Appendix D2

Report: *Updated Mine Waste Rock and Tailings Management Plan*

Meadowbank Gold Mine

Updated Mine Waste Rock and Tailings Management Plan

March 2013

Version 01

EXECUTIVE SUMMARY

Agnico-Eagle Mines Ltd. Meadowbank Division (AEM) is operating the Meadowbank Gold Mine (the Mine), located on Inuit-owned surface lands in the Kivalliq region approximately 70 km north of the Hamlet of Baker Lake, Nunavut. The Mine is subject to the terms and conditions of both the Project Certificate issued in accordance with the Nunavut Land Claims Agreement Article 12.5.12 on December 30, 2006, and the Nunavut Water Board Water Licence No. 2AM_MEA0815 issued on June 9, 2008. This report presents an updated version of the Mine Waste Management Plan for the Mine and forms a component of the documentation series that has been produced in accordance with the above.

The Mine consists of several gold-bearing deposits: Portage, Goose and Vault (including Phaser). A series of dikes are required to isolate the mining activities from neighbouring lakes. The dikes were and will be constructed using quarried materials or using materials produced during mining.

Waste rock from the Portage and Goose Pits is currently being stored in the Portage Rock Storage Facility (RSF). Starting in early 2013 waste rock will be stored in the Portage Pit following completion of mining in this area. The Portage Rock Storage Facility was constructed to minimize the disturbed area and will be capped with a layer of non-acid-generating rock to constrain the active layer within relatively inert materials. The control strategy to minimize the onset of oxidation and the subsequent generation of acid rock drainage includes freeze control of the waste rock through permafrost encapsulation and capping with an insulating convective layer of NAG rock. The waste rock below the capping layer is expected to freeze, resulting in low rates (if any) of acid rock drainage (ARD) generation in the long term.

Waste rock from the Vault Pit will be stored in the Vault Rock Storage Facility. Geochemical predictions indicate that a capping layer will not be required over this area. An adaptive management plan will include monitoring of water quality during operations to confirm modelling predictions and to allow adjustments to the closure plan as required. The waste rock is expected to eventually freeze.

The Tailings Storage Facility (TSF) is delineated by a series of dikes and saddle dams built and to be built around and across the basin of the dewatered northwest arm of Second Portage Lake. The TSF is divided into the North and South Cells. From 2010 to 2015 tailings are to be stored in the North Cell, delineated by the Stormwater Dike and Saddle Dams 1 and 2. Once the North Cell is full, deposition will switch to the South Cell until mine operations cease in 2018. The South Cell will be delineated by the Central Dike and Saddle Dams 3, 4 and 5. The division of the TSF into cells allows tailings management in comparatively smaller areas with shorter beach lengths that reduce the amount of water that is trapped and permanently stored as ice. Operation in cells also allows progressive closure and cover trials to begin in the North Cell while tailings deposition continues in the South Cell.

Tailings are placed sub-aerially as slurry and water from the pond is reclaimed during operation. The tailings deposition strategy is to build beaches against the faces of the perimeter dikes to push the pond away, and ultimately produce a tailings surface that directs drainage towards the western abutment of the Stormwater Dike. Following mine operations, a minimum 2-m thick cover of NPAG rockfill will be placed over the tailings as an insulating convective layer to confine the active layer

within relatively inert materials. The final thickness of the rockfill cover layer will be confirmed based on thermal monitoring to be completed during operations. The control strategy to minimize water infiltration into the TSF and the migration of constituents out of the facility includes freeze control of the tailings through permafrost encapsulation.

A Thermal Monitoring Plan (TMP) was developed to observe the freezeback of the TSF and RSFs in order to comply with Part I, Conditions Applying to General and Aquatic Effects, Item 11 of the Nunavut Water Board (NWB) water license 2AM-MEA0815. Item 11 requires a TMP to monitor temperatures of the TSF and RSFs during and after, mining operations.

All infrastructure needed for mine operations, closure and reclamation, including mine waste management areas, will be re-contoured and/or surface treated during closure according to site specific conditions to minimize windblown dust and erosion from surface runoff. This activity is designed to enhance the potential for re-vegetation to occur and wildlife habitat re-establishment.

DOCUMENT CONTROL

Version	Date (YM)	Section	Page	Revision
1	2009/10	All	All	Original Plan
2	2013/04	All	All	Comprehensive Updated to Original Plan

Prepared By: ____________________________
Engineering and Environmental Department

Approved by: ____________________________
Engineering and Environmental Department

Table of Contents

LIST OF TABLES

LIST OF FIGURES

MEADOWBANK MINE LOCATION MAP

SECTION 1 • INTRODUCTION

During operations, with the 2012 Life of Mine (LOM) calculation, the mine will generate a total of approximately 193 Mt of mine waste rock & till and 29.5 Mt (dry) of tailings from the following deposits:

- Portage;
- Goose; and
- Vault (including Phaser).

Tailings are stored within the Tailings Storage Facilities (TSF – North and South cells), The TSF's include dikes built and to be built; they are located in the basin of the former north-west arm of Second Portage Lake (2PL) which has been dewatered to allow mining in the Portage Pit. The TSF's has been separated by the Stormwater Dike to form a North and South Cell. Currently, and until March, 2015 tailings are deposited into the North Cell. The South Cell is now operating as the Portage Attenuation Pond (PAP) which collects site contact water as well as freshet flow. Saddle Dams (1 and 2) have been constructed around the North Cell TSF to ensure that the tailings are impounded onsite. From 2015 thru 2018 (LOM) tailings will be deposited into the South Cell. South Cell containment will be accomplished by construction of the Central Dike which is now completed to elevation 115m. Construction will continue in 2013 between elevation 120m and 125m. Final elevation of this dike is currently planned to be 150m. The footprint area designated for tailings storage has not changed from the previous Plan (where mine was scheduled to close in 2021). The mine is now scheduled to cease production in early 2018.

At the present time, tailings are placed subaerially as slurry in the North Cell and water from the pond is reclaimed by the mill. The tailings deposition strategy is to build beaches against the faces of the perimeter dikes/dams such that water/drainage is directed toward the western abutment of the Stormwater Dike. Thermal modelling indicates that the tailings will freeze in the long term, and that the talik that currently exists below 2PL Arm will freeze before seepage from the TSF reaches the groundwater below the permafrost. Thermistor monitoring results to date indicate that this is occurring. Therefore, the potential for groundwater contamination to occur as a result of seepage from the TSF is considered low. Also to date, AEM's groundwater monitoring program has not detected any parameters of concern (ie cyanide) downstream from the TSF.

Tailings are potentially acid generating (PAG); therefore a minimum 2-m thick cover of non-potential (NAG) rockfill will be placed over the tailings to physically isolate the tailings and to confine the active layer within relatively inert materials. Cover trials will be completed during operations (when deposition to North Cell is completed) to confirm the required cover thickness to physically isolate the tailings and to confine the active layer within relatively inert materials. The control strategy to minimize water infiltration into the TSF and the migration of constituents out of the facility includes freeze control of the tailings through permafrost encapsulation.

Waste rock from the Portage and Goose open pits is stored in an area to the north of 2PL Arm and to the west of the Vault Haul Road, designated as the Portage Rock Storage Facility (Portage RSF). Starting in 2013 waste rock from Portage and Goose Pits will be stored within the mined out portion of Portage Pit, which will ultimately be flooded. Waste rock from the Vault Pit will be stored in an area to the west of the pit, designated as the Vault Rock Storage Facility (Vault RSF) (see figure 2.1).

The Portage RSF has been, progressively reclaimed around the perimeter with 4m of NPAG rock, and will be (top portion) capped at closure with a 4m layer of NAG rock to constrain the active layer within relatively inert materials, and will be regraded to promote runoff from the facility. The PAG waste rock is expected to freeze, resulting in low rates (if any) of acid rock drainage (ARD) generation in the long term. To date, thermistor readings taken from the Portage RSF indicate freezeback is occurring as predicted.

The Vault RSF will be regraded at closure to encourage runoff and to provide a final shape consistent with the surrounding topography. The water seepage from the Vault RSF area is expected to be of suitable quality to allow discharge to the environment without treatment (Golder, 2007c), and capping of this facility is therefore not proposed. An adaptive management plan will include monitoring of water quality during operations to confirm modelling predictions and to allow adjustments to the closure plan as required. The waste rock is expected to eventually freeze.

A plan for the management of contact and diverted water is presented in this document; generally contact water will be directed toward the TSF and PAP and non-contact water will be diverted by a ditching system to prevent contact with mine related activities (see figure 2.1).

SECTION 2 • BACKGROUND INFORMATION

2.1 MINING OPERATION DESCRIPTION

The Meadowbank Gold Mine consists of several gold-bearing deposits within reasonably close proximity to one another. The three main deposits are: Vault (including Phaser), Portage (South, Center and North Portage deposits), and Goose.

The South Portage deposit is located on a peninsula, and extends northward under 2PL and southward under Third Portage Lake (3PL). The North Portage deposit is located on the northern shore of 2PL. The South, Center and North Portage deposits will be mined from a single pit, termed the Portage Pit, which will extend approximately 2 km in a north-south direction. The Goose deposit lies approximately 1 km to the south of the Portage deposit, and beneath 3PL. The Vault deposit is located adjacent to Vault Lake, approximately 6 km north of the Portage deposits. A series of dewatering dikes (East, West Channel, Bay-Goose, South Camp and Vault) are required to isolate the mining activities from the lakes. Additional dikes (the Central Dike, Stormwater Dike and Saddle Dams) are required to manage tailings within the dewatered 2PL Arm. East Dike, West Channel, Bay-Goose, South Camp and Stormwater Dikes, Saddle Dam 1 and Saddle Dam 2 were all constructed within the past 4 years. The dikes were and will be constructed primarily using materials produced on site.

Mining is primarily a truck-and-shovel open pit operation. The current mining plan indicates that approximately 29.5 Mt of ore will be mined over a nominal mine life of approximately 8.5 years.

2.2 SITE CONDITIONS

The site layout is illustrated in Figure 2.1.

2.2.1 Climate

The Meadowbank region is located within a low Arctic ecoclimate described as one of the coldest and driest regions of Canada. Arctic winter conditions occur from October through May, with temperatures ranging from +5°C to -40°C. Summer temperatures range from -5°C to +25°C with isolated rainfall increasing through September (Table 2.1).

Table 2.1: Estimated Average Monthly Climate Data – Meadowbank Site

Month	Max. Air Temp. (°C)	Min. Air Temp. (°C)	Rainfall (mm)	Snowfall (mm)	Total Precip. (mm)	Lake Evap. (mm)	Min. Relative Humidity (%)	Max. Relative Humidity (%)	Wind Speed (km/h)	Soil Temp. (°C)
January	-29.1	-35.5	0	6.9	6.9	0	67.1	75.9	16.3	-25.5
February	-27.8	-35.2	0	6.0	6.1	0	66.6	76.5	16.0	-28.1
March	-22.3	-30.5	0.0	9.2	9.2	0	68.4	81.4	16.9	-24.9

April	-13.3	-22.5	0.4	13.6	14.0	0	71.3	90.1	17.3	-18.1
May	-3.1	-9.9	5.2	7.7	12.8	0	75.7	97.2	18.9	-8.0
June	7.6	0.0	18.6	3.1	21.7	8.8	62.6	97.2	16.4	2.0
July	16.8	7.2	38.6	0.0	38.6	99.2	47.5	94.3	15.1	10.5
August	13.3	6.4	42.8	0.6	43.4	100.4	59.2	97.7	18.4	9.3
September	5.7	0.9	35.2	6.7	41.9	39.5	70.8	98.6	19.3	3.6
October	-5.0	-10.6	6.5	22.6	29.1	0.1	83.1	97.4	21.4	-2.8
November	-14.8	-22.0	0.2	16.2	16.4	0	80.6	91.1	17.9	-11.7
December	-23.3	-29.9	0	9.4	9.5	0	73.3	82.7	17.7	-19.9

Note: Data from Baker Lake A station is available from 1946 to 2011. During this period, the data quality is good, with the exception of years 1946 to 1949, and 1993 which were removed from the compilation.

The long-term mean annual air temperature for Meadowbank is estimated to be approximately 11.1°C. Air temperatures at the Meadowbank area are, on average, about 0.6°C cooler than Baker Lake air temperatures, and extreme temperatures tend to be larger in magnitude. This climatic difference is thought to be the effect of a moderating maritime influence at Baker Lake.

The prevailing winds at Meadowbank for both the winter and summer months are from the northwest. A maximum daily wind gust of 93 km/h was recorded on September 1, 2009. Light to moderate snowfall is accompanied by variable winds up to 70 km/h, creating large, deep drifts and occasional whiteout conditions. Skies tend to be more overcast in winter than in summer.

The Table 2.1 presents monthly rainfall, snowfall and total precipitation values for the mine site. August is the wettest month, with a total precipitation of 43.4 mm, and February is the driest month, with a total precipitation of 6.1 mm. During an average year the total precipitation is 249.6 mm, split between 147.5 mm of rainfall and 102.1 mm of snowfall precipitation.

2.2.2 Faults

As indicated on Figure 2.5, two main faults are inferred in the Portage deposit area. The Second Portage fault trends to the northwest and is expected underneath the Central Dike and TSF, roughly parallel to the orientation of the Second Portage Lake. Analysis conducted during the design of the Central Dike showed little seepage potential. To date Central Dike has been completed to elevation 115m and no seepage has been evident in Portage pit. However if seepage that affects operation in the future mitigation plans such as grouting could be carried out beneath the Central Dike.

2.2.3 Permafrost

The Meadowbank Gold Mine is located in the area of continuous permafrost, as shown on Figure 2.2.

Lake ice thicknesses of between 1.5 m and 2.5 m have been encountered during geotechnical investigations in mid to late spring. Taliks (areas of permanently unfrozen ground) are expected where water depth is greater than about 2 to 2.5 m. Based on thermal studies and measurements of ground temperatures (Golder, 2003), the depth of permafrost at site is estimated to be in the order of 450 to 550 m, depending on proximity to lakes. The depth of the active layer ranges based on depth of overburden, vegetation and organics, proximity to lakes, and aspect is about 1 to 1.5 m

Based on ground conductivity surveys and compilation of regional data, the ground ice content is expected to be low. Locally on land, ice lenses and ice wedges are present, as indicated by ground conductivity, and by permafrost features such as frost mounds. These areas of local ground ice are generally associated with low-lying areas of poor drainage.

A thermal monitoring plan, which meets the requirement of the Water Licence, is presented in Section 8 of this document.

2.2.3.1 Second Portage Lake Talik

Thermistors have been installed in numerous boreholes (see Figure 2.3 for locations); the inferred thermal regime beneath the 2PL Arm, based on measurements from these instruments, is shown in Figure 2.4. A talik exists below 2PL Arm, and is expected to extend to the base of the permafrost (Figure 2.6).

2.2.3.2 Vault Lake Talik

Due to the size of Vault Lake, the underlying talik is expected to be closed or confined within the permafrost. This means it does not extend to the deep groundwater flow regime, because the size and depth of the lake is not sufficient for an open talik to develop. Much of the lake is less than 2 m in depth; consequently it freezes to the bottom during winter.

2.2.3.3 Impact of Global Warming on Site Conditions

A report titled “Implications of Global Warming and the Precautionary Principle in Northern Mine Design and Closure” (BGC, 2003) was prepared for Indian and Northern Affairs Canada, and provides guidance relevant to mine design in Nunavut.

This report suggests that globally the average temperature may increase by about 2°C by 2100 due to global warming. However, the report also states that the increase may be double the global average for sites located at 50°N, and may be 3.5 times greater for sites located at 80°N. In a more recent study, the Intergovernmental Panel on Climate Change (IPCC, 2007) projected the maximum average air temperature to increase by 6.4°C by 2100 for a site located at 65°N latitude.

Table 2.2 presents a summary of reported climate change predictions used on a number of northern projects that have been reported in the engineering and scientific literature.

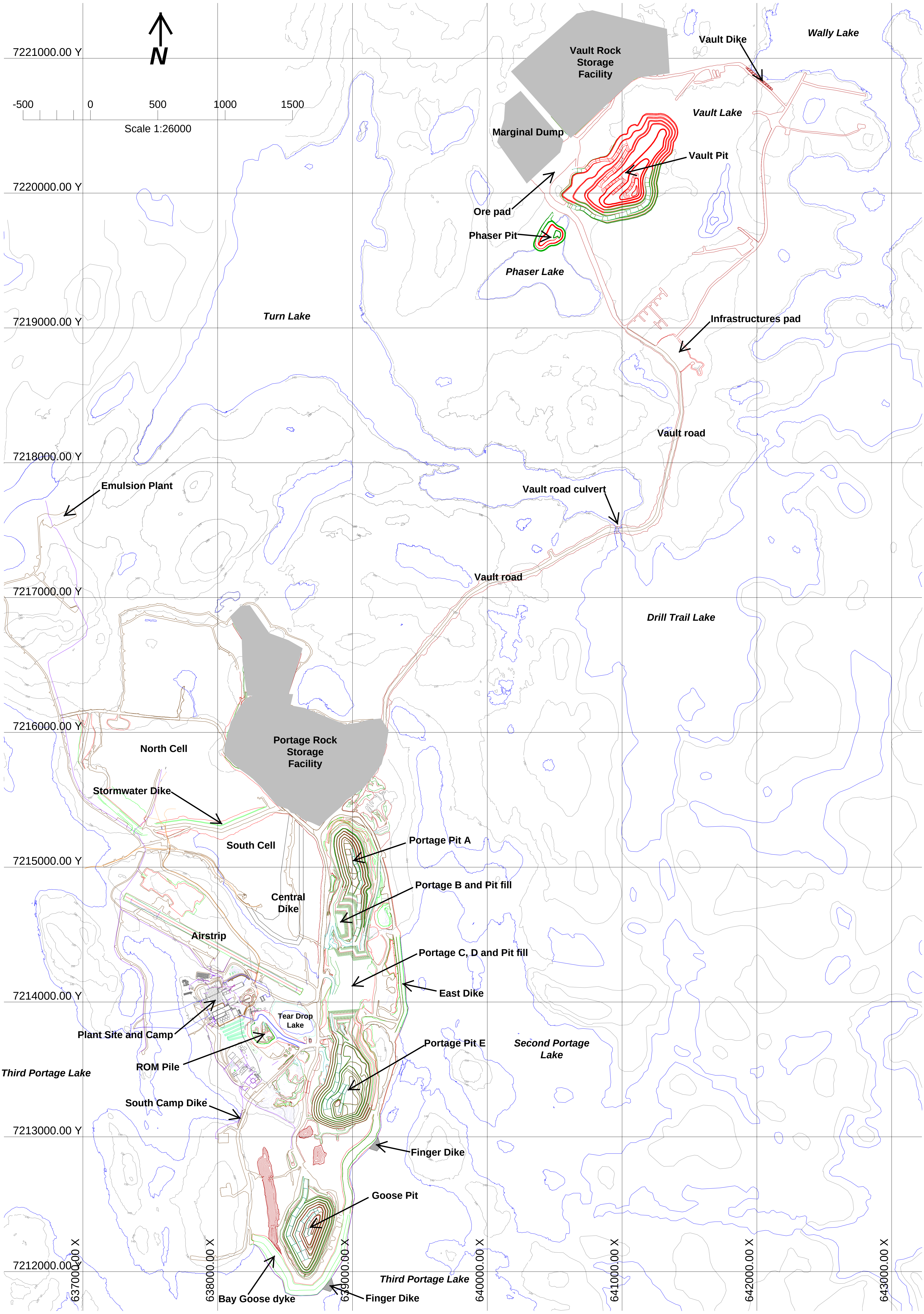
Table 2.2: Summary of Reported Climate Change Rates Used in Northern Projects Engineering Studies

Reference	Increase in MAAT by Year 2100 (°C)	Notes
Hayley (2004)	4.7	Used in design studies for the Inuvik Regional Health Center. Reported as increase of 0.47°C per decade.
Hayley and Cathro (1996)	5.0	Used for Raglan Dam analyses.
Diavik	3.2	Used for the Processed Kimberlite Containment Facility Design
Burn (2003)	6.0	For use in the Western Arctic for pipeline design projects. Reported as increase of 1.75°C over a 29 year period

Based on Table 2.2, a climate warming trend of 6.4°C over 100 years is considered to be a conservative upper estimate of the climate change rate for the mine area and is consistent with predicted and recommended climate change trends for projects in the north.

By the middle of the 21st century, the effect of temperature change is predicted to reduce near-surface permafrost by 12% to 15% once equilibrium conditions become established under the new temperatures. The predicted increase in active layer thickness of 15% to 30% will reach equilibrium relatively faster (NRC, 2004).

Studies indicate that the boundaries of discontinuous and continuous permafrost are expected to move northward due to global warming (Woo et al., 1992) (Figure 2.2). Predictions based on a warming of 4°C to 5°C over the next 50 years (NRC, 2004) (approximately double the rate predicted above) suggests that the Meadowbank property would remain within the zone of continuous permafrost, but the active layer thickness would be expected to increase, and the total thickness of permafrost may slowly reduce in time.



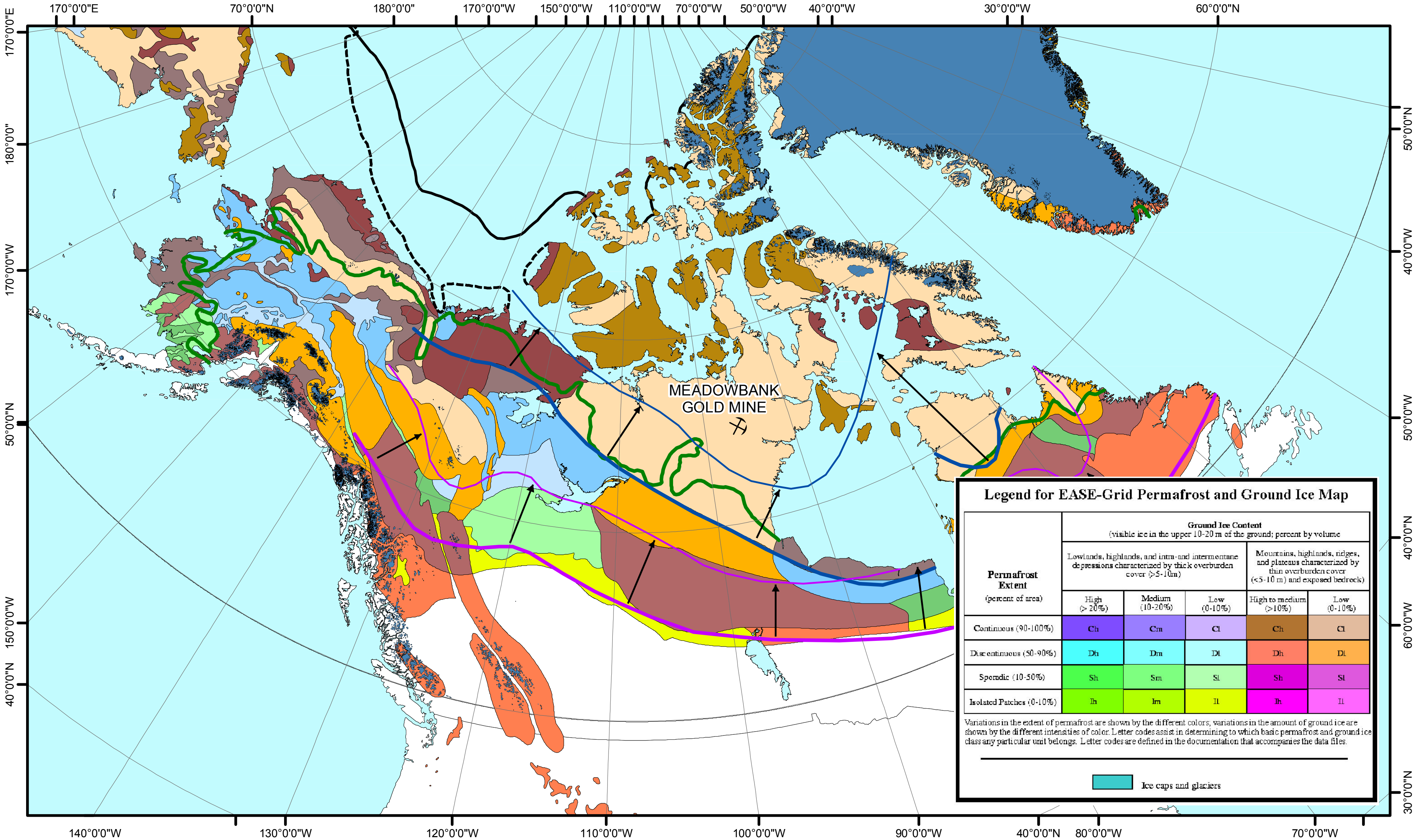
Notes:
1) All dimensions are in metres unless otherwise noted.
2) All elevations are in metres above sea level (masl).

Grid Reference: NAD 83, UTM zone 14

Date: 2013/03/03
By : Jose Gabriel Condoretty

Figure 2.1

MEADOWBANK DIVISION
Meadowbank Gold Mine
Nunavut
General Site Plan



LEGEND

- TREELINE
- SEA-ICE EDGE LIMIT
- SUBSEA PERMAFROST LIMIT
- SOUTHERN BOUNDARY OF DISCONTINUOUS PERMAFROST - PRESENT
- SOUTHERN BOUNDARY OF DISCONTINUOUS PERMAFROST - PREDICTED
- SOUTHERN BOUNDARY OF CONTINUOUS PERMAFROST - PRESENT
- SOUTHERN BOUNDARY OF CONTINUOUS PERMAFROST - PREDICTED
- PREDICTED MOVEMENT OF PERMAFROST BOUNDARIES

NOTES

1) PROJECTION: LAMBERT AZIMUTHAL EQUAL AREA

0 300 600 900 1 200 1 500

Scale in Kilometres

REFERENCES

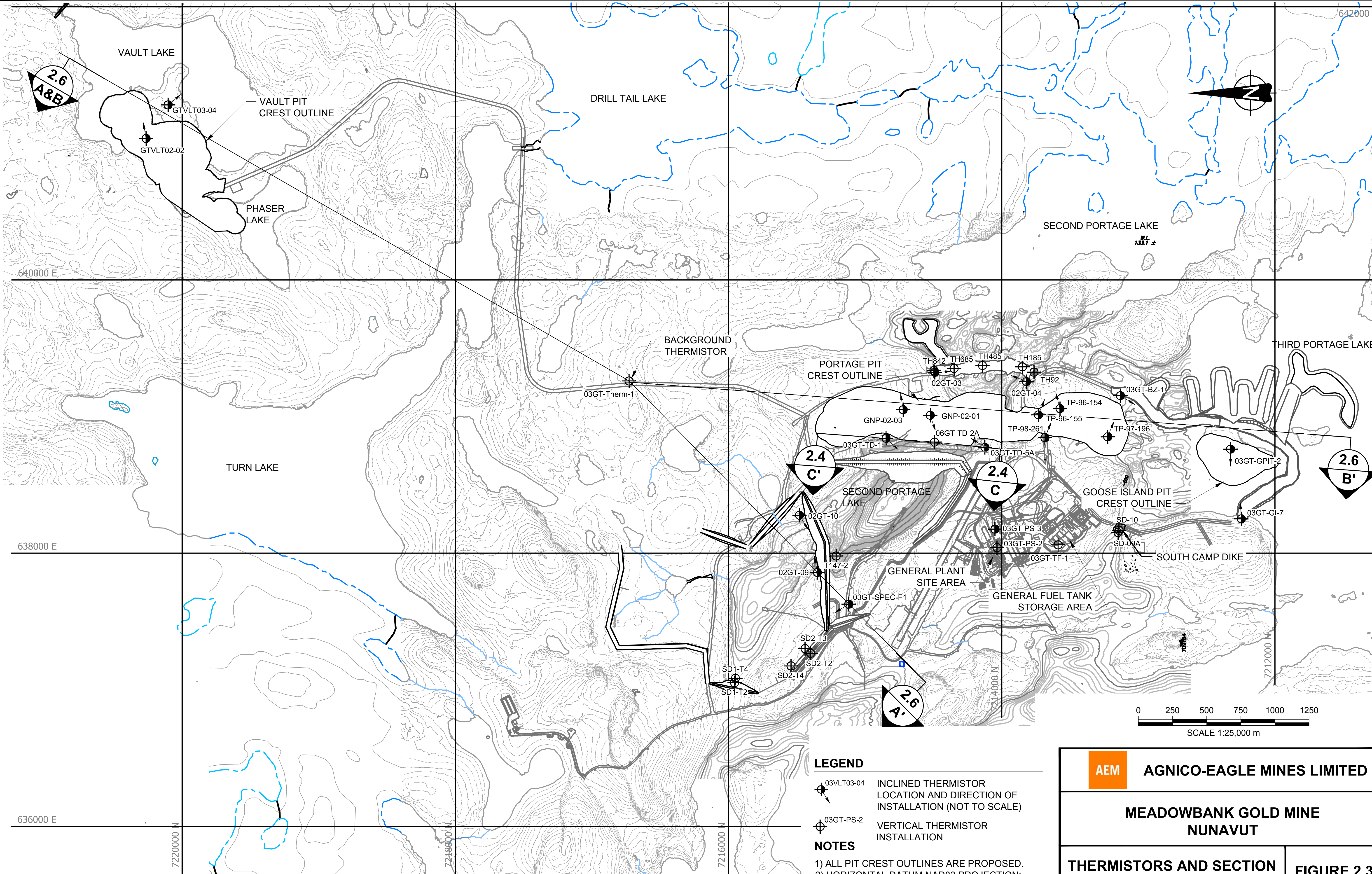
1) BROWN, J., O.J. FERRIANS JR., J.A. HEGINBOTTOM, AND E.S. MELNIKOV. 1998. CIRCUM-ARCTIC MAP OF PERMAFROST AND GROUND-ICE CONDITIONS. BOULDER, CO: NATIONAL SNOW AND ICE DATA CENTER/WORLD DATA CENTER FOR GLACIOLOGY. DIGITAL MEDIA.
2) PREDICTED PERMAFROST BOUNDARIES BASED ON WOO ET AL., 1992.

AEM AGNICO-EAGLE MINES LIMITED

MEADOWBANK GOLD MINE
NUNAVUT

PERMAFROST MAP OF CANADA

FIGURE 2.2



LEGEND

03VLT03-04 — INCLINED THERMISTOR LOCATION AND DIRECTION OF INSTALLATION (NOT TO SCALE)

03GT-PS-2 — VERTICAL THERMISTOR INSTALLATION

NOTES

1) ALL PIT CREST OUTLINES ARE PROPOSED.
2) HORIZONTAL DATUM NAD83 PROJECTION: UTM ZONE 14

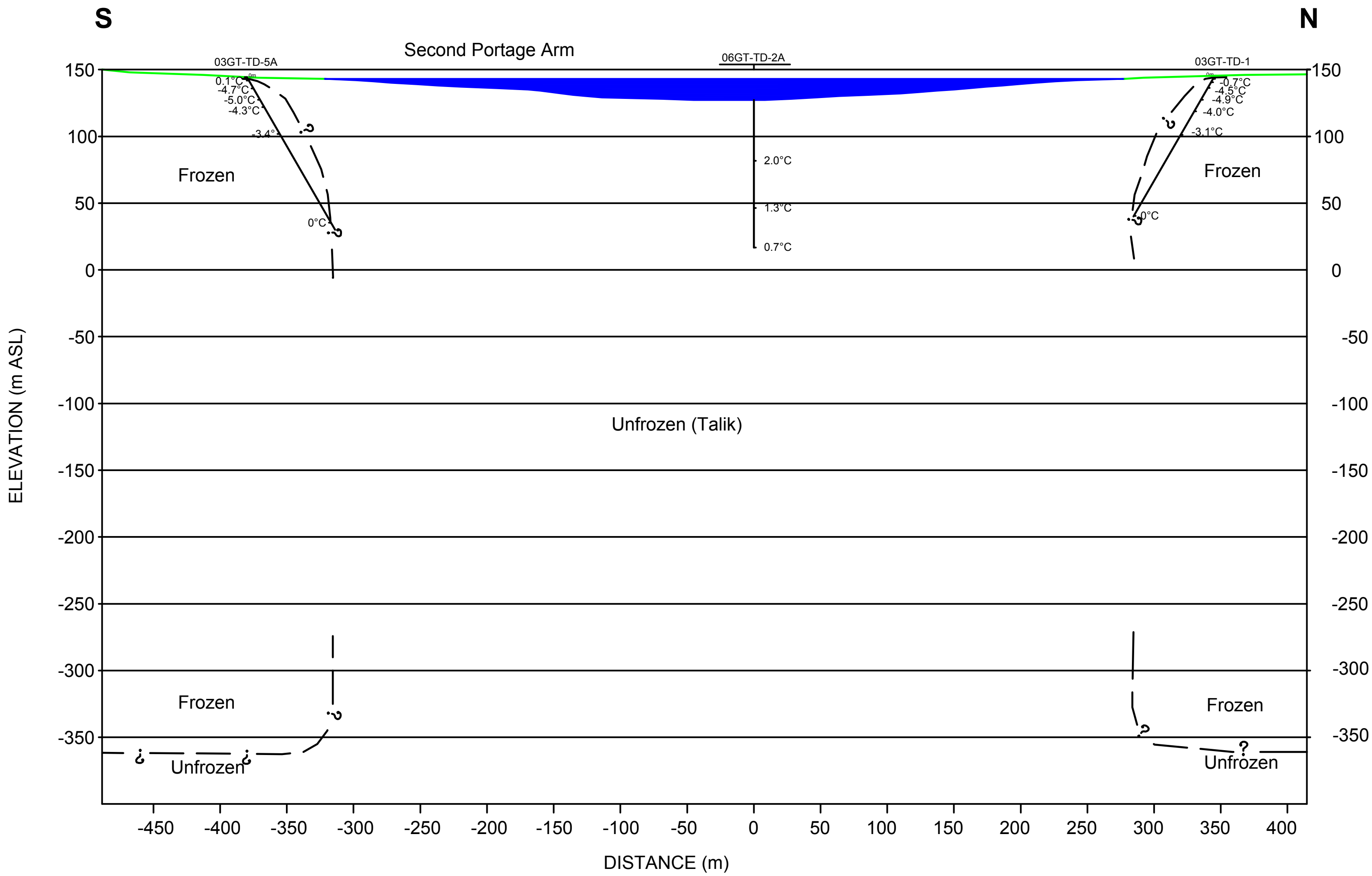
AEM AGNICO-EAGLE MINES LIMITED

MEADOWBANK GOLD MINE
NUNAVUT

THERMISTORS AND SECTION LOCATION PLAN

FIGURE 2.3

REVISION DATE: 09/07/07 09:08AM By: ASalvador CADD FILE: N:\Bur-Graphics\Projects\2009\1428\09-1428-0014\Drafting\2000\Task-1000\0914280014-1000-FIG_2.3.dwg



C
2.3

CROSS SECTION C-C'

0 50 100 150 200 250
SCALE IN METRES

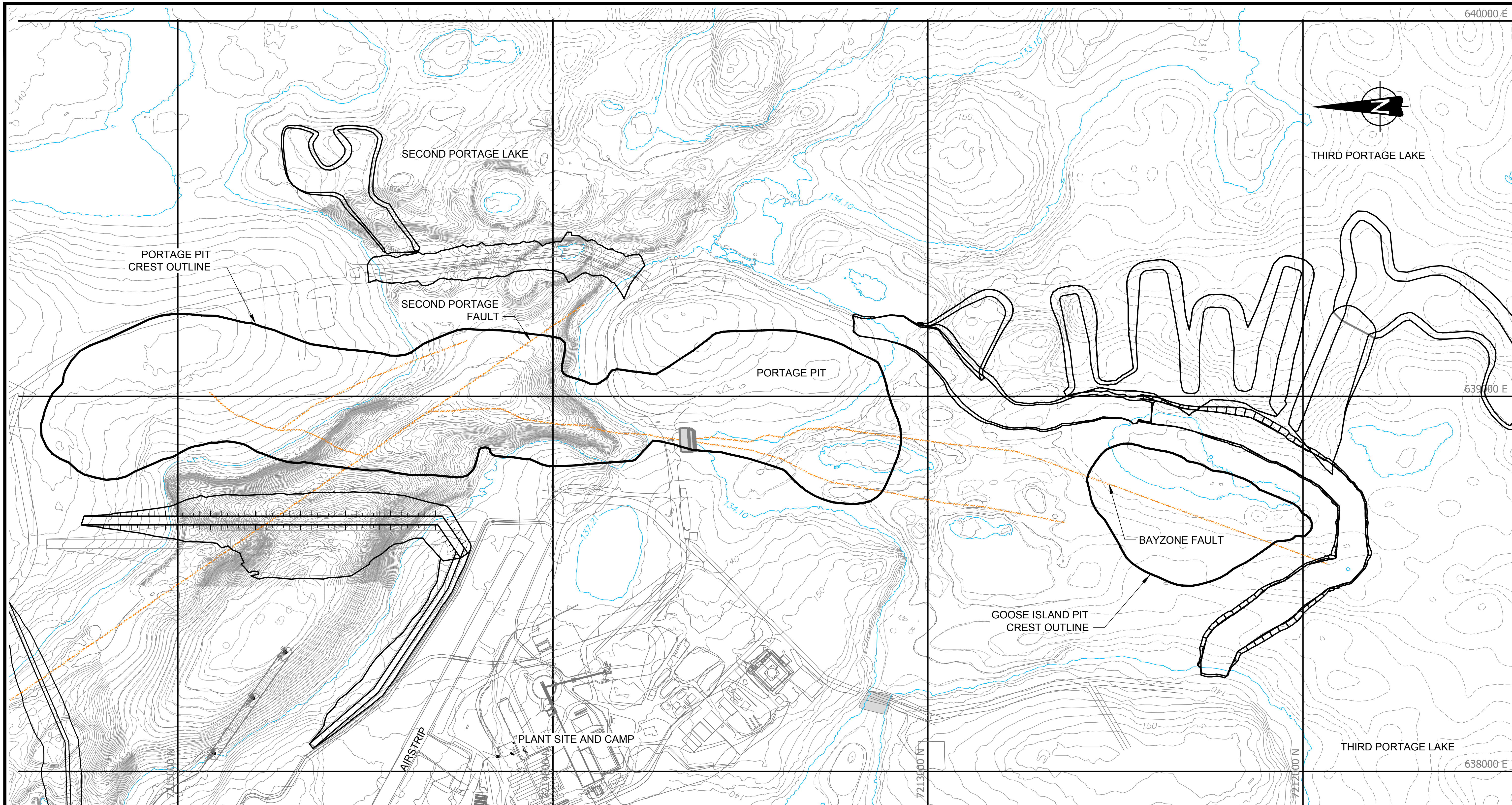
LEGEND

— —? — Inferred Permafrost Boundary

AEM **AGNICO-EAGLE MINES LIMITED**

MEADOWBANK GOLD MINE
NUNAVUT

BASELINE THERMAL CONDITION BELOW SECOND PORTAGE ARM	**FIGURE 2.4**



LEGEND

LAKE SHORELINE CONTOUR
LAND - BASED MAJOR CONTOUR
LAND - BASED MINOR CONTOUR
PIT CREST
BATHYMETRY MAJOR CONTOUR
BATHYMETRY MINOR CONTOUR
INFERRED LOCATION OF FAULTS

NOTES

1) ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2) ALL ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (masl), UNLESS OTHERWISE NOTED.
3) GRID REFERENCE: NAD 83, UTM ZONE 14.
4) CONTOUR INFORMATION ON LAND SUPPLIED BY AGNICO-EAGLE MINES LIMITED
5) CONTOUR BELOW LAKE SURFACE ARE BASED ON BATHYMETRIC SURVEYS BY GOLDER ASSOCIATES LTD., 2002, 2003, 2006.
6) BATHYMETRY CONTOUR DATA SUBJECT TO FUTURE UPDATE.
7) LAKE CONTOURS ARE BASED ON SURVEYED LAKE SURFACE ELEVATIONS:
2nd PORTAGE LAKE= 133.1m,
3rd PORTAGE LAKE= 134.1m.
8) TOPOGRAPHIC CONTOUR INTERVAL 2M.
9) BATHYMETRIC CONTOUR INTERVAL 1M.

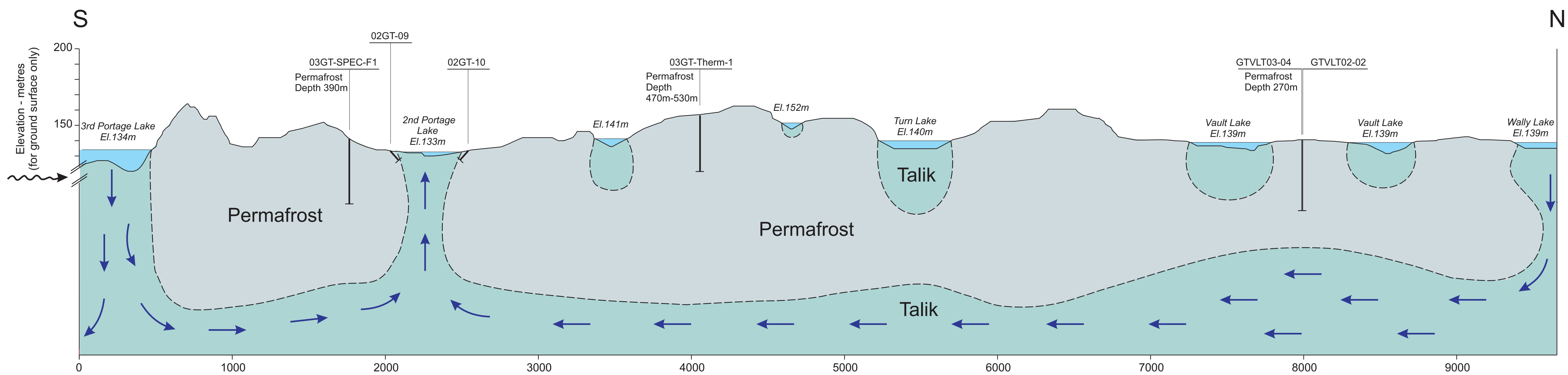
0 100 200 300 400 500
SCALE 1:10,000 m

AEM AGNICO-EAGLE MINES LIMITED

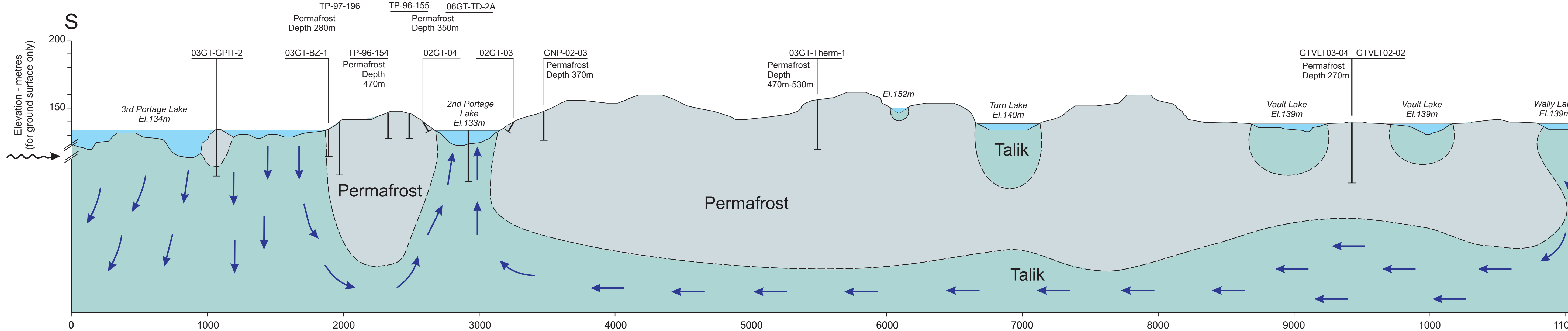
MEADOWBANK GOLD MINE
NUNAVUT

INFERRED LOCATIONS OF FAULTS

FIGURE 2.5



A 2.3 CROSS SECTION A-A'



B 2.3 CROSS SECTION B-B'

0 400 800 1200 1600 2000

Horizontal Scale (m)

0 40 80 120 160 200

Vertical Scale (m)
(above ground surface)

0 100 200 300 400 500

Depth Scale (m)
(For below ground surface. Permafrost depth measured from ground surface.)

NOTES

1. DIKES AND PITS NOT SHOWN.

AEM	AGNICO-EAGLES MINES LIMITED
MEADOWBANK GOLD MINE NUNAVUT	
BASELINE PERMAFROST AND GROUNDWATER CONDITIONS	**FIGURE 2.6**

SECTION 3 • MINE DEVELOPMENT PLAN

3.1 MINE WASTE PRODUCTION SEQUENCE

The current mine plan (2013 to 2018) indicates that approximately additional 20.2 Mt (around 9.3 Mt mined to date) of ore will be processed over a nominal mine life of 6 years including ore from pits and stockpiles. The final totals from mining operations will generate approximately 193 Mt of mine waste rock & till and, approximately 29.5 Mt of tailings.

The 2009, 2010, 2011 and 2012 material balance is presented in Table 3.1, Table 3.2, Table 3.3 and Table 3.4 and the predicted material balance is presented in Table 3.5. This balance indicates the distribution of the following categories of materials by rock type:

- Mine rock for construction;
- Mine rock for dike construction;
- Mine rock for capping; and
- Mine rock to RSFs and Portage Pit fill.

Table 3.6, Table 3.7, Table 3.8 and Table 3.9 shows the material distribution for Portage Pit, Goose Pit and Vault Pit.

Stripping and mine waste rock (NAG) was and will be used for most of the construction of remaining mine infrastructure and dikes at the site. Some PAG will be used to increase the Stormwater Dike (covered with NPAG at closure) and in the construction of Central Dike (freezeback encapsulation). Construction rockfill was initially coming from pre-stripping operations, but now also comes from the active pit operation. Based on current material balance calculations, sufficient quantities of suitable rock fill and till borrow materials will be available for construction, mining activities and reclamation. The general mine development sequence is described in Section 3.2.

Table 3.1: Meadowbank Mined Tonnages for 2009

	North Portage (Tonnes)			South Portage (Tonnes)			Total (Tonnes)
	Rock	Ore	Waste	Rock	Ore	Waste	-
January	160,294	-	-	-	-	-	-
February	103,323	-	-	-	-	-	-
March	256,972	-	280	-	-	-	-
April	388,725	12,733	1,306	-	-	-	-
May	516,829	-	-	-	-	-	-
June	531,933	729	-	-	-	-	-
July	584,364	5,910	6,820	-	-	-	-
August	741,518	-	-	-	-	-	-
September	528,191	9,618	4,445	-	-	-	-
October	640,295	42,452	250	19,778	-	2,548	-
November	378,005	33,247	3,167	601,807	94,848	4,061	-
December	322,641	6,307	-	341,547	339,991		-
TOTAL	****5,153,090**	*****110,996**	***16,268**	****963,132**	*****434,839**	***6,609**	**6,684,934**
*Total Waste Rock Transferred to Waste Dump							22,877
**Total Rock Used for Construction Purposes (road, dikes, etc.)							6,116,222
***Total Ore							545,834

Table 3.2: Meadowbank Mined Tonnages for 2010

	Portage Pit (tonnes)									Ore Processed in Mill (tonnes)
	Ore	Waste Rock								
		Dikes	Roads	Crushers	Waste Dump[1]	Landfill	Stockpiles	Other	Total	
January	97,446	223,842	190,281	156,162	173,736	-	-	-	744,021	-
February	43,979	281,368	46,654	123,727	359,649	-	32,298	1,295	844,991	47,745
March	75,333	503,299	107,635	-	197,125	23,540	-	-	831,599	163,399
April	116,940	258,416	63,100	171,451	428,814	-	-	6,196	927,977	176,857
May	136,444	258,481	10,019	148,576	672,724	-	-	50,073	1,139,873	177,610
June	152,606	534,039	24,748	126,155	401,748	-	-	12,632	1,099,322	215,389
July	236,768	471,106	176,169	127,379	237,095	-	-	-	1,011,749	193,422
August	225,467	493,626	506,385	168,085	115,930	-	-	-	1,284,026	215,559
September	272,675	503,624	606,044	161,673	214,866	5,621	-	-	1,491,828	227,502
October	232,888	235,924	595,322	56,337	461,627	53,522	-	-	1,402,832	198,394
November	247,401	3,813	104,087	8,991	963,805	-	-	-	1,080,596	218,260
December	323,641	-	299,167	8,991	1,118,767	-	-	-	1,426,925	214,400
TOTAL	**2,161,588**	**3,767,538**	**2,729,611**	**1,257,527**	**5,345,886**	**82,683**	**32,298**	**70,196**	**13,285,739**	**2,048,537**

1. *Waste Rock disposed at the waste dump includes overburden stripped for exploitation of Portage Pit*

Table 3.3: Meadowbank Mined Tonnages for 2011

	Portage Pit (tonnes)									Ore Processed in Mill (tonnes)
	Ore	Waste Rock								
		Dikes	Roads	Crushers	Waste Dump[1]	Landfill	Stockpiles	Other	Total	
January	231,025	-	113,259	37,096	1,109,543	-	-	2,544	1,262,442	193,748
February	133,165	-	25,308	51,280	766,807	-	-	404	843,798	213,313
March	86,161	-	21,288	33,271	662,028	-	-	1,044	717,631	221,615
April	235,303	-	77,596	85,064	1,497,859	-	-	11,504	1,672,024	223,041
May	207,399	-	64,171	137,980	1,448,630	-	-	49,069	1,699,851	186,811
June	326,108	8,744	291,067	176,248	1,592,345	-	-	26,615	2,095,019	257,401
July	340,966	54,927	99,513	74,750	1,869,449	-	-	19,140	2,117,779	284,295
August	326,808	122,696	4,674	117,745	1,484,613	-	-	2,384	1,732,111	275,766
September	412,783	333,829	27,199	148,545	1,724,305	-	-	22,884	2,256,762	306,020
October	389,418	22,085	136,862	53,614	1,791,385	-	-	162,725	2,166,671	306,756
November	321,180	12,725	29,518	83,943	1,972,577	-	-	110,214	2,208,976	214,868
December	334,768	164,399	55,516	52,137	1,913,103	-	-	53,454	2,238,609	294,088
TOTAL	**3,345,084**	**719,404**	**945,971**	**1,051,671**	**17,832,645**	**-**	**-**	**461,981**	**21,011,673**	**2,977,722**

1. *Waste Rock disposed at the waste dump includes overburden stripped for exploitation of Portage Pit*

Table 3.4 Meadowbank Mined Tonnages for 2012

	Portage Pit, Goose Pit & Vault Pit (tonnes)									Ore Processed in Mill (tonnes)
	Ore	Waste Rock								
		Dikes	Roads	Crushers	Waste Dump[1]	Landfill	Stockpiles	Other	Total	
January	312,546	-	25,347	853	1,707,100	-	-	568,896	2,302,196	275,186
February	320,370	-	57,299	-	1,859,479	-	-	276,030	2,192,808	307,134
March	311,938	-	4,574	33,835	1,760,145	-	-	374,271	2,172,825	304,740
April	318,550	-	29,748	171,964	2,187,929	-	-	183,366	2,573,007	285,702
May	253,947	37,372	200,732	103,650	2,000,982	-	-	231,500	2,574,236	320,542
June	276,731	78,343	281,403	64,460	1,866,369	-	-	226,695	2,517,270	294,829
July	354,765	9,991	342,978	134,006	1,791,752	-	-	268,051	2,546,777	337,110
August	271,444	260,083	261,459	214,516	1,327,154	-	-	720,701	2,783,914	352,831
September	364,410	674,872	515,804	7,309	1,446,572	-	-	273,284	2,917,841	313,014
October	119,100	-	488,259	-	2,163,147	-	-	590,936	3,242,342	358,860
November	133,041	6,880	281,560	7,439	2,081,931	-	-	337,974	2,715,783	356,646
December	176,287	105,724	142,448	-	2,178,832	-	-	577,195	3,004,199	314,317
TOTAL	**3,213,129**	**1,173,266**	**2,631,610**	**738,031**	**22,371,392**	**-**	**-**	**4,628,899**	**31,543,198**	**3,820,911**

1. *Waste Rock disposed at the waste dump includes overburden stripped for exploitation of Portage Pit & Goose Pit*

Table 3.5 **Projected Meadowbank Mined Tonnages (2013 – 2018)**

		2013	2014	2015	2016	2017	2018	
Portage Pit	Total Waste Rock (t)	21,108,692	12,371,050	7,014,369	1,139,384	-	-	41,633,495
	NPAG (~ %)	*35*	*52*	*60*	43	-	-	44.5
	PAG (~ %)	*65*	*48*	*40*	57	-	-	55.5
	Till (t)	316,421	-	-	-	-	-	316,421
	Ore (t)	2,392,822	1,669,950	1,890,878	791,929	-	-	6,745,579
Goose Pit	Total Waste Rock (t)	10,676,829	3,547,391	326,429	-	-	-	14,550,648
	NPAG (~ %)	*67*	*69*	*23*	-	-	-	66.5
	PAG (~ %)	*33*	*31*	*77*	-	-	-	33.5
	Till (t)	443	-	-	-	-	-	443
	Ore (t)	900,911	1,108,760	265,979	-	-	-	2,275,650
Vault Pit	Total Waste Rock (t)	0	11,799,901	21,328,947	20,437,078	7,998,760	255,758	61,820,444
	NPAG (~ %)	0	95	95	95	95	95	95
	PAG (~ %)	0	5	5	5	5	5	5
	Till (t)	0	1,944,397	231,500	-	429,889	-	2,706,847
	Ore (t)	40,955	1,533,715	2,916,798	3,967,479	2,548,190	200,080	11,207,217

Table 3.6 Portage & Goose PAG, Destinations & Tonnages (2013 – 2018)

	2013	2014	2015	2016	2017	2018	
Portage Rock Storage Facility (PAG Dump)	11,578,595	627,872	-	-	-	-	12,206,467
	41.4%	2.2%	-	-	-	-	43.6%
Portage Pit Fill	5,810,515	4,745,735	1,860,063	-	-	-	12,416,313
	20.8%	17.0%	6.6%	-	-	-	44.4%
Central Dike	987,387	707,351	619,873	607,939	-	-	2,922,549
	3.5%	2.5%	2.2%	2.2%	-	-	10.4%
Stormwater Dike	113,697	-	-	-	-	-	113,697
	0.4%	-	-	-	-	-	0.4%
Rock Garden Bay Goose	-	-	329,319	-	-	-	329,319
	-	-	1.2%	-	-	-	1.2%
All Portage & Goose PAG Destination	18,490,194	6,080,958	2,809,255	607,939			27,988,345
	66%	22%	10%	2%	-	-	100%

Table 3.7 Portage & Goose NAG, Destinations & Tonnages (2013 – 2018)

	2013	2014	2015	2016	2017	2018	
Capping Portage Rock Storage Facility (PAG Dump) with NAG	2,469,647	1,191,050	-	-	-	-	3,660,697
	8.8%	4.2%	-	-	-	-	13.0%
Central Dike	-	-	1,379,177	263,314	-	-	1,642,491
	-	-	4.9%	0.9%	-	-	5.8%
Capping TSF (North Cell)	-	-	2,599,778	-	-	-	2,599,778
	-	-	9.2%	-	-	-	9.2%
Roads Maintenance	217,196	176,751	138,075	143,626	-	-	675,649
	0.8%	0.6%	0.5%	0.5%	-	-	2.4%
Air Strip Extension	163,413	-	-	-	-	-	163,413
	0.6%	-	-	-	-	-	0.6%
Saddle Dams	-	420,481	62,276	71,813	-	-	554,570
	-	1.5%	0.2%	0.3%	-	-	2.0%
Thermal Capping on Goose Dike	357,390	-	-	-	-	-	357,390
	1.3%	-	-	-	-	-	1.3%
Capping Primary Crusher Ramp	-	626,357*	-	-	-	-	626,357
	-	2.2%	-	-	-	-	2.2%
NAG Stockpile for mine closure Requirement	12,145,021	5,770,434	-	-	-	-	17,915,455**
	43.1%	20.5%	-	-	-	-	63.5%
All Portage & Goose NAG Destination	15,352,668	8,185,072	4,179,306	478,753	-	-	28,195,799
	54.5%	29.0%	14.8%	1.7%	-	-	100%

* The Primary crusher ramp will be capped with NAG material (from Goose pit) in 2014.

** Not including 2012 NAG Inventory (2,810,338 tons)

Table 3.8 NAG Stockpile for mine closure requirement, Destinations & Tonnages (2013 – 2018)

	2013	2014	2015	2016	2017	2018	
Capping TSF (North Cell)	-	-	3,125,028	5,480,835	-	-	8,605,863
	-	-	20.6%	36.1%	-	-	56.6%
Roads Maintenance	-	-	188,216	-	-	-	188,216
	-	-	1.2%	-	-	-	1.2%
Saddle Dams	-	-	188,216	256,914	227,797	-	672,927
	-	-	1.2%	1.7%	1.5	-	4.4%
Capping TSF (South Cell)	-	-	-	-	-	5,391,277	5,391,277
	-	-	-	-	-	35.5%	35.5%
Capping Marginal Stockpile	-	-	-	-	-	334,862	334,862
	-	-	-	-	-	2.2%	2.2%
NAG stockpile Destination	-	-	3,501,459	5,737,750	227,797	5,726,139	15,193,144
	-	-	23.0%	37.8%	1.5%	37.7%	100%

Table 3.9 Vault Pit, Destinations & Tonnages (2013 – 2018)

	2013	2014	2015	2016	2017	2018	
Vault Rock Storage Facility (Till,NAG&PAG)	0	13,744,298	21,560,447	20,437,078	8,529,710	255,758	64,527,291
Vault Pit Fill	-	-	-	-	-	-	-
Rock Garden Vault	-	-	-	-	-	-	-
All Vault Till,NAG&PAG Destination	0	13,744,298	21,560,447	20,437,078	8,529,710	255,758	64,527,291

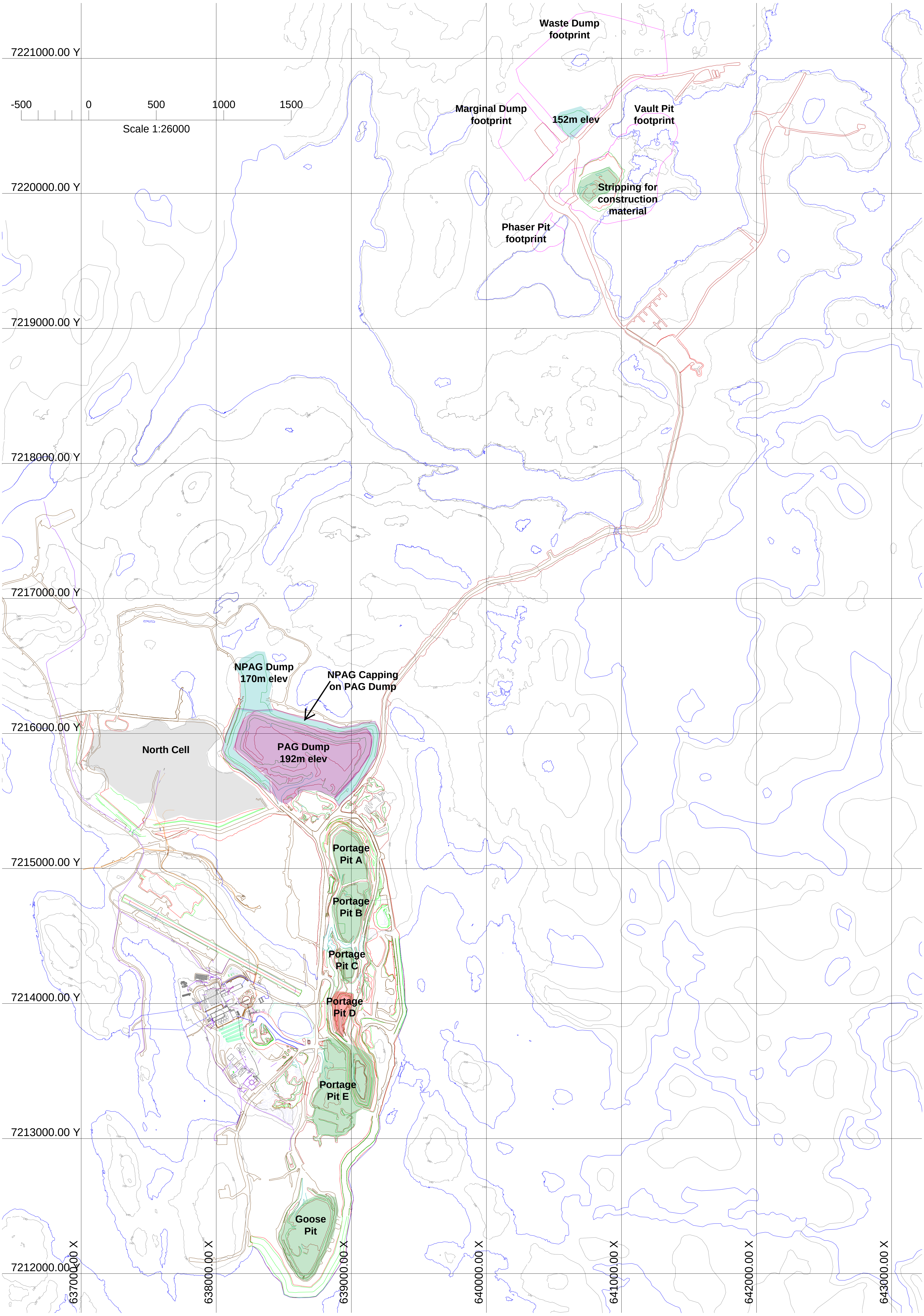
3.2 PROPOSED MINE DEVELOPMENT SEQUENCE

The general sequence of mine development over the operating life is listed in Table 3.10 and illustrated in Figures 3.1 to 3.4. A conceptual sequence of pit development is illustrated in Figure 3.5.

Table 3.10 Proposed Mine Development Sequence

Fig. No.	Year	Items
3.2	2013	- Continue tailings deposition in the North Cell of the TSF - Raise of Stormwater Dike at elevation 150 masl. - Second raise of Central Dike to elevation between elevation 120 and 125 masl. - Advance mining in North Portage, South Portage and Goose Pits. Complete mining in Center and Central North Portage Pits. - Runoff from Portage RSF and Landfill directed to Reclaim Pond. - Portage and Goose Pit waters, plant site and airstrip runoff directed to Attenuation Pond. - Construction of the Vault Dike. - Dewater Vault Lake to Wally Lake. Dewater volume discharged directly to Wally Lake if TSS discharge criteria are met. Otherwise, treated before release. - Monitor water quality within Portage Attenuation Pond, treating if required prior to decant of excess to 3PL, the Reclaim Pond is pumped to Process Plant for use as make-up water. Investigation regarding use of Portage Attenuation Pond water for mill operations eliminating discharge to 3PL.
3.3	2014	- Third raise of Central Dike, to elevation 135 masl. - First stage of Saddle Dams 4 and 5 construction, to elevation 144 masl. - Commence construction of fish habitat structures (“Finger Dikes”) - Runoff from Portage RSF and Landfill directed to Reclaim Pond. - Portage and Goose pit waters, plant site and airstrip runoff directed to Attenuation Pond. - Selective placement of waste rock into Portage Pit. - Advance and complete mining of North Portage Pit. - Advance mining in South Portage and Goose Pits. - Stripping and initiate mining in Vault Pit. - Runoff from Vault RSF directed to Vault Attenuation Pond. - Vault pit waters directed to Vault Attenuation Pond. -Monitor water quality within Portage Attenuation Pond, treating if required prior to decant of excess to 3PL, the Reclaim Pond is pumped to Process Plant for use as make-up water. . Investigation regarding use of Portage Attenuation Pond water for mill operations eliminating discharge to 3PL. -Monitor water quality within Vault Attenuation Pond, treating if required prior to decant of excess to Wally Lake. - Reclaim Pond is pumped to Process Plant for use as make-up water.

Fig. No.	Year	Items
3.4	2015-2018	- Complete construction of Central Dike, to elevation 150 masl. - Complete construction for Saddle Dams 3, 4 and 5, to elevation 150 masl. - Stop tailings deposition in North Cell of TSF, Commence in the South Cell and initiate TSF closure. - Portage Attenuation and Reclaim ponds combined. - Commence flooding of Portage Pits, Goose Pit and Vault Pit Lake. - Continue and complete construction of fish habitat structures at Bay-Goose Dike, and Goose Rock Garden. - Advance and complete mining of South Portage, Goose and Vault pits. Start final closure and reclamation. - Runoff from Vault RSF directed to Vault Attenuation Pond. - Monitor water quality within Vault Attenuation Pond, treating in–situ if required prior to decant of excess to Wally Lake. - Runoff from Portage Rock Storage Facility and Landfill directed to Reclaim Pond. - Plant site and airstrip runoff to be directed to Stormwater Management Pond before discharge of excess TSF. - Reclaim Pond water treated if necessary and discharged to Portage and Goose Pits to assist with flooding. - Monitor water quality within flooded pits, treating in–situ if required and/or pumping to Process Plant for use as process water. - Runoff from Vault RSF directed to Vault Attenuation Pond. - Vault Pit waters directed to Vault Attenuation Pond. - Monitor water quality within Vault Attenuation Pond, treating if required prior to decant of excess to Wally Lake. - Reclaim Pond is pump to Process Plant for use as make-up water.
10.1	post closure	- Breach dewatering dikes once pit lake water quality is suitable for mixing with neighbouring lakes.



AEM

Active Mining area

Completed Mining area

Tailing Storage Facility

Rock Storage Facility (NPAG)

Rock Storage Facility (PAG)

Grid Reference: NAD 83, UTM zone 14

Date: 2013/03/01

By : Jose Gabriel Condoretty

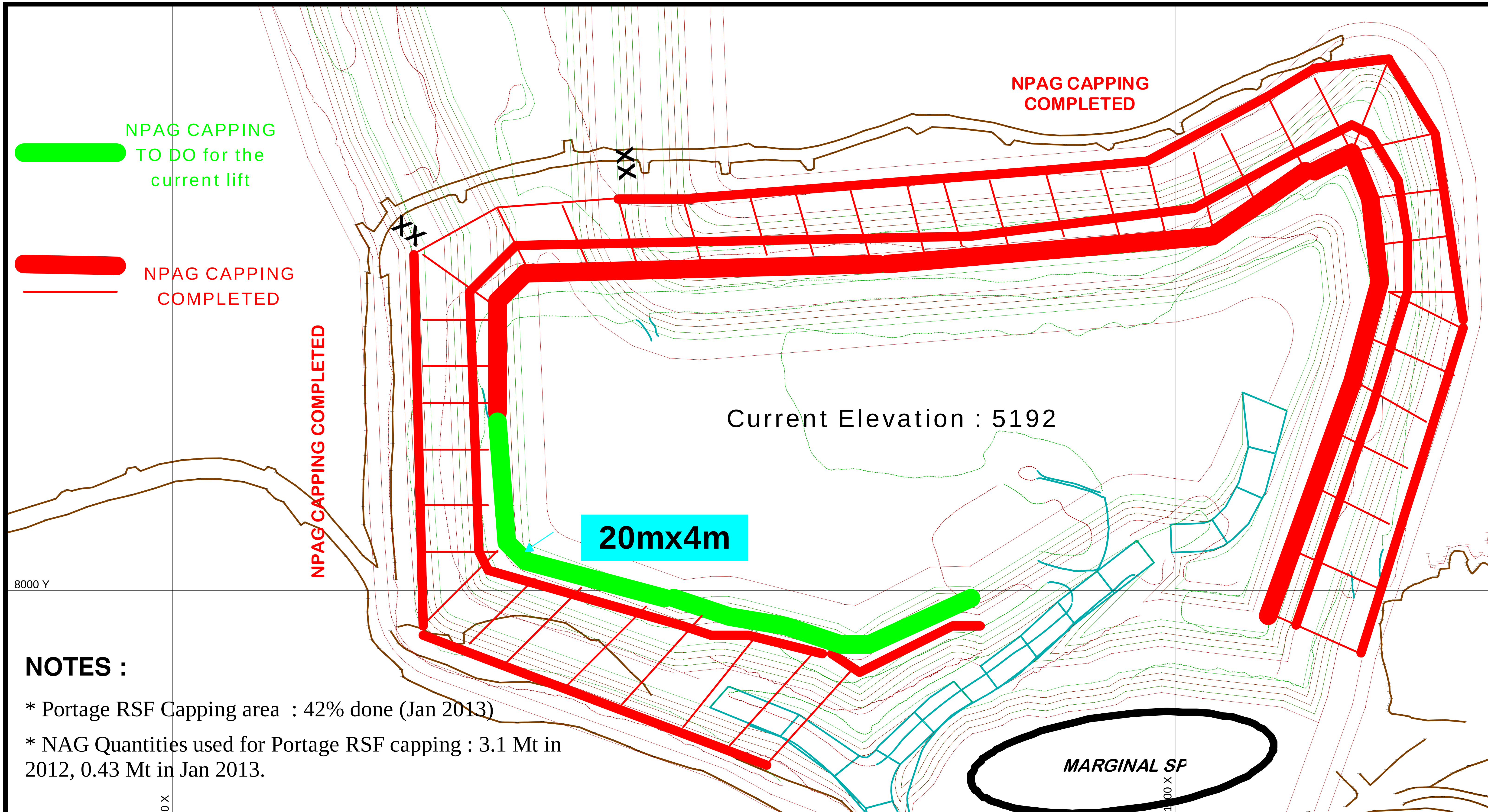
Figure 3.1.1

MEADOWBANK DIVISION

Portage, Goose and Vault

End of 2012

Pits and Dumps Status

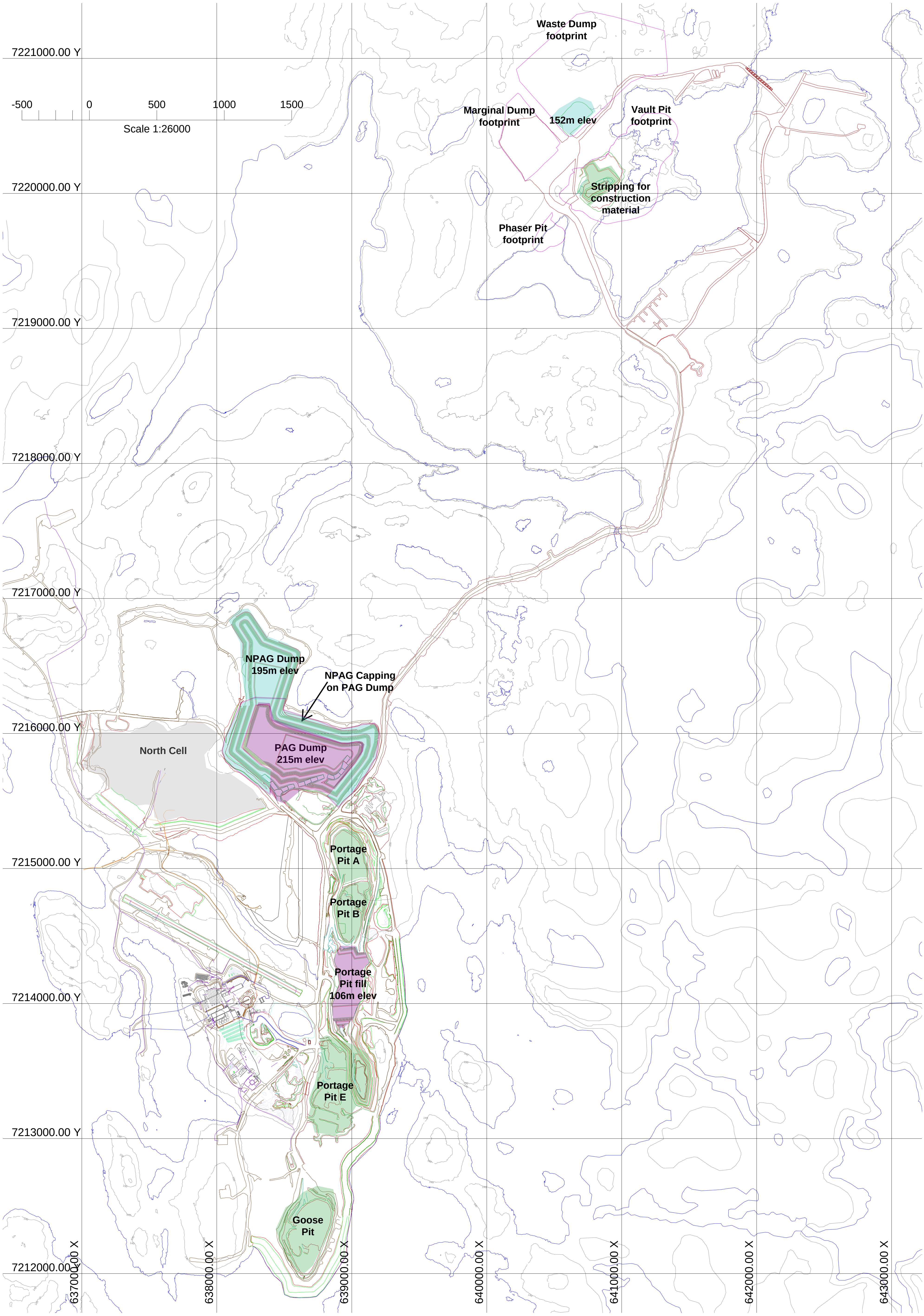


NOTES :

* Portage RSF Capping area : 42% done (Jan 2013)

* NAG Quantities used for Portage RSF capping : 3.1 Mt in 2012, 0.43 Mt in Jan 2013.

AEM	PORTAGE RSF CAPPING JANUARY 2013 Figure 3.1.2	AGNICO-EAGLE MINES LIMITED MEADOWBANK GOLD PORJECT NUNAVUT



AEM

- *Active Mining area*
- *Completed Mining area*
- *Tailing Storage Facility*
- *Rock Storage Facility (NPAG)*
- *Rock Storage Facility (PAG)*

Grid Reference: NAD 83, UTM zone 14

Date: 2013/03/02

By : Jose Gabriel Condoretty

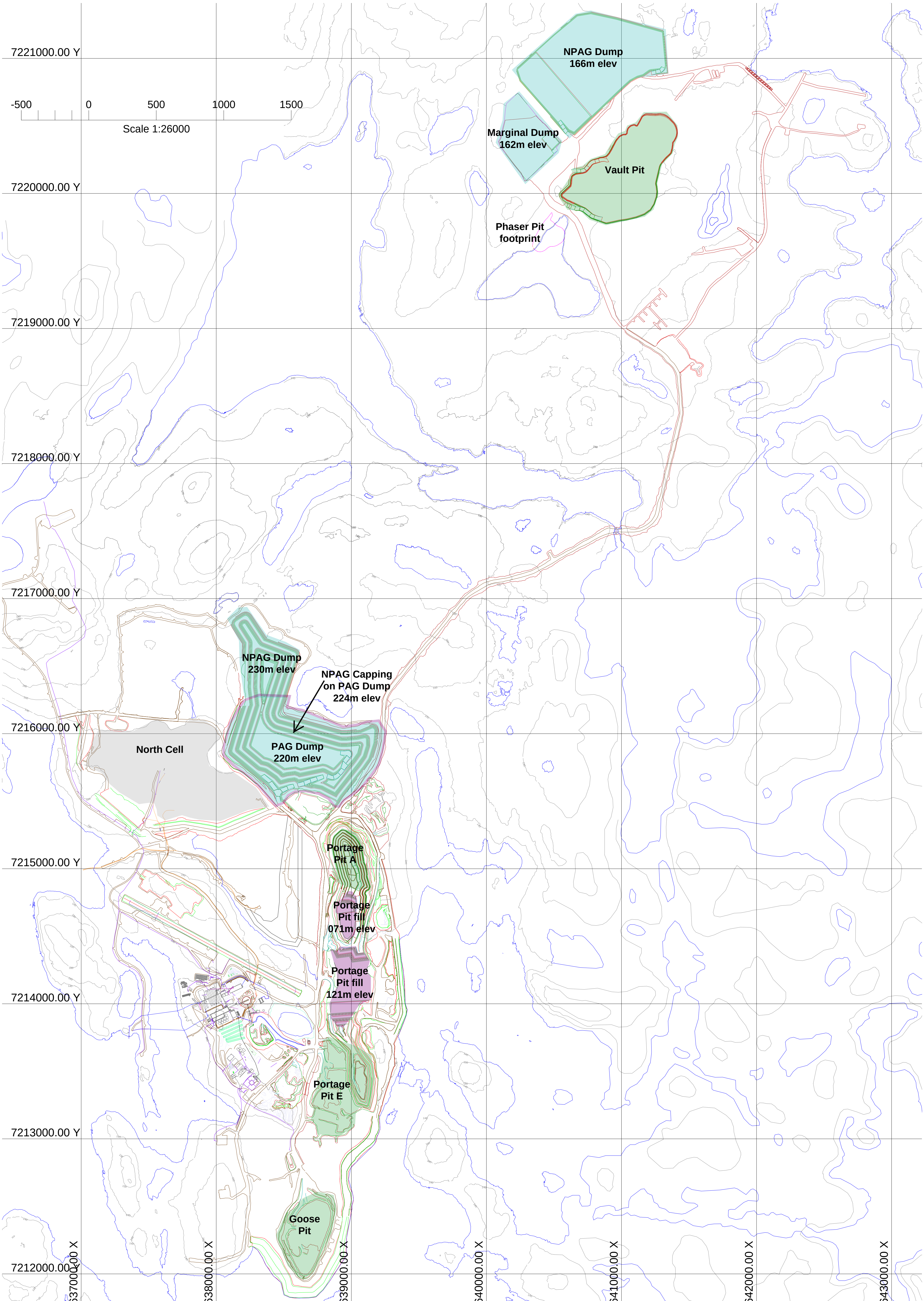
Figure 3.2

MEADOWBANK DIVISION

Portage, Goose and Vault

End of 2013

Pits and Dumps Status



AEM

- Active Mining area
- Completed Mining area
- Tailing Storage Facility
- Rock Storage Facility (NPAG)
- Rock Storage Facility (PAG)

Grid Reference: NAD 83, UTM zone 14

Date: 2013/03/02

By : Jose Gabriel Condoretty

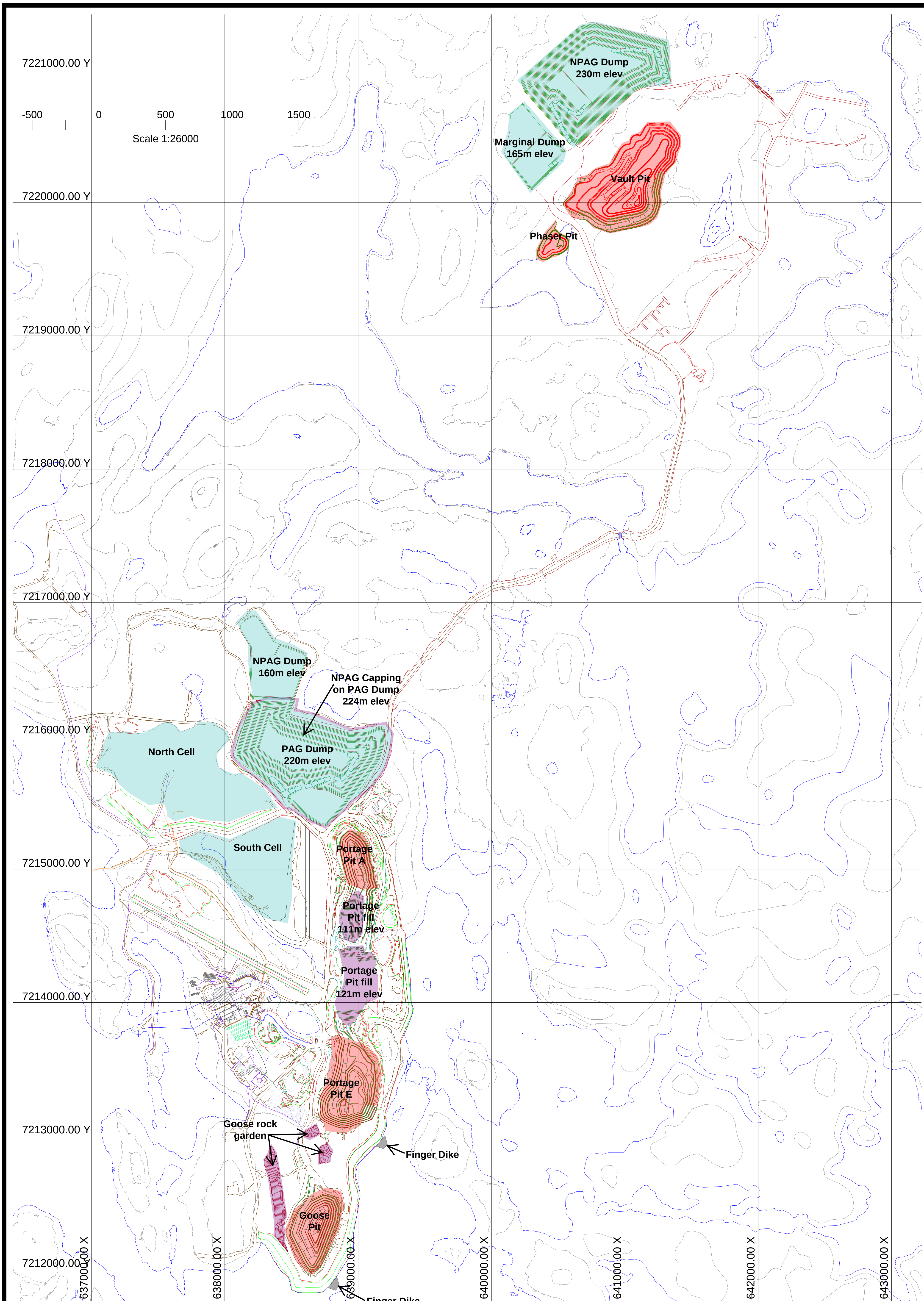
Figure 3.3

MEADOWBANK DIVISION

Portage, Goose and Vault

End of 2014

Pits and Dumps Status



AEM

- *Active Mining area*
- *Completed Mining area*
- *Tailing Storage Facility*
- *Rock Storage Facility (NPAG)*
- *Rock Storage Facility (PAG)*

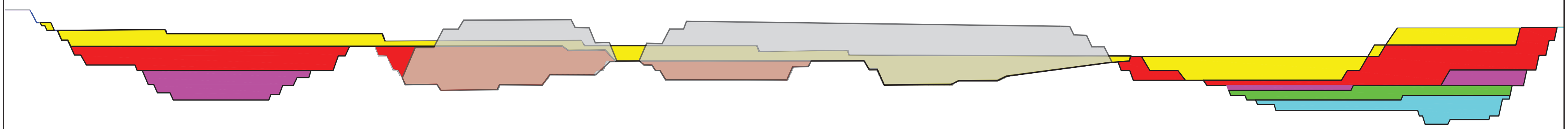
Grid Reference: NAD 83,
UTM zone 14

Date: 2013/03/03
By : Jose Gabriel Condoretty

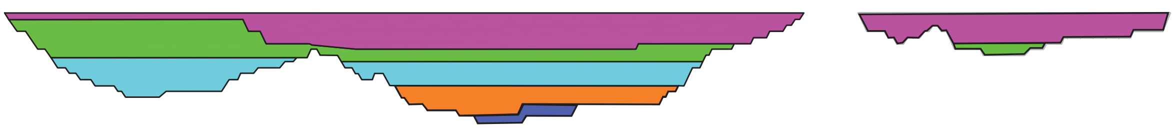
Figure 3.4

MEADOWBANK
DIVISION
Portage, Goose and Vault
End of 2018
Pits and Dumps Status

PROPOSED MINING SEQUENCE AND ROCKFILL
PORTAGE PIT



PROPOSED MINING SEQUENCE AND ROCKFILL
VAULT PIT



PROPOSED MINING SEQUENCE
GOOSE PIT

Mining Sequence by Year

2012 2013 2014 2015 2016 2017
2018 Pit fill

AEM

AGNICO-EAGLE MINES LIMITED

MEADOWBANK GOLD MINE
NUNAVUT

MINING SEQUENCE- LOM (not to scale)

FIGURE 3.5

SECTION 4 • CONTROL STRATEGIES FOR ACID ROCK DRAINAGE IN COLD REGIONS

The generation of metal leachate in acidic drainage is a concern for mining projects. In evaluating the potential control strategies for the disposal of the mine waste at the Meadowbank Gold Mine, consideration was given to control strategies that are effective in cold regions. A discussion of the alternative control strategies considered for the Meadowbank Gold Mine is summarized below.

Common control strategies for the prevention or reduction of acid mine drainage in cold regions are:

1. Control of acid generating reactions;
2. Control of migration of contaminants; and
3. Collection and treatment.

In assessing the overall control strategies for the Meadowbank Gold Mine, emphasis has been placed on methods that satisfy (1) and (2) in the above list, which then has an impact on (3) by potentially reducing the requirements for these activities. Table 4.1 presents various acid mine drainage control strategies.

The Meadowbank Gold Mine is located within the zone of continuous permafrost, and has a mean annual air temperature of about -11.1°C. Based on thermal data collected from the site since 1996, the mine area is underlain by permafrost to depths between 450 and 550 m. In developing the Mine Waste Management Plan, freeze control and climate control strategies have been adopted.

Freeze control strategies rely on the immobilization of pore fluids to control acid mine drainage reactions, and the potential migration of contaminated pore water outside of the storage facility. The climate conditions at the Meadowbank Gold Mine site are amenable to freeze control strategies, and hence should be taken advantage of. In addition to immobilization of pore fluids, permafrost can reduce the hydraulic conductivity of materials by several orders of magnitude. Consequently, freeze control strategies are effective methods for reducing the migration of contaminants through materials.

According to Dawson and Morin (1996), freeze control strategies can only be effective if sufficient quantities of non-acid generating (NAG) waste rock are available for use as a cover and insulation protection. Based on the production forecast schedule for the Meadowbank Gold Mine, there will be sufficient NAG rock available to provide cover over the Portage RSF and TSF.

Table 4.1: Acid Mine Drainage Control Strategies of the Arctic

Strategy	Tailings	Waste Rock
Freeze Controlled	Total or perimeter freezing options can be considered. Can freeze up to greater than 15 m annually if freezing in thin layers. Process chemicals could cause high unfrozen water contents.	Requires considerable volumes of non-acid waste rock for insulation protection. Better understanding of air and water transport through waste rock required for reliable design.
Climate Controlled	May not be a reliable strategy for saturated tailings.	Requires control of convective air flow through waste rock, infiltration control with modest measures and temperature controls. Better understanding of waste rock air, water, and heat transport for reliable design.
Engineered Cover	Special consideration for freeze-thaw effects. Availability and cost of cover materials are major impediments.	
Subaqueous Disposal	Special considerations for winter ice conditions and pipeline freeze-up.	Very difficult to dispose of waste rock beneath winter ice.
Collection and Treatment	Costly to maintain at remote locations Long term maintenance cost.	
Segregation and Blending	Tailings are normally geochemically homogeneous.	May be very effective. Research and development on-going.

Reference: (MEND 1.61.2, 1996)

Climate control strategies rely on cold temperatures to reduce the rate at which oxidation occurs. The low net precipitation in permafrost regions limits infiltration of water into waste rock and tailings disposal areas. Consequently, the climate of the Meadowbank Gold Mine area will act as a natural control to reduce the production of acid mine drainage and metal leachate. Climate control strategies are best applied to materials placed at a low moisture content to reduce the need for additional controls on seepage and infiltration. This strategy is considered to be effective for waste rock, but not tailings. Therefore, the arid climate at the Meadowbank Gold Mine is also suited for climate control strategies for use with the RSFs.

SECTION 5 • OVERBURDEN MATERIALS

5.1 LAKE BOTTOM SEDIMENTS

The lakebed is generally expected to consist of soft, fine-grained sedimentary deposits, referred to as lake bottom sediments that are underlain by till or other soil materials, and then bedrock. The thickness of lake bottom sediments is expected to be variable, and may range from a few centimetres up to 10 metres or more, as suggested by geophysical surveys and information obtained from various drilling programs.

The sediments present underneath the footprint of the Stormwater Dike and the coffer dam (constructed within the upstream limit of the Central Dike footprint) were removed prior to the construction. In addition the sediments were removed from the entire Central Dike footprint in 2012. The sediments at the bottom of the core of the dewatering dikes were removed during the excavation of their main and center trenches. A portion of the sediments present in the footprint of Portage Pit and the totality of the sediments present in the footprint of Goose Pit were removed as part of pre-stripping activities.

The remaining sediments present in the footprint of Portage Pit will be removed as part of pre-stripping activities. The sediments present underneath the footprint of Central Dike, will be removed prior to construction.

The majority of sediments removed for the Dewatering Dikes, Stormwater Dike, the Portage Pits, the coffer dam and Central Dike phase 1 were sent to Portage RSF. Some sediments were placed within the South Cell (Attenuation Pond) in the north abutment valley. As for sediments that will be removed from the Central Dike footprint and south portion of Portage Pit, an estimated range of potential volumes has been provided in Table 5.1. These sediments will be disposed of within the PRSF.

Table 5.1: Estimate of Lake Bottom Sediment Volumes

	Sediments to be removed (m3)[1]
Central Dike	179,800
Goose Pit	0
South Portion Portage Pit	316,421
Total	496,221

1. Volumes are based on plan areas of pits and dike below lake level where soft sediments may be present, and not on total footprint areas.

5.2 TILL

The remainder of the overburden materials on site consist of well graded till or till-like materials with alluvial deposits of silt and sand intermixed. The till and till-like materials is generally described as a silty sand/gravel. It contains cobble and boulder-sized particles with an average of 30 to 40% silt and clay sized particles. Some of the till or till-like material has been and will continue to be used in the construction of TSF perimeter dikes/dams; with the balance placed in the RSFs. Till placed in the

RSFs will either be mixed with the waste rock. The average till thicknesses throughout the Mine area varies based on location and may be from zero to upwards of 18 m.

SECTION 6 • MINE WASTE ROCK

Waste rock from the open pit mines, not used for site development purposes, has been and will be trucked to one of the two Waste Rock Storage Facilities (RSFs) until the end of mine operations. From 2013 to 2015, some waste rock will be placed within the Portage Pit and then will become submerged as the pit is flooded (subaqueous disposal).

Due to the distance between the Portage mining area and the Vault mining area, two separate waste rock storage facilities are required. Waste rock from the Portage and Goose pits is stored in a storage facility located near to these pits (Portage RSF), while waste rock from the Vault open pit will be stored in a separate storage facility adjacent to the Vault Pit (Vault RSF).

6.1 WASTE ROCK PROPERTIES

The quantities of waste rock excavated between 2009 and 2012 are summarized in Table 3.1, Table 3.2, Table 3.3 and Table 3.4. The quantities of waste rock to be excavated in the open pits from 2013 to 2018 are summarized in Table 3.5. The estimated quantities to be stored in each of the RSFs are summarized in Table 6.1.

Table 6.1: Quantities of Waste Rock by destination

Destination (RSF & Others destination)	Rock Type	Quantity
Portage RSF	Waste Rock (about 18% of NAG)	64.6 Mt
Portage Pit Filling	Waste Rock (about 100% of PAG)	12.4 Mt
Construction – Dikes, Roads and Infrastructures (1)	Waste Rock (about 82% of NAG and 18% of PAG)	33.5 Mt
Capping	Waste Rock (about 100% of NAG)	17.5 Mt
Rock Garden	Waste Rock (about 100% of PAG)	0.3 Mt
Vault RSF	Waste Rock (about 95% of NAG)	64.7 Mt

Note (1): Quantities of PAG and NPAG material may vary according to design changes of dikes, roads and infrastructure.

6.2 WASTE ROCK FACILITY MANAGEMENT

Waste rock within the RSFs was and will be disposed of on land and in the Portage Pit. Deposition, final cover (NAG) and freezeback will minimize the potential for acid rock drainage (ARD). The waste types that report to the RSFs show variable ARD potentials, some of which requires control measures. Based on the results of thermal modelling, it is expected that the material within the RSFs will freeze within two years of placement (BGC, 2004).

Waste rock deposition plans for the Portage and Vault RSF's are shown on Figure 6.1 and Figure 6.2, respectively. Placement of waste rock within the Portage RSF has commenced closest to the Portage Pit and will generally progress westward over the entire footprint, then upward to further benches during development of the mine. Placement of waste rock within the Vault RSF will commence closest to the Vault Pit and will proceed in a northward direction and then raised upward as pit development progresses.

As a further ARD control measure, the Portage RSF will be capped with a 4-m thick cover of NAG rock at closure. The depth of cover was selected based on thermistor data, which indicates the depth of thaw (active layer depth) to be on the order of 1.5 m. The 4m cover also takes into account climate change discussed earlier in this document. The cover material would be coarse to allow the development of convective cooling during winter, and insulation through trapped air within voids during summer. Given the high evaporation rate and low annual average precipitation at the site, the average annual infiltration into the pile is expected to be low.

Most of the waste rock (95%) from the Vault deposit is NAG and water quality modeling concluded that the Vault RSF is not expected to require capping.

6.3 WASTE ROCK STORAGE DIMENSIONS

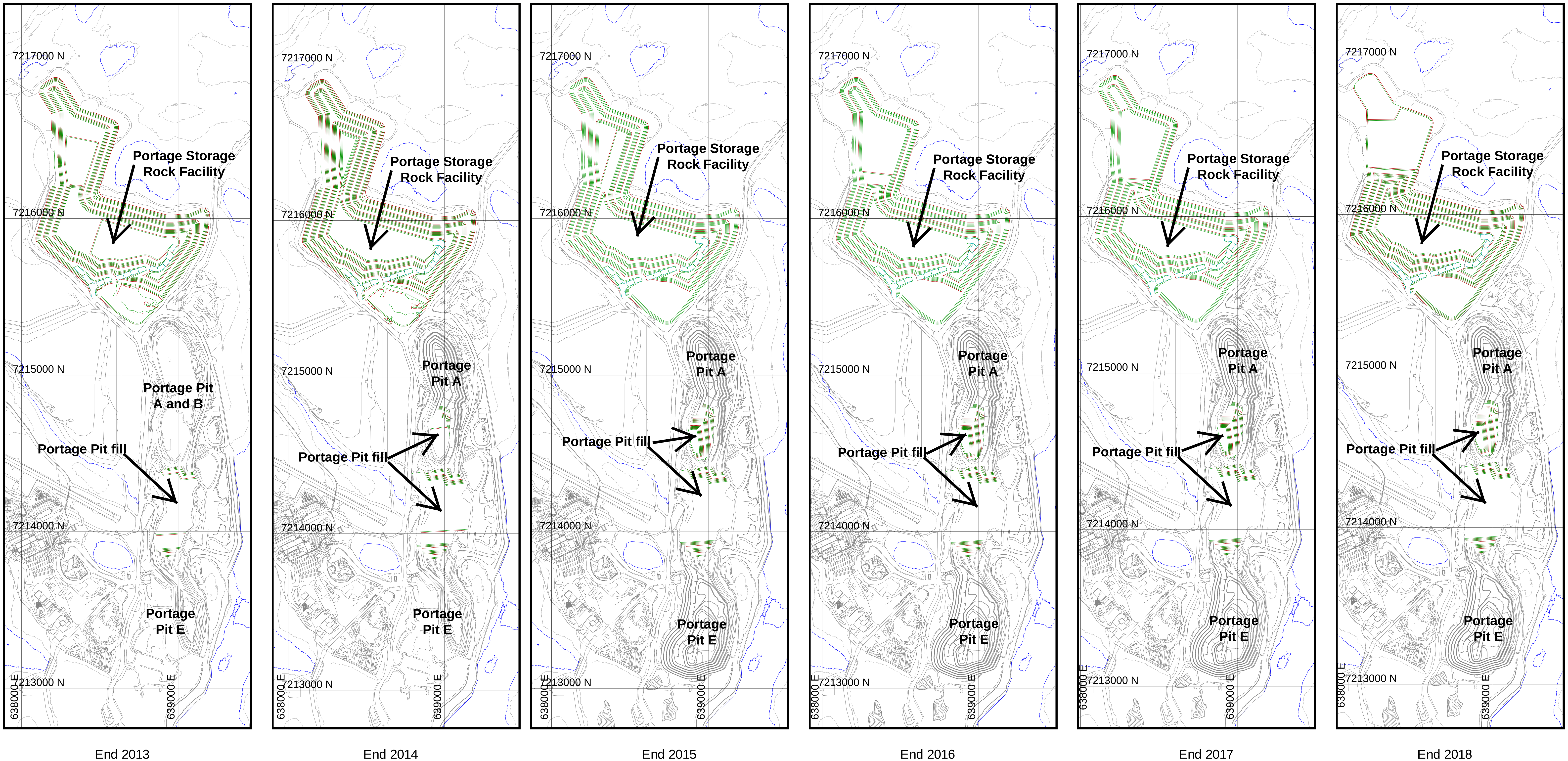
Table 6.2 summarizes the physical dimensions and aspects of the Portage and Vault RSFs.

Table 6.2: Details of Proposed Rock Storage Facilities

Descriptors	Portage Rock Storage Facility	Vault Rock Storage Facility
Approximate storage volume	38.9 Mm^3	34.5 Mm^3
Approximate crest elevation	250 m	230 m
Approximate height	90 m	82 m
Maximum elevation of adjacent topography	192 m	190 m
Approximate footprint area	80.8 ha	80.1 ha

Portage Rock Storage Facility Expanded Area

In 2012, AEM decided to revise Portage rock storage facilities (PRSF) waste rock footprint which resulted in a temporary expansion from the original area of the Waste Storage Facility from 63 ha to 80.8 ha. (See Fig 6.3). The main reason for this was that there was no area to store NAG rock within the PRSF. The deposition of waste rock within the PRSF has to be completed according to strict engineering stability principles. The NAG could not be stored in the current storage area as we are depositing upward and the amount of NAG we are generating would have to be covered with PAG material (no area to store while the deposition upward is occurring). AEM wants to keep all available NAG material for reclamation and on site construction. Therefore a separate storage area of NAG rock was created. The total amount of waste rock is similar to the prediction in the 2009 Plan; the deposition pattern was changed to allow for a separate NAG material storage area. The expansion is still within our original mine footprint and all runoff is directed to the TSF or the Attenuation pond as originally designed. The diversion ditch system is on the outside of the PRSF and thus any watershed freshet is directed away from the PRSF. This is considered a minor revision in that the volume is similar and the material will be used for reclamation leaving the original deposition as designed.



Grid Reference: NAD 83, UTM zone 14

-1000 0 1000

Scale 1:24000

By : Jose Gabriel Condoretty

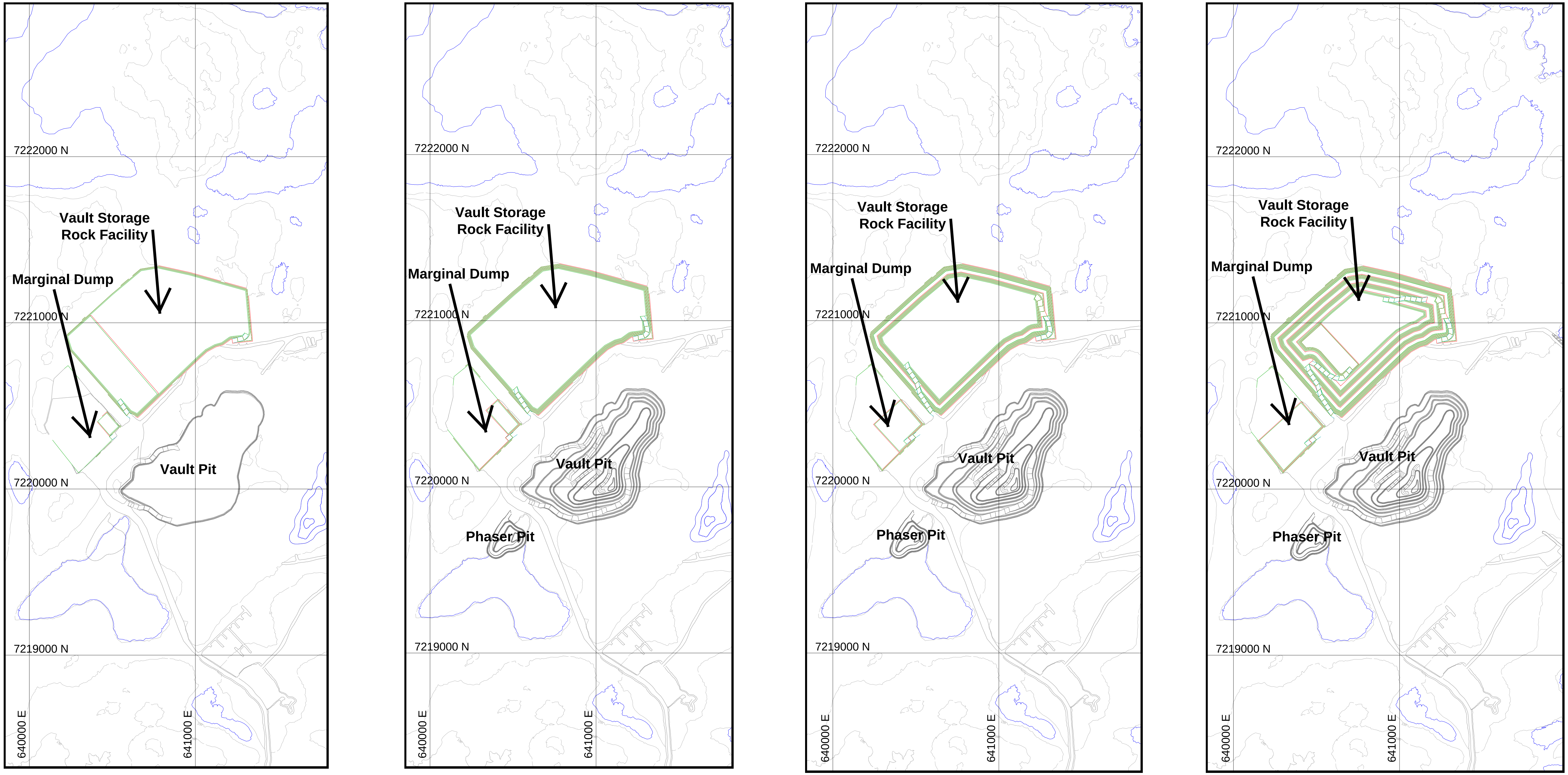
Date: 2013/03/04

AEM AGNICO-EAGLE MINES LIMITED

MEADOWBANK GOLD MINE
NUNAVUT

CONCEPTUAL WASTE ROCK DEPOSITION PLAN PORTAGE ROCK STORAGE FACILITY

FIGURE 6.1



End 2014

End 2015

End 2016

End 2017

Grid Reference: NAD 83, UTM zone 14

-1000 0 1000

Scale 1:24000

By : Jose Gabriel Condoretty

Date: 2013/03/04

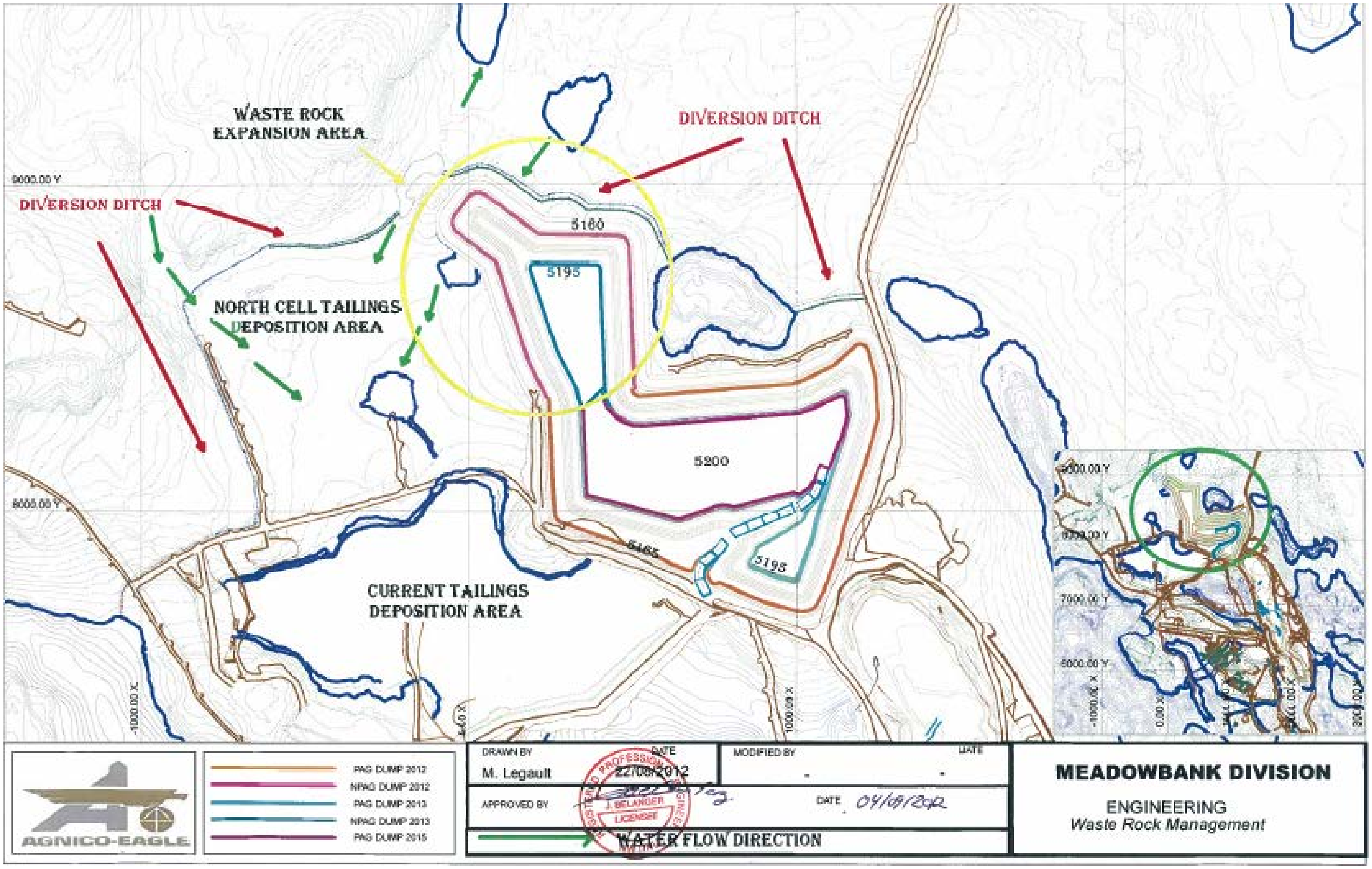
AEM AGNICO-EAGLE MINES LIMITED

MEADOWBANK GOLD MINE
NUNAVUT

CONCEPTUAL WASTE ROCK DEPOSITION PLAN VAULT ROCK STORAGE FACILITY

FIGURE 6.2

Figure 6.3: Waste Rock Expansion Area



SECTION 7 • TAILINGS MANAGEMENT

Tailings are the processed material by-product of the gold recovery process. Tailings are processed through a cyanide destruction circuit, then pumped to the Tailings Distribution Box, and then pumped to the Tailings Storage Facility (TSF).

The TSF is divided by the Stormwater dike into the North and South Cells. The North Cell is currently delimited by the Saddle Dams 1 and 2. The South Cell is currently delimited by the Central Dike which has been completed to elevation 115m. This dike will be raised to elevation 120m in 2013 with a final elevation currently planned to elevation 150m.

Tailings discharge started in February 2010, in the North Cell, and will switch to the South Cell in April, 2015. For the early years (2010 - March, 2015) of operation, the pond in the South Cell was continued 2PL dewatering (2010, 2011) before becoming and being operated as the Attenuation Pond.During this time the reclaim pond is operated within the North Cell. When the deposition will switch to the South Cell, the Attenuation and Reclaim ponds will combine. At this point there will be no further discharge to Third Portage Lake from the attenuation Pond.

7.1 TAILINGS PROPERTIES

Properties of the tailings relevant to the design of the TSF are presented in Table 7.1.

Table 7.1: Relevant Data for Tailings Storage Facility

Property	Value
Mine design life	8.5 yrs
Mill production (solids)	8,500 to 11 400 tpd
Ore processed (including In pit Reserves)	29.5 Mt
Goose pit (In pit Reserves)	2.3 Mt
Vault pit (In pit Reserves)	11.2 Mt
Portage and Goose pits (Ore mined)	9.2 Mt
Portage pit (In pit Reserves)	6.7 Mt
Average specific gravity for ore	3.1 t/m^3
Assumed void ratio	1.4
Assumed in situ dry density	1.27 t/m^3
Volume of tailings	23.2 Mm^3

Processed tailings volumes and associated properties for 2010, 2011 and 2012 are presented in Table 7.2, Table 7.3 and Table 7.4.

Table 7.2: 2010 Processed Tailings Volume and Associated Properties

	Tailings (tonnes)	Density of Tailings (% solid)	Density of Slurry (tonnes / m^3)	Tailings pumped to TSF (m^3)
January	-	-	-	0
February	47,745	25%	1.20	39,659
March	163,399	34%	1.30	125,330
April	176,857	31%	1.27	139,341
May	177,610	34%	1.30	136,347
June	215,389	37%	1.33	161,963
July	193,422	43%	1.41	137,237
August	215,559	34%	1.30	165,911
September	227,502	45%	1.44	157,952
October	198,394	50%	1.51	131,460
November	218,260	45%	1.44	151,407
December	214,400	43%	1.41	151,544
TOTAL				**1,498,151**

Table 7.3: 2011 Processed Tailings Volume and Associated Properties

	Tailings (tonnes)	Density of Tailings (% solid)	Density of Slurry (tonnes / m^3)	Tailings pumped to TSF (m^3)
January	193,748	55%	1.60	121,337
February	213,313	53%	1.56	136,692
March	221,615	53%	1.56	141,906
April	223,041	52%	1.55	144,213
May	186,811	54%	1.58	118,424
June	257,401	54%	1.57	164,165
July	284,295	53%	1.56	181,984
August	275,766	54%	1.57	175,828
September	306,020	55%	1.58	193,082
October	306,756	56%	1.61	191,047
November	214,868	56%	1.61	133,255
December	294,088	51%	1.53	192,542
TOTAL				**1,894,475**

Table 7.4 2012 Processed Tailings Volume and Associated Properties

	Tailings (tonnes)	Density of Tailings (% solid)	Density of Slurry (tonnes / m^3)	Tailings pumped to TSF (m^3)
January	275,186	49.71 %	1.51	182,527
February	307,134	49.73 %	1.51	203,668
March	304,740	49.78 %	1.51	201,969
April	285,702	49.61 %	1.51	189,682
May	320,542	49.74 %	1.51	212,531
June	294,829	49.81 %	1.51	195,350
July	337,110	49.81 %	1.51	223,368
August	352,831	49.81 %	1.51	233,780
September	313,014	49.81 %	1.51	207,406
October	358,860	49.73 %	1.51	237,973
November	356,646	49.71 %	1.51	236,558
December	314,317	49.61 %	1.51	208,676
TOTAL				**2,533,488**

7.2 TAILINGS MANAGEMENT STRATEGIES

Due to the arid climate and permafrost environment, tailings are disposed of in a manner that encourages total freezing as a control strategy. Given the length of time that water at the site is ice covered, subaerial disposal is preferred. The objective is to allow the tailings to be frozen in layers in order to maximize the total frozen thickness. It is anticipated that the tailings will eventually become encapsulated by permafrost; thus limiting oxygen diffusion and water infiltration into the tailings, seepage from the tailings, and the generation of acid mine drainage.

The TSF was designed in two cells in order to allow tailings management in smaller areas with shorter beach lengths reducing the amount of water that is trapped and permanently stored as ice. Operation in cells also allows progressive closure and cover trials to begin in the North Cell while tailings deposition continues in the South Cell.

Tailings deposition started in the North Cell and is done from the perimeter dikes. The primary objective is to build tailings beaches to keep the pond away from the dikes especially prior to the freezing period to protect the liner against ice build-up.

Once deposition switches to the South Cell, Stormwater Dike becomes an internal dike dividing the North Cell from the South Cell. Exfiltrations from the Stormwater Dike will flow to the South Cell.

The tailings deposition plan in the South Cell will result in the development of a tailings beach starting on the upstream slope of the Central Dike and progressively advancing northwest, away from the Central Dike and Portage pit. This will force potential seepage pathway away from Central Dike and its foundation materials reducing seepage-flux to the environment.

Once hydraulic gradients are reduced, the migration seep water into the talik beneath the North Arm of 2PL can only occur by diffusion. Diffusive transport is calculated to require more than $1x10^6$ years for 1% of the initial constituent concentration to reach the deep regional groundwater system. The rate of advance of the freezing front into the talik beneath the 2PL is therefore expected to exceed the rate of advance of diffusive transport, eventually encapsulating any constituents.

During operations, the cells (North or South) into which tailings will be deposited will initially be a local groundwater discharge area as the water level in the tailings will be below Second Portage Lake. As the Portage Pit is excavated however, it will become a regional hydraulic sink in the area. Any seepage into the talik beneath the tailings area will be directed towards the Portage Pit where it will be captured during the open pit operations and redirected back to the TSF (if necessary).

At closure, the tailings surface will be capped with a minimum 2-m thick layer of NAG rockfill and will be shaped to direct water away from the perimeter dikes. The final thickness of capping will be selected to limit yearly thawing (the active layer) to within the acid-buffering capping layer, and promote the development of permafrost within the tailings. Cover trials will be completed during operations to confirm the required cover thickness to physically isolate the tailings and to confine the active layer within relatively inert materials.

In addition to providing a layer to limit the depth of potential frost penetration into reactive tailings pile, the cover layer will also serve the following beneficial purposes:

- The cover will reduce the potential for wind blown tailings;
- The cover will be composed of acid buffering waste rock; and
- The cover will contribute to shedding of water from the surface of the tailings, and consequently will limit infiltration of water into the tailings pile.

The beneficial effects of the cover layer will provide an alternative and secondary strategy for the management of the TSF in the event that permafrost develops more slowly than predicted.

During the post-closure period, the tailings are predicted to freeze with time, resulting in permafrost encapsulation. A very low seepage flux of tailings pore water is expected to report to the Portage Pit Lake until the tailings are frozen. The pit lake will be isolated from the adjacent 3PL until monitoring indicates the pit lake water quality achieves acceptable levels to allow removal of sections of the Bay-Goose Dike.

7.3 TAILINGS FREEZEBACK AND SEEPAGE

Modeling of tailings freezeback and contaminant transport was completed in two stages of increasing complexity, as described in Golder 2007a and 2008a. The first stage of modeling was completed using a simplified thermal model of the proposed tailings deposit in the northwest arm of 2PL. It was carried out to predict the range of time required to freeze the tailings and into the underlying talik (Golder, 2007a). The model was intended to simulate thermal changes in and beneath the tailings during operations and after closure. The second stage of modeling included the effects of staged flooding of the Portage Pit, and contaminant transport semi-coupled with seepage/thermal processes on foundation and tailings temperatures (Golder, 2008a).

The modeling assumed that tailings were deposited instantaneously as a thawed mass to the full depth, approximating advective heat flow preventing freezing of the tailings until the tailings cells have been fully filled by end of mine life. These are conservative assumptions, as it is expected that the climate conditions at site will result in some freezing of the tailings mass.

Climate change was also incorporated into the modeling exercise using climate warming trend of 6.4°C over 100 years. This is considered to be a conservative upper estimate of the climate change rate for the mine area and is consistent with predicted and recommended climate change trends for projects in the north.

The model results indicate that the degree of freezing, time to reach fully frozen tailings, and the depth of the frozen foundation beneath the tailing pile would depend upon the placement of the tailings and the duration of the exposure of the tailings to air temperature. The results also indicate that water flowing through the tailings will increase the time for the tailings to freeze completely. However, the impact of heat introduced by water flow will be limited by the expected low hydraulic conductivity of the tailings.

The seepage component of the coupled model analysis indicated that water flux in the TSF will be mainly controlled in the short term by the hydraulic gradient existing between the tailings and Portage Pit areas. Upon mine closure and flooding of the Portage Pit, the hydraulic gradient between the two areas will gradually reduce as the lake level rises and the tailings drain. Hydrostatic equilibrium will occur within about 10 years causing flux from the tailings area to practically cease. After that, the freezing front will progressively advance into the tailings and the tailings will freeze within a period of about 40 years after closure.

7.3.1 Monitoring of Tailings Freezeback

During the development and mining of the deposits, an adaptive management plan will be implemented with respect to monitoring of the TSF. The Thermal Monitoring Plan (TMP) is presented in detail in Section 8 of this document.

During the operational phase, a number of test pad stratigraphies have and will be developed to assess various cover designs, and to determine the most appropriate design for the actual site conditions. Such an approach has been used previously at northern mines such as Nanisivik.

The monitoring program will provide the data required to validate the predictions of freezeback within the tailings. If it is determined by monitoring during operations that the tailings are freezing at lower rates than predicted, then mitigation procedures would be implemented.

A number of mitigation measures are available to control ground temperature and to enhance freezing. These include the use of passive or active thermosyphon systems. Passive systems rely on natural (or wind induced) ventilation while active systems rely on forced ventilation or circulation of refrigerants through a heat exchanger. The passive systems utilizing natural circulation are less costly, and are easily implemented, consisting essentially of an air convection pile, or pipe, that is open to the atmosphere. Heat is exchanged by convective circulation resulting from the cold air from the surface environment sinking within the open pipe, and warm air inside the pipe rising. These systems can also be closed systems having some internal fluid that is used as the heat transfer medium. Active (forced ventilation) systems utilize pumps and refrigerants to achieve the same cooling effect but at an accelerated rate. Both systems are used reliably in northern climates to preserve or promote freezing.

As indicated before, the tailings will also be covered with a minimum 2-m thickness of NPAG rockfill (final thickness to be confirmed based on cover trials), which will provide an alternative and preventive strategy for the management of the TSF in the event that permafrost develops more slowly than predicted.

7.3.2 Monitoring of Tailings Seepage

Following dewatering of 2PL Arm and during investigations and construction of the TSF perimeter dikes, several investigative procedures were and will continue to be used to identify the location and hydraulic properties of faults that are inferred to be present beneath the North Arm of 2PL including mapping of exposed bedrock, and packer testing in boreholes.

The results of the investigations are used to locate monitoring wells and thermistors that are and will be installed within the dikes, and between the Central Dike and crest of the Portage Pit. Thermal data are and will continue to be monitored to evaluate seepage from the TSF and freezeback of the TSF, and of the Central Dike and foundation.

- If monitoring indicates flow rates and water qualities of concern, then mitigation measures would be undertaken. The potential mitigation action would be dependent on observed flow rates and water quality data, but might include the following (Golder, 2007b): Installation of a grout curtain beneath the Central Dike; and
- If, during monitoring, it is found that the freezeback of the dike and tailings deposit are occurring at a rate less than predicted, then enhancement by artificial freezing methods may be considered.

7.3.3 Requirements for Sumps and Seepage Pump Back

Seepage collection systems are planned downstream of the TSF dikes as a contingency against seepage. Seepage collection systems consist of trenches and sumps located immediately downstream of the TSF dikes. Seepage reporting to the sumps is to be pumped back over the dike into the TSF. Seepage pump back rates will be monitored and recorded as a measure of dike performance. Seepage water quality is monitored in accordance with the Water License and results to date indicate there are no contaminants of concern noted (ie cyanide).

7.4 TAILINGS DEPOSITION PLANNING

The main components of the TSF are illustrated in Figure 7.1 and the general operation of the TSF facility will follow the sequence laid out in Table 3.10. The storage capacity of the tailings storage facility, Attenuation/Reclaim Pond, and total basin capacity are shown on Figure 7.2. An updated operational detailed deposition plan for the TSF is presented under separate cover (Golder 2012).Due to changes in LOM, AEM is currently revising the Tailings Deposition Plan and appropriate updates will be provided upon completion of the new Plan (April/May 2013)

Tailings deposition planning for the mine is based on the following general objectives and operating philosophy:

- Define a deposition sequence based on proposed dike alignments with sufficient capacity to store the life of mine tailings plus a contingency while maintaining the required setback from the Portage Pit;
- Define a deposition sequence that allows the cells to be partitioned to facilitate the lake dewatering sequence, construction of the Central Dike, and to allow a portion of the TSF to be operated as an attenuation pond for at least 3 years. This has been completed as the Central Dike is constructed to elevation 115m. AEM is currently investigating the reuse of water collected in the attenuation pond in the mill process;
- Define a deposition sequence that maintains a reclaim pond with sufficient depth for efficient operation of the reclaim barge near the west side of the impoundment;
- Define a deposition sequence that maintains beaches on the upstream faces of perimeter dikes, Stormwater Dike, Central dike and all associated Saddle Dams;
- Define a deposition sequence to operate in cells to reduce beach length to more efficiently operate in cold conditions to minimize the storage of ice;
- Define the staged construction schedule for the dikes so that adequate freeboard (2m) is maintained within the impoundment;
- Define a deposition sequence that creates a tailings surface that will require the minimum earthworks during closure and, if possible, will allow covering of some portion of the tailings surface during operations; and
- Define a deposition sequence that promotes freezing of the tailings during the operating period.

As mentioned above, the general operational management strategy for the TSF involves discharging tailings into the North Cell of the TSF to a maximum elevation of 148m. Once the North Cell is filled, the reclaim barge will be moved into the South Cell, and tailings deposition will continue. While the South Cell is operated, the North Cell will be allowed to freeze, and progressive reclamation trials will commence. The tailings will be covered with rockfill placed in the northern sector of North cell and working towards Stormwater Dike.

7.5 TAILINGS STORAGE FACILITY CAPACITY

As mill processing rates and tailings characteristics are liable to fluctuate over the life of the mine, the design of the TSF and tailings deposition plan will continue to evolve based on changes in design parameters including mill process rates, tailings beach slopes, ice entrapment, and tailings in-situ densities. As such, a preliminary deposition plan was done in 2009 to provide guidelines for operation of the facility and to schedule the construction of the TSF perimeter dikes. This deposition plan was updated twice and included data collected from the first years of deposition within the TSF and took into account the updated mine plan and operational plans. The TSF was designed to have sufficient capacity to store the expected tailings volume over the life of mine (Golder, 2008b). In that same study, a sensitivity analysis was conducted to evaluate the impact of possible ice entrapment on the final elevation of the TSF. It is likely that some ice can be trapped in the tailings as a result of tailings transport water freezing before it reaches the Reclaim Pond. The results are summarized in Table 7.5. The original design included an assumption of a 20% tailings bulking factor due to ice entrapment. AEM completed the 2012 Water Management Plan and it was determined that thereis an additional 20% water within the tailings pores. This is consistent with original estimates made in AEM's previous Waste Management Plan (October, 2009). The tailings solid content is 50.4 %

(Ws/(Ws+Ww)). This value means that for each ton of tailings, there is app 1 m³ of water. This water is pumped in the North Cell - TSF with the slurry, but a part of this water is captured in the material void. This water could be found in different states : ice lens formation and the tailings capilliartiy hold water (inside the solid portion). As a result only 60% of the slurry water became reclaim water. The other 40% is trapped inside the tailings pond as ice and pore water (as predicted).

The quantity of ice trapped will depend on the tailings beach management, but increases in volume due to ice entrapment of up to 30% have been reported by other mines in similar environments. The impact of varying proportions of entrapped ice on the storage capacity of the TSF is presented in Figure 7.3. The figure indicates that an increase in bulking from 20% to 30% due to ice entrapment in the tailings would result in an increased final height of the tailings.

Since the beginning of deposition, bathymetric surveys conducted at least yearly revealed that density is lower than predicted by the sensitivity analysis; 1.27 t/m^3 measured compared to 1.37 t/m^3 predicted). Therefore, additional storage contingency may be available within the TSF.

Table 7.5 Average Height Increase of Tailings Surface Elevation for Various Amounts of Ice Entrapment based on Golder, 2008b

Proportion of Entrapped Ice (%)	Average Height Increase of Final Tailings Surface Elevation* (m)
0	-
10	1.4
20	2.5
30	3.7

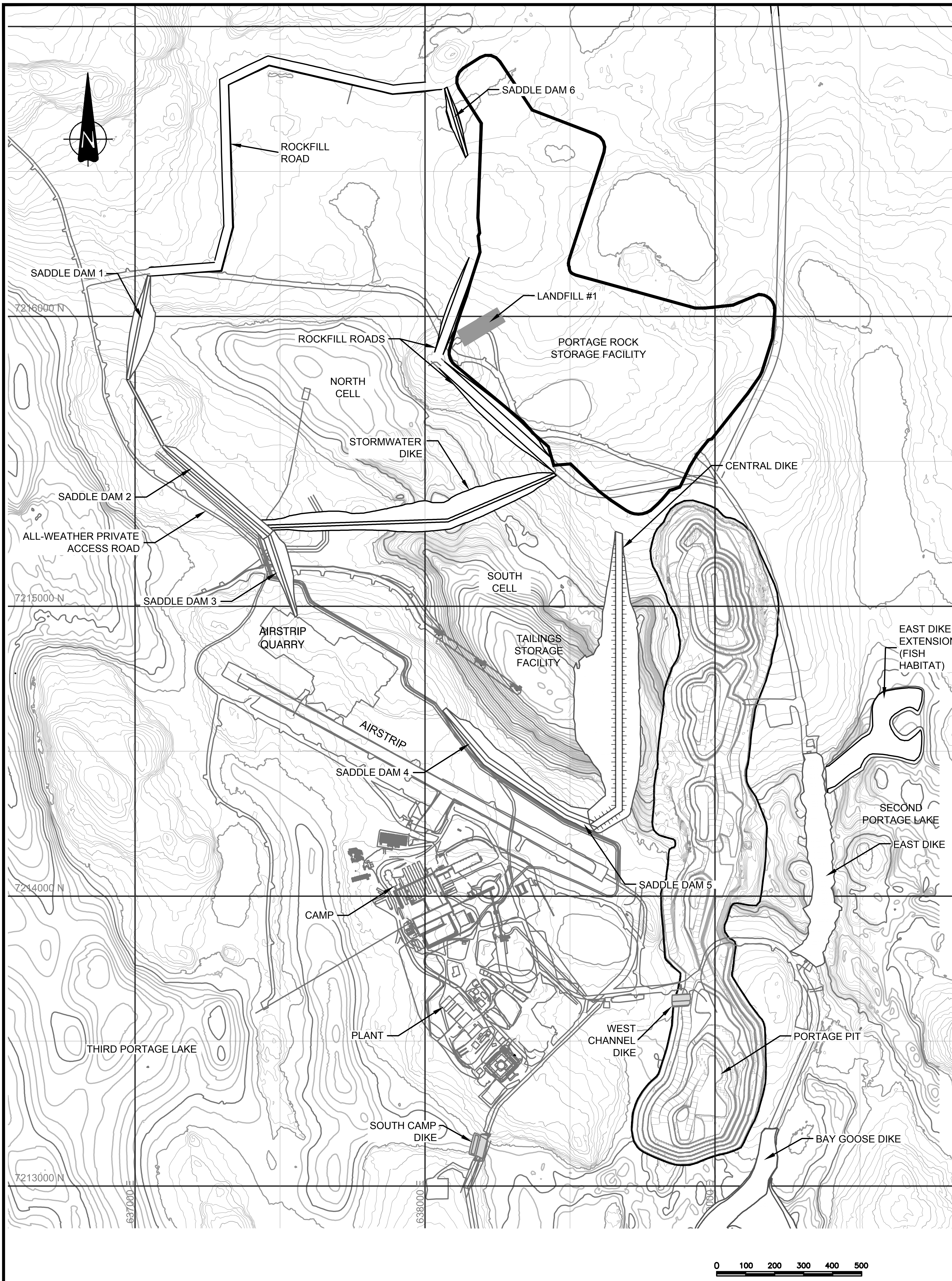
*Based on initial ore reserves.

In addition to the contingency related to density, the design of the dikes allows for staging crest elevations without major re-design. The TSF dikes are raised by the downstream method, and the alignments of the dikes were selected to allow additional raising to occur above 150 masl, should additional ore bodies be identified.

The key variables that will influence the performance of the facility are the following:

- Tailings beach slope;
- Reclaim pond volume;
- In-situ dry density;
- Seepage; and
- Ice content.

Regular monitoring of the TSF discharge operation, such as bathymetry and topography surveys, are to be conducted throughout the life of the TSF to adjust model parameters and deposition strategy. This ensures proper planning of the raisings/dikes construction, water availability in the TSF pond and water release strategy following freshet. It will also help in the evaluation of ice entrapment throughout the life of the TSF and verification of model parameters and deposition strategy within the updated deposition plan.



NOTES

1) TOPOGRAPHIC CONTOUR INTERVAL 2M.
2) GRID REFERENCE: NAD 83, UTM ZONE 14

REFERENCES

1) AMEC AMERICAS LTD., DRAWING NUMBER A1-131395-100-C-0001 (100- C-0001.DWG), MEADOWBANK FEASIBILITY STUDY, APRIL 2005.

PROJECT

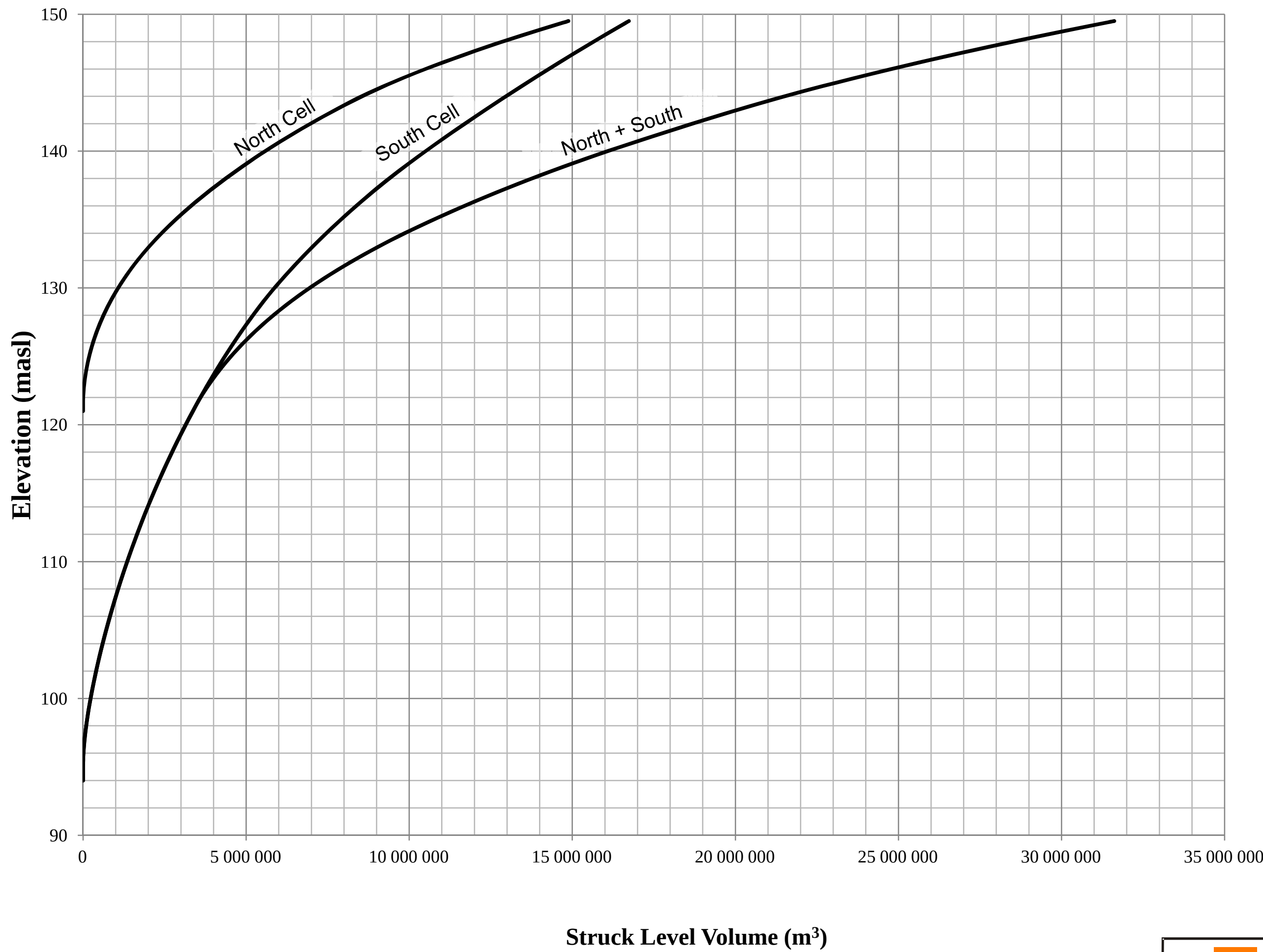
AEM **AGNICO-EAGLE MINES LIMITED**

TITLE

MEADOWBANK GOLD MINE
NUNAVUT

TAILINGS STORAGE FACILITY MAIN COMPONENTS

FIGURE 7.1

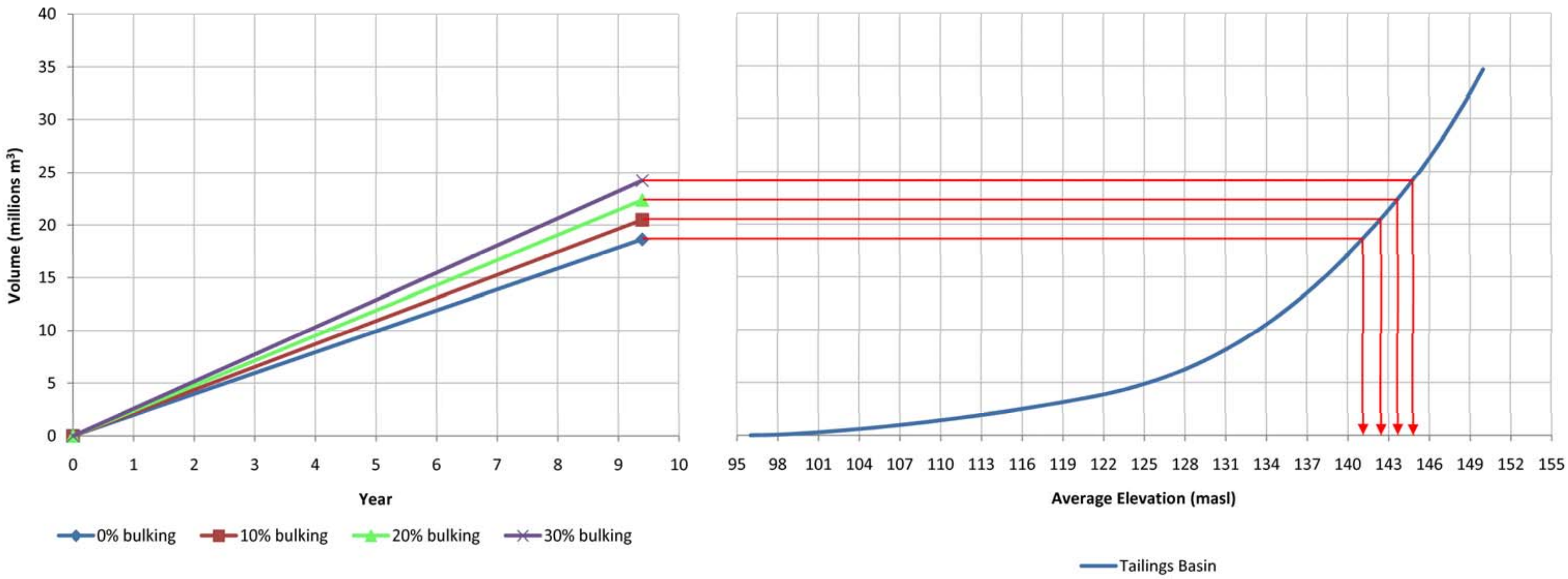


REVISION DATE: 8JUL09 BY: DRW FILE:O:\Active_2008\1428\08-1428-0029 Meadowbank TSF Dike Design\7000 Updated Water Management Plan\GoldSim 2008\Updated Figures\Figure 3.18.ppt

REFERENCE

FROM THE TSF FILLING SCHEME MODEL (GOLDER 2011a)

AEM AGNICO-EAGLE MINES LIMITED	
MEADOWBANK GOLD MINE NUNAVUT	
TAILINGS STORAGE FACILITY STAGE STORAGE CURVE	FIGURE 7.2



NOTE
FOR COMPARATIVE PURPOSES ONLY.
FINAL TAILINGS ELEVATIONS ARE AVERAGES ONLY AND DO NOT REFLECT POTENTIAL ELEVATION VARIATIONS ACROSS THE BASIN

REVISION DATE: 10JUL09 BY: DRW FILE:O:\Active_2009\1428\09-1428-0014 Mine Waste Meadowbank\2000 Figures\Figure 8.9.ppt

AEM AGNICO-EAGLE MINES LIMITED	
MEADOWBANK GOLD MINE NUNAVUT	
TSF STORAGE AS A FUNCTION OF ICE CONTENT	FIGURE 7.3

SECTION 8 • THERMAL MONITORING PLAN

To observe the freezeback of the Tailing Storage Facility (TSF) and Rockfill Storage Facilities (RSF), a series of subsurface thermistors have been installed at strategic, prescribed locations at these facilities.

The thermistors have been installed in boreholes drilled around and in the perimeter of the RSF/TSF. The purpose of the thermistors in the TSF is to monitor the talik temperatures underneath the TSF as freezing progresses. The purpose of the thermistors in the RSF is to monitor the RSF temperature as freezing progresses. Finally, the purpose of the perimeter thermistors is to monitor the temperature of the perimeter structures (dams and dikes) area to make sure they remain frozen. See figure 8.1 for specific location of those thermistors.

The thermistors are and will be monitored throughout the operational period as well as during closure and post closure. The results are and will continue to be used to evaluate the predicted thermal response of the facilities with the actual thermal response. This will allow adjustments to the tailings deposition plan and the Waste Rock deposition to be made during the operational period to attempt to influence the rate at which the TSF and RSF freeze.

Results to date from the thermistors indicatethat freezeback is occurring in the North Cell TSF and in the RSF structures. The thermistors installed on the perimeter (in the dikes) of the TSF/RSF show that the foundation and the dikes remain frozen on yearly basis.

Additional thermistors are planned to be installed in the North Cell in 2013. These installations have and will continue to take place as the TSF is filled with tailings. Initially, some of the thermistor installations may be ‘sacrificial’ or temporary; in other words installations may be used to collect data over a short period and then may be destroyed or inaccessible as deposition progresses. The rationale behind installing such thermistors is to monitor the thermal conditions within and beneath the TSF from a very early stage in the life of the facility. As the TSF reaches final elevation, thermistors will be installed from the final tailings surface, and directly into the underlying bedrock. These will likely be on the order of 50 m to 75 m in length (potentially deeper) with nodes placed at intervals to monitor temperatures within the tailings and within the bedrock. The thermistors are currently monitored, and the results to date indicated freezeback is occurring in the RSF’s and the TSF.

The locations and proposed phased installation of the thermistors are based on tailings deposition plans. For waste rock, the phasing and locations are based on the deposition plan described in Section 6 of this document. The sequence, methods and volumes of deposition presented in Tailings deposition plans may differ from actual deposition during operations. Timing and locations of thermistors is provided as a guideline to be followed as closely as possible. Future deposition plans will be taken into account prior to scheduling future installations, and if necessary, thermistor specifications and locations would be modified as necessary.

8.1 INSTRUMENT LOCATION

Installed locations of thermistors are presented on Figure 8.1.

8.1.1 Operations

During the operational life of Meadowbank, monitoring of the TSF can be divided into two phases, 2011 to 2018 in the North Cell and 2015 to 2018 in the South Cell.

The Portage RSF will operate from 2009 to 2016. The Vault RSF will operate from 2014 to 2018.

The following describes the requirement for thermistors at each storage facilities.

8.1.1.1 TSF North Cell

- Several thermistors have already been installed as part of Saddle Dam 1 (SD1), Saddle Dam 2 (SD2) and Stormwater Dike (SWD) construction in 2009-2011. Data collected from these structures form part of the TMP.

- T121-1(RF1-T1) and T73-6; Installed in 2012 along the perimeter of RF1 (upstream). This will provide a leading indicator of seepage through RF1 towards the Portage RSF. It will also monitor thermal regime of the upper 40 m into the overlying soils and bedrock.

- T122-1; Installed in 2012 along the perimeter of RF2 (upstream). This will provide a leading indicator of seepage through RF2 towards the Portage RSF. It will also monitor thermal regime of the upper 40 m into the overlying soils and bedrock.

- TSF-N-T1; Proposed for installation in 2014 within the TSF North Cell, subject to accessibility and the location and stability of tailings deposited to date in the area of the east abutment of SWD, approximately at a tailings elevation of 147 m and monitored from the nearest point on the Stormwater Dike, about 150 m away. This will monitor a depth of about 10-15 m of tailings deposited in 2010, and about 10 m below the original lakebed.

- T90-2; Installed in 2012 in tailings near the Saddle Dam 1.

- TSF-N-T3; Proposed to be installed as part of the TSF North Cell in 2015 as part of the cover trials. It will monitor the active cover layer, the tailings, and about 50 m below the lakebed into the Talik.

8.1.1.2 TSF South Cell

- T147-2; this 57 m depth thermistor was installed in 2010 as part of the groundwater monitoring exploration wells.

- CD-T1 through CDT7; The Central Dike will be fully instrumented during its construction between 2012 and 2016.

- SD3-T1, T2, T3, T4; these thermistors are proposed as instrumentation for SD3. Construction is currently scheduled for 2015 to 2017 and installation of thermistors will be done in 2015 and 2017

- SD5-T1, T2, T3, T4; these thermistors are proposed as instrumentation for SD5. Construction is currently scheduled for 2014 to 2016 and installation of all thermistors will be done in 2014.TSF-S-T1.

- SD4-T1, T2, T3, T4; these thermistors are proposed as instrumentation for SD4. Construction is currently scheduled for 2014 and 2016 and installation of all thermistors will be done in 2014.TSF-S-T1.

- TSF-S-T1; Location and specifications to be reviewed in conjunction with South Cell cover design, installation schedules in 2018. This would monitor a cross-section of the south cell, including the active layer through the cover and tailings, about 50 m depth of tailings, and 40 m into the Talik.

8.1.1.3 Portage RSF

- RSF-T1; This location is proposed for installation in 2013 within the Portage RSF on the 165 m bench. It will monitor waste rock and about 5-10 m into the original ground. This will act as a leading indicator of seepage from TSF, and provide mitigation against potential loss of data at RSF-T1 and T-121.

- RSF-T2; This location proposed for immediate installation within the Portage RSF, requires a 150 m lead to a monitoring location near the contact water sumps.

- RSF-T3; Upon completion of the Portage RSF waste deposition and in conjunction with cover trials in 2016, this location to a total depth of 120 m will provide a complete cross-section of the RSF cover, waste rock, and foundation to about 10-20 m into original ground.

8.1.1.4 Vault RSF

- No instrumentation is currently planned within Vault RSF as it is expected to behave similarly to Portage RSF.

8.1.2 Closure

Since the exact closure date of the TSF and RSFs is still unknown, criteria for the covers have been developed, but are not finalized (for TSF's) and will be subject to results obtained from the site trials, previously discussed. RSF-T3, TSF-N-T3 and TSF-S-T1 will serve to monitor the performance of the covers on the Portage RSF, the TSF North Cell and the TSF South Cell, respectively. Before the installation of these 3 thermistors, it is expected that their locations, specifications and quantity will be reviewed and revised in conjunction with detailed cover design. Monitoring of TSF and RSF freezeback in the post-closure phase is a requirement of the Water Licence.

8.2 INSTRUMENT SPECIFICATIONS

Each thermistor to be installed as part of the TMP must comply with the general specifications presented in Table 8.1. Table 8.2 provides details concerning the installations.

Table 8.1: Thermistor Specifications

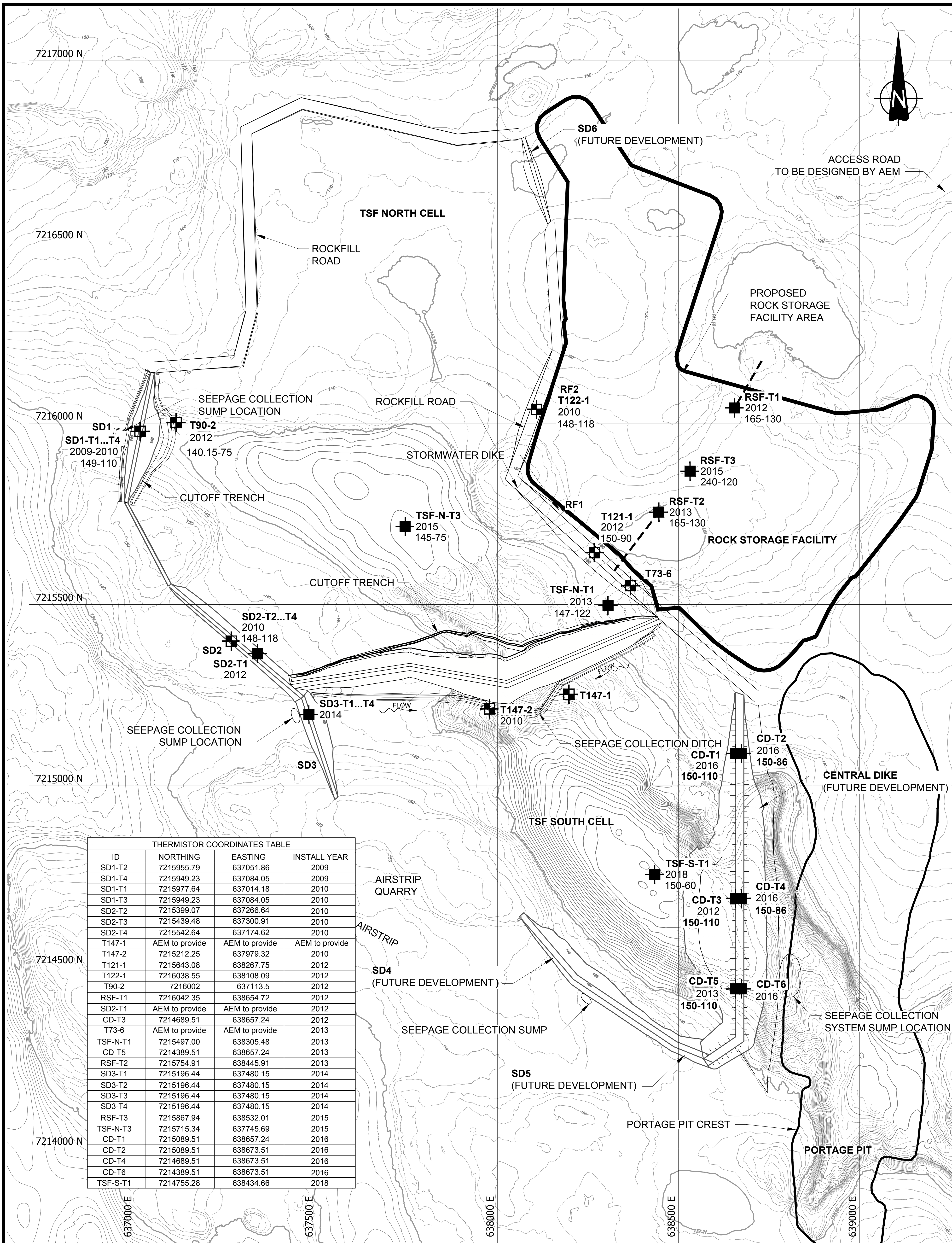
Items	Specifications
Accuracy	1 degree Celsius
Thermistor temperature range	-40 to 40 degree Celsius
Method of cable termination	Amphenol connector
Cable termination enclosures	Weatherproof Animal resistant
Readout and datalogger	Manual

Table 8.2: Existing and Proposed Thermistor Installation Details

Name	Northing	Easting	Year Installed (I) or Planned (P)	Purpose	Notes	Special Environmental Conditions	Top - Bot Elevation	Depth/ Length	Lead Length	Nodes	NODE DEPTHS (m)
SD1-T2	7215956	637052	2009 (I)	Stage 1 Rockfill and foundation	Installed to 10m below bedrock, 2m spacing	Tailings	140 -110	30		16	0 2 4 6 8 10 12 … 2 m spacing to 30 m
SD1-T4	7215949	637084	2009 (I)	Stage 1 U/S toe and foundation	Installed to 10m below bedrock, 2m spacing	Tailings	134- 119	15		16	0 1 2 3 4 5 6 … 1 m spacing to 16 m
SD1-T1	7215978	637014	2010 (I)	Stage 1 & 2 U/S 3:1 slope	Installed to bedrock, at U/S toe of SD1	Tailings	149 -133	16		16	0 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
SD1-T3	7215949	637084	2010 (I)	Stage 2 Rockfill and foundation	Installed to 10m below bedrock, 2m spacing	Tailings	148 -118	40		16	2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32
SD2-T2	7215399	637267	2010 (I)	Stage 1 Rockfill and foundation	Installed to 10m below bedrock, 2m spacing	Tailings	148-118	30		16	2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32
SD2-T3	7215439	637301	2010 (I)	Stage 2 Rockfill and foundation	Installed to 10m below bedrock, 2m spacing	Tailings	144-129	15		16	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
SD2-T4	7215542	637175	2010 (I)	Stage 1 U/S toe and foundation	Installed to 10m below bedrock, 2m spacing	Tailings	144-121	23		16	0 1 2 3 4 5 6 7 9 11 13 15 17 19 21 23
T147-1	7215204	637964	2012 (I)	Monitor Talik beneath 2PL	To replace T147-2	Tailings	119.15	62		16	4 6 8 10 12 14 16 21 26 31 36 41 46 51 56 61
T147-2	7215212	637979	2010 (I)	Monitor Talik beneath 2PL	Installed part of G/W monitoring Well investigation	Tailings	119.15	62		16	4 6 8 10 12 14 16 21 26 31 36 41 46 51 56 61
T121-1 (RF1-T1)	7215643	638268	2012 (I)	Monitor potential seepage through RF1 and foundation to RSF.	Installed on RF1 crest	PAG Rock	150- 90	60		16	7 9 11 13 15 17 19 21 23 25 27 31 35 40 50 60
T122-1	7216039	638108	2012 (I)	Monitor potential seepage through RF2 and foundation to RSF.	Installed on RF2 crest	PAG Rock	150- 90	60		16	7 9 11 13 15 17 19 21 23 25 27 31 35 40 50 60
T90-2 (SD1)	7216002	637113.5	2012 (I)	Monitor Talik beneath 2PL	Former TSF-N-T2	Tailings	140.15-75				
RSF-T1	7216042	638655	2012 (P)	1) Waste rock freezeback 2) 10m into foundation	Tracks potential seepage through RSF from TSF	PAG Rock	165- 130	35	150	6	0 10 20 25 30 35
SD2-T1	AEM to provide		2012 (P)								

Name	Northing	Easting	Year Installed (I) or Planned (P)	Purpose	Notes	Special Environmental Conditions	Top - Bot Elevation	Depth/ Length	Lead Length	Nodes	NODE DEPTHS (m)
CD-T3	7214689.51	638657.24	2012 (P)	U/S – Freezback of tailings		Tailings	150-110			21	0 5 10 15 20 25 30 … 100
T73-6	7215562	638277	2012 (I)	Monitor potential seepage through RF2 and foundation to RSF.		Tailings	149.5-133			16	
TSF-N-T1	7215497	638505	2013 (P)	Monitor Talik beneath 2PL		Tailings	122-147	25	100	11	0 1 2 4 6 8 10 12 15 20 25
CD-T5	7214439.51	638657.24	2013 (P)	U/S – Freezback of tailings		Tailings	150-110			21	0 5 10 15 20 25 30 … 100
RSF-T2	7215755	638446	2013 (P)	1) Potential Seepage from TSF through RF1 2) freezeback of rockfill		PAG Rock	165-130	35	200	6	0 10 20 25 30 35
SD3-T1	7215196	637480	2014 (P)	Stage 1 & 2 U/S 3:1 slope	Install to bedrock, at U/S toe of SD3	Tailings	150-	~45		~9	0 5 10 20 25 30 35 …
SD3-T2	7215196	637480	2014 (P)	Stage 1 Rockfill and foundation	Installed to 10m below bedrock, 2m spacing	Tailings	145				0 2 4 6 8 10 12 …
SD3-T3	7215196	637480	2014 (P)	Stage 2 Rockfill and foundation	Installed to 10m below bedrock, 2m spacing		150				0 2 4 6 8 10 12 …
SD3-T4	7215196	637480	2014 (P)	Stage 1 U/S toe and foundation	Installed to 10m below bedrock, 2m spacing	Tailings	138				0 2 4 6 8 10 12 …
RSF-T3	7215868	638532	2015 (P)	1) Potential Seepage from TSF through RF1 2) freezeback of rockfill 3) RSF Cover Trial		PAG Rock	240-120	120		16	0 1 2 3 4 6 75 85 95 98 101 104 107 110 113 120
TSF-N-T3	7215715	637746	2015 (P)	1) Monitor freezeback of cover and tailings 2) Monitor talik	Install on tailings cover. Location to be determined, node locations to be reviewed upon cover design.	Tailings	145-75	70		14	0 1 1 2 2 2.5 3 5 10 20 25 30 50 70
CD-T1	7215089.51	638657.24	2016 (P)	U/S – Freezback of tailings		Tailings	150-110			21	0 5 10 15 20 25 30 … 100

Name	Northing	Easting	Year Installed (I) or Planned (P)	Purpose	Notes	Special Environmental Conditions	Top - Bot Elevation	Depth/ Length	Lead Length	Nodes	NODE DEPTHS (m)
CD-T2	7215089.51	638673.51	2016 (P)	1) Potential Seepage from TSF through RF1 2) freezeback of rockfill		PAG-NPAG Rock	150-86			32	0 2 4 6 8 10 12 … 62
CD-T4	7214689.51	638673.51	2016 (P)	1) Potential Seepage from TSF through RF1 2) freezeback of rockfill		PAG-NPAG Rock	150-86			32	0 2 4 6 8 10 12 … 62
CD-T6	7214439.51	638673.51	2016 (P)	1) Potential Seepage from TSF through RF1 2) freezeback of rockfill		PAG-NPAG Rock	150-86			32	0 2 4 6 8 10 12 … 62
TSF-S-T1	7214755	638435	2018 (P)	1) Monitor freezeback of cover and tailings 2) Monitor talik	Installed on tailings cover. Location to be determined, node locations to be reviewed upon cover design.	Tailings	150-60	90		16	0 1 1 2 2 2.5 3 5 10 20 35 50 55 60 75 90



THERMISTOR COORDINATES TABLE			
ID	NORTHING	EASTING	INSTALL YEAR
SD1-T2	7215955.79	637051.86	2009
SD1-T4	7215949.23	637084.05	2009
SD1-T1	7215977.64	637014.18	2010
SD1-T3	7215949.23	637084.05	2010
SD2-T2	7215399.07	637266.64	2010
SD2-T3	7215439.48	637300.91	2010
SD2-T4	7215542.64	637174.62	2010
T147-1	AEM to provide	AEM to provide	AEM to provide
T147-2	7215212.25	637979.32	2010
T121-1	7215643.08	638267.75	2012
T122-1	7216038.55	638108.09	2012
T90-2	7216002	637113.5	2012
RSF-T1	7216042.35	638654.72	2012
SD2-T1	AEM to provide	AEM to provide	2012
CD-T3	7214689.51	638657.24	2012
T73-6	AEM to provide	AEM to provide	2013
TSF-N-T1	7215497.00	638305.48	2013
CD-T5	7214389.51	638657.24	2013
RSF-T2	7215754.91	638445.91	2013
SD3-T1	7215196.44	637480.15	2014
SD3-T2	7215196.44	637480.15	2014
SD3-T3	7215196.44	637480.15	2014
SD3-T4	7215196.44	637480.15	2014
RSF-T3	7215867.94	638532.01	2015
TSF-N-T3	7215715.34	637745.69	2015
CD-T1	7215089.51	638657.24	2016
CD-T2	7215089.51	638673.51	2016
CD-T4	7214689.51	638673.51	2016
CD-T6	7214389.51	638673.51	2016
TSF-S-T1	7214755.28	638434.66	2018

LEGEND

SD1 SADDLE DAM
RF1 ROCKFILL ROAD
EXISTING THERMISTOR LOCATION
PLANNED THERMISTOR LOCATION
TSF-S-T3 - ID
2018 - YEAR OF INSTALLATION
150-60 - NODE ELEVATION RANGE

120 LAND-BASED TOPOGRAPHIC MAJOR CONTOURS INTERVAL 10m
LAND-BASED TOPOGRAPHIC MINOR CONTOURS INTERVAL 2m
133.10 FORMER SHORELINE
PIT CREST
DIKE FOOTPRINT
THERMISTOR LEAD TO MONITORING STATION

0 100 200 300 400 500
SCALE IN METRES

DRAFT

AEM AGNICO-EAGLE MINES LIMITED

MEADOWBANK GOLD MINE
NUNAVUT

THERMISTOR LOCATION PLAN | FIGURE 8.1

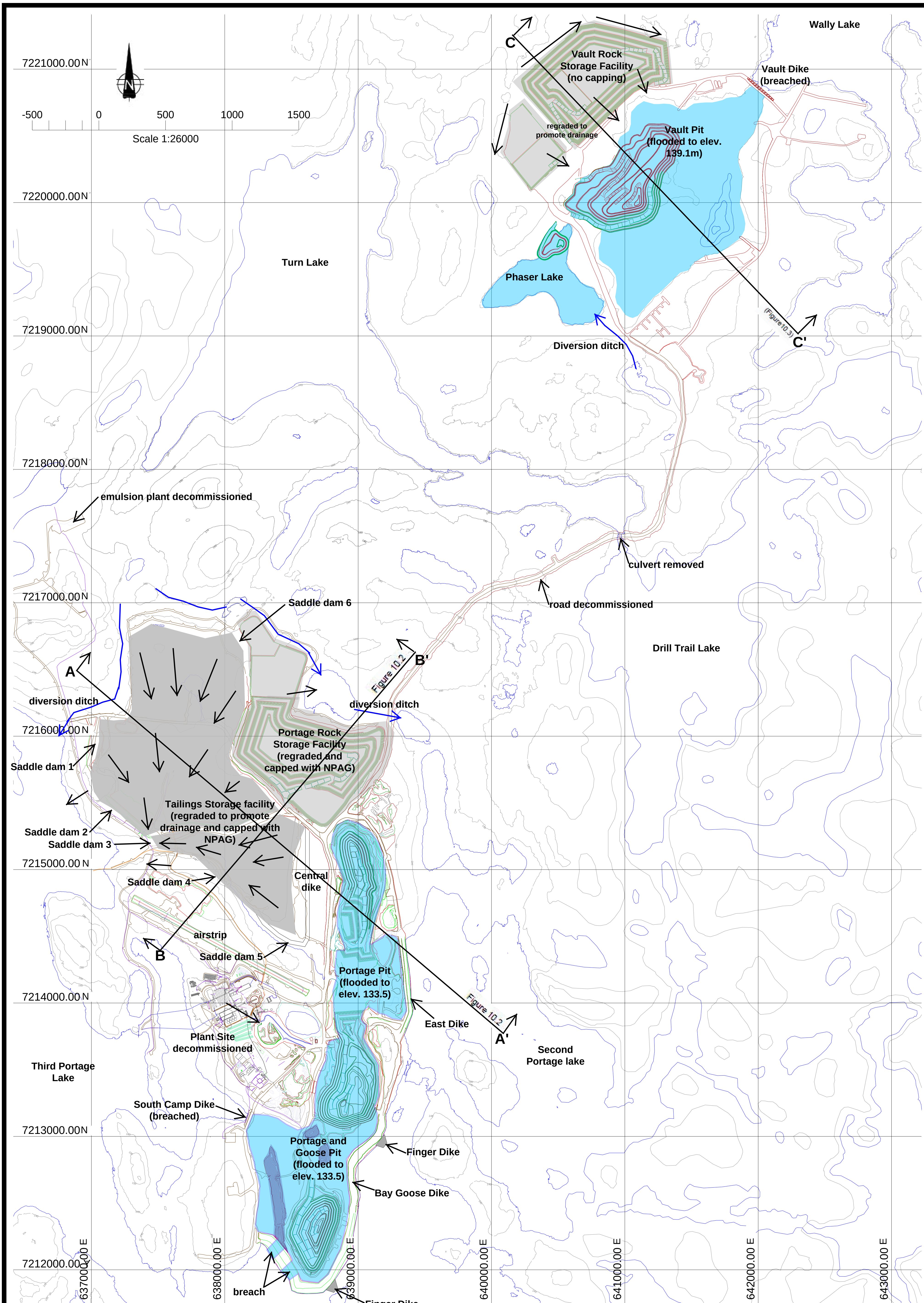
SECTION 9 • MONITORING AND CLOSURE

Mine closure and reclamation will utilize currently accepted management practices and appropriate mine closure techniques that comply with accepted protocols and standards. Closure will be based on project design and operation to minimize the area of surface disturbance, stabilize disturbed land surfaces and permafrost against erosion, and return the land to post-mining uses for traditional pursuits (MMC, 2007a).

The post-closure concept is illustrated in Figure 9.1. Mine waste rock and tailings storage facilities will be progressively closed during mine operations. A dry 4m cover of NAG rock will be placed over PAG waste rock piles at the PRSF and a minimum of 2m (depending on cover trials) will be placed over the TSF to confine the active layer within relatively inert materials while promoting freezeback. The covers are also designed to provide a physical barrier that promote freezeback. The surfaces of the Portage and Vault RSFs will be contoured to direct drainage to the Reclaim and Vault Attenuation pond areas. Sections through the Portage RSF and TSF areas at closure are illustrated in Figure 9.2. A section through the Vault RSF is shown on Figure 9.3.

The Reclaim Pond will remain in place until mining and milling has been completed. At this time, reclaim water will be drained from the TSF and treated, if necessary, prior to discharge to the Goose or Portage pit lakes. If necessary, treatment of reclaim water will be completed in-situ or through a water treatment plant that would be constructed within portions of the original Process Plant. It is expected that treatment of reclaim water, if required, would produce approximately 3,000 m^3 of 30% solids density sludge. The sludge would be tested but is expected to be chemically stable. Sludge would be disposed of in the TSF prior to final cover with NAG. The sludge material would freeze along with the underlying tailings.

All infrastructure associated with mine operations, closure and reclamation including waste management facilities will be re-contoured and/or surface treated according to site specific conditions to minimize windblown dust and erosion from surface runoff, and to enhance the re-establishment of natural vegetation and wildlife habitat. The initial Reclamation and Closure Plan for the Mine has been developed and will be updated (2013) in conjunction with the mine plan so that considerations for site closure are incorporated into the mine design. Monitoring will be carried out during all stages of the mine life in accordance with all permits and licenses. Additional operational monitoring will also be conducted to assist in final and progressive reclamation activities. Monitoring is required to demonstrate appropriate and safe environmental performance of all mine facilities. If any non-compliant or inappropriate conditions are identified, then corrective measures will be implemented in a timely manner to ensure the successful and safe completion of the Reclamation and Closure Plan.



AEM

Waste Rock and capping

Flooded area

Non-contact water diversion

Drainage direction

Grid Reference: NAD 83, UTM zone 14

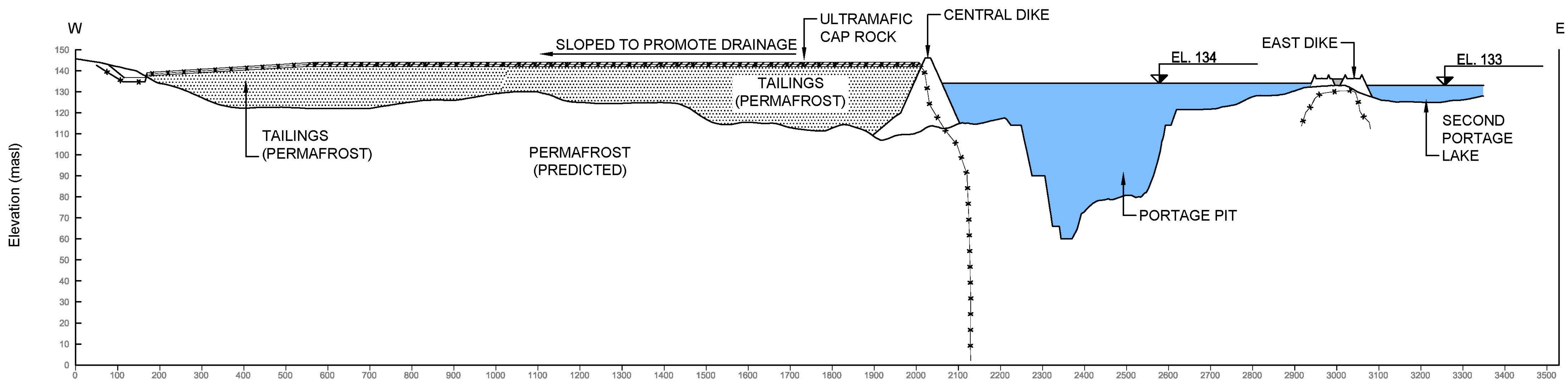
Date: 2013/03/03

By : Jose Gabriel Condoretty

Figure 9.1

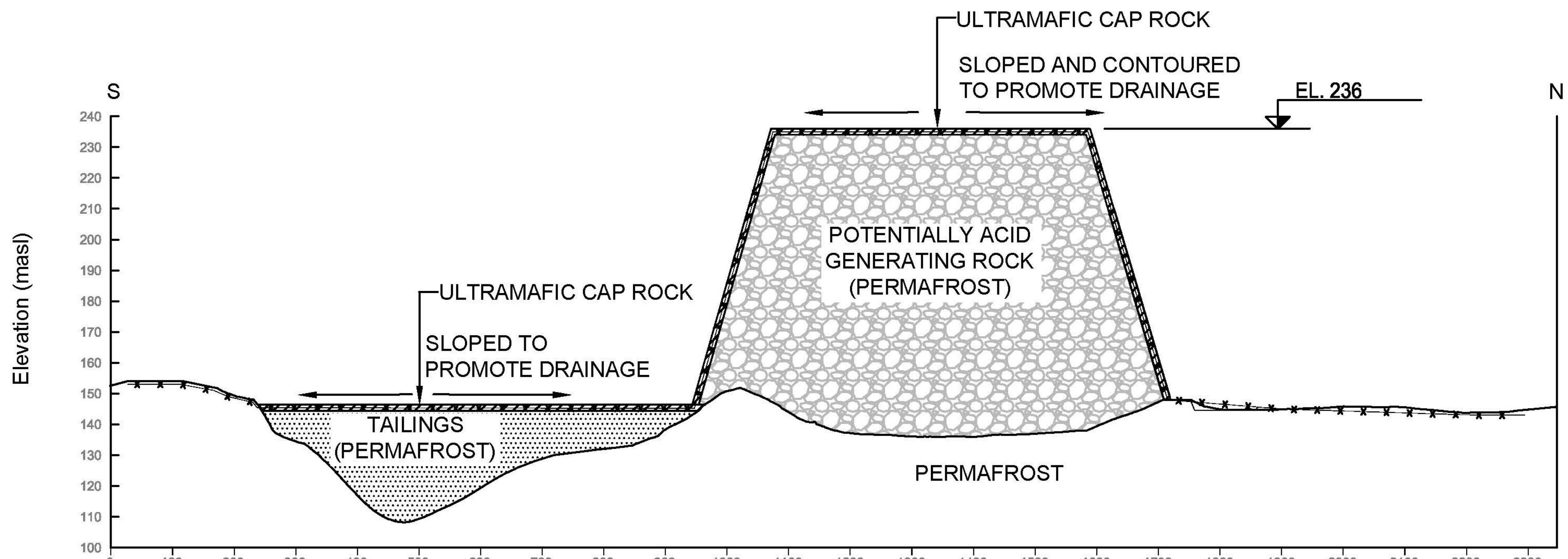
AGNICO-EAGLE MINES MEADOWBANK GOLD MINE NUNAVUT

Site Post Closure Concept



A
10.1

CROSS SECTION A-A'
TAILINGS STORAGE FACILITY

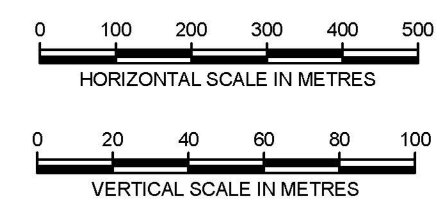


B
10.1

CROSS SECTION B-B'
PORTAGE ROCK STORAGE FACILITY

NOTE:

The vertical exaggeration is 5x



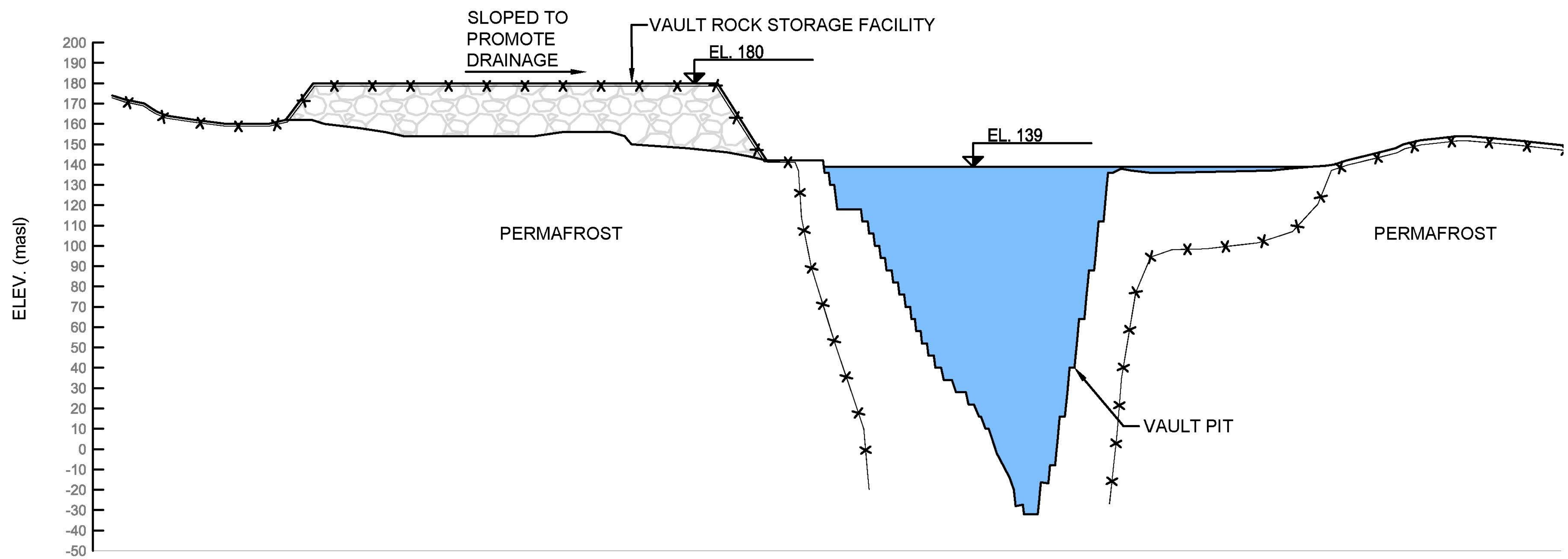
LEGEND:

-x-x-x-x-x- PERMAFROST BOUNDARY (INFERRED)

AEM **AGNICO-EAGLE MINES LIMITED**

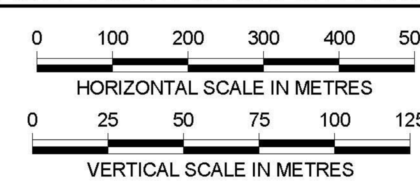
MEADOWBANK GOLD MINE
NUNAVUT

PORTAGE TAILINGS AND ROCK STORAGE CLOSURE DESIGN CONCEPT CROSS SECTION	**FIGURE 9.2**



CROSS SECTION C-C'
VAULT ROCK STORAGE FACILITY

C
10.1



LEGEND:

-x-x-x-x-x-x- Permafrost Boundary (inferred)

REFERENCES

1) Amec Americas Ltd., Drawing Number A1-131395-100-C-0001 (100-C-0001.DWG), Meadowbank Feasibility Study, April 2005.

AEM	AGNICO-EAGLE MINES LIMITED
MEADOWBANK GOLD MINE NUNAVUT	
VAULT ROCK STORAGE CLOSURE DESIGN CONCEPT CROSS SECTION	FIGURE 9.3

SECTION 10 • REFERENCES

AEM, 2009. Meadowbank Gold Project, Mine Waste Management Plan. October 2009

AMEC, 2003. Baseline Hydrology Study, AMEC Earth and Environmental, December 2003 with January 2004 errata sheets.

AMEC, 2005a. Meadowbank Gold Project Hydrologic Monitoring 2004 Draft Data Report. February 2005.

AMEC, 2005b. Meadowbank Gold Project Feasibility Study Report. June 2005.

BGC Engineering Incorporated, (BGC) 2003. Implications of Global Warming and the Precautionary Principle in Northern Mine Design and Closure. 2003.

BGC Engineering Incorporated, (BGC) 2004. Meadowbank Gold Project Preliminary Geothermal and Slope Stability Modelling of Rock Storage Facilities. March 31, 2004.

Brown, J.O., Ferrians Jr., J, Heginbottom, J.A., and Melinkov, E.S., 1998. Circum-Arctic Map of Permafrost and Ground-Ice Conditions. Boulder, Colorado: National Snow and Ice Data Centre/World Data Center for Glaciology. Digital Media.

Burn, C. R. 2003. Thermal modeling, Meadowbank Gold Project.

Dawson and Morin, 1996. Mine Effluent Neutral Drainage (MEND), 1.61.2: Acid Mine Drainage in Permafrost Regions: Issues, Control Strategies and Research Requirements, 1996.

Golder Associate Ltd (Golder) 2012. Tailings Deposition Plan – Update 2012, Meadowbank Project, Doc 1344, issued in April 2012

Golder Associate Ltd (Golder) 2011a. Tailings Deposition Plan, Meadowbank Project, Doc 1272, to be issued in July 2011

Golder Associate Ltd (Golder) 2011b. 2011 Central Dike Geotechnical Investigation, Tailings Storage Facility, Meadowbank Project, Doc 1268, May 17, 2011

Golder Associate Ltd (Golder) 2011c. Tailings Deposition Plan Update, Tailings Storage Facility, Meadowbank Project, Doc. 1253, March 2011

Golder Associate Ltd (Golder) 2011d. Preliminary Results - Tailings Deposition Plan - Spigot Scenario, Tailings Storage Facility, Meadowbank Project, Doc 1261, March 31, 2011

Golder Associates Ltd. (Golder), 2008a. Coupled Thermal/Seepage and Contaminant Transport Modeling For The Tailings Facility, Meadowbank Gold Project. August 1, 2008.

Golder Associates Ltd. (Golder), 2008b. Report on Tailings Storage Facility Dike Design, Meadowbank Gold Project. December 17, 2008.

Golder Associates Ltd. (Golder), 2008c. Letter: Bay-Goose Dike and South Camp Dike Designs, Meadowbank Gold Project. December 2008.

Golder Associates Ltd. (Golder), 2008d. Report on East Dike Design, Meadowbank Gold Project. October 2008.

Golder Associates Ltd. (Golder), 2007a. Detailed Design of Central Dike, Meadowbank Gold Project. March 16, 2007.

Golder Associates Ltd. (Golder), 2007b. Mitigative Measures for Potential Seepage from Tailings Facility. August, 2007.

Golder Associates Ltd. (Golder), 2007c. Water Quality Predictions, Meadowbank Gold Project, Nunavut. August, 2007.

Golder Associates Ltd. (Golder), 2006. Report on Winter 2006 Second Portage Central Dike Geotechnical Drilling, Hydrogeological, and Televiewer Investigation, Meadowbank Gold Project, Nunavut. July, 2006.

Golder Associates Ltd. (Golder), 2003. Report on Permafrost Thermal Regime Baseline Studies, Meadowbank Project. December 18, 2003.

Hayley, D. W. 2004. Climate Change – An Adaptation Challenge for Northern Engineers. The PEGG. January 2004, p.21.

Hayley, D.W. and Cathro D.C. 1996. Working with Permafrost when Planning an Arctic Mine. CIM Edmonton 96, April 28 - May 2, 1996, Edmonton, Alberta.

IPCC (Intergovernmental Panel on Climate Change), 2007. Climate Change 2007: The Physical Science Basis.

Meadowbank Mining Corporation (MMC), 2007a. Meadowbank Gold Project Preliminary Closure and Reclamation Plan. August, 2007.

MEND 1.61.2, 1996. Acid Mine Drainage in Permafrost Regions: Issues, Control Strategies and Research Requirements. July.

NRC (Natural Resources Canada), 2004. National Annual Temperature Scenario: 2050. The Atlas of Canada. Natural Resources Canada. On-line map. Accessed July 2007. Available: http://atlas.gc.ca/site/english/maps/climatechange/scenarios/nationalannualtemp2050/

Woo, M.-K., A. G. Lewkowicz, and W. R. Rouse, 1992. Response of the Canadian Permafrost Environment to Climatic Change. 1992.