north of Rankin Inlet, and 80 km southwest of Chesterfield Inlet in the Kivalliq Region of Nunavut. Situated on the western shore of Hudson Bay, the Project site is located on a 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 Project is located within the Meliadine Lake watershed of the Wilson Water Management Area (Nunavut Water Regulations Schedule 4).

The mine plan proposes open pit and underground mining methods for the development of the Tiriganiaq gold deposit, with two open pits (Tiriganiaq Pit 1 and Tiriganiaq Pit 2) and one underground mine. The mine will produce approximately 14.9 million tonnes (Mt) of ore, 31.4 Mt of waste rock, 7.1 Mt of overburden waste, and 14.9 Mt of tailings. There are four phases to the development of Tiriganiaq: 3.5 years construction (Q4 Year -5 to Q2 Year -1), 8.5 years mine operation (Q2 Year 1 to Year 8), 3 years closure (Year 9 to Year 11), and post-closure (Year 11 forwards).

Mining facilities include an industrial pad and accommodation buildings, three 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 (CPs), water diversion channels, and retention dikes/berms, a Reverse Osmosis (RO) system, a Saline Water Treatment Plant (SWTP), an Effluent Water Treatment Plant (EWTP), and a Water Treatment Plant (WTP). The general mine site location for the Project and the site layout plan are shown in Figures 1.1 and 1.2, respectively (Appendix A).

1.1 Concordance

The Project is subject to land and resource management processes established by the Nunavut Land Claims Agreement (NLCA) and other Federal laws and regulations. Agnico Eagle submitted a Type A Water Licence Application for a Mining and Milling Undertaking (Application) to the Nunavut Water Board in accordance with the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (NWNSRTA) and Nunavut Water Regulations (NWR).

The Type A Water Licence 2AM-MEL1631 was issued on April 15, 2016 and signed by the minister on May 19, 2016. The Mine Waste Management Plan reflects the commitments made with respect to submissions provided during the technical review of the Application, as well as final submissions and issues raised during the Public Hearing Process, where applicable, to comply with Part B Section 13, and Part E Section 10 of the Type A Water Licence 2AM-MEL1631. The Plan also reflects current operations at the project site.

1.2 Mine Waste Management Plan Summary

The purpose of the Plan is to provide consolidated information in regard to the management of waste rock, overburden, and tailings and includes strategies for water management (runoff),dust control and monitoring programs for the waste storage facilities. The Plan is divided into the following components:

- Introductory section (Section 1);
- A brief summary of the physical setting at the mine site (Section 2),
- A brief summary of the mine plan (Section 3);
- A description of the waste rock and overburden management plan (Section 4);
- A description of a temporary waste storage pad within footprint of Tiriganiaq Pit 2
- A description of the tailings management plan (Section 5);
- A description of water management associated with mine waste management (Section 6);
- A description of dust management associated with mine waste management (Section 7);
- A description of reclamation and closure related to mine waste management (Section 8); and
- Monitoring program (Section 9).

The Plan will be updated, as required, to reflect changes in operation or design and incorporate any new information and/or latest technology, where appropriate, to comply with Part B Section 15 of the Type A Water Licence 2AM-MEL1631.

1.3 Overall Schedule and General Activities

The construction phase started in last quarter of Year -5 and is anticipated to take 3.5 years (Q4 Year-5 to Q2 of Year -1). The mine construction period will primarily focus on site preparation and the construction of infrastructure, with some mining activities (advancement of the mine ramp) occurring at the Tiriganiaq underground mine. Operation will commence after commissioning is completed at the end of Q2 of Year -1. The operation phase will span approximately 8.5 years (Q2 Year -1 to Year 8). Mining activities are expected to end in Year 7 and ore processing is expected to end in Year 8. Closure will occur within three years (Year 9 to Year 11) after the completion of mining and will include the removal of non-essential site infrastructure. Flooding of the mined-out open pits with water pumped from Meliadine Lake and flooding of the underground mine with natural groundwater seepage will start in Year 8 as progressive reclamation. Post-closure phase will commence as closure is completed in Year 11 and will continue until it is shown that the site and water quality meets all the regulatory closure objectives. Table 1.1 summarizes the overview of the timeline and general activities.

Table 1.1: Key Mine Development and Water Management Activities and Sequence

Mine Year	Mine Development Activities	Water Management Activities
Q4 of Yr-5 2015	• Started to construct the industrial pad • Developed the ramp to Tiriganiaq underground mine • Constructed portion of rock pad for OP1 and OP2 stockpiles to store the ore from Tiriganiaq underground ramp development • Installed Culvert2 • Constructed Channel2	• Started to re-use the underground water • Dewatered top 0.5 to 1.0 m of fresh water in Pond H17
Yr -4 PC: 2016	• Continued construction of the industrial pad • Started Construction of D-CP1 to impound CP1 • Started Construction of D-CP5 to impound CP5 • Constructed and operate the temporary landfill • Started to place waste rock in the WRSF2 • Constructed and operate P-Area Containment Ponds • Constructed Saline Pond for additional underground saline water storage	• Dewatered of H17 into Meliadine Lake. • Dewatered Pond A54 in Q3 of Year -4 and pumped the water to CP1. • Started to store the excess groundwater from the underground mine at surface. • Implemented and tested evaporators at P-Area to reduce water volumes stored at surface. • Constructed trenches down gradient from DP1-B and DP3-A to be able to pump collected water seep and pump back to the associated containment pond.

Table 1.1: Key Mine Development and Water Management Activities and Sequence

Mine Year	Mine Development Activities	Water Management Activities
Yr -3 PC: 2017	• Completed the industrial pad • Constructed and utilized Type A Landfarm • Constructed and operated the operation Type A Landfill • Completed Construction D-CP1, jetty and Pumping station CP1 • Completed Construction D-CP5 jetty and Pumping station CP5 • Erected and closed all main buildings except, Crusher, Paste Plant and Crushed Ore Storage • Erected Incinerator • Erected and operated Effluent Water Treatment plant • Installed fuel tanks at portal 1 • Constructed channel 1, 7 & 8 and berm 1 and 3 • Constructed freshwater intake causeway in Meliadine Lake & Install Pumping station • Constructed Lv75 Water stope for additional underground saline water storage • Installed Culverts 1, 3, 4	• Started to pump the water from CP1 to EWTP for treatment prior to discharge to the outside environment via the diffuser in Meliadine Lake. • Pumped the underflow sludge water from the EWTP to CP1. To limit recirculation of the sludge within CP1, the discharge will be located away from the EWTP intake. • Started to treat sewage water and pump the treated sewage water from STP to CP1. • Started to pump the contact water from CP5 to CP1 for treatment • Started to pump water seepage collected in trenches, down gradient from D-CP1, D-CP5, DP1 and DP3 to the associated containment pond. • Started to pump the water from the Type A Landfarm to CP1 after pre-treatment for oil. • Started to pump water from washbay to underground for storage until treatment for oil plant arrives at the site
Yr -2 PC: 2018	• Erected and closed crusher, paste plant and crushed ore storage • Fuel tank 20ML in Rankin, • Fuel Tank 6ML and 250KL at site • Started construction Channel 3, Berm 2, CP3	• Started diversion of the contact water from industrial pad to CP1 via Channel1 • Constructed and commissioned (in Q4) SWTP to discharge to CP1
Yr -1 PC: 2019	• Install all remaining culverts • Start to place waste rock in the WRSF1 • Construct Channels 3, 4, and Berm 2 • Construct D-CP3 to form CP3, jetty and start to collect contact water • Construct D-CP4 to form CP4, jetty and start to collect contact water	• Commission wash bay water treatment unit, monitor water quality monthly and transport treated water to CP1 • Start to pump the contact water in CP3 to the partially drained Pond H13 where the water will flow through Channel1 into CP1 Q2 Year -1 • Construct Saline Water Storage Pond at Tirigniaq Pit 2

Table 1.1: Key Mine Development and Water Management Activities and Sequence

Mine Year	Mine Development Activities	Water Management Activities
	• Start process commissioning at end of Q4 of Year -2 • Start to place dry stack tailings in Cell 1 of TSF at end of Q4 of Year -2 • Start full capacity of ore processing early Q2 of Year -1 • Create temporary wasterock storage area within footprint of TiriGaniaq Pit 2 – from construction of Saline Water Storage Pond	
Yr 1 PC: 2020		• Start to pump the contact water in CP4 to the partially drained Pond H13 where the water will flow though Channel1 into CP1
Yr 2	• Start to mine Tiriganiaq Pit 1 • Start to place overburden and waste rock from Tiriganiaq Pit 1 in WRSF1	• Start to pump contact water collected in Tiriganiaq Pit 1 to CP5
Yr 3	• Expand process plant to reach the process capacity of 6,000 tpd • Construct temporary overburden stockpile to store the selected ice-poor overburden that will be used for progressive reclamation of TSF	• Dewater Ponds H19 and H20 in Q3 of Year 3 and pump the water to CP1
Yr 4	• Increase mill production to 5,500 tpd for 2023 and 6,000 tpd beyond • Start to mine Tiriganiaq Pit 2 • Start to place waste rock and overburden from Tiriganiaq Pit 2 in WRSF3 • Construct D-CP6 to CP6 and start to collect contact water • Start to place dry stack tailings in Cell 2 of TSF • Start to place low grade ore from the open pits in the OP1 stockpile • Construct rock pad for OP3 to store marginal grade ore from the open pits • Stop placing rock and overburden in WRSF1 when WRSF1 reaches design capacity	• Start to pump contact water collected in Tiriganiaq Pit 2 to CP5 • Start to pump contact water in CP6 to CP1
Yr 5	• Start to place waste rock from Tiriganiaq Pit 1 in WRSF2	• Water management plan similar to Year 4

Table 1.1: Key Mine Development and Water Management Activities and Sequence

Mine Year	Mine Development Activities	Water Management Activities
	• Place final closure cover on top of tailings surface in Cell 1 of TSF (waste rock cover over final Cell 1 perimeter slope to be placed as progressive reclamation -as soon as slope reaches final grade)	
Yr 6	• Stop placing overburden waste in WRSF3	• Water management plan similar to Year 4
Yr 7	• Stop mining of Tiriganiaq Pit 1 and Tiriganiaq Pit 2 when the open pits reach design elevation • Stop Tiriganiaq underground operation when underground mine reaches design elevation • Stop placing waste rock and overburden in WRSF2 when WRSF2 reaches design capacity • Stop placing waste rock in WRSF3 when WRSF3 reaches design capacity	• Water management plan similar to Year 4 • Stop pumping water from the open pits when the pits are mined-out at end of year • Stop pumping excess water from underground when underground mine is completed
Yr 8	• Process the ore from the OP1, OP2, and OP3 until all stored ore is processed • Decommission of underground mine surface openings as needed	• Start to fill the mined-out Tiriganiaq Pits 1 and 2 with active pumping water from Meliadine Lake • Start natural flooding of Tiriganiaq Underground mine with groundwater seepage • Stop pumping water to process plant when the processing is completed

Table 1.1: Key Mine Development and Water Management Activities and Sequence

Mine Year	Mine Development Activities	Water Management Activities
Closure (Yr 9 to 11)	• Place final closure cover on top of tailing surface in Cell 2 of TSF in Year 9 (waste rock cover over final Cell 3 perimeter slope to be placed as progressive reclamation - as soon as slope reaches final grade) • Decommission non-essential mine infrastructure and support buildings in Years 9 and 10 • Continue to fill the mined-out open pits with active pumping water from Meliadine Lake until Year 10 • Start monitoring and maintenance in Year 9 (start in Year 8 if possible)	• Finish flooding Tiriganiaq Pit 1 and Tiriganiaq Pit 2 by Q4 of Year 10 • Continue to collect and manage the contact water in CP1 to CP6 • Continue to pump the contact water in CP1 to WTP, if required, for treatment before being discharged to the outside environment • Remove non-essential site infrastructure • Pump the underflow sludge water from WTP to CP1 • Continue natural flooding of Tiriganiaq Underground mine with groundwater seepage • Remove Meliadine Lake pumping system
Post-Closure	• Continue monitoring and maintenance until Year 18	• Treat the contact water until water quality meet direct discharge criteria and then decommission the water management system • Continue natural flooding of Tiriganiaq Underground (progressive reclamation since Year 8) • Breach water retention dikes D-CP1, D-CP3, D-CP4, D-CP5 and D- CP6 once water quality monitoring results meet discharge criteria to allow water to naturally flow to outside environment • Remove culverts and breach remaining water retention dikes/berms in Year 18

SECTION 2 • PHYSICAL SETTING

2.1 Site Conditions

The mine site is located in lowlands near the northwest coast of Hudson Bay. The dominant terrain at the mine site area comprises glacial landforms such as drumlins (glacial till), eskers (gravel and sand), and small lakes. The topography is gently rolling with a mean elevation of 65 m above sea level and a maximum relief of 20 m.

The local overburden typically consists of sand and gravel deposits of various thicknesses overlying till with cobbles and boulders. Some of the surfaces are covered by a thin layer of organics. Bedrock at the mine site area consists of a stratigraphic sequence of clastic sediments, oxide iron formation, siltstones, graphitic argillite, and mafic volcanic flows (Snowden 2008; Golder 2009a).

Low-lying areas are poorly drained as a result of a low slope in the landscape and intermittent streams connect numerous shallow ponds and lakes. The following subsections summarize the physical setting at the mine site.

2.2 Climate

The mine site is located in the Kivalliq Region of Nunavut, near the northern border of the southern Arctic terrestrial ecozone, and within the Arctic tundra climate region. Within this region daylight reaches a minimum of 4 hours per day during the winter to a maximum of 20 hours per day during the summer. The climate is extreme with long cold winters and short cool summers. Temperatures are cool, with a mean temperature of 12°C in July and -31 °C in January. The mean annual air temperature at the Project site is approximately -10.4 °C (Golder 2012a).

The recorded prevailing winds are from north and north-northwest. The wind blows from the north and north-northwest direction more than 30% of the time, and the least frequent wind direction is west-southwest, with a frequency of 2.1%. The calm frequency is 2.8% of the time. The mean values for wind speed show that the north-northwest together with north and northwest winds have the highest speeds and tend to be the strongest.

Mean annual precipitation at the mine site, based on the hydrological year from 1 October to 30 September, is estimated to be 411.7 mm after accounting for rainfall and snowfall undercatch. Approximately 51% of precipitation occurs as rain (207.1 mm) and 49% occurs as snow (199.1 mm).

2.3 Permafrost

The mine site is located in an area of continuous permafrost, as shown on Figure 2.1 as attached in Appendix A.

Late-winter ice thicknesses on freshwater lakes in the mine site area were recorded from 1998 to 2000. The measured data indicated that ice thickness ranges from 1.0 to 2.3 m with an average thickness of 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 (Golder 2012 b).

Published data regarding permafrost were used to recreate the permafrost map of Canada shown in Figure 2.1. Based on thermal studies and measurements of ground temperatures, the depth of permafrost at the mine site is estimated to be in the order of 360 to 495 m. The depth of the active layer ranges from about 1 m in areas with shallow overburden, up to about 3 m adjacent to the lakes. The depth of the permafrost and active layer will vary based on proximity to the lakes, overburden thickness, vegetation, climate conditions, and slope direction (Golder 2012b). The typical permafrost ground temperatures at the depths of zero annual amplitude (typically at the depth of below 15 m) are in the range of -5.0 to -7.5 °C in the areas away from lakes and streams. The geothermal gradient ranges from 0.012 to 0.02 °C/m (Golder, 2012c).

2.4 Taliks

Taliks (areas of unfrozen ground) are to be expected where lake depths are greater than about 1.0 to 2.3 m. Formation of an open-talik, which penetrates through the permafrost, would be expected for lakes that exceed a critical depth and size. It is anticipated that an open-talik exists below Lake B7 based on the depth and geometry of this lake (Golder, 2012b). The salinity of groundwater also influences the temperature at which the groundwater will freeze. The test results on two deep groundwater samples collected below the base of the permafrost for baseline study indicated salinity level leads to a freezing point depression of about 3.2 °C (FEIS Volume 7, Appendix 7.2-A).

2.5 Subsurface Condition

A series of geotechnical site investigation programs had been carried out at the mine site (Golder 1999, 2009b, 2010a, 2010b, 2012d, 2012e, SRK 2007, Tetra Tech EBA 2013a, 2014a, 2016a), and LVM (2015). A total of 175 geotechnical boreholes were drilled and 37 thermistor cables were installed during the site investigation programs.

Fourteen boreholes were drilled within the footprints of the WRSFs during the previous site investigations. In general, a veneer of organic material ranging from 0.02 to 0.70 m was encountered in most of boreholes. The underlying overburden material encountered in most of boreholes consisted of a sand and silt matrix, gravelly, and some gravel with cobbles and boulders. The overburden thickness ranges between 1.5 to 13.6 m and is underlain by greywacke bedrock. Overburden soils with excess ice were observed in most of the boreholes. Massive icy beds up to 1.5 m thick were also encountered.

In 2014, a total of seven boreholes were drilled within the footprint of the TSF. The subsurface soil profile is similar to the soil encountered within the footprint of the WRSFs. Generally, the soil profile consists of a veneer of organic material ranging from 0.1 to 0.75 m, layers of a sand and silt matrix, and overlaid by bedrock. The overburden thickness ranges from 1.3 to 7.3 m. An ice layer up to 1.75 m thick was encountered in one borehole. Soil porewater salinity tests (Tetra Tech EBA, 2013a) indicated that the overburden soils at the mine site may have a porewater salinity of 4 to 12 parts per thousand.

2.6 Seismic Zone

The mine site is situated in an area of low seismic risk. The peak ground acceleration (PGA) for the area was estimated using seismic hazard calculator from the 2010 National Building Code of Canada website (http://www.earthquakescanada.nrcan.gc.ca/hazard-alea/interpolat/index_2010-eng.php). The estimated PGA is 0.019 g for a 5% in 50-year probability of exceedance (0.001 per annum or 1 in 1,000 year return) and 0.036 g for a 2% in 50-year probability of exceedance (0.000404 per annum or 1 in 2,475 year return) for the area.

SECTION 3 • MINING PLAN

3.1 Mine Development Plan

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 14.9 Mt of tailings will be produced.

The following mining development sequence is planned:

- Tiriganiaq underground mine will be developed and operated from Year -5 to Year 7;
- Tiriganiaq Pit 1 will be mined from Year 2 to Year 7; and
- Tiriganiaq Pit 2 will be mined from Year 4 to Year 7.

3.2 Mine Waste Development Plan

Three mine waste streams will be produced: waste rock, tailings, and overburden material.

The term “waste rock” designates all fragmented rock mass that has no economic value and needs to be stored separately. Waste rock is also commonly referred to as “mine rock” in the mining industry. Typically, waste rock is produced during the initial stripping and the subsequent development of open pits and underground workings.

The term “overburden” designates all soils above the bedrock that need to be stripped at surface prior to developing the open pits. Generally, the overburden at the site consists of a thin layer of organic material overlying a layer of non-cohesive soil with variable amounts of silt, sand, and gravel.

Tailings are the processed material by-product of the gold recovery process and generally comprise water with gravel, sand, silt, and clay sized particles.

Table 3.1 summarizes the schedule and quantities to be mined from the open pit and underground mining operations. The usage or destination of the three mine waste materials is presented in Table 3.2. Figure 3.1 presents a graphical representation of the mine waste management flow sheet.

Further details on the management of the mine waste materials are presented in Sections 4 and 5 of this plan.

Table 3.1: Summary of Mine Waste Production Schedule

Year	Mine Waste and Ore from Underground (t)		Mine Waste and Ore from Tiriganiaq Pit 1 (t)			Mine Waste and Ore from Tiriganiaq Pit 2 (t)		
	Waste Rock	Ore	Overburden	Waste Rock	Ore	Overburden	Waste Rock	Ore
Yr-5	290,705*	36,911**	0	0	0	0	0	0
Yr-4	355,200	7,646	0	0	0	0	0	0
Yr-3	583,679	5,725	0	0	0	0	0	0
Yr-2	691,529	120,865	0	0	0	0	0	0
Yr-1	764,683	602,440	0	0	0	0	0	0
Yr1	959,950	1,185,403	0	0	0	0	0	0
Yr2	789,614	1,051,472	2,038,237	68,930	0	0	0	0
Yr3	608,626	1,254,293	4,328,239	4,205,799	0	0	0	0
Yr4	336,059	1,237,507	236,246	5,774,071	905,004	391,137	287,727	6,509
Yr5	31,567	1,154,294	0	5,004,160	742,892	97,830	1,667,353	70,586
Yr6	0	967,430	0	3,703,548	781,391	0	2,468,635	123,008
Yr7	0	888,008	0	1,830,060	710,953	0	973,358	254,040
Total (t)	**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

Table 3.2: Summary of Mine Waste Tonnage and Destination

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		Dike and road 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	Backfilled to underground mine as cemented paste backfill

3.2 Mine Waste Storage

The overall objective of the site selection for the WRSFs and TSF was to minimize the footprint of the areas occupied by the waste rock, overburden, and tailings, and where possible, avoid environmentally and socially sensitive areas.

3.2.1 Waste Rock and Overburden Storage Area

Three areas were identified for the combined storage of waste rock and overburden material as shown in Figure 1.2 of Appendix A. These areas can be described as follows:

- The WRSF1: located north of Tiriganiaq Pit 1 with an approximate footprint of 41.4 ha.
- The WRSF2: located south of Pond H17 (CP1) with an approximate footprint of 20.2 ha.
- The WRSF3: located north of Tiriganiaq Pit 2, covered H20 pond basin with an approximate footprint of 22.7 ha.

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 from mining the five deposits. Comparatively, the 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 as shown in Figure 3.2. In addition to the permanent WRSFs, a temporary waste rock storage pad will be generated within the Tiriganiaq Pit 2 footprint to facilitate the construction of Saline Pond 2. The details of this temporary facility are provided in Section 4.2.4 of this plan.

3.2.2 Tailings Storage Area

Tailings will be placed and stored as dry stacked tailings within the TSF. The TSF is located on an area of high ground between the mill and east of Lake B7 as shown on Figure 1.2. It will be constructed on land and will not cover any major waterbodies. A total 14.9 Mt of tailings will be produced over a mine life of approximately 8.5 years. About 10.9 Mt tailings (73% of total tailings) will be placed in the TSF as dry stack tailings. The remaining 4.0 Mt (27% of total tailings) will be used as underground cemented paste backfill for the primary stopes and longitudinal stopes.

3.3 Use of Traditional Knowledge in the Planning for Mine Waste Management

Inuit Qaujimajatuqangit (IQ) is the most successful and oldest monitoring practice in Nunavut, where the resource users do the observing or monitoring. Information collected can contribute to mine design and monitoring.

Agnico Eagle is committed to including IQ and public concerns stemming from IQ, where practical, in the design of management and monitoring plans for the Project. Agnico Eagle will continue active engagement with communities and Inuit organizations as the Project proceeds through permitting, and if approved, construction, operations and closure. This consultation and engagement should lead to further inclusion of IQ, as it becomes available, in updates to the design and implementation of environmental programs. Section 1.5 of the Main Application Document developed for the Type A Water Licence Application (Agnico Eagle 2015a) summarizes IQ and public concerns. A list of public concerns can be found in the Public Engagement and Consultation Baseline Report, in compliance with the Type A Water Licence 2AM-MEL-1631.

This Mine Waste Management Plan considers IQ, including traditional ecological knowledge (TEK), traditional land use (TLU) and public concerns regarding Project effects on traditional resources and traditional land use sites, through the following Project design and mitigation measures:

- Based on IQ and community consultation, it is clear that clean water and the health of fish, wildlife, birds, and caribou is important to the local population within the surrounding communities. Therefore, the WRSFs and TSF for the Project are designed and will be operated to minimize the impact on the environment. For example, the surface runoff and seepage water from the storage facilities will be diverted via channels, collected in water collection ponds, and treated as needed prior to discharge to the outside environment. In addition, contact water quality will be monitored and assessed throughout the construction, operations, closure, and post-closure phases such that any required changes to how the water is managed on site can be identified. If necessary appropriate mitigation measures will implemented in a timely fashion.
- Inuit Qaujimajatuqangit indicates that caribou move through the Project area on a regular basis. Therefore, progressive reclamation of Project waste management infrastructure includes closure activities that take place prior to the end of mining (final closure). These closure activities consider minimizing the risk of erosion and sediment loss as a result of on-site runoff, minimizing dust generation and soil drifting and stabilizing slopes. Final landscaping will ensure that caribou will be able to continue to move through the area in the future as they have done in the past.
- Through IQ and community consultation, it is known that people have fished and continue to fish in the Meliadine area. The use of dry stack tailings avoids potentially impacting and/or using significant bodies of water, such as Lake B7, and further limits the amount of seepage potentially reporting from the TSF, both during operations and into closure and post-closure of the proposed mine. The dry stack tailings process also minimizes the traditional “tailings pond” surface area thereby reducing the potential for contact between migratory birds and the tailings “pond”.
- Inuit Qaujimajatuqangit states that berry picking and caribou hunting are important parts of past and present Inuit culture. Community members have expressed concern over dust that could impact the health of the caribou and berries. Therefore, dust suppression measures will be implemented through the design, operation, and closure phases of all waste management infrastructure at the Project. Monitoring programs have been included to monitor the impact

of dust on vegetation near the mine site and to specifically measure uptake of metals by such vegetation.

SECTION 4 • WASTE ROCK AND OVERBURDEN MANAGEMENT

4.1 General Description of Waste Rock and Overburden Management

Approximately 31.4 Mt of waste rock will be mined from the open pits and underground mine operations. The majority 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: about 2.0 Mt will be backfilled to the underground mine, 1.65 Mt of waste rock will be used for construction activities, and 2.40 Mt of waste rock will be used as TSF closure cover material.

Approximately 7.1 Mt of overburden will be produced. About 7.0 Mt of overburden will be 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.

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 (i.e., EWTP, RO) 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-MEL 1631 (See section 9) during each stage of the mine life, including construction, operations, closure, and post-closure. The geochemical characterization of the waste rock, ore, tailings and overburden was submitted as SD 6-3 Geochemical Characterization of Waste Rock, Ore, Tailings and Overburden Meliadine Gold Project, Nunavut (Agnico Eagle 2014).

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 MMER during operation, and MMER, 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.

4.2 Waste Rock Storage Facilities

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; and

- 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 4.1 summarizes some of the key physical parameters used for the design of the WRSFs.

Table 4.1: Design Parameters for Waste Rock Storage Facilities

Design Parameters	WRSF1	WRSF2	WRSF3
Height of the first lift above original ground surface (m)	5		
Sideslope of each lift of waste rock	1.3(H):1(V)		
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 sideslopes of each WRSFs (from bottom toe of first lift to top crest of final lift)	2.5(H):1(V) to 3.4(H):1(V)	2.2(H):1(V) to 2.4(H):1(V)	2.3(H):1(V) to 2.5(H):1(V)
Sideslope for each lift of overburden	1.6(H):1(V)		
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		

Based on the above design criteria, the WRSFs will provide a 9.4 Mm^3, 3.6 Mm^3, and 5.0 Mm^3 of design capacity for WRSF1, WRSF2, and WRSF3, respectively.

4.2.1 Waste Rock Storage Facility 1

The proposed WRSF1 will occupy an area of approximately 41.4 ha and will be located to the north of Tiriganiaq Pit 1. Two small shallow ponds (Ponds A17 and B9) are located within the footprint of WRSF1 and will be covered by the facility as shown in Figure 4.1. The ponds are less than 2 m deep and freeze to the bottom annually during the winter season. These ponds do not provide habitat for fish designated as commercial, recreational, or aboriginal (CRA) fish species (Golder 2015).

The proposed WRSF1 was designed in consideration of both frozen and unfrozen foundation conditions. Thus, the stability of the facility 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. The 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 (5.42 Mm^3) of waste rock and 6.5 Mt (4.02 Mm^3) of overburden will be placed in WRSF1.

From Year -2 to Year 4, the majority 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.

It is important to note that Agnico Eagle plans to submit the Final Design and Construction Drawings Detailed Report for WRSF 1 to the Nunavut Water Board, for approval, in early Q1, 2019. This is in anticipation of operations commencing around the end of Q1, early Q2, 2019. As a result the volume of waste rock will likely change slightly. Once approved the Waste rock volumes will be updated in the Mine Waste Management Plan.

4.2.2 Waste Rock Storage Facility 2

The proposed WRSF2 is located to the south of CP1 (previously Pond H17) 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 as shown in Figure 4.1. Pond A58 will be fully covered and the other four ponds will be partially covered by waste rock. All five ponds are less than 2.0 m deep and freeze to bottom during the winter (about 8 months of the year). Of the five ponds impacted by WRSF2, only nine-spined stickleback were caught in Ponds A58 and H10. These ponds do not provide habitat for fish designated as CRA fish species and the nine-spine stickleback is not considered to be a species supporting the CRA fisheries (Golder 2015).

The WRSF2 will accommodate the majority of waste rock produced from Tiriganiaq Pit 1 from Year 5 to Year 7. The WRSF2 is expected to reach its design capacity by the end of Year 7.

4.2.3 Waste Rock Storage Facility 3

The proposed WRSF3 is located to the north of Tiriganiaq Pit 2, and will cover the basin of Pond H20 with an approximate footprint of 22.7 ha as shown in Figure 4.1. The runoff water from WRSF3 will be collected within Pond H19. Maximum water depths for Ponds H19 and H20 are 1.4 m and 1.6 m, respectively. No fish species were found in these two ponds.

The proposed WRSF3 was designed in consideration of both frozen and unfrozen foundation conditions. Thus, the stability of the facility 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. The 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 and Year 5. The WRSF3 is expected to reach its design capacity by end of Year 7.

4.2.4 Temporary Waste Rock Stockpile for Construction of Saline Pond 2

As part of the strategy to manage excess groundwater infiltration of saline water within the underground portion of the mine, Agnico Eagle applied to the Nunavut Impact Review Board for approval to discharge saline water to the sea (Melvin Bay, Rankin Inlet). At this time, Agnico Eagle is awaiting approval from the Minister for the project.

Based on adaptive management strategies, the project will require a second saline water storage pond (Saline Pond 2). Saline Pond 2 will be temporary in nature and will be constructed in bedrock within the footprint of Tiriganiaq Pit 2 (Figure 4.1.1 below). Saline Pond 2 is designed to have a storage volume of 75,000 m^3. The groundwater will be pumped to Saline Pond 2 where it may then be treated for salinity removal at the SWTP. Once approved, more details will be developed in regard to treatment quantity and quality. This information will be incorporated in a Saline Water Management Plan.

Construction of Saline Pond 2 will require the extraction of an approximate 246,400 tonnes of waste rock within the tiriganiaq formation (Tiriganiaq Pit 2), comprising of greywacke and siltstone, and sometimes siltstone intersections. The waste rock will be temporally stored immediately east of Saline Pond 2 in addition to 45,600 tonnes of overburden. Monitoring for seepage and/or runoff will be undertaken in accordance with Type A Water Licence. These volumes of material are already accounted for in previous sections and would otherwise be deposited at the future WRSF3. Some of the material will be used to construct roads and pads to support the extraction process. Once mining of Tiriganiaq Pit 2 commences, the waste rock will be permanently placed at WRSF3. In addition to the pond itself, the temporary waste rock stockpile will remain entirely within the footprint of Tiriganiaq Pit 2.

The waste rock being extracted for the development of Saline Pond 2 will be non acid-generating and non metal-leaching as per the Meliadine FEIS (Tables 4.1.1, 4.1.2, and 4.1.3). Additional samples will be collected prior to the extraction of the waste rock (confirmation drilling) and also during the extraction of the waste rock.

Figure 4.1.1: Temporary waste rock stockpile for construction of Saline Pond 2 within Tiriganiaq Pit 2.

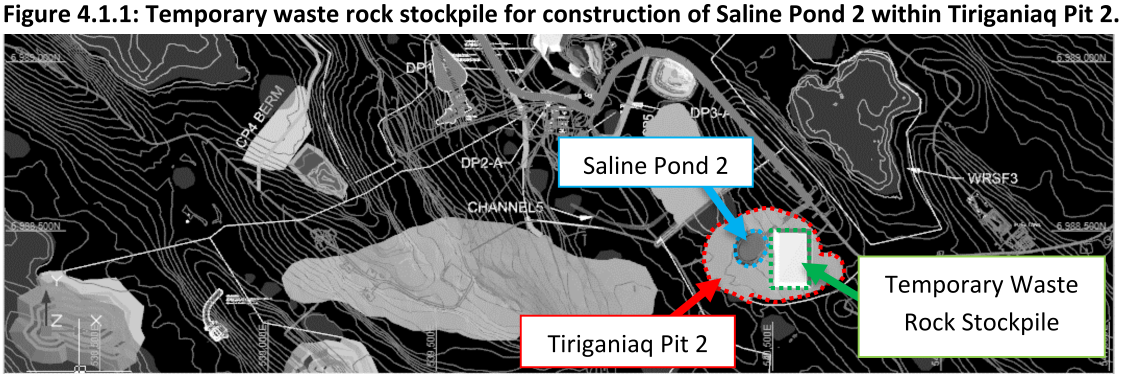

Table 4.1.1: Summary of Total Waste Rock Tonnage and Waste Rock Sample Count

Deposit	Rock Type	Tonnage (tonnes)		Number of Samples	
		Estimated Tonnage1 (tonne)	Proportion of Total Tonnage	Count	Proportion of Total
Tiriganiaq	Gabbro	4,856,498	3%	10	4%
	Greywacke/Siltstone	113,694,449	81%	194	77%
	Iron Formation	7,514,454	5%	6	2%
	Mafic Volcanic	14,211,578	10%	43	17%
	Undefined	954,282	1%		
	Total	141,231,271	100%	253	100%

Table 4.1.2: ARD Designation of Selected Kinetic Test Samples and Sample Selection Rationale for Kinetic Testing

Deposit	Rock Type	Estimated Waste Rock Tonnage		Bulk ARD Potential	Sample Information		Ranking of the Sample Based on Static Results per Rock Type		
		Tonnage (Kt)[2]	Proportion[3]		Sample ID	ARD Potential[4]	Total As (ICP)	Leachable As (SFE)	Sulphide Sulphur
Tiriganiaq	Greywacke /Siltstone	113694	81%	non-PAG	M03-508-01	non-PAG	>median	median	75th percentile
					M06-623-01	non-PAG	<median	upper quartile	lower quartile
					M06-625-01	non-PAG	75th percentile	75th percentile	lower quartile
					M97-95-02	non-PAG	upper quartile	median	median
					M98-194-01	non-PAG	upper quartile	upper quartile	75th percentile
					M99-403-03	non-PAG	upper quartile	median-75th	<median
					M04-533-01	non-PAG	upper quartile	median	<median
	Iron Formation	7514	5%	non-PAG	M04-526-01	non-PAG	median	75th percentile	upper quartile
					M96-74-01	non-PAG	upper quartile	upper quartile	median
	Mafic Volcanic	14211	10%	non-PAG	M99-409-05	non-PAG	upper quartile	75th percentile	median
					GT08-04-02	non-PAG	upper quartile	upper quartile	lower quartile
					M05-536A-01	non-PAG	upper quartile	>75th percentile	slightly <75th
					M97-141-01	non-PAG	>median	median	upper quartile

Table 4.1.3: Summary of Waste Rock and Ore Static Leach Test (SFE) Results

Deposit	Rock Type	Number of Samples	Median Final pH	Average As (mg/L)	MMER* (number of samples)
Tiriganiaq	Gabbro	10	8.4	0.007	n.e.
	Greywacke/Siltstone	194	8.2	0.05	As (1)
	PAD waste rock	13	7.9	0.05	n.e.
	PAD WR (-200 µm)	6	7.8	0.02	n.e.
	Iron Formation	6	8.1	0.009	n.e.
	Mafic Volcanic	43	8	0.01	n.e.
	Ore/GW	3	8	0.3	As (1)
	Ore/MV	4	8.1	0.4	As (1)
	Pad Lode 1000	1	7.8	0.3	n.e.
	Pad Lode 1100	1	8	0.2	n.e.

4.3 Waste Rock Distribution

An estimate for the production schedule, quantities, and distribution of waste rock by year is presented in Table 4.2. The development plan for the waste rock placement is shown in Figures 1.2.

Table 4.2: Schedule, Quantities, and Distribution of Waste Rock by Year

Mine Year	Total Waste Rock from Mine Operation (t)	Utilization of Waste Rock (t)			Waste Rock to be Placed in WRSFs(t)		
		Construction	Rockfill for Underground Backfill	TSF Closure Cover	WRSF1	WRSF2	WRSF3
Yr -5	290,705*	290,705	0	0	0	0	0
Yr -4	355,200	355,200	0	0	0	0	0
Yr -3	583,679	583,679	0	0	0	0	0
Yr -2	691,529	0	0	0	691,529	0	0
Yr -1	764,683	0	31,910	39,760	732,773	0	0
Yr 1	959,950	0	190,180	97,036	608,842	0	0
Yr 2	858,544	0	235,839	89,103	458,491	0	0
Yr 3	4,814,425	19,268	188,991	110,124	4,477,764	0	0
Yr 4	6,397,857	0	349,005	139,379	3,221,661	0	2,590,557
Yr 5	6,703,080	0	364,965	240,979	0	3,059,326	2,867,493
Yr 6	6,172,183	0	370,885	154,474	0	3,093,548	2,468,635
Yr 7	2,803,418	0	319,338	127,840	0	977,528	973,358
Yr 8	0	0	0	46,250	0	-313,774	0
Yr 9	0	0	0	230,180	0	-269,094	0

Table 4.2: Schedule, Quantities, and Distribution of Waste Rock by Year

Mine Year	Total Waste Rock from Mine Operation (t)	Utilization of Waste Rock (t)			Waste Rock to be Placed in WRSFs(t)		
		Construction	Rockfill for Underground Backfill	TSF Closure Cover	WRSF1	WRSF2	WRSF3
Total (t)	**31,395,253**	**1,248,852**	**2,051,112**	**2,397,235**	**10,191,060**	**6,547,534**	**8,900,043**
Volume (m^3)	**16,999,603**	**664,283**	**1,091,017**	**1,275,125**	**5,420,777**	**3,482,731**	**4,734,065**
*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							

4.4 Overburden Storage and Management

Approximately 7.1 Mt of overburden material will be removed from the surface footprint of the two pits over the mine life. The approximate quantities and proposed placement location of the overburden is presented in Table 4.3.

The overburden material will be mainly stored within the WRSFs. A small volume of overburden (approximately 0.5% of total overburden produced) will be used for site infrastructure construction. The amount of overburden used for site infrastructure construction is included within the quantities of overburden placed into the WRSFs, as presented in Table 4.3. 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 temporary overburden stockpile is approximately 5.0 m high with sideslopes of 3(H):1(V).

The design of the main overburden WRSF was revisited to determine if a portion of the 7.1 M tonnes of overburden removed prior to mining of the Tiriganiaq open pits could be placed in a manner within the same overburden/WRSF footprint that would permit later recovery of this overburden for use in mine site reclamation purposes. Two options were considered (Tetra Tech EBA 2016b), including the placement, storage, and recovery of the overburden material in a zone at the outer edge of the facility; and the recovery of the overburden material from the top of the facility. However, given the small footprint and compactness of the mine layout, there is no available real estate to reconfigure the WRSF's to accommodate the late recovery of overburden materials. There is the potential to recover some of the overburden materials from the top of WRSF1, which would require careful management and would yield approximately 0.15 M tonnes.

Table 4.3: Schedule, Quantities, and Distribution of Overburden by Year

Mine Year	Total Overburden from Mine Operation (t)	Utilization of Overburden (t)		Overburden to be Placed in WRSFs (t)		
		Overburden Stockpile for TSF Closure Cover	Withdraw from Stockpile for TSF Closure Cover	WRSF1	WRSF2	WRSF3
Yr -5	0	0	0	0	0	0
Yr -4	0	0	0	0	0	0
Yr -3	0	0	0	0	0	0
Yr -2	0	0	0	0	0	0
Yr -1	0	0	0	0	0	0
Yr 1	0	0	0	0	0	0
Yr 2	2,038,237	0	0	2,038,237	0	0
Yr 3	4,328,239	94,816	0	4,233,423	0	0
Yr 4	627,383	0	0	236,246	0	391,137
Yr 5	97,830	0	22,940	0	0	97,830
Yr 6	0	0	0	0	0	0
Yr 7	0	0	0	0	0	0
Yr 8	0	0	0	0	0	0
Yr 9	0	0	42,610	0	0	0
Total (t)	**7,091,689**	**94,816**	**65,550**	**6,507,906**	**0**	**488,967**
Volume (m^3)	**4,377,585**	**58,528**	**40,463**	**4,017,226**	**164,806**	**301,831**

4.5 Anticipated Design Performance of WRSFs

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. Using the geometric parameters presented in Section 4.2, the results of the stability analysis indicates 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. Information on the stability and thermal studies for the WRSFs is described in the report of *Tailings, Waste and Water Management for Feasibility Level Study, Meliadine Project, Nunavut* (Tetra Tech EBA, 2014b).

It should be noted that the design and performance of the WRSFs are not dependent on freeze-back of waste rock and permafrost conditions continuing to exist at the site (i.e., the design has included for thaw of the WRSFs and its foundations). 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.

SECTION 5 • TAILINGS MANAGEMENT

5.1 General Description of Tailings Management

Dry stack tailings produced in the mill at Meliadine will be dewatered to a solids content of 85%. The dewatered tailings 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 compactor.

Site contact water from the TSF will be 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-MEL 1631 during each stage of the mine life (See Section 9.2). The geochemical characterization is provided in the document *Meliadine Project Trade-Off Dry-Stack vs. Slurry* (Agnico Eagle 2013).

5.2 Tailings Storage Facility

The TSF is located on high ground west of the proposed mill and east of Lake B7, as shown in Figure 1.2. 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.

With the exception of the southeast corner of the proposed facility, which encompasses the top of the northern tip of the Tiriganiaq esker, the ground surface of the proposed 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. Vegetation in the area consists of moss/peat cover. 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.

The TSF is designed to accommodate approximately 10.9 Mt of tailings. Version 3 of the *Mine Waste Management Plan*, submitted March 2018, included a three (3) cell TSF system design. The *Tailings Storage Facility Design Report and Drawings*, approved December 2018, has been updated to utilize a two (2) cell system (Figure 5.1 to 5.3; Appendix B).The two cell 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. The closure plan for TSF is described in Section 8 and the *Tailings Storage facility Design Report and Drawings* (Appendix B).

The properties of the tailings and TSF operation parameters relevant to the design of the TSF are presented in Table 5.1. Refer to Section 5 of the *Tailings Storage Facility Design Report and drawings* (Appendix B) for a detailed description of construction methods and procedures.

Table 5.1: Design Parameters for the Tailings Storage Facility Operations

Parameters	Value
Mine design life	8 years
Mill production	3,000 tpd in Years -1 to 3 5,000 tpd per day in Years 4 to 8
Ore processed	14.9 Mt
Tailings to TSF as dry stack	10.9 Mt (or 80% or total tailings)
Tailings backfilled to underground mine	4.0 Mt (or 20% or 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)
Average tailings dry density	1.65 t/m^3
Maximum height of TSF over original ground surface	30 m
Side slope for the bottom 15 m thick (or below elevation of 84 m)	4H:1V
Side slope for the top 15 m thick (or above elevation of 84 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)

5.3 Tailings Physical and Geotechnical Properties

A laboratory test program on the tailings was conducted for the slurry tailings option with solids contents of 65% and 72%. The test program included physical index tests, a gradation analysis test, settling tests, thermal conductivity tests, a consolidated-undrained triaxial test, a consolidation test, a hydraulic conductivity test, and a direct shear test. The index and gradation analysis tests indicated that the tailings are inorganic silt with low plasticity and low compressibility and consist of 17% sand, 81% silt, and 2% clay size particles. Tailings have the gradation curve of 98% passing 150 µm, 83% passing 75 µm, 40% passing 20 µm, and 5% passing 3 µm (Tetra Tech EBA 2013b).

Additional tailings laboratory geotechnical tests were carried out in 2014 for the dry stack tailings option with a tailings solid content of 85% at disposal (Tetra Tech EBA 2014c). The test included moisture-density relationship (Standard Proctor), consolidation test, soil water characteristic curve, direct shear test, and hydraulic conductivity test. The key finding from the test results are briefly summarized below:

- The moisture-density relationship (Standard Proctor, ASTM D698) test indicated that the maximum dry density of the tailings was 1.8 t/m^3 at an optimum moisture content of 14.9%.
- The coefficient of consolidation (c_v) of the tailings ranged from 24.6 to 29.8 (m^2/year) under various pressures ranging between 10 and 1,600 kPa.
- The tailings had a soil water characteristic curve with an air entry value of 20 kPa and a residual suction of 900 kPa.
- The shear strength parameters were determined to be an inferred internal angle of friction of 33.5° and an apparent cohesion of 9.9 kPa for the tailings samples with a dry density of 1.7 t/m^3.
- The saturated hydraulic conductivity of the tailings sample was 2.91E-07 m/sec for the tailings sample with a dry density of 1.7t/m^3.

5.4 Schedule, Quantities, and Distribution of Tailings

Commissioning of the process plant started near the end of Q4, 2018. Actual production should commence by Q2, 2019 . The production schedule, quantities, and distribution of tailings by year are presented in Table 5.2. 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.

Table 5.2: Schedule, Quantities, and Distribution of Tailings by 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**

5.5 Tailings Placement Plan

The dry stacked tailings will be dewatered to a solid content of 85% by mass in the mill. Thereafter the tailings will be hauled from the mill to the TSF by truck; end dumped, spread, and compacted. The following tailings placement and management strategy will be used:

- Prior to tailings placement, remove all surface water and snow within the footprint of placement.
- A starter waste rock berm will initially be 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. 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.
- Tailings placement will start from Cell 1 in the first quarter of Year -1. The dewatered tailings will be hauled to the TSF Cell 1 with haul trucks, end dumped, and bladed into thin lifts using a dozer. Thereafter, the tailings' lifts will be compacted using a vibratory drum roller. This compaction is designed to promote runoff, reduce the potential for oxygen ingress and water infiltration, and maintain geotechnical stability. The thickness of each lift will be approximately 0.3m.
- Based on the tailings production schedule, Cell 1 will reach its design capacity by Year 5 at a height of 30 m above the original ground. Cell 2 will start operation from Year 4 and will reach design capacity in Year 8.
- When possible and practical, as the tailings stack increases in height, a waste rock layer will be placed along the side slopes as erosion 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. This will comprise 0.5 m of overburden followed by 2.5 m of waste rock.

Table 5.3 presents the yearly schedule of deposition per cell, as well as average height of tailings placed in each cell. Tailings placement progressions corresponding to Year 2, Year 7 and Closure are shown in Figure 5.1, Figure 5.2 and Figure 5.3, respectively. Figure 5.4 shows the typical cross-section of the TSF. The external perimeter slopes of the TSF will be covered with waste rock but no perimeter berm is planned.

Table 5.3: Tailings Placement Schedule and Estimated Tailings Heights

Year	Mine Year	Tailing Solids to be Placed in Dry Stack TSF (t)		Estimated Average Height of Tailings Placed in Each Cell (m)		Planned Tailings Placement Period	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 2	Cell 3
2019	Yr -1	582,026		1.6		Jan to Dec	
2020	Yr 1	885,037		5.3		Jan to Dec	
2021	Yr 2	1,052,607		10.3		Jan to Dec	
2022	Yr 3	997,007		16.1		Jan to Dec	
2023	Yr 4	868,728	620,522	22.7	2.6	Jan to Jul	Aug to Dec
2024	Yr 5	717,635	992,439	33	6.9	Jan to May	Jun to Dec
2025	Yr 6		1,689,813		15.2		Jan to Dec
2026	Yr 7		1,668,059		24.7		Jan to Dec
2027	Yr 8		846,252		33		Jan to Aug
Total		**5,103,041**	**5,817,086**				
*Tailings produced during commissioning in the last quarter of Year -2 (construction phase)							

5.6 Tailings Freeze-back

Based on ground temperatures and climate data for the Project site, it is anticipated that the TSF will freeze back in the long term. In order to promote freeze-back of the TSF, the following tailings placement strategies will be adopted during mine operation, when feasible and practical:

- November to March is typically a period of sub-zero temperatures and snowfall, while April to October is a period of thawing/freezing conditions with rainfall. The initial lift of tailings over original ground will be placed during winter conditions whenever feasible.
- During the initial year of placing tailings in a cell, maximum thickness of tailings placed will be limited to 2.6 m in the center area of each cell (up to 4.9 m in the area close to the cell perimeter where the original ground elevation is lower than the center area).
- In the subsequent years, the total yearly thickness of the tailings placed in a cell will be limited to no greater than 10.3 m.
- The tailings will be placed and compacted in a lift of no greater than 0.3 m. Each lift of the tailings will be placed over the entire top surface of the planned area in each cell before next lift is placed such that localized placement of thick tailings is avoided. This will promote freeze-back of the tailings placed in winter and limit the overall thickness of the tailings placed in summers.

Preliminary thermal analyses were conducted to estimate the thermal conditions of the tailings and foundations during the TSF operation and after closure. The detailed information of the thermal analysis is described in Section 4.3 of the *Tailings Storage Facility Design Report and Drawings* (Appendix B) and the report of Tetra Tech EBA (2018). Thermal monitoring will be implemented pursuant Part I Item 13 of the Type A Water Licence 2AM-MEL 1631, and is discussed in Section 9.1 and 9.2 below.

5.7 Anticipated Design Performance of TSF

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. The information of the stability analysis is described in Section 4 of the *Tailings Storage Facility Design Report and Drawings* (Appendix B) and the Tetra Tech EBA (2014b) report.

SECTION 6 • WATER MANAGEMENT ASSOCIATED WITH MINE WASTE MANAGEMENT

6.1 Water Management

The water management objectives for the Project are to minimize potential impacts to the quantity and quality of surface water at the site. For more detail, refer to the *Water Management Plan* (Agnico Eagle, 2018). Seepage and runoff water from the WRSFs, TSF, and temporary overburden stockpile will be managed with water diversion channels, water retention dikes/berms, and water collection ponds. If the water quality does not meet the discharge criteria, the contact water in the water collection ponds will be treated appropriately (i.e., EWTP) prior to being discharged to the outside environment. No water will be discharged without authorization.

6.1.1 Water Management Associated with WRSFs

As shown in Figure 4.1, WRSF1 will straddle three catchment areas (catchment of CP1, catchment of Pond CP5, and catchment of Lake B7). WRSF2 will straddle two catchment areas (catchment of CP1 and catchment of CP5), and WRSF3 will be located within the basin of Pond H20.

Seepage and runoff from the WRSFs during construction and operation phases will be managed using the water management system described below:

- Seepage and runoff from WRSF1 within the catchment of CP1 will be diverted to CP1 via Channels 1, 7 and 8;
- Seepage and runoff from WRSF1 within the catchment of CP5 will be diverted to CP5 via Channels 5 and 6;
- Seepage and runoff from WRSF1 within the catchment of Lake B7 will be diverted and collected in CP4 via Channel 4;
- Seepage water and runoff from WRSF2 within the catchment of CP1 will be diverted to CP1 via Channel 1 and Channel 7 or flow directly into CP1;
- Seepage water and runoff from WRSF2 within the catchment of CP5 will be diverted to CP5 via Channel 6;
- Seepage and runoff from WRSF3 will directly report to CP6; and
- The water collected in CP4, CP5, and CP6 will be pumped to CP1, where the contact water will be treated by the EWTP prior to discharging to outside environment.

The WRSFs water management infrastructure will remain in place until mine closure activities are completed and monitoring results demonstrate that the contact water quality from the WRSFs meets discharge criteria outlined in Section 7.3 of the *Water Management Plan* (Agnico Eagle, 2018). Once the water quality from the WRSFs meets the discharge criteria, the water retention dikes/berms will be breached to allow the water from the WRSFs to directly flow to the outside environment. Further details on water management for the WRSFs are described in the Water Management Plan (Agnico Eagle, 2018).

6.1.3 Water Management Associated with TSF

The TSF is located within the catchment of Lake B7 with a small portion straddling the water catchment of CP1, as shown in Figure 4.1. Water sources from the TSF during construction and operation will be managed as follows:

- Seepage and runoff from the placed filtered tailings within the CP1 catchment will stream through Culverts 1, 18, 19, 2 and 3 to deposit in CP1;
- Seepage and runoff within the Lake B7 catchment will be collected in Pond CP3 either directly or via Channel 3. CP3 water quality will be monitored; and
- Water within CP3 will be pumped to H13 where it will flow through Culvert 2, Channel 1, and Culvert 3 into CP1.

The TSF water management infrastructure will remain in place until mine closure activities are completed and monitoring results demonstrate that the contact water quality from the TSF meets discharge criteria. Once the water quality from the TSF meets the discharge criteria, the water retention dikes/berms will be breached to allow the water from the TSF to directly flow to the outside environment. Further details on water management for the TSF are described in the *Water Management Plan* (Agnico Eagle, 2018).

SECTION 7 • DUST MANAGEMENT ASSOCIATED WITH MINE WASTE MANAGEMENT

The possible sources of dust related to the waste rock, overburden, and dry stacked tailings management during construction, operation, and closure include:

- Site preparation prior to placement of waste rock, overburden or dry stacked tailings i.e., stripping, excavation and/or placement of foundation pad;
- Wind erosion of fine particles from the WRSFs and TSF surface;
- Vehicle traffic dislodging fine particles from the surface of WRSFs and TSF, and associated service and haul roads to WRSFs and TSF;
- Waste rock, overburden, and dry stack tailings handling and transfer - loading, hauling, unloading, placement and compaction; and
- Placement of closure and capping layers.

Dust suppression measures, which are considered to be typical of the current mine practices (i.e. Meadowbank Mine) and consistent with best management practices, will be considered through design, operation and closure phases to control the dust.

Minimal site preparation is required for the WRSFs and the TSF during the construction phase. Therefore, dust is not expected to be problematic.

Dust is expected to be a minor issue during the operation of the WRSFs as the waste rock produced at the Project site will generally comprise large pieces of rock that will not be susceptible to wind erosion. The overburden contains material that is fine-grained and thus more susceptible to wind erosion. The plan is to store the majority of the overburden materials within the core of the WRSFs. Therefore, dust from the overburden materials is not expected to be an issue. However, should dusting become an issue, dust control measures such as spraying water and/or other approved chemical dust suppressants, such as calcium chloride, will be used as necessary.

Dry stacked tailings will be placed in lifts and spread with a dozer and then compacted. The surface compaction of the lifts will significantly reduce the potential for wind erosion of the tailings surface. Dust related to TSF operation during the winter season will be further managed by limiting the exposed surface area of the tailings. In the summer period, dust from the TSF will be controlled by spraying water and/or other approved chemical dust suppressants if problematic. Other control measures considered in the design of TSF to minimize dust generation include:

- Place the waste rock cover over the final perimeter tailings slope surface as soon as possible;
- TSF will be operated by cells to limit the tailings surface area exposed to wind and facilitate progressive closure;
- Consideration of prevailing north-northeast wind direction by development of the southern portion of Cell 1 first and progression northward;
- Tailings surface will be covered progressively once it reaches the design elevation; and

- Flat sideslope of 4(H):1(V) for the TSF was adopted to minimize the erosion potential and maintain overall stability of the tailings stack.

Dust generated from vehicles travelling on the surface of the WRSFs, TSF, and associated access roads will be controlled principally by spraying water on the traffic area, which will be carried out regularly by mine services during dry periods in the summer. Watering the haul and access roads is only possible when temperatures are above freezing. When the temperature is below freezing, dust suppression using water or chemical will pose a safety hazard for travel; therefore, reducing the speed limit will be the principal way of controlling dust during these periods. More details on the dust management for traffic are described in the Roads Management Plan.

Other control measures considered in design and operation related to dust generation by vehicles travelling include:

- Road will be designed as narrow and short as possible while maintaining safe construction and operation practices;
- Coarse size rock will be used as much as possible for road construction;
- Roads will be regularly graded to mix the fines found on the road surface with coarser material located deeper in the roadbed; and
- As required, roads and travel areas will be topped with additional aggregate.

Dust from material handling is not expected to be problematic on site. Long end dumps which can generate significant amounts of dust will not occur at site, since waste rock, overburden and dry stack tailings will be dumped in lifts and spread with a dozer. Where possible, multiple handlings of materials that have the potential to generate dust will be avoided. However, should dust related to material handling occur on site, specific control measures will be evaluated and applied, as required.

At closure, the TSF will be fully covered to prevent further wind erosion of the tailings. The proposed closure cover includes a layer of 0.5 m thick of overburden followed by a layer of 2.5 m thick waste rock on the top of the facility. The TSF slopes closure cover includes a 3.7 m to 4.2 m thick waste rock layer only. The overburden will be surrounded by waste rock in the WRSFs; therefore, dusting is not expected to be an issue. The need for dust control at closure will be further evaluated during closure activities.

SECTION 8 • RECLAMATION AND CLOSURE OF THE WRSFs AND TSF

Progressive reclamation includes closure activities that take place prior to permanent closure in areas or at facilities that are no longer actively required for current or future mining operations. Reclamation activities can be done during operations with the available equipment and resources to reduce future reclamation costs, minimize the duration of environmental exposure, and enhance environmental protection. Progressive reclamation may shorten the time for achieving reclamation objectives and may provide valuable experience on the effectiveness of certain measures that might be implemented during permanent closure. The WRSFs and TSF will be operated to facilitate progressive reclamation as discussed in the above sections. Detailed mine closure and reclamation activities are provided in the *Preliminary Closure and Reclamation Plan* (Agnico Eagle, 2015).

Monitoring will be carried out during all stages of the mine life to demonstrate geotechnical stability and the safe environmental performance of the facilities (Section 9). If any non-compliant conditions are identified, then maintenance and planning for corrective measures will be completed in a timely manner to ensure successful completion of the Mine Closure and Reclamation Plan.

8.1 Closure and Reclamation of WRSFs

Mine closure and the 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 types and at various scales show that drainage water quality is expected to meet MMER monthly mean effluent limits, including results for arsenic. Therefore, a closure cover system is not proposed for the WRSFs. The *Water Management Plan* (Agnico Eagle, 2018) provides the water quality site predictions.

The WRSFs were designed for long-term stability and no additional re-grading will be required at closure. It is anticipated that the native lichen community will naturally re-vegetate the surface of the WRSFs over time.

The contact water management system for the WRSFs and TSF 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. Once water quality meets the discharge criteria outlined in Section 7.3 of the *Water Management Plan* (Agnico Eagle, 2018), 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.

8.2 Closure and Reclamation of the TSF

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. The closure plan for the TSF is to progressively place an engineered cover over the tailings surface. The proposed closure cover includes the following:

- 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; and

- 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; and

- Placed in an unfrozen condition and have a minimum thickness of 0.5 m.

Volumes of waste rock and overburden for TSF closure are provided in Table 8.1.

Table 4: Summary of Cover Material Quantities during Mine Operations

Year	Mine Year	Volume of Waste Rock Placed on Side Slopes (m^3)	Volume of Waste Rock Placed on Final Top Surface (m^3)	Total Volume of Waste Rock Placed as Closure Cover (m^3)	Total Volume of Overburden Placed on Top Surface (m^3)
2019	-1	39,760		39,760	
2020	1	97,036		97,036	
2021	2	89,103		89,103	
2022	3	110,124		110,124	
2023	4	139,379		139,379	
2024	5	117,037	123,942	240,979	22,940
2025	6	154,474		154,474	
2026	7	127,840		127,840	
2027	8	46,250		46,250	

2028	9	--	230,180	230,180	42,610
Total		**921,003**	**354,122**	**1,275,125**	**65,550**

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.

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.

SECTION 9 • MONITORING PROGRAM

This section presents a summary of the monitoring programs that will be carried out during construction and operation related to mine waste storage management. The monitoring program presented here includes; stability and deformation, ground temperature, and annual inspections per the Type A Water Licence 2AM-MEL1631. The detailed information on monitoring of runoff and seepage from the WRSFs and the TSF is described in the *Water Management Plan* (Agnico Eagle, 2018). General monitoring is subject to change as directed by an Inspector, or by the Licensee, subject to approval by the NWB.

9.1 Monitoring Activities for WRSFs

Table 9.1 summarizes the monitoring activities for each WRSF. Each monitoring activity will be further defined, including location and type of instrumentation, prior to construction of each WRSF, according to the approved environmental protocols. It is important to note that Agnico Eagle plans to submit the Final Design and Construction Drawings Detailed Report for WRSF 1 to the Nunavut Water Board, for approval, in early Q1, 2019. This is in anticipation of operations commencing around the end of Q1, early Q2, 2019. Once approved the monitoring plan (more detailed) will be updated in the Mine Wste Management Plan.

Table 9.1: Waste Rock Storage Facilities Monitoring Activities

<table>
<tr><th colspan="2">Monitoring Component</th><th>Monitoring Frequency</th><th>Reporting</th></tr>
<tr><td rowspan="5">Verification Monitoring</td><td>Quantities of waste rock produced</td><td>Monthly</td><td rowspan="5">Monitoring data will be used by Agnico Eagle internally.</td></tr>
<tr><td>Routine visual inspections of WRSFs</td><td>Daily during active rock placement, Monthly to semi-annually after placement</td></tr>
<tr><td>Elevation and geometry survey</td><td>Annually</td></tr>
<tr><td>Waste rock and overburden sampling</td><td>To be determined</td></tr>
<tr><td>Seepage collection and monitoring</td><td>Monthly over the open water season</td></tr>
<tr><td rowspan="5">General Monitoring</td><td>Quantities of waste rock placed into facilities</td><td>Monthly</td><td rowspan="5">Monitoring data will be reported to the Regulators in the annual water licence report or annual inspection report</td></tr>
<tr><td>Geochemical monitoring</td><td>Eight samples per 100,000 tonnes of mined material</td></tr>
<tr><td>Thermal and freeze-back monitoring</td><td>Quarterly</td></tr>
<tr><td>Dust monitoring related to WRSFs</td><td>Governed by Air Quality Monitoring Plan</td></tr>
<tr><td>Geotechnical inspection by qualified Geotechnical Engineer</td><td>Annually or more frequent at the request of an Inspector</td></tr>
</table>

9.1.1 Verification Monitoring Program for WRSF

Verification monitoring data will be used by Agnico Eagle for the management of waste rock and overburden. The following verification monitoring data will be collected, compiled, and managed internally:

- The WRSFs were designed to store approximately 31.4 Mt of waste rock and 7.1 Mt of overburden material during mine operation. Monthly quantities of the waste rock and overburden produced during mine operation will be recorded.
- During the active development of each WRSF, site staff will carry out daily visual inspections in relation to the performance and condition of each structure. When placement activity ceases on an interim or seasonal basis, the inspection frequency will shift to monthly. Following the completion of a WRSF, inspections will continue on a semi-annual basis until closure. The purpose of these inspections is to identify and document any potential hazards or risks to the facility, such as deformations, unusual seepage, slumping, local failure, etc.
- The heights of the WRSFs are estimated to be approximately 35 to 40 m. During operation an annual elevation survey of the WRSFs will be performed to estimate the overall volume placed, determine the reclamation progress, and provide input information to the operation plan.
- Surface runoff and seepage from the WRSFs will be monitored during the construction and operation phases by visual inspection during the ice free season. Additional inspections will be carried out after rainfall events and during the freshet period. The detailed information on the monitoring of surface runoff and seepage from the WRSFs is described in the Water Management Plan.

9.1.2 General Monitoring Program for WRSF

The following general monitoring data will be reported to the NWB through either the Water Licence Annual Report or an Annual Inspection Report:

- Monthly quantities of the waste rock and overburden placed into the WRSFs during mine operation.
- Once production has started waste rock samples will be taken from the production blast holes and analyzed for the percentage of sulphur and carbon. The results from these analyses will be used to differentiate NPAG and PAG based on the derived NPR. To validate the classification method of NPAG/PAG based on NPR, additional samples will be taken evenly at a rate of one sample per 100,000 tonnes of mined material. The collected samples will be sent to an accredited commercial laboratory for ARD and ML using the ABA (the modified Sobek method) and SFE analyses.
- The placed waste rock and overburden are expected to freeze back and permafrost is likely to develop within the WRSFs with time. Thermistors will be installed in each WRSF to monitor the rate of freeze-back and permafrost development progress in the facilities during closure.

Temperature readings will be taken quarterly to track permafrost development within the WRSFs.

- Dust related to waste rock and overburden management is not expected to be an issue by employing the dust suppression measures presented in Section 7.0 through design, operation, and closure phases. Air quality at the mine site will be monitored during construction, operation, and closure through air quality monitoring stations and reported annually.
- The performance of the WRSFs will be inspected and assessed during the annual geotechnical site inspection by a geotechnical or civil engineer registered in Nunavut. The visual assessment and recommended actions to be taken related to the WRSFs will be summarized in the Annual Inspection Report. Inspections may occur more frequently at the request of the Inspector. Records of all inspections will be maintained for the review of the Inspector upon request.

The results from the general monitoring program related to waste rock and overburden management will be reported to the Regulators in the annual water license report or in the annual geotechnical inspection report.

9.2 Monitoring Activities for the TSF

Table 9.2 summarizes the monitoring activities for the TSF. The TSF Detailed Design Report was approved by the Nunavut Water Board on Dec 3, 2018. A more detailed monitoring plan was included in the report and has been incorporated in the following tables.

Table 9.2: Tailings Storage Facility Monitoring Activities

Proposed Monitoring	Monitoring Component	Monitoring Frequency	Reporting
Verification Monitoring	Tailings production rate and solid content	Continuous	Monitoring data will be used by Agnico Eagle internally, and will be reported to the Regulators upon request
	In situ density testing and moisture content determination of recently placed tailings	Weekly	
	Routine visual inspections of TSF	Weekly when water is being actively managed	
	Elevation and geometry survey	Annually	
	Water quality monitoring of CP3	Monthly over the open water season or when water is present	
General Monitoring	Quantities of tailings placed into facilities	Monthly	Monitoring data will be reported to the Regulators in annual water licence report or annual inspection report
	Thermal and freeze-back monitoring	Monthly during Year -1, Quarterly thereafter	
	Dust monitoring related to TSF	Daily during operation phase	
	Geotechnical inspection by qualified Geotechnical Engineer	Annually or more frequent at the request of an Inspector	

9.2.1 Verification Monitoring Program for TSF

A summary of the verification monitoring program for the TSF is presented below.

- The tailings production rate at the mill and solid content will be continuously monitored during mine operation.
- In situ density testing and moisture content of placed tailings will be carried out weekly to ensure that dry density of placed tailings meets the design criteria.
- During the active development of the TSF, the procedures and protocols for routine and annual inspections of the WRSFs will also apply, consistent with the inspection of the TSF.
- The heights of the TSF are estimated to be approximately 33 m. An annual elevation survey of the TSF will be performed to estimate the overall volume placed, determine the reclamation progress, and provide input information to the operation plan.
- The runoff and seepage monitoring procedures and protocols for the WRSFs during mine operation will also apply to the TSF. Specifically, CP3 water quality will be monitored at a monthly frequency or when water is present in accordance with Part I Items 14 and 15 of the Type A Water Licence 2AM-MEL1631.
- Pursuant Part E Item 15 of the Type A Water Licence 2AM-MEL 1631, weekly inspections of water management structures during periods of flow and monthly inspections thereafter will be conducted. These inspections will focus on CP3, D-CP3, Berm 2 and Channel 3.

9.2.2 General Monitoring Program for TSF

A summary of the general monitoring program for the TSF is presented below.

- The monthly quantities of tailings placed into the TSF will be recorded.
- In accordance with Part I Item 13 of the Type A Water Licence 2AM-MEL1631, a TSF thermal monitoring regime will be implemented. This will include a minimum of eight (8) thermistor cables being installed in the TSF to monitor the permafrost development within the facility during operation and closure. The planned locations of these thermistors are shown in Figures 5.1 to 5.3. The temperature readings will be taken monthly during Year -1 and quarterly (i.e. 4 times per year) thereafter to verify thermal conditions and assumptions. The monitoring schedule will be reviewed and modified as necessary. The measured temperatures within the TSF will also provide the background information for the study of permafrost development.
- Dust related to tailings management is not expected to be an issue by employing the dust suppression measures presented in Section 7 through design, operation, and closure phases. Air quality at the mine site will be monitored during construction, operation, and closure through air quality monitoring stations.
- Pursuant Part I Item 14 of the Type A Water Licence 2AM-MEL 1631, the performance of the TSF will be inspected and assessed during the annual geotechnical site inspection by a geotechnical or civil engineer registered in Nunavut. The visual assessment and

recommended actions to be taken related to the TSF will be summarized in the annual inspection report. Inspections may occur more frequently at the request of the Inspector. Records of all inspections will be maintained for the review of the Inspector upon request.
- Visual inspections and monitoring can provide early warning of many conditions that can contribute to structure failures and incidents. Pursuant Part F Item 20 of the Type A Water Licence 2AM-MEL 1631, Agnico Eagle will undertake weekly visual inspections of the TSF and note areas of seepage, unusual settlement or deformation, cracking or other signs of instability. Records of all inspections will be maintained.
- Under Section 3.2 of the Sewage Treatment Plant (STP) Operation and Maintenance Manual (Agnico Eagle, 2017), excess sludge will be disposed of in the TSF. Volume of sewage sludge deposited in TSF will be recorded on a monthly bases pursuant Part I Item 9h of the Type A Water Licence 2AM-MEL 1631.

The results from general monitoring program related to tailings management will be reported to the Regulators in the Annual Water License Report or in the Annual Geotechnical Inspection Report.

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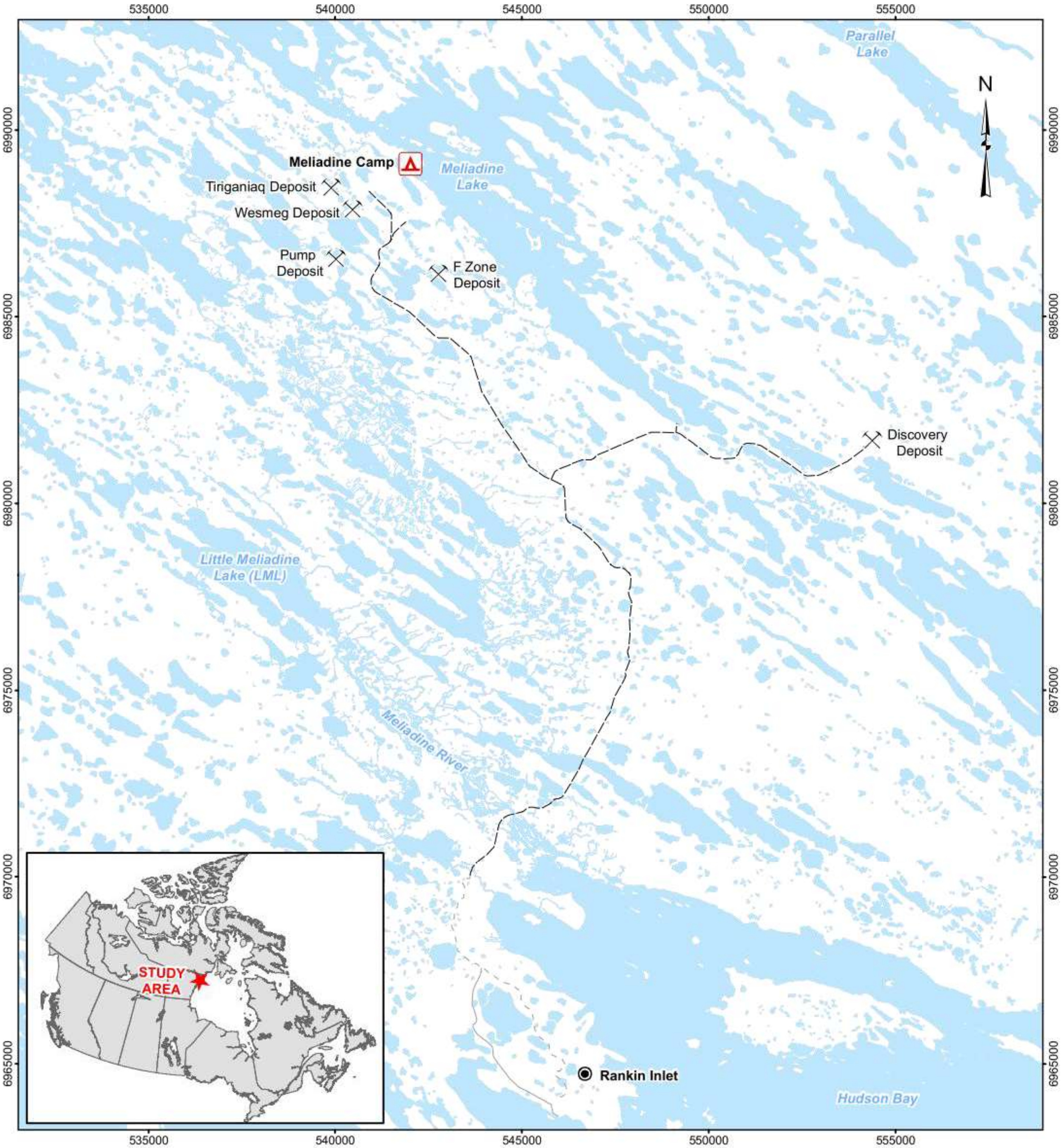
APPENDIX A • FIGURES

FORMAT ANSI A-8.5x11



LEGEND

- Camp
- Proposed Mine Site
- All-weather Access Road (AWAR)
- Road - New
- Road - Existing
- Watercourse
- Waterbody

AGNICO EAGLE

AGNICO EAGLE – MELIADINE GOLD PROJECT

FIGURE 1.1 GENERAL PROJECT LOCATION PLAN

No. PROJET PROJECT No.		DATE	09-23-2014
DESSINÉ PAR DRAWN BY	CB	FEUILLE/SHT	1 / 1
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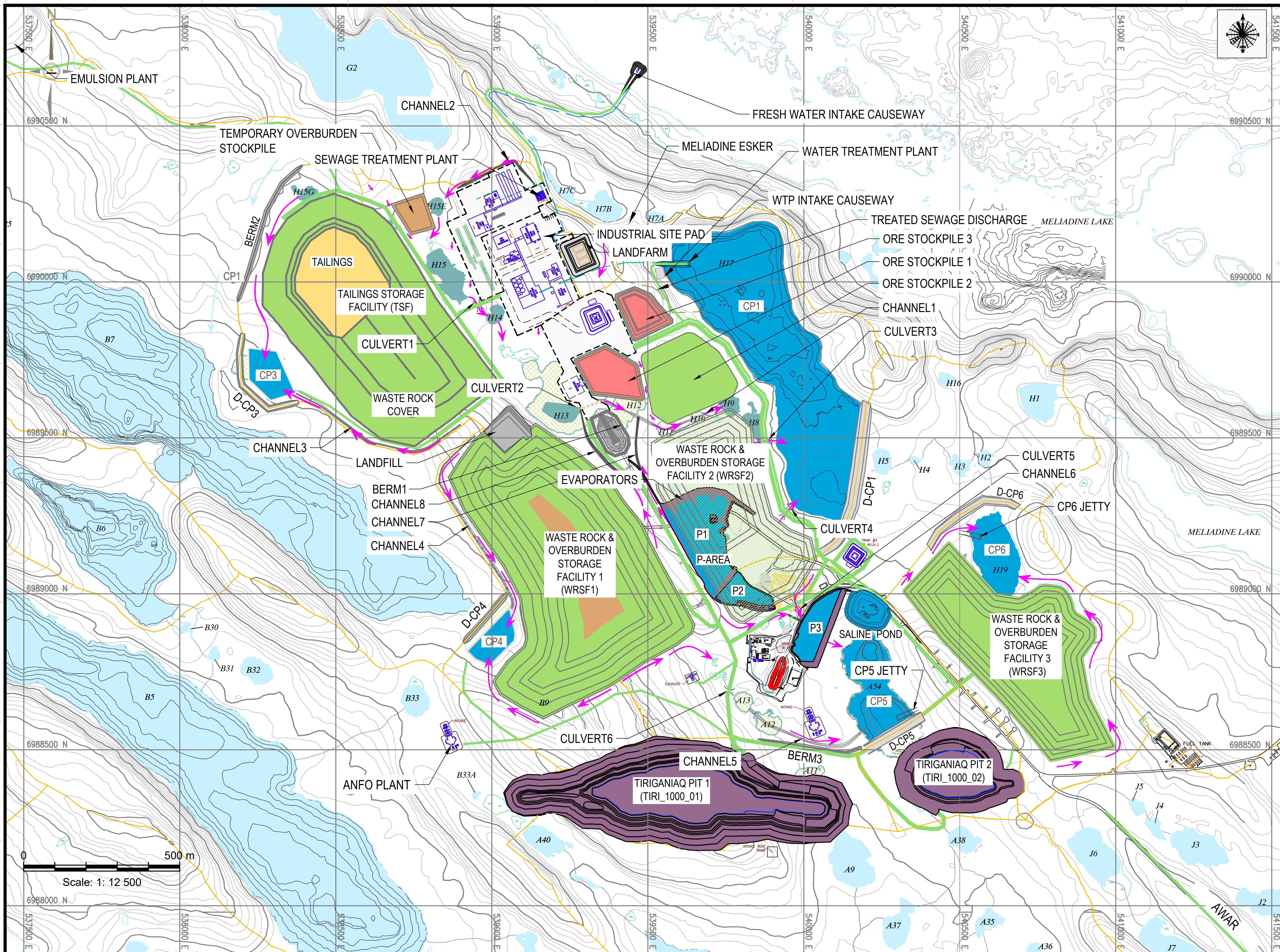

LEGEND

- CATCHMENT BOUNDARY
- SERVICE ROAD
- HAUL ROAD
- NON CONTACT WATERBODY
- CONTACT WATERBODY
- WATER COLLECTION POND
- DRAINED POND AREA
- OPEN PIT
- OVERBURDEN
- WASTE ROCK
- ORE
- TAILINGS
- INDUSTRIAL SITE PAD
- CONTACT WATER FLOW DIRECTION

AGNICO EAGLE

TITRE / TITLE	# DWG
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APPROUVÉ PAR APPROVED BY			
No. PROJET PROJECT NO.			
DATE			

TITRE / TITLE
AGNICO EAGLE – MELIADINE GOLD PROJECT
FIGURE 1.2 GENERAL MINE SITE PLAN LAYOUT

ÉCHELLE/ SCALE	1:12500	FICHIER FILE	.DWG

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I:\OPERATIONS\Water Management\WMP Figures\For Jen\Draft2\FIGURE 1.2R2.dwg

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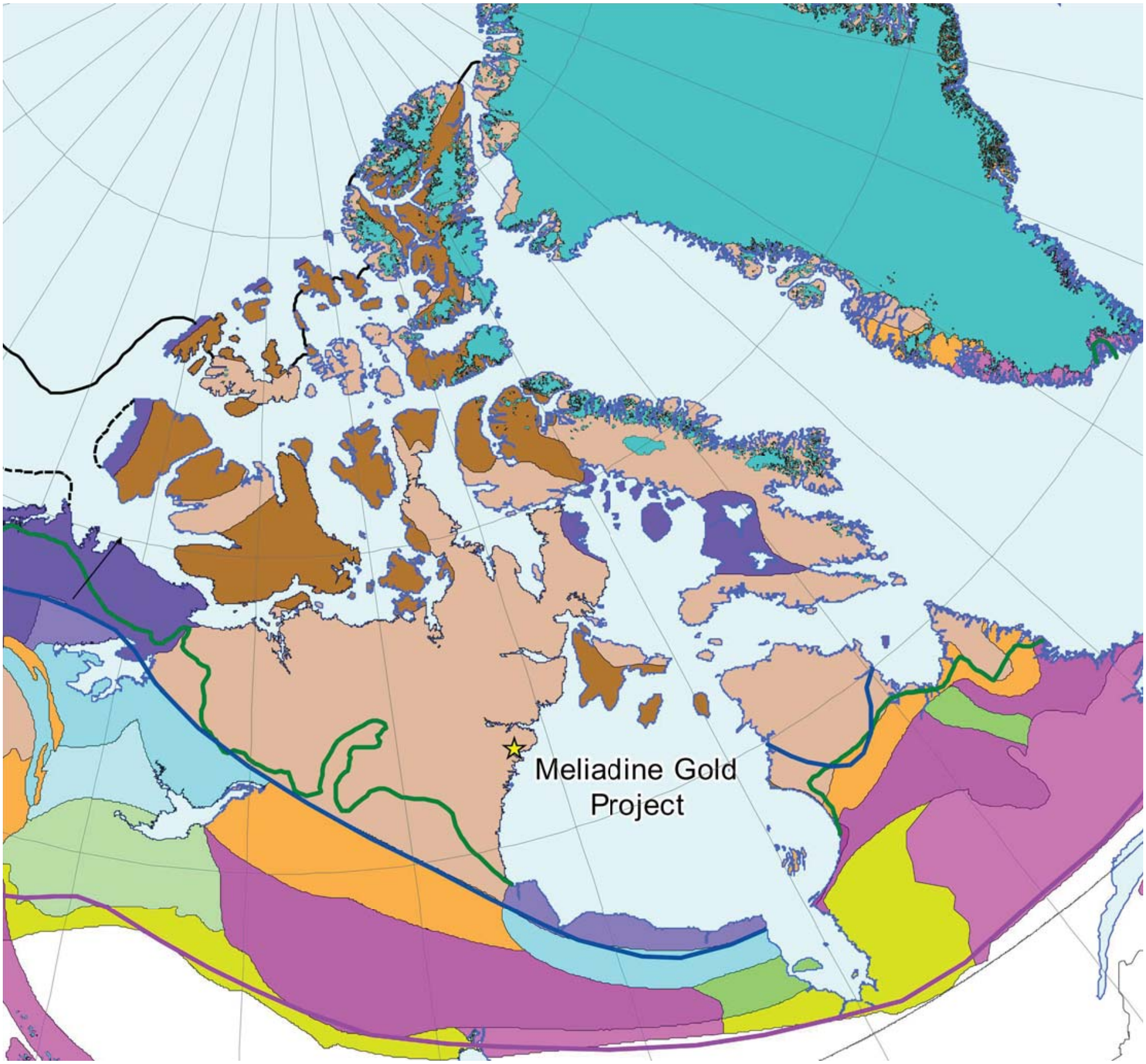

Legend for EASE-Grid Permafrost and Ground Ice Map

Permafrost Extent (percent of area)	Ground Ice Content (visible ice in the upper 10-20 m of the ground; percent by volume) — Lowlands, highlands, and intra-and intermontane depressions characterized by thick overburden cover (>5-10m): High (> 20%)	Medium (10-20%)	Low (0-10%)	Mountains, highlands, ridges, and plateaus characterized by thin overburden cover (<5-10 m) and exposed bedrock): High to medium (>10%)	Low (0-10%)
Continuous (90-100%)	Ch	Cm	Cl	Ch	Cl
Discontinuous (50-90%)	Dh	Dm	Dl	Dh	Dl
Sporadic (10-50%)	Sh	Sm	Sl	Sh	Sl
Isolated Patches (0-10%)	Ih	Im	Il	Ih	Il

Variations in the extent of permafrost are shown by the different colors; variations in the amount of ground ice are shown by the different intensities of color. Letter codes assist in determining to which basic permafrost and ground ice class any particular unit belongs. Letter codes are defined in the documentation that accompanies the data files.

Ice caps and glaciers

LEGEND

- MELIADINE GOLD PROJECT
- SOUTHERN BOUNDARY OF CONTINUOUS PERMAFROST - PRESENT
- SOUTHERN BOUNDARY OF DISCONTINUOUS PERMAFROST - PRESENT
- TREELINE
- SEA-ICE EDGE LIMIT
- SUBSEA PERMAFROST LIMIT

REV	DATE	DESCRIPTION	PAR BY

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AGNICO EAGLE

AGNICO EAGLE – MELIADINE GOLD PROJECT

FIGURE 2.1 PERMAFROST MAP OF CANADA

No. PROJET / PROJECT No.	
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APPROUVÉ PAR / APPROVED BY	HX
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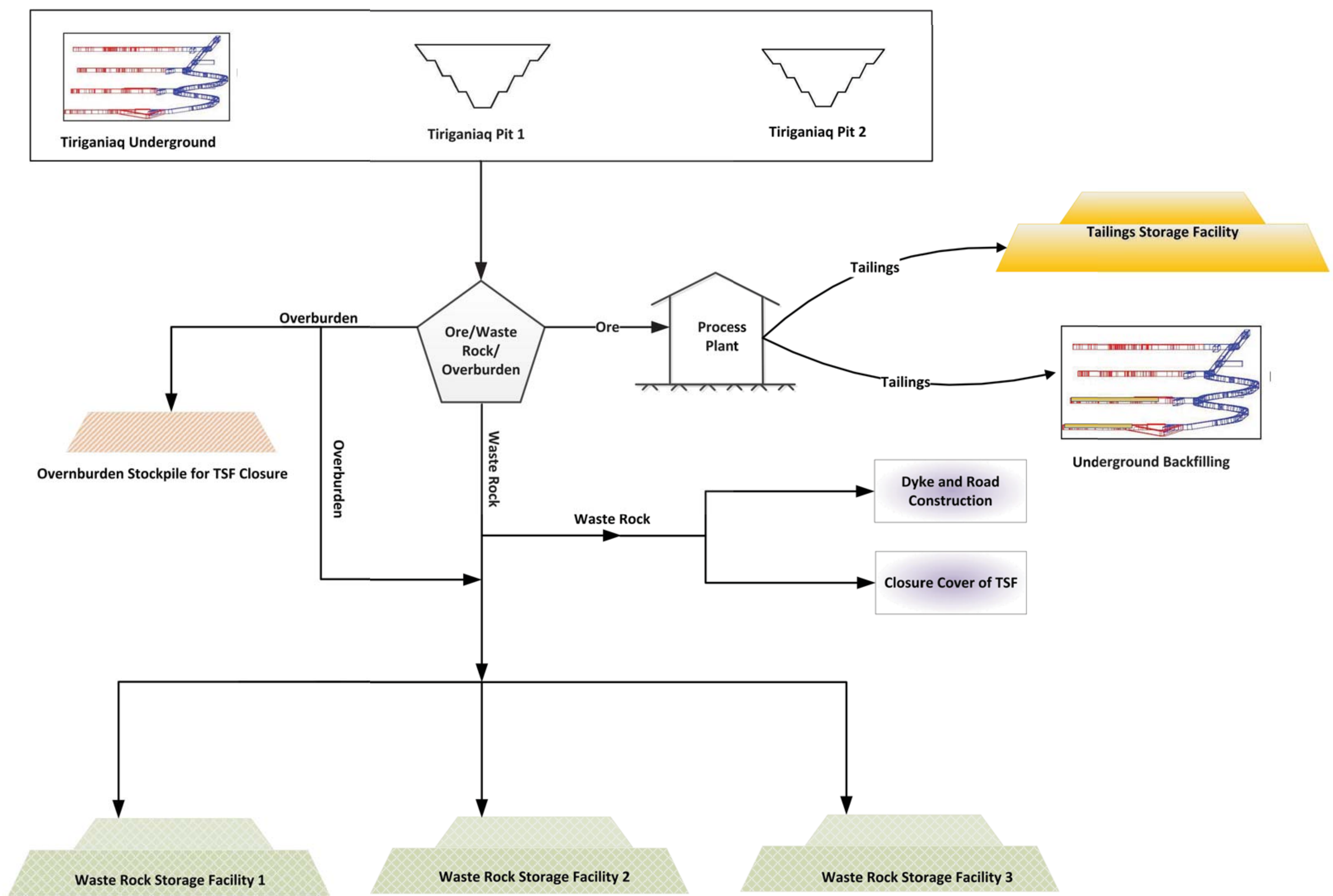

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AGNICO EAGLE

TETRA TECH EBA

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DATE			

TITRE / TITLE
AGNICO EAGLE – MELIADINE GOLD PROJECT
FIGURE 3.1 MINE WASTE MANAGEMENT FLOW DIAGRAM

ÉCHELLE/ SCALE	FICHIER FILE .DWG		
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AE–CART–ANSI B

Q:\Edmonton\Engineering\E141\Projects\E14103209_Meladine_Mgmt_Plans\EBA Drawings\Mine Waste MP\FIGURE 3.1.dwg–September 5, 2014

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LEGEND

CATCHMENT BOUNDARY

WATERBODY

AGNICO EAGLE

TETRA TECH EBA

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APPROUVÉ PAR / APPROVED BY			
No. PROJET / PROJECT NO.	6500		
DATE			

TITRE / TITLE
AGNICO EAGLE – MELIADINE GOLD PROJECT
FIGURE 3.2 LOCATIONS AND FOOTPRINTS OF WASTE ROCK STORAGE FACILITIES AND TAILINGS STORAGE FACILITY

ÉCHELLE / SCALE	1:30000	FICHIER / FILE	.DWG
No. DESSIN / DRAWING NO.	6500-680-210-200	REVISION	A
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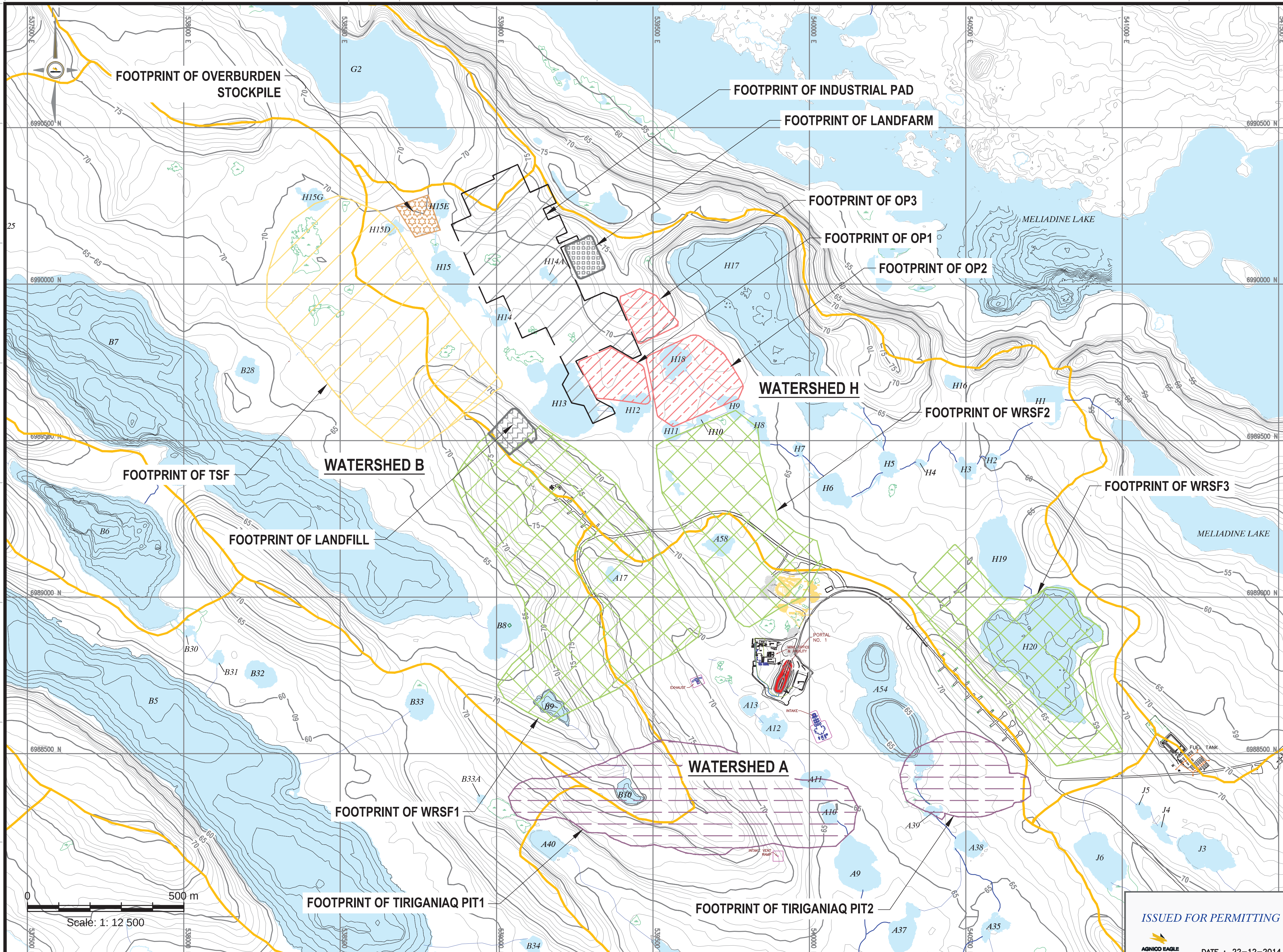

LEGEND

CATCHMENT BOUNDARY

NON CONTACT WATERBODY

AGNICO EAGLE

TETRA TECH EBA

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DATE			

TITRE / TITLE
AGNICO EAGLE – MELIADINE GOLD PROJECT
FIGURE 4.1 WATERSHED AND WATERBODIES AFFECTED BY SITE INFRASTRUCTURE

ISSUED FOR PERMITTING
DATE : 22-12-2014

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Q:\Edmonton\Engineering\E141\Projects\E14103209_Meladine_Mgmt_Plans\EBA Drawings\Mine Waste MP\CAD_Feb_2015\FIGURE 5.1.dwg-September 5, 2014

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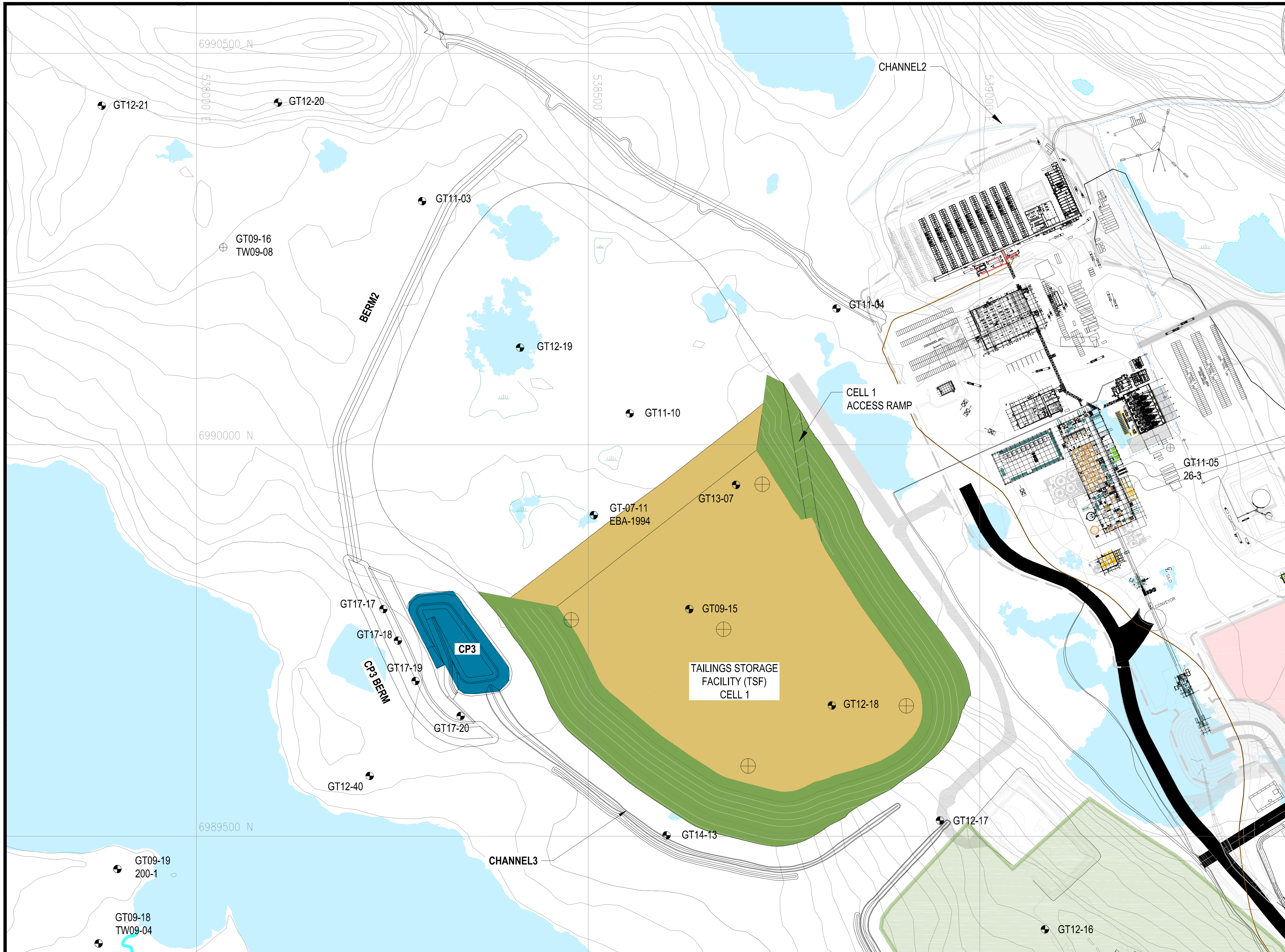

LEGEND

- 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

G. ZHANG
LICENSEE
NOV. 14, 18
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AGNICO EAGLE

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A	ISSUED FOR REVIEW	2018–11–05	

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TITRE / TITLE
MELIADINE TAILINGS STORAGE FACILITY DESIGN

YEAR 2

ÉCHELLE/ SCALE
FICHIER FILE .DWG

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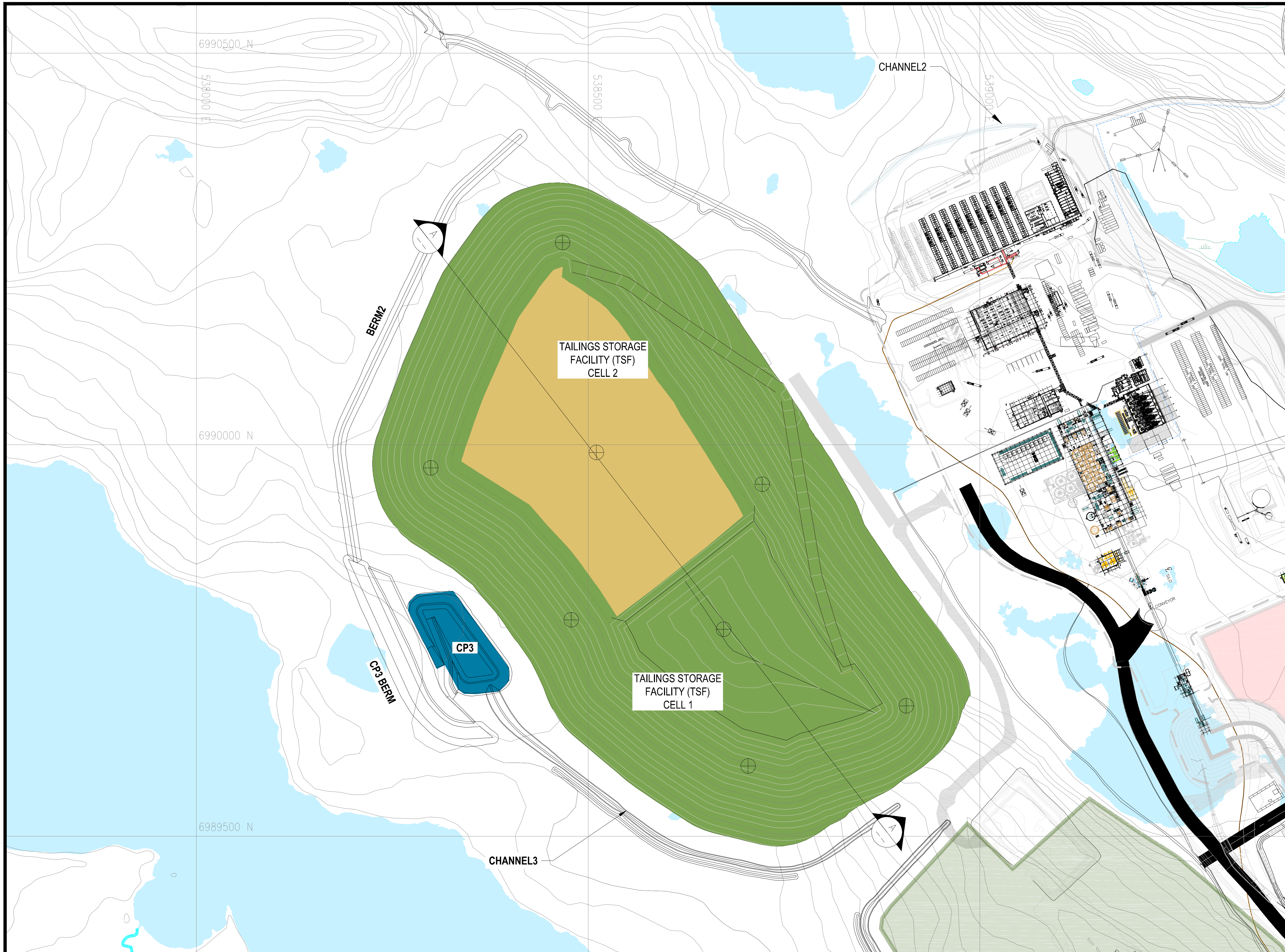

LEGEND

WASTE ROCK
ORE
TAILINGS
WATER COLLECTION POND
PROPOSED GROUND TEMPERATURE CABLE LOCATION

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TITRE / TITLE
MELIADINE TAILINGS STORAGE FACILITY DESIGN

YEAR 7

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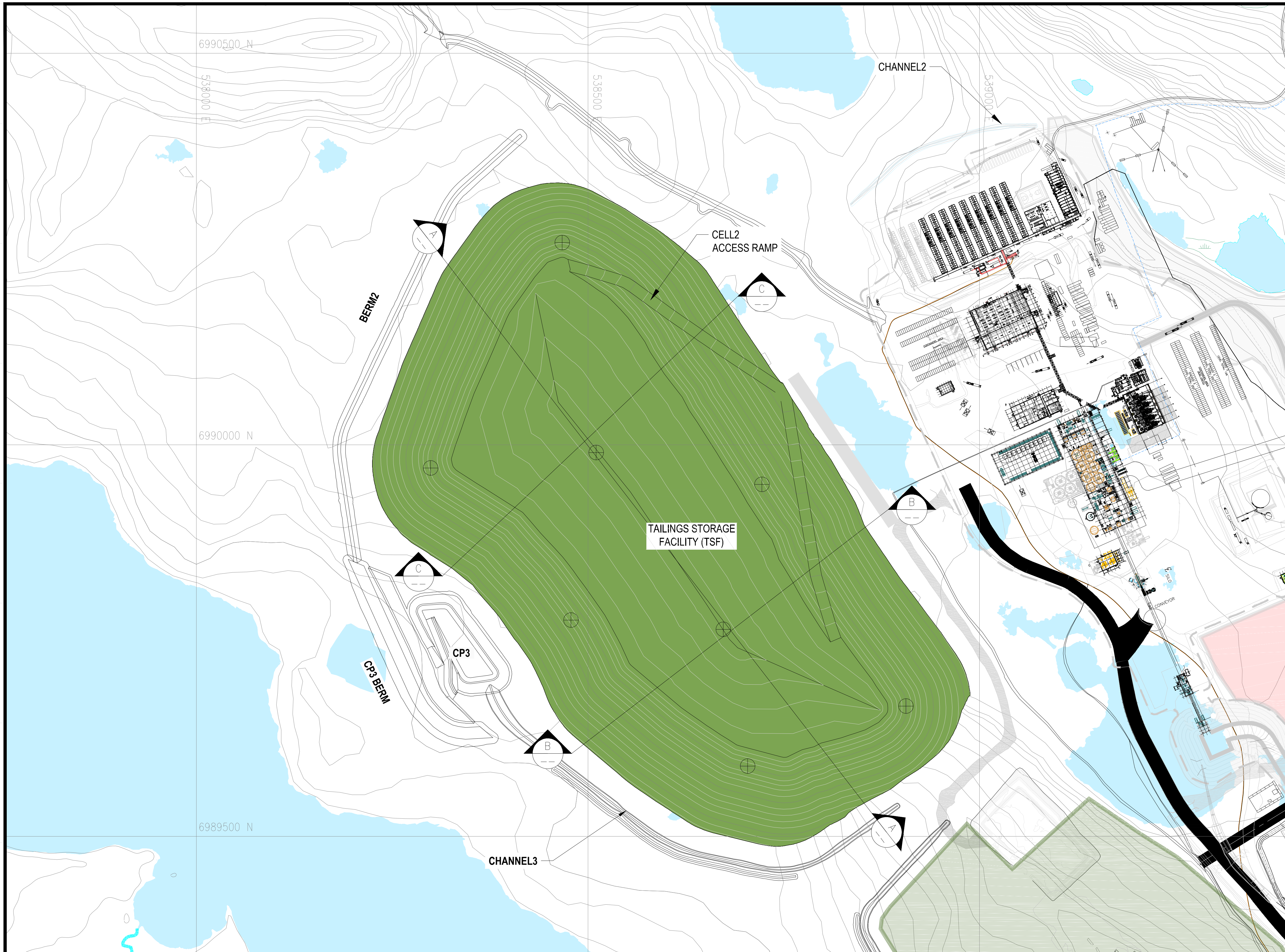

LEGEND

- WASTE ROCK
- ORE
- TAILINGS
- PROPOSED GROUND TEMPERATURE CABLE LOCATION

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CLOSURE

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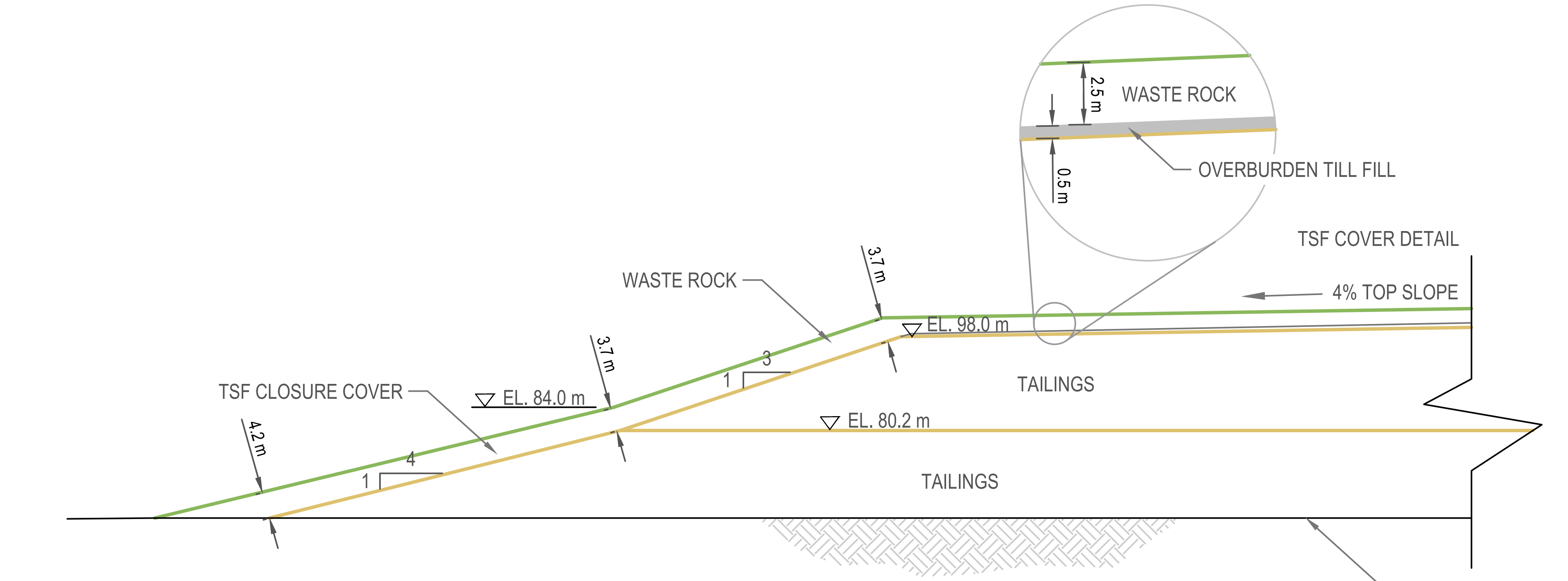
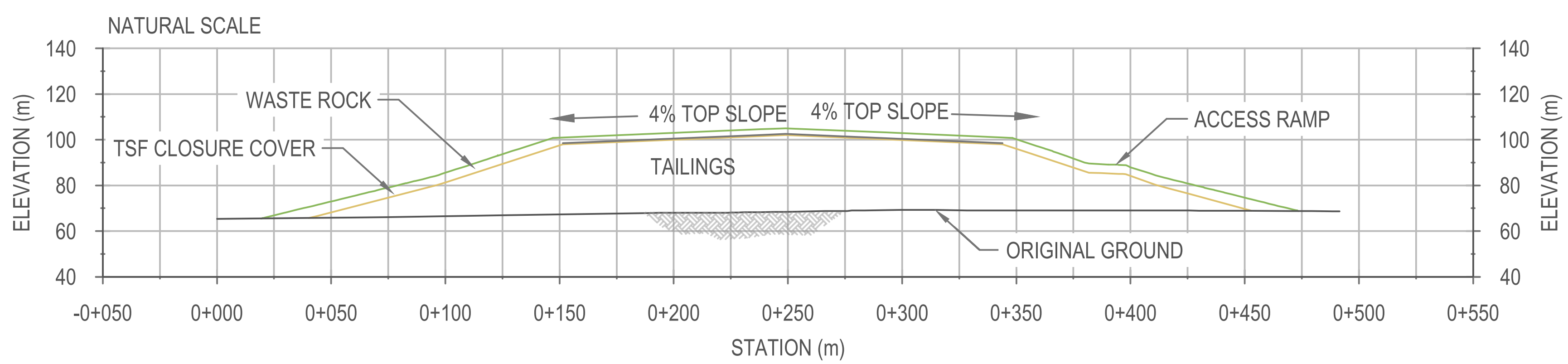
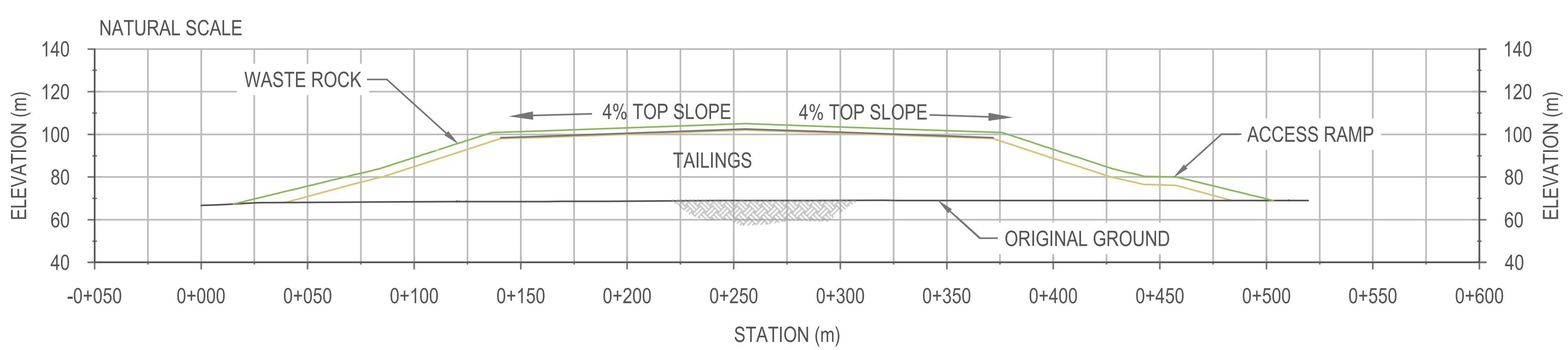


NOTE: TSF CLOSURE COVER THICKNESS AND CONFIGURATION TO BE FINALIZED DURING THE DEVELOPMENT OF THE FINAL CLOSURE COVER DESIGN PENDING PERFORMANCE MONITORING OF DRY STACKED TAILINGS FACILITY DURING OPERATION.

TYPICAL DESIGN SECTION FOR TSF



SECTION B–B THROUGH CELL 1



SECTION C–C THROUGH CELL 2

NOTES:

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Date Nov. 14, 2018
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER G. ZHANG LICENSEE NWT/NU Nov. 14, 2018

AGNICO EAGLE

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TITRE / TITLE
MELIADINE TAILINGS STORAGE FACILITY DESIGN

TYPICAL DESIGN SECTION OF TSF AND SECTIONS B–B AND C–C THROUGH CELLS 1 AND 2

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APPENDIX B • TAILINGS STORAGE FACILITY DESIGN REPORT AND DRAWINGS

Tailings Storage Facility (TSF) Design Report and Drawings
6515-583-163-REP-001

30-Day Notice to Nunavut Water Board
In Accordance with Water License 2AM-MEL1631 (Part D, item 1)

Prepared by:
Agnico Eagle Mines Limited – Meliadine Division

November 2018

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1	November 15, 2018			Design Report

Prepared by:

REGISTERED PROFESSIONAL ENGINEER
J.J. PYLIUK
LICENSEE
NOV. 15, 2018
NT/NU

Jennifer Pyliuk, M. Eng., P. Eng.(NWT, Nunavut)
Geotechnical Engineer

Blandine Arseneault

Signature numérique de Blandine Arseneault
DN : cn=Blandine Arseneault
Date : 2018.11.15 14:19:13 -05'00'

Blandine Arsenault
Project Environment Lead

Approved by:

Philippe Lapointe

Signature numérique de Philippe Lapointe
DN : cn=Philippe Lapointe
Date : 2018.11.02 16:05:55 -04'00'

Philippe Lapointe
Engineering Superintendent

Nancy Duquet Harvey
Environment Superintendent

Thomas Lepine

Digitally signed by Thomas Lepine
DN: cn=Thomas Lepine
Date: 2018.11.15 15:12:33 -05'00'

Thomas Lepine, P. Eng. (NWT,Nunavut)
Engineer of Record

1 INTRODUCTION

Agnico Eagle Mines Limited (Agnico Eagle) is developing the Meliadine Project (the Project), a gold mine located approximately 25 km north of Rankin Inlet and 80 km southwest from Chesterfield Inlet in the Kivalliq Region of Nunavut. Situated on the western shore of Hudson Bay, the Project site is located on a peninsula between the east, south, and west basins of Meliadine Lake (63°1'23.8'' N, 92°13'6.42"W).

The current mine plan focuses on the development of the Tiriganiaq gold deposit which will be mined using both conventional open-pit and underground mining operations. Existing or proposed mining facilities to support this development include a plant site and accommodations, overburden stockpile, tailings storage facility (TSF) and a water management system comprised of collection ponds, diversion channels, dikes and retention berms. A Type “A” Water License (No. 2AM-MEL-1631) was awarded to Agnico Eagle for the development of this Project in 2016.

Tailings generated from mill production at the Project will be dewatered by pressure filtration to a solids content of approximately 85% by weight. The filtered tailings will have the consistency of damp, sandy silt and will be transported by haul truck to either the paste plant for use underground as backfill or for placement and storage in the TSF in a process conventionally referred to as “dry stacking”. Production of filtered tailings is expected to commence in Q1 of 2019 as part of the commissioning process for the mill.

In accordance with Part D of the Type “A” Water License, this report summarizes the design basis and design criteria for the TSF. Also provided are construction and operational procedures, thermal instrumentation and monitoring requirements and issued for construction (IFC) drawings.

2 GENERAL SITE CONDITIONS

2.1 CLIMATE

The Project site lies within the Southern Arctic Climatic Region, where daylight reaches a minimum of four hours per day in winter and a maximum of 20 hours per day in summer. The nearest weather station is Rankin Inlet A (Station 2303401), located approximately 25 km south of the Project site.

The climate is extreme, experiencing long cold winters and short cool summers. The monthly mean air temperature is typically above 0°C for the months of June to September, and is below 0°C between October and May. July is typically the warmest month with a mean temperature of 12°C and January the coldest with a mean temperature of -31°C. The mean annual temperature for the period of record from 1981 to 2009 was -10.4°C.

Mean annual precipitation at the Project site is estimated to be 411.7 mm, after accounting for rainfall and snowfall undercatch (based on the hydrological year from October 1 to September 30). Approximately 51% of the precipitation occurs as rainfall, while 49% occurs as snow.

The region is known for high winds, blowing from the north and north-northwest direction more than 30% of the time. The mean values for wind speed show that the north-northwest, together with north and northwest winds, have the highest speeds and tend to be the strongest. Mean monthly wind speeds are typically between 19 km/hour and 27 km/hour. Calm winds occur at a frequency of only 2.8%.

The climate in the Project region is projected to be warmer for the 2020s, 2050s, and 2080s time horizons when compared to the observed historic values (Agnico Eagle and Golder 2014).

Precipitation shows an increase compared to historical values, but the majority of projections are not significantly different from the annual recorded precipitation value

2.2 PERMAFROST

The Project site is located within the Southern Arctic terrestrial eco-zone in an area of continuous permafrost. Continuous permafrost to depths of between 360 m to 495 m is expected based on ground temperature data from thermistors installed throughout the Project site and as measured in underground development. The measured ground temperature data indicates that the active layer is 1.0 m to 3.0 m in areas of shallow soils and areas away from the influence of lakes. The typical permafrost ground temperatures at the depths of zero annual amplitude (typically at a depth of below 15 m) are in the range of -5.0°C to -7.5°C in the areas away from lakes and streams. The geothermal gradient ranges from 0.012°C/m to 0.02°C/m (Golder 2012a).

2.3 GROUNDWATER

In areas of continuous permafrost, there are generally two groundwater flow regimes: a shallow groundwater flow regime located in the active layer near the ground surface, and a deep groundwater flow regime located beneath permafrost. From late spring to early autumn, when temperatures are above 0˚C, the active layer thaws. Within the active layer, the water table is expected to be a subdued replica of topography, and is expected to parallel the topographic surface. The Project area groundwater in the active layer flows to local depressions and ponds that drain to larger lakes.

The permafrost in the rock in the Project area would be virtually impermeable to groundwater flow. The shallow groundwater flow regime, therefore, has little to no hydraulic connection with the deep groundwater regime. A numerical hydrogeological model for the deep groundwater flow regime was developed (Golder 2013a). The results of the hydrogeological model have indicated that the rock at the Project site below the base of the permafrost or in taliks is generally of low hydraulic conductivity, on the order of 3×10^{-9} m/s (Golder 2013b).

To a lesser degree, groundwater beneath the permafrost is influenced by density differences due to the upward diffusion of deep-seated brines (density-driven flow). In the Canadian Shield, concentrations of Total Dissolved Solids (TDS) in groundwater increase with depth, primarily in response to upward diffusion of deep-seated brines. Salinity can induce a freezing point depression, creating a cryopeg in permafrost where water can be unfrozen even though the temperature is below 0°C. At the Project site, the freezing point depression was calculated to be equivalent to -3.3°C (Golder 2012a). The portion of the permafrost, where groundwater may be partially or wholly unfrozen due to the freezing point depression, has been estimated to be at a depth of 350 m to 375 m (Golder 2012a).

2.4 SEISMIC ZONE

The Project is situated in an area of low seismic risk. The peak ground acceleration (PGA) for the area was estimated from the 2015 National Building Code of Canada seismic hazard website (http://earthquakesscanada.nrcan.gc.ca). 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.

3 DESIGN BASIS

3.1 2018 MINE WASTE MANAGEMENT PLAN

As part of the documentation series produced for the Type "A" Water License application, Agnico Eagle presented a Mine Waste Management Plan (MWMP) for the Project in March of 2018. This plan described the feasibility-level design basis and general operational procedures for the TSF.

Key points for the design and construction of the TSF from the 2018 MWMP included the following:

- A total of 12.1 Mt of tailings will be produced over a mine life of approximately eight (8) years. About 9.7 Mt of tailings (80% of the total) will be placed in the TSF as dry stack tailings, with the remaining 2.4 Mt (20% of the total) to be used as underground cemented paste backfill for the primary and longitudinal stopes.
- Process commissioning and tailings placement is to begin in Q2 of Year -1 (2019), with full ore processing capacity expected at the end of Q3 (Year -1).

3.1.1 Refinements Since 2018 Mine Waste Management Plan

Refinements to the expected production schedule and predicted quantities have been made since the release of the March 2018 MWMP. Specifically, full ore processing capacity is now anticipated in early Q2 of Year -1 (2019), or about six (6) months ahead of the previous schedule. Accordingly, commissioning and early tailings placement have also advanced, with initial commissioning activities now slated to begin at the very end of Q4 of Year -2 (2018).

The current projections of expected tailings quantities have increased, with the total amount over the eight (8) year life-of-mine now anticipated to be approximately 14.9 Mt. A greater proportion of tailings are now slated for use as underground backfill (27% or 4.0 Mt), while a lesser proportion (73% or 10.9 Mt) will be stored in the TSF.

Table 1 summarizes the production schedule, quantities and distribution of the tailings by year.

Table 1: Schedule, Quantities and Distribution of Tailings by Year

Year	Mine Year	Tailing Solids from Mill (t)	Tailing Solids to be Used as Underground Backfill (t)	Tailing Solids to be Placed in Dry Stack 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**

** Includes approximately 60,000 t of tailings produced during commissioning from end Q4 (2018) to Q1 (2019)*

3.2 TAILINGS PROPERTIES AND CHARACTERISTICS

3.2.1 Geotechnical Properties

Laboratory testing to establish the physical and geotechnical properties to guide design of the TSF was conducted by Tetra Tech (EBA, 2013 and Tetra Tech EBA, 2014a). The test program included physical index testing, gradation analysis, moisture-density relationship (Standard Proctor) testing, consolidation, direct shear, hydraulic conductivity and soil water characteristics. The key findings from the test results are summarized as follows:

- The tailings will comprise approximately 17% sand, 81% silt and 2% clay-sized particles. The material is of low plasticity and low compressibility;
- The maximum dry density is 1,800 kg/m^3 at an optimum moisture content of 14.9% (Standard Proctor);
- The coefficient of consolidation (c_v) of the tailings ranges from 24.6 to 29.8 m^2/year under pressures ranging from 10 to 1,600 kPa;
- The tailings have a soil water characteristic curve with an air entry value of 20 kPa and a residual suction of 900 kPa;
- For tailings samples with a dry density of 1,700 kg/m^3, the inferred angle of friction is 33.5º and the apparent cohesion is 9.9 kPa. The saturated hydraulic conductivity for these samples is 2.91 x 10^{-07} m/sec;

3.2.2 Geochemical Characteristics

A series of waste geochemical characterization programs were carried out between 1998 and 2011, with the principle findings presented in Golder 2014. Testing the acid rock drainage and metal leaching potential included mineralogical and chemical composition testing, acid base accounting (ABA), shake flask extraction (SFE), humidity cell tests (HCTs), large column tests and field cell tests. Results of the geochemical characterization indicate that both the tailings from the Tiriganiaq deposit and the waste rock is considered non-potentially acid generating (NPAG) and have low potential for metal leaching (ML).

Salinity content stimulation indicate levels of 8,000 ppm of chlorides can be expected in the steady state process water, assuming a 3% moisture content of the ore (Soutex, 2016).

3.3 LOCATION AND SURFACE CONDITIONS

The TSF will be located on the high ground to the west of the Process Plant and east of Lake B7. Drawing 6515-583-163-001 in Appendix A shows the proposed footprint of the TSF in relation to other site infrastructure, including the TSF water management facilities and haulage roads. Haulage distance from the mill to the TSF ranges from 400 m to 800 m, while a minimum distance of approximately 200 m from the edge of the dry stack pile to Lake B7 is respected.

With the exception of the southeast corner of the proposed facility, which encompasses the top of the northern tip of the Tiriganiaq esker, the ground surface of the proposed 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. Vegetation in the area consists of moss/peat cover. 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.

3.4 SUBSURFACE GEOTECHNICAL CONDITIONS

Numerous site investigation programs have been conducted at Meliadine since 1998, with a total of seven (7) boreholes having been drilled within the proposed TSF footprint. The location of these boreholes is shown on Drawing 6515-583-163-002 and the key geotechnical information summarized in Table 2.

In general, the subsurface of the TSF consists of a thin layer of organic material overlying ice-rich silty sand, gravelly silt and sand, with traces of clay and shells with cobbles. Excess ice was observed in most of the boreholes. The depth to bedrock ranges from 1.3 m on the eastern side of the TSF to 7.3 m at the southeastern side.

Table 2: Summary of Geotechnical Information from Overburden Soils in TSF Area

Borehole No.	Organic Layer Thickness (m)	Overburden Soil Description	Ice Conditions	Bedrock Depth (m)
GT07-11	0.20	Sand, ice-rich fine-grained materials, till (not logged in detail)	~2.25 m (from 0.75 to 2.0 m) ice-rich fine-grained material with up to 75% ice	~5.5
GT09-15	0.30	Low recovery – gravel, silty sand	NA - Thawed during drilling	3.5
GT11-10	0.75	Silty peat, ice and silt, gravelly sandy silt	1.75 m ice and silt from 0.75 m to 2.5 m	6.3
GT12-18	--	Gravelly silty sand, sandy silt, silty sand	Vs from 1 to 2 m	7.3
GT12-19	--	Gravelly silty sand, sandy silt, silty sand	Vs to Vc, Vr from 2 to 2.7 m	3.1
GT13-07	0.10	Boulders, sand and silt	NA – thawed during drilling	1.3
GT14-13	0.10	Silty gravelly sand, sand and silt	Up to 10% Vx, Vc, 5% from 1.8 m to 3.2 m	3.2

3.5 ADDITIONAL KEY DESIGN CONSIDERATIONS

In addition to the expected tailings production schedule, quantities and characteristics, a number of other factors were reflected in the detailed design of the TSF. Additional key considerations include:

- **Site climate conditions**: The geographic location of the site was maximized to promote the tailings freezing process, freeze-back of the underlying foundation soils and encourage permafrost development in the facility;
- **Environmental obligations**: Avoidance of impacts on fish-bearing habitat by maintaining a suitable buffer distance from protected natural lakes, minimizing the overall footprint and limiting surface dust generation;
- **Water management**: Facilitate the collection and management of contact water from the TSF during operations to avoid potentially negative impacts on the outside environment and where feasible, divert clean, natural run-off to avoid contact with the tailings and minimize water flow through the TSF area;
- **Geotechnical issues**: Including favorable geotechnical foundation conditions, controlling surface erosion and maintain the short and long term stability of the facility;
- **Constructability/Operational concerns**: Minimize haulage wherever feasible, reduce pre-production construction and optimize local construction availability;

- **Closure**: Reduce closure costs by facilitating early progressive closure of the facility during mine operations when cover materials are readily available and establish a proper closure cover system to limit the potential for long-term seepage through the tailings.

4 DESIGN OF TAILINGS STORAGE FACILITY

4.1 DESIGN CONCEPT AND PARAMETERS

To address the numerous considerations presented in the design basis for the TSF, filtered tailings will be managed using a two-cell placement system and incorporating a progressive closure cover as placement advances. Table 3 presents the key parameters adopted for the detailed TSF design.

Table 3: Key Design Parameters for the TSF

Design Parameter	Value
Filtered tailings solid content to TSF	85% w/w (weight percentage)
Moisture content of filtered tailings to TSF	17.6% (by mass)
Minimum target dry density of compacted tailings	1,650 kg/m^3
Average height of filtered tailings over original ground surface	33 m
Side slope for lower placed tailings (below elevation 80.2 m)	4H:1V
Side slope for upper placed tailings (above elevation 80.2 m)	3H:1V
Slope of 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

4.1.1 Refinements Since 2018 Mine Waste Management Plan

The 2018 MWMP presented a three-cell management system that had originally been proposed during the 2014 feasibility level scoping assessment. However, a two-cell system has been progressed during detailed design, which offers the following technical advantages over the previously discussed three-cell system:

- **Construction access**. To accommodate the additional 1.2 Mt of tailings expected to be placed in the TSF, both the overall footprint and the average height of the facility have increased slightly from the 2018 MWMP. In order to maintain an acceptable 10% grade on the access ramps to the upper levels of the facility with a three cell system would have required either switch-backs or wrap around ramps, both of which would have further decreased available space and introduced potential safety concerns.
- **Freeze-back**. The two-cell system provides a thinner annual tailings placement which thereby enhances the freeze-back potential of both the underlying ground surface and the placed tailings.

The 2018 MWMP provides a dry density value of 1,710 kg/m^3 for the filtered tailings, which corresponds to 95% compaction when compared to the maximum dry density of 1,800 kg/m^3 (Standard Proctor, ASTM D698) and optimum moisture content of 14.9%. Since the filtered tailings are anticipated to leave the mill at a moisture content that is 2.7% wetter than the optimum, it is anticipated that the 1,710 kg/m^3 dry density will be difficult to achieve in field conditions, particularly during winter placement. For the purposes of detailed design therefore, the more conservative target dry density value of 1,650 kg/m^3 was adopted, which reflects 92% of the maximum dry density value.

4.2 STABILITY ANALYSIS

Limit equilibrium analyses were conducted to calculate the deterministic factor of safety (FoS) against slope failure under both static and pseudo-static (seismic) conditions during the 2014 feasibility study. Typical cross sections of the TSF were evaluated under short and long term construction and closure situations assuming various conditions. The minimum calculated FoS assuming unfrozen tailings and ground conditions under various loading scenarios from this analyses are provided in Table 4.

Table 4: Summary of Slope Stability Analysis Results

Loading Scenario	Calculated Minimum Factor of Safety (Tetra Tech, 2014)	Condition
Short-term static (Construction)	2.1	Unsaturated, unfrozen tailings overlying unfrozen ice-rich silt, water table on ground surface, excess pore water pressures generated
Long-term static (Closure)	1.9	Unsaturated, unfrozen tailings overlying thawing ice-rich silt, water table on ground surface, no excess pore water pressures
Long-term pseudo-static (Closure)	1.7	Same condition as above with addition of appropriate peak ground acceleration for seismic condition

Generally, the selection of a design FoS for an earth structure depends on the importance of the structure, potential failure consequences, and uncertainties involved in design loads and soil parameters. The 2014 stability analysis compared the calculated safety factors to guidelines for mine waste dumps as presented in PAE (1991). Updated guidelines for mine waste dump and stockpile design and suggested stability acceptable criteria based on overall consequence of failure and confidence level on site conditions, input parameters, and supporting data have been presented by Hawley and Cunning (2017). The consequence of failure for the TSF can be classified as “Low” for low risk of structure failure and “Moderate” for potential moderate environmental impacts (but manageable). The confidence level can therefore be classified as “Low” to “Moderate”.

Based on the classifications and site conditions, the minimum FoS for the TSF stability design are adopted as presented in Table 5.

Table 5: Design Factors of Safety for TSF Stability

Conditions	Suggested Factor of Safety in PAE (1991)	Suggested Factor of Safety in Hawley and Cunning (2017)	Design Factor of Safety Adopted for TSF
Long-term, static loading for shallow slip surfaces	1.2	N/A	**1.2**
Short-term, during construction for overall stability (or deep-seated slip surfaces)	1.3 – 1.5	N/A	**1.3**
Long-term static loading for overall stability (or deep-seated slip surfaces)	1.5	1.4 – 1.5	**1.5**
Long–term seismic (pseudo-static) loading for overall stability (or deep-seated slip surfaces)	1.1 - 1.3	1.1 – 1.15	**1.1**

The results indicate that the calculated FoS for the TSF exceed industry and AEM requirements for all loading scenarios assuming unfrozen tailings and ground conditions. The stability analyses did not consider the freeze back that is expected to occur in the facility and the related accompanying increase in strength parameters. As the 2014 results are therefore considered conservative, and as the general geotechnical parameters of the TSF are unchanged since the initial stability assessment, there are no plans to update this analysis at this time.

4.3 THERMAL ANALYSIS

Thermal analysis was conducted to estimate the thermal conditions of the tailings and the foundation soils during mine operations and closure during the 2014 feasibility study, with a summary of these results reported in the following paragraphs. It is recognized that this analysis is reflective of the tailings placement plan and schedule of the 2018 MWMP and requires updating based on the quantities and schedule presented in this report. However, although overall filtered tailings quantities have increased, the adaptation of a two-cell management system is expected to increase freeze-back capabilities so that the 2014 thermal analysis is anticipated to be conservative.

The results from the 2014 thermal analysis indicated that given the assumed conservative initial tailings temperatures of 15°C to 25°C when placed:

- The original overburden ground below the tailings can freeze back and be maintained in a frozen condition afterwards, with the estimated temperature being around -4°C in the long term;
- The majority of the tailings placed would freeze after one winter and would remain frozen except for the final top thick layer placed during the late stages of cell development or the layer placed within the active layer;
- Almost all the tailings will become frozen within several winters after the final closure cover is placed;
- The predicted temperatures of the placed tailings range from -1°C to -4°C within 100 years of assumed climate change conditions after initial mine closure.

The thermal model will be verified and refined on a periodic basis throughout the life-span of the TSF, as ground/tailings temperature monitoring data and as-built information becomes available.

4.4 CREEP AND LONG TERM DEFORMATION

As noted in Section 3.4, the foundation soils underlying the TSF tend to be ice-rich, with excess or visible ice observed in most of the boreholes drilled throughout the footprint. As frozen soils and ice act as visco-elastic materials under loading and exhibit time dependant deformation (creep), analysis was conducted during the 2014 feasibility assessment to evaluate the potential for creep movements of the ice-rich material in the TSF foundation. The analysis was based on the conservative assumption of the presence of a continuous 1 m thick layer of ice-rich silt beneath the entire TSF footprint. Based on predicted long-term overburden temperatures of -4°C (from the thermal analysis), the results of the creep analysis are summarized as follows:

- Maximum horizontal displacements are expected to occur at the middle of the TSF side slopes, with 0.07 m of horizontal movement predicted ten years after closure and 0.55 m of movement after 100 years;
- Maximum vertical displacements occur at the crest of the TSF side slopes, with 0.02 m of movement predicted ten years after closure and 0.26 m after 100 years;

- The TSF and ice-rich permafrost foundation are expected to deform in secondary creep with a low strain rate of 3.4×10^{-7}/hour or less in the long term.

As mentioned, these results are based on conservative assumptions regarding the underlying foundation soils of the TSF and may be updated as required as the thermal model continues to be verified and refined.

4.5 PROGRESSIVE AND FINAL CLOSURE COVER

The TSF final closure cover was designed based on the thermal and stability analysis conducted at the feasibility stage of the project and has the design objectives of controlling erosion and dust generation from the stack, in addition to enhancing the freeze-back capabilities of the facility. To reduce final closure costs and minimize erosion, cover material on the side slopes will be placed progressively with the filtered tailings. The closure cover design may be updated when required pending performance monitoring of the TSF during mine operations.

Cover material placed on the side slopes will:

- Consist of 600 mm minus NPAG waste rock, of varying gradation;
- Be placed in controlled lifts of maximum 1.0 m in height prior to compaction with a 10-ton vibratory roller;
- Be placed in minimum thicknesses of 4.2 m over the lower toe of the final tailings side slopes and in minimum thicknesses of 3.7 m over the upper side slopes.

Final closure cover material will be placed when each cell reaches its operational capacity and sloped 4% to discourage ponding and surface infiltration. In addition to a top capping of 2.5 m thickness of 600 mm minus waste rock, the final cover will incorporate select overburden till placed and compacted over the top surface of the tailings. The till material is intended to reduce surface infiltration and enhance freeze-back potential and enhance thermal protection 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.

Volumes of closure cover material distributed by year are provided in Table 6.

Table 6: Summary of Cover Material Quantities during Mine Operations

Year	Mine Year	Volume of Waste Rock Placed on Side Slopes (m3)	Volume of Waste Rock Placed on Final Top Surface (m3)	Total Volume of Waste Rock Placed as Closure Cover (m3)	Total Volume of Overburden Placed on Top Surface (m3)
2019	-1	39,760		39,760	
2020	1	97,036		97,036	
2021	2	89,103		89,103	
2022	3	110,124		110,124	
2023	4	139,379		139,379	
2024	5	117,037	123,942	240,979	22,940
2025	6	154,474		154,474	
2026	7	127,840		127,840	
2027	8	46,250		46,250	
2028	9	--	230,180	230,180	42,610
Total		**921,003**	**354,122**	**1,275,125**	**65,550**

5 CONSTRUCTION METHODS AND PROCEDURES

5.1 PRE-CONSTRUCTION

Limited pre-construction activities are required at the TSF prior to tailings placement. As the facility is generally located on high ground with a series of water management and diversion structures around it, a bottom drainage layer is not necessary and the design assumes that filtered tailings will be placed directly over original ground.

Excess snow and/or ice will be removed from the ground surface before tailings placement and efforts will be made to avoid placement in areas of localized water accumulation.

A topographical survey of each cell will be completed prior to tailings placement.

5.2 OPERATIONAL CONSTRUCTION

After processing, filtered tailings will be deposited via conveyor from the mill to the Tailings Dewatering Building (TDB). The TDB has a maximum storage capacity of approximately 12,000 tonnes of filtered tailings (two to three days at maximum production) in the event that extreme weather conditions or equipment issues prevent haulage.

From the TDB, the tailings will be loaded with a CAT 988 loader into Volvo 40-ton haul trucks and hauled to either the TSF or to the Paste Plant where the filtered tailings will be mixed with cement and used underground as structural backfill for mining operations. The design capacity of the Paste Plant is approximately 3,000 tonnes per day (tpd), with operations expected to commence in Q2 2019.

The general construction sequence of the TSF during mill operations will be as follows:

- Conduct a topographical survey of the original ground surface and place stakes marking the limits of closure material, tailings and lift heights.
- Access from the haul road will be constructed with compacted waste rock cover material.
- Excess snow will be pushed out of the dumping area with the bulldozer during winter placement.
- Tailings will be spread after dumping into controlled lifts of maximum height 0.3 m with a CAT D6 bulldozer.
- Each lift of tailings will be compacted with a CAT CS356 10-ton vibratory drum roller to the target dry density before the next lift is placed.
- Each subsequent lift of tailings material will be “stepped in”, forming a staircase-like structure around the perimeter to establish the required design side slope.
- Waste rock will be placed and compacted around the side slopes as progressive cover material.

Further details regarding the overall deposition plan are provided in Section 6.0.

5.3 QUALITY CONTROL

A quality control plan will be developed and included as part of the Operation, Maintenance and Surveillance (OMS) plan for the TSF. This plan is expected to include on-going verification of design assumptions and parameters, including monitoring of ground/tailings temperatures, moisture content, placement temperatures of the filtered tailings, target dry density (compaction) and pore water salinity.

6 OVERALL TAILINGS DEPOSITION PLAN

The overall tailings deposition plan considers measures to both promote freeze-back of the tailings and the underlying original ground, as well as limit dust generation, control surface erosion and reduce final closure costs. The yearly schedule of deposition per cell, as well as average height of tailings placed in each cell is summarized in Table 7. Drawings 6515-583-163-002 to 6515-583-163-008 in Appendix A illustrate the yearly planned development of the TSF during mine operations and closure.

Table 7: Tailings Placement Schedule and Estimated Tailings Heights

Year	Mine Year	Tailing Solids to be Placed in Dry Stack TSF (t)		Estimated Average Height of Tailings Placed in Each Cell (m)		Planned Tailings Placement Period	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
2019	Yr-1	582,026		1.6		Jan to Dec	
2020	Yr 1	885,037		5.3		Jan to Dec	
2021	Yr 2	1,052,607		10.3		Jan to Dec	
2022	Yr 3	997,007		16.1		Jan to Dec	
2023	Yr 4	868,728	620,522	22.7	2.6	Jan to Jul	Aug to Dec
2024	Yr 5	717,635	992,439	33.0	6.9	Jan to May	Jun to Dec
2025	Yr 6		1,689,813		15.2		Jan to Dec
2026	Yr 7		1,668,059		24.7		Jan to Dec
2027	Yr 8		846,252		33.0		Jan to Aug
Total		**5,103,041**	**5,817,086**				

To promote freeze-back and permafrost development in the tailings and underlying ground surface, the following placement strategies will be adopted:

- Seasonality considerations. November to March is typically a period of sub-zero temperatures and snowfall, while April to October is a period of thawing/freezing conditions with rainfall. The initial lift of tailings over original ground will be placed during winter conditions whenever feasible.
- Restricted yearly tailings thickness. The maximum thickness of tailings placed during the initial year of each cell will be limited to 2.6 m, while the total yearly thickness placed in a cell for subsequent years will be no greater than 10.3 m.

As discussed in Section 5.2, the placed filtered tailings will be spread into thin lifts and compacted, with this placement method expected to reduce the potential for wind erosion and dust generation from the surface. However, dust generation is anticipated to be a challenge during tailings placement in active zones, particularly during the winter months due to freeze drying of the surface. Additional measures to limit dust and control surface erosion of the overall deposition plan will include:

- Placement of progressive closure cover over the final perimeter slopes as soon as possible;
- The final closure cover over the top tailings surface of Cell 1 will be placed when Cell 1 reaches capacity;
- Consideration of prevailing north-northeast wind direction by development of the southern portion of Cell 1 first and progression northward;

- During summer months, dust will be controlled by spraying water and/or other approved chemical dust suppressants if problematic. Winter months will utilize smaller working zones and sealing of the surface through compaction of zones that are finished.

The placement of thin lifts of rock material will be used to facilitate circulation of haul trucks to the deposition point during summer placement if required. These intermittent layers will be covered in tailings when surfaces become trafficable.

Alternate zones for deposition within the TSF, particularly during periods when weather conditions make placement more complex (i.e. heavy rainfall) or if the tailings are produced at less than optimum condition, will be identified.

7 WATER MANAGEMENT

The water management system of the TSF consists of berms, channels and collection ponds designed to collect any seepage and runoff from the filtered tailings, as well as divert water away from the storage facility itself. Design and drawings of the water management infrastructures related to the TSF have been approved by the Nunavut Water Board.

As indicated previously, two catchment systems are impacted by the TSF, with the management strategy for each watershed summarized as follows:

1. CP1 Catchment. Seepage and runoff from the placed filtered tailings within the CP1 catchment area will stream through Culverts 1, 18 and 19 to Channel 1 for deposit in CP1.
2. Lake B7 Catchment. Seepage and runoff will be collected in Pond CP3 either directly or via Channel 3. Water collected in CP3 will be pumped to H13 where it will flow through Channel 1 into CP1. Berm 2 serves to divert surface runoff away from the placed filtered tailings.

All water management infrastructure will remain in place until mine closure activities are complete and monitoring results demonstrate that the contact water quality from the TSF meets the discharge criteria. Further details on water management for the TSF are provided in the Water Management Plan (Agnico Eagle, 2018a).

8 MONITORING AND INSPECTION

Performance monitoring is an integral part of the operation of any structure in an arctic environment. Geotechnical instrumentation is required to monitor the behavior of the placed filtered tailings and the underlying foundation during operation of the TSF. The instrumentation is intended to provide the following information:

- Confirmation that the performance of the foundation soils and placed filtered tailings are consistent with the predictions made during the design studies, notably in terms of stability, deformation, seepage, and thermal analyses.

- Early warning of the development of potentially adverse trends such as seepage, deformation, and permafrost degradation.

The instrumentation plan therefore includes a minimum of eight (8) vertical ground temperature cables (GTCs) throughout the TSF area, installed to a minimum depth of 10 m below the original ground to verify the thermal conditions and assumptions. The proposed locations of the GTCs is presented on Drawing 6515-583-163-004. Additional vertical and horizontal ground temperature cables may be installed if required after review of monitoring data and operational performance. Thermistor readings will be measured once a month during the first year, and then on a quarterly basis during operation, with the measured readings analyzed and reported in the annual inspection report.

Visual inspection and monitoring can provide early warning of many conditions that can contribute to structure failures and incidents. Agnico Eagle will regularly undertake a visual inspection of the TSF, especially during spring and summer periods and note areas of seepage, unusual settlement or deformation, cracking or other signs of instability. Records of all inspections will be maintained.

An annual inspection, in accordance with Part I, items 14 and 15 of Water Licence-2AM-MEL1631 will be conducted by a qualified Geotechnical Engineer to document the performance of the facility. The reports will be submitted to the Nunavut Water Board as per the water license requirements.

Further details regarding the monitoring and inspection plan for the TSF can be located in the 2018 MWMP (Agnico Eagle, 2018b).

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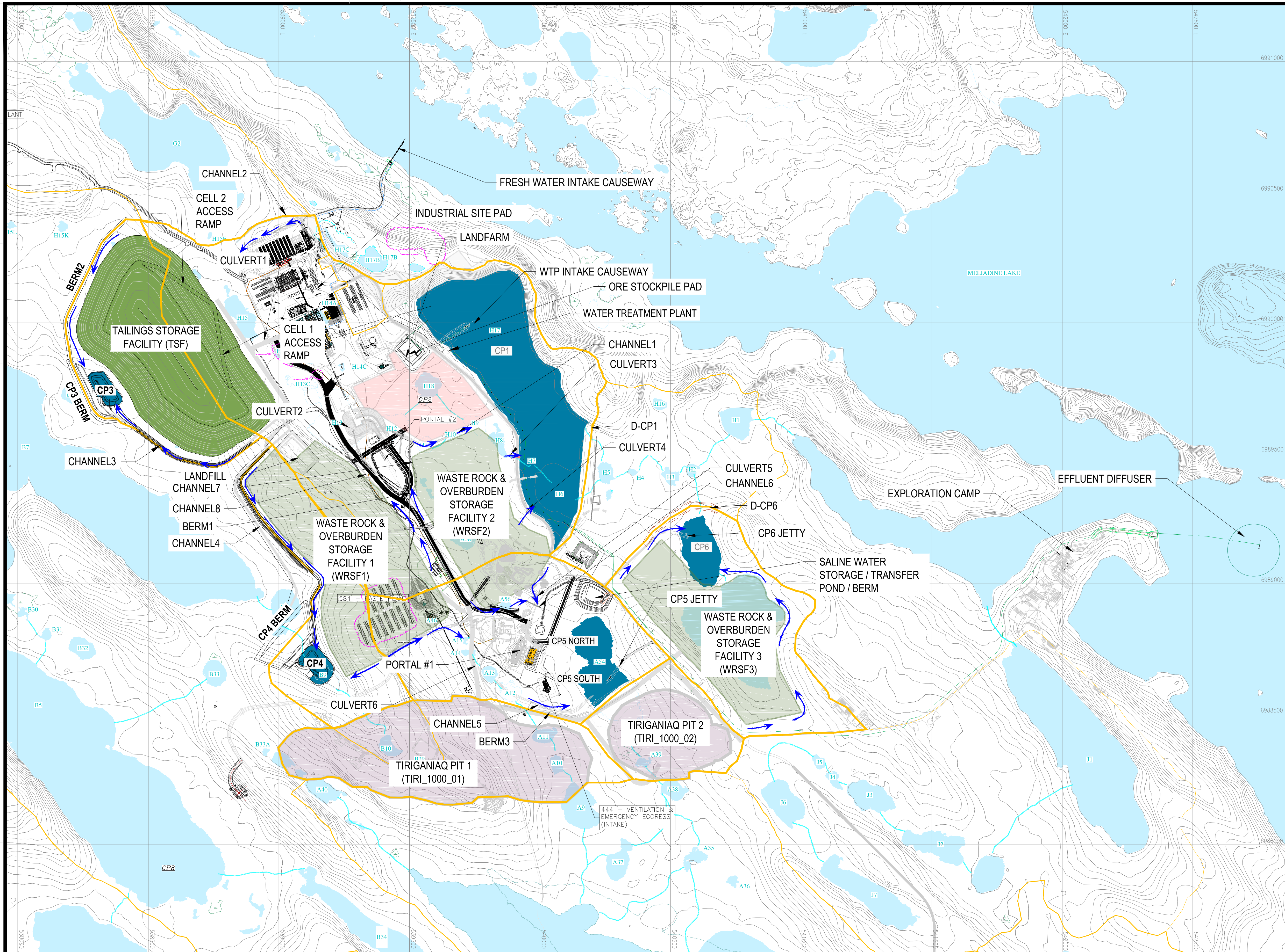
Appendix A

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

REGISTERED PROFESSIONAL ENGINEER
G. ZHANG
LICENSEE
NOV. 14, 2018
NWT/NU

AGNICO EAGLE

TETRA TECH

POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 11/14/2018

TITRE / TITLE	# DWG
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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

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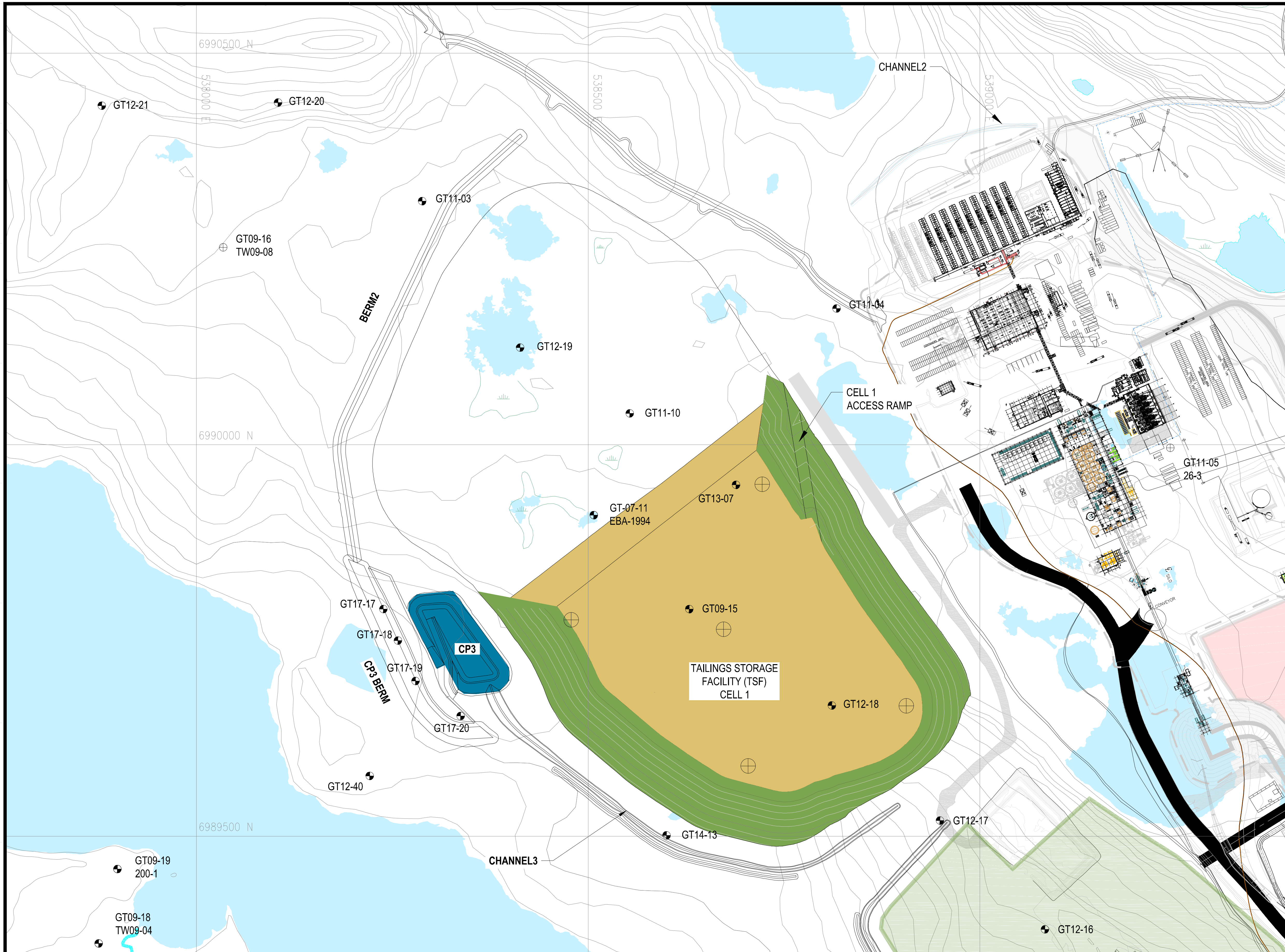

LEGEND

- WASTE ROCK
- ORE
- TAILINGS
- WATER COLLECTION POND
- BOREHOLE
- PROPOSED GROUND TEMPERATURE CABLE LOCATION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
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NT/NU Association of Professional Engineers and Geoscientists

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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
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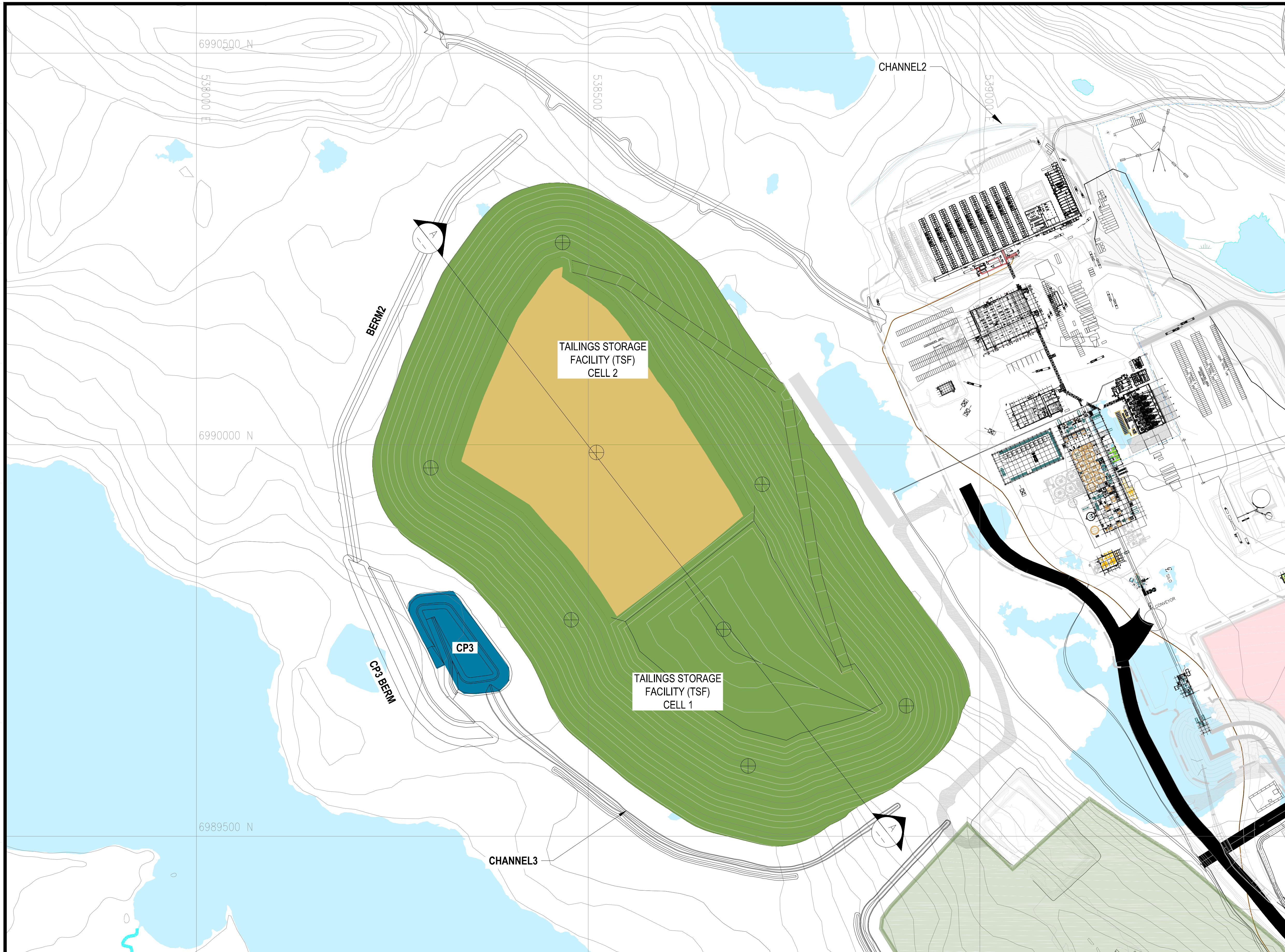

LEGEND

- WASTE ROCK
- ORE
- TAILINGS
- WATER COLLECTION POND
- PROPOSED GROUND TEMPERATURE CABLE LOCATION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
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NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
G. ZHANG
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NOV. 14, 2018
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AGNICO EAGLE

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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

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DRAWING NO.

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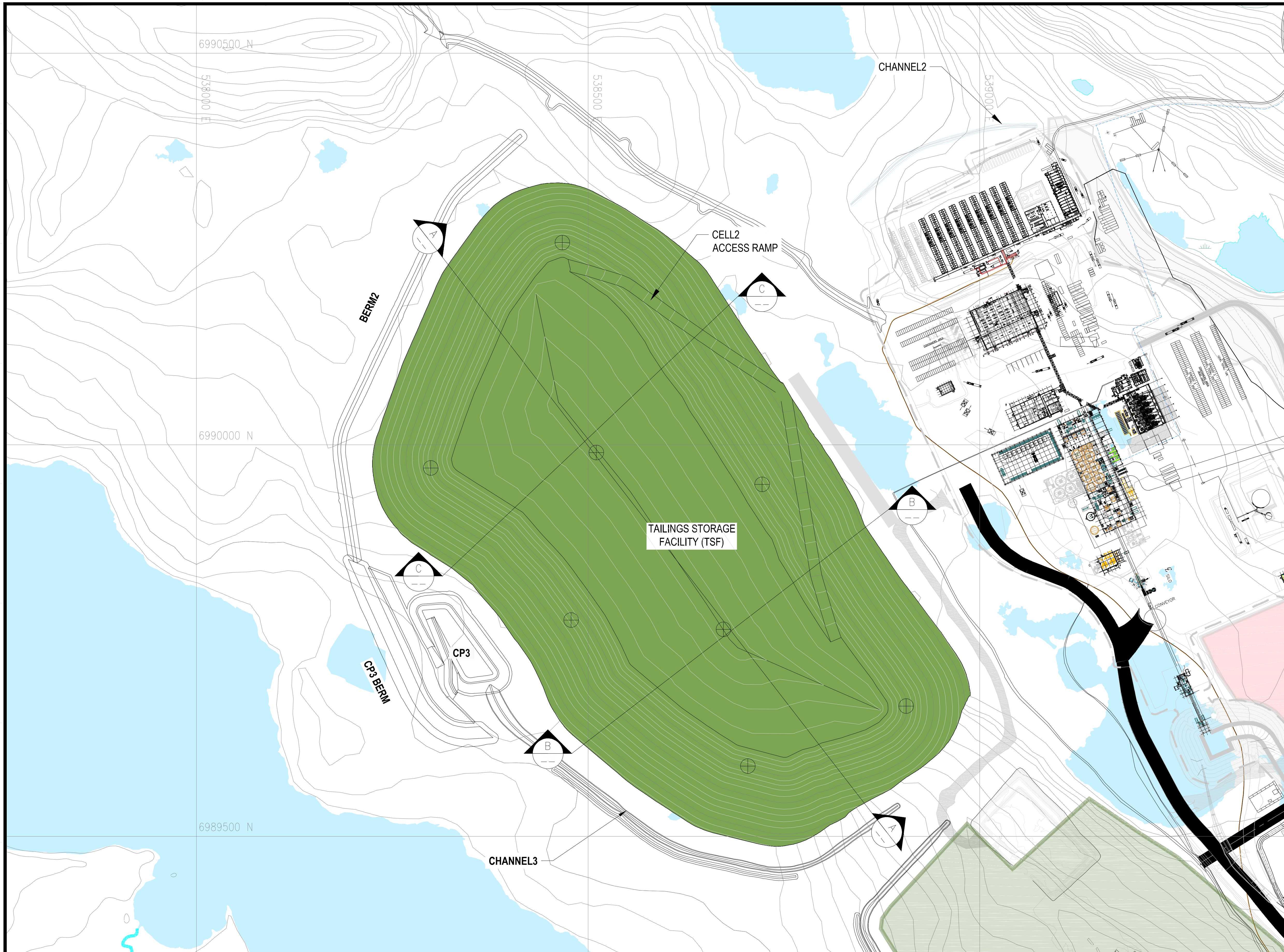

LEGEND

- WASTE ROCK
- ORE
- TAILINGS
- PROPOSED GROUND TEMPERATURE CABLE LOCATION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
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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

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NO. DESSIN
DRAWING NO.

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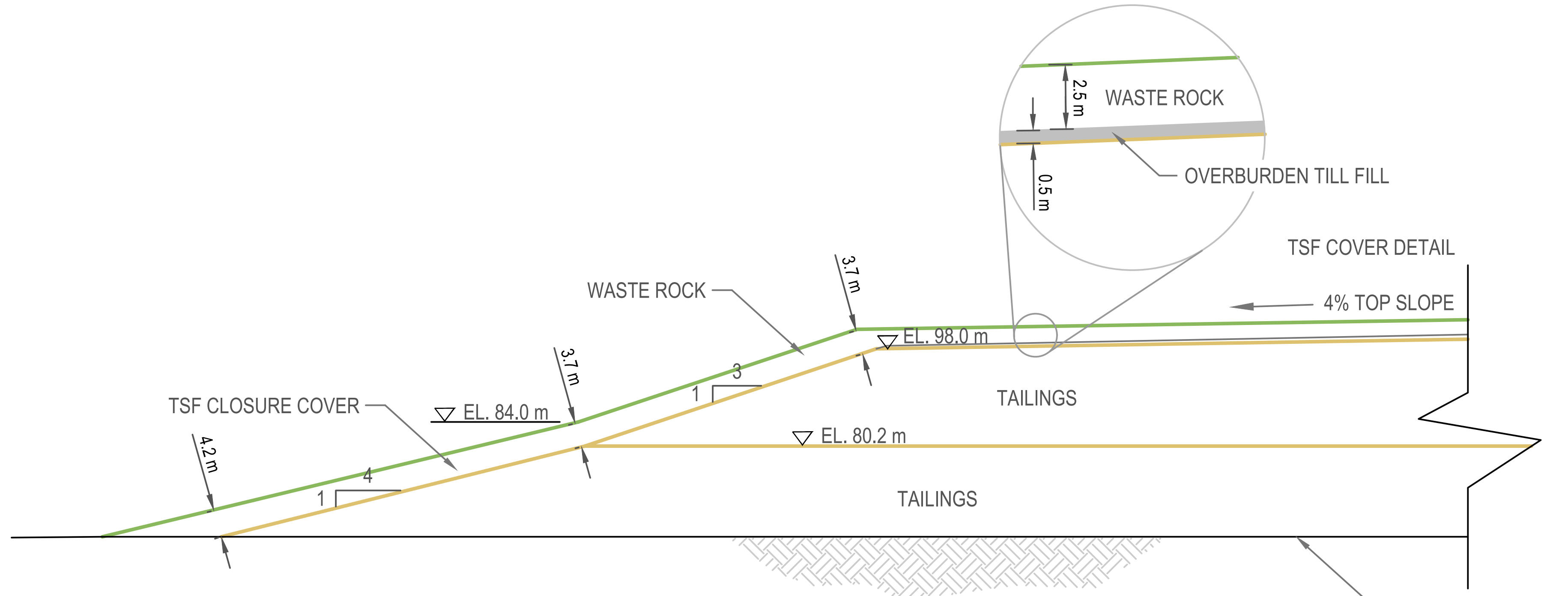
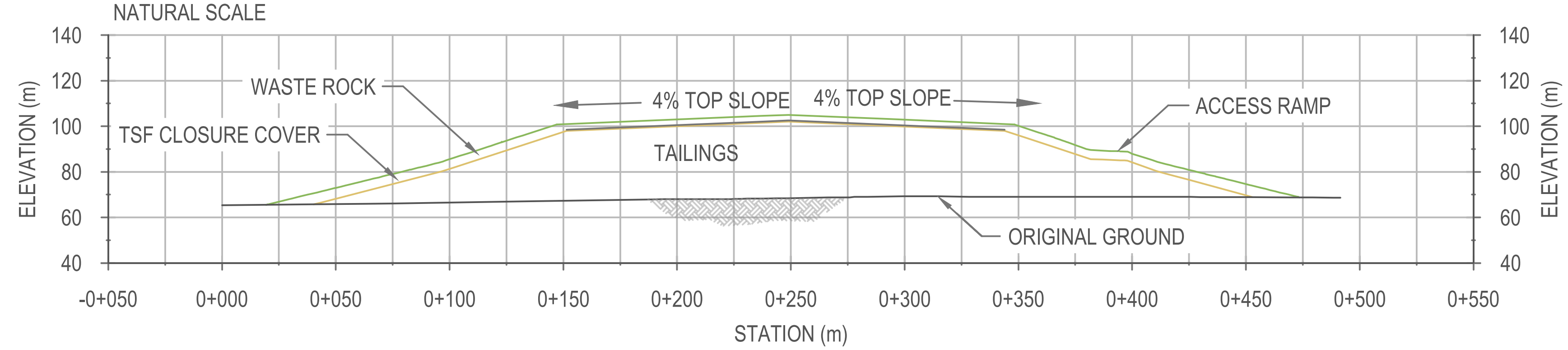
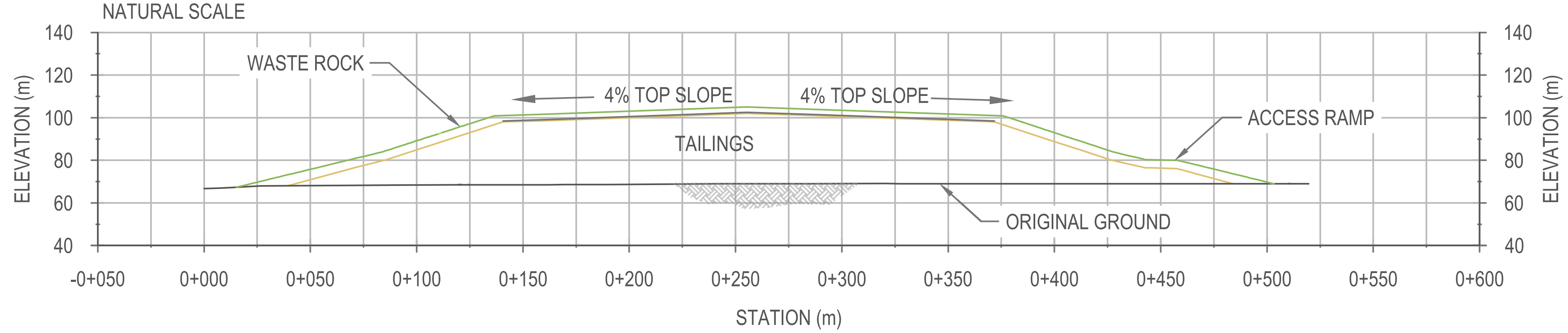


NOTE: TSF CLOSURE COVER THICKNESS AND CONFIGURATION TO BE FINALIZED DURING THE DEVELOPMENT OF THE FINAL CLOSURE COVER DESIGN PENDING PERFORMANCE MONITORING OF DRY STACKED TAILINGS FACILITY DURING OPERATION.

TYPICAL DESIGN SECTION FOR TSF



SECTION B–B THROUGH CELL 1



SECTION C–C THROUGH CELL 2

NOTES:

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NOV. 14, 2018
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AGNICO EAGLE

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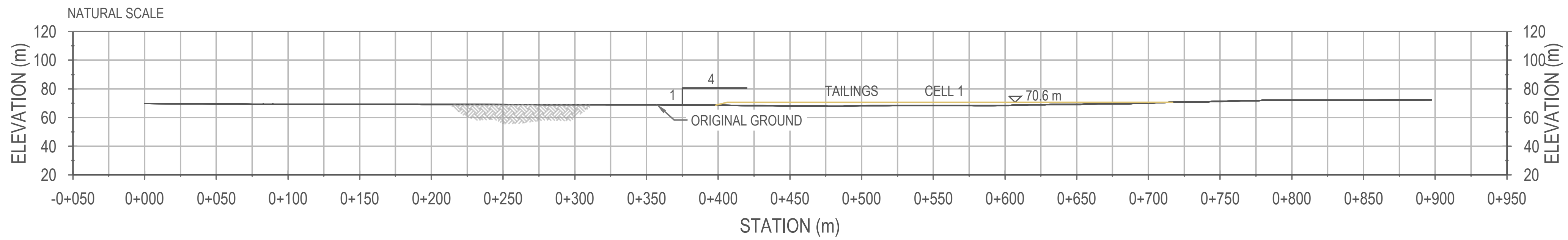
TITRE / TITLE
MELIADINE TAILINGS STORAGE FACILITY DESIGN

TYPICAL DESIGN SECTION OF TSF AND SECTIONS B–B AND C–C THROUGH CELLS 1 AND 2

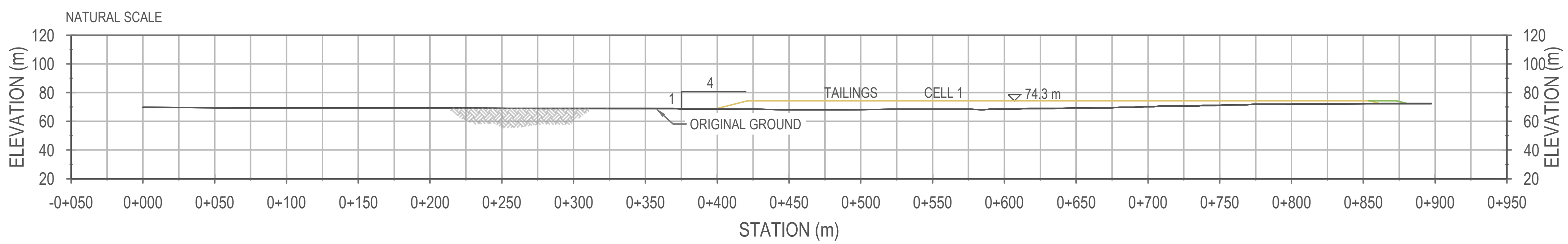
ÉCHELLE/ SCALE	FICHIER FILE .DWG		
No. DESSIN/ DRAWING NO. 6515–583–163–005	REVISION 0	FEUILLE/SHT 5 / 9	

NO. DESSIN
DRAWING NO.

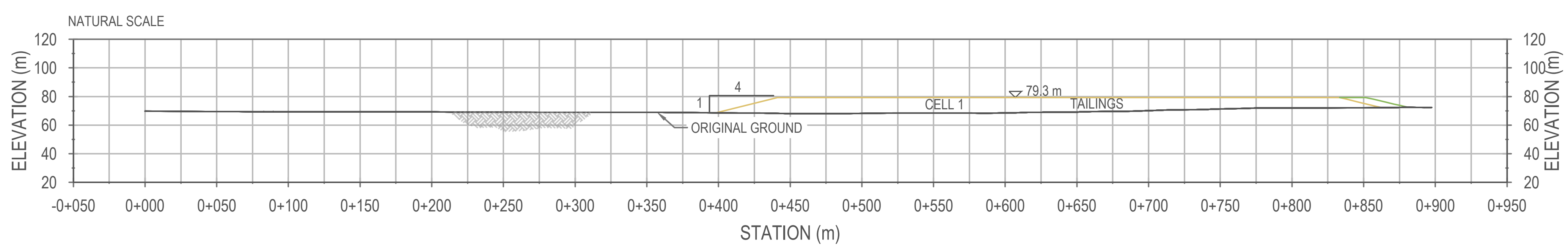
FORMAT ANSI B-11x17



SECTION A–A TSF DURING OPERATION (YEAR –1 SHOWN)



SECTION A–A TSF DURING OPERATION (YEAR 1 SHOWN)



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.

SECTION A–A TSF DURING OPERATION (YEAR 2 SHOWN)

NOTES:

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TETRA TECH CANADA INC.
Signature
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REGISTERED PROFESSIONAL ENGINEER
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APPROUVÉ PAR / APPROVED BY		

No. PROJET / PROJECT NO.

DATE

TITRE / TITLE
MELIADINE TAILINGS STORAGE FACILITY DESIGN

SECTION A–A TSF DURING OPERATION
YEARS –1 to 2

ÉCHELLE/ SCALE
FICHIER FILE .DWG

No. DESSIN/ DRAWING NO.	REVISION	FEUILLE/SHT
6515–583–163–006	0	6 / 8

AE–CART–ANSI B

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NO. DESSIN
DRAWING NO.

FORMAT ANSI B–11x17

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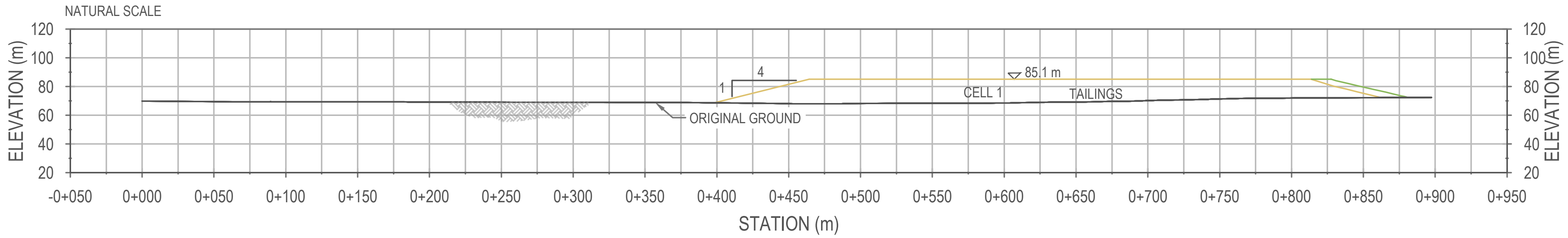
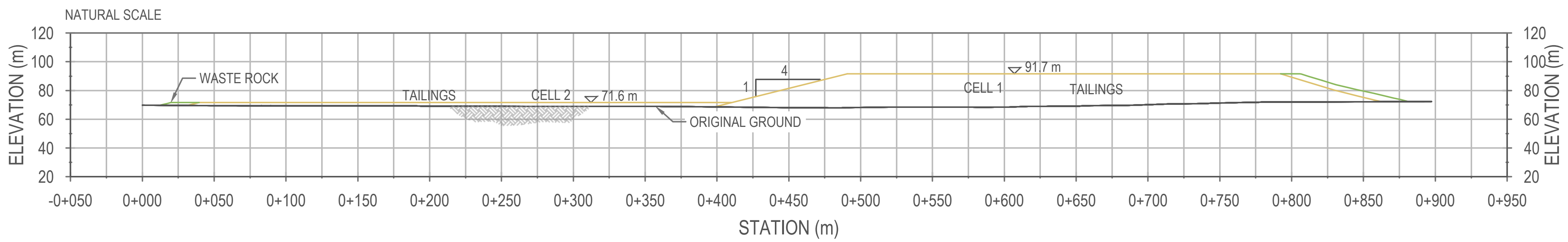
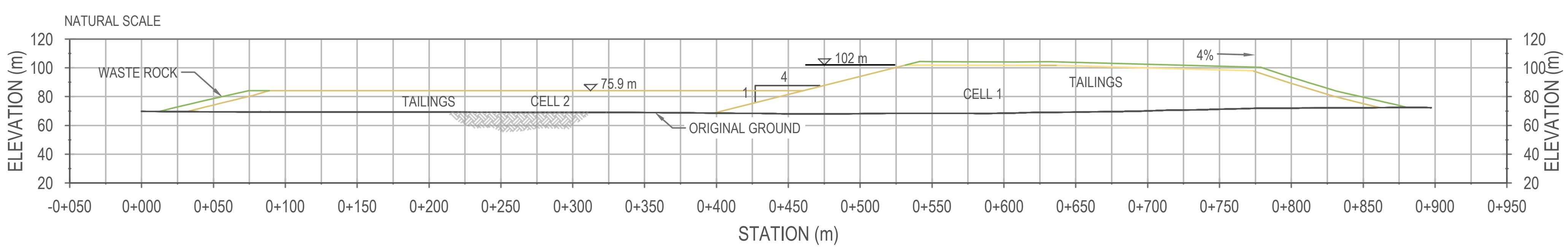


SECTION A–A TSF DURING OPERATION (YEAR 3 SHOWN)



SECTION A–A TSF DURING OPERATION (YEAR 4 SHOWN)



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.

SECTION A–A TSF DURING OPERATION (YEAR 5 SHOWN)

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TETRA TECH CANADA INC.
Signature
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REGISTERED PROFESSIONAL ENGINEER
G. ZHANG
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REVISIONS

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APPROUVÉ PAR / APPROVED BY		
No. PROJET / PROJECT NO.		
DATE		

TITRE / TITLE
MELIADINE TAILINGS STORAGE FACILITY DESIGN

SECTION A–A TSF DURING OPERATION
YEARS 3 to 5

ÉCHELLE/SCALE
FICHIER/FILE .DWG

No. DESSIN/DRAWING NO. 6515–583–163–007
REVISION 0
FEUILLE/SHT 7 / 8

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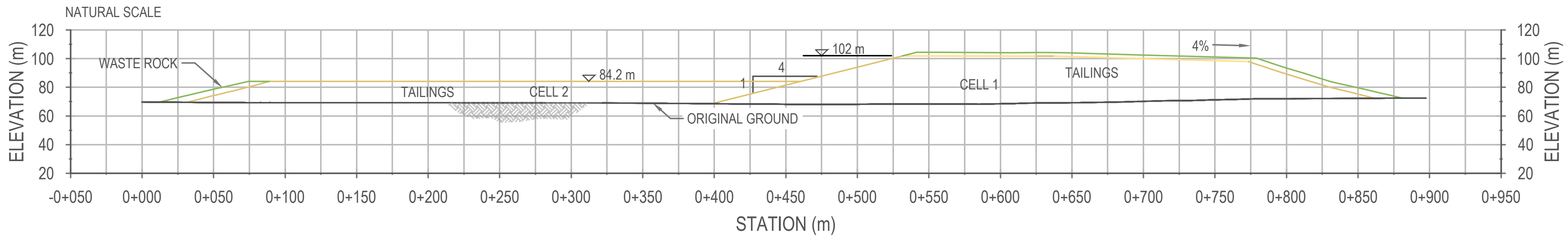
NO. DESSIN
DRAWING NO.

FORMAT ANSI B-11x17



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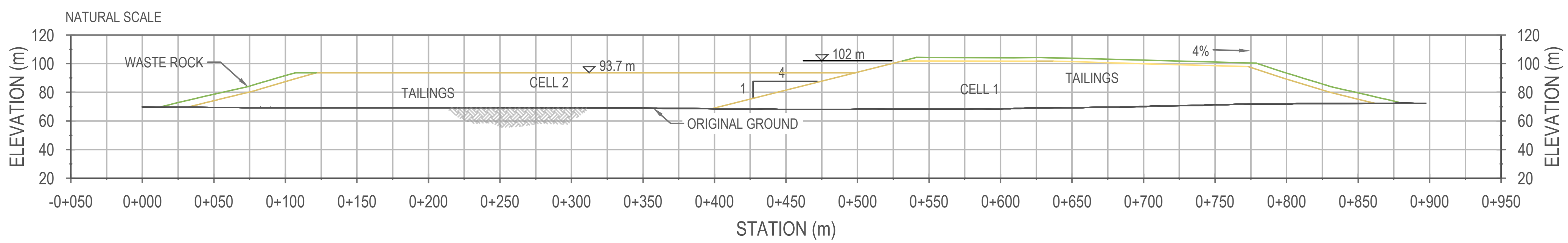

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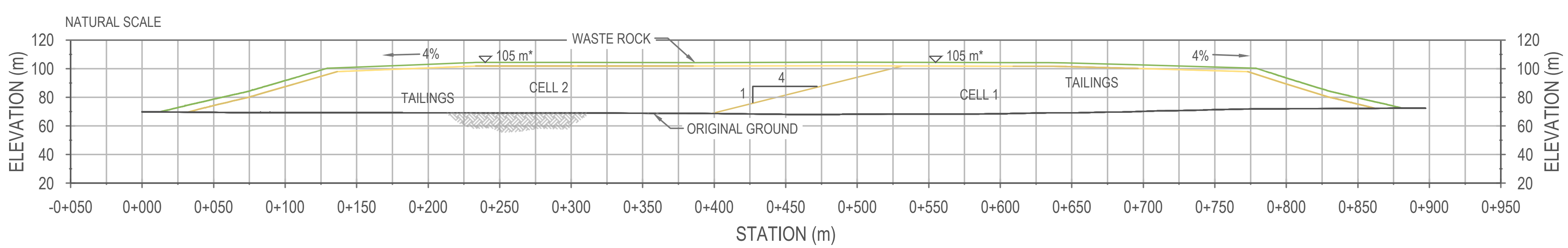

NOTE: * TSF CLOSURE COVER THICKNESS AND CONFIGURATION TO BE FINALIZED DURING THE DEVELOPMENT OF THE FINAL CLOSURE COVER DESIGN PENDING PERFORMANCE MONITORING OF DRY STACKED TAILINGS FACILITY DURING OPERATION.

SECTION A–A TSF DURING CLOSURE (YEAR 8 SHOWN)

NOTES:

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TETRA TECH CANADA INC.
Signature
Date Nov. 14, 2018
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G. ZHANG
LICENSEE
NOV. 14, 2018
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AGNICO EAGLE

TETRA TECH

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TITRE / TITLE
MELIADINE TAILINGS STORAGE FACILITY DESIGN

SECTION A–A TSF DURING OPERATION
YEARS 6 to 8

ÉCHELLE/ SCALE
FICHIER FILE .DWG

No. DESSIN/ DRAWING NO. 6515–583–163–008
REVISION 0
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