REPORT

Hydrogeology Modelling Report

Meliadine Extension

Submitted to:

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Submitted by:

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Distribution List

1 Electronic Copy - Agnico Eagle Mines Limited

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Executive Summary

This report presents the development and calibration of an updated groundwater model for the Meliadine Extension, along with the prediction of groundwater inflow (quantity and TDS quality) for the mine developments located below the permafrost or in open taliks during operations. Relative to the 2014 FEIS, a new model was built to appropriately incorporate the new underground developments proposed as part of the Project and the updated conceptual model. The model was calibrated to observed conditions since the completion of the FEIS (2015 – 2020) and to pressure responses observed during a 72-hr flow recession test in 2020.

Base case predictions of total saline groundwater inflow to be managed from the combined underground developments range from current inflows of 300 m^3/day at the Tiriganiaq Underground up to a peak inflow of 1,900 m^3/day in Year 2027, with inflow at the Tiriganiaq Underground contributing up to 87% of this total inflow. The predictions incorporate grouting, which is an ongoing mitigation measure that has been in place since 2015. For the Upper Bound predictions, the peak inflow is estimated to be up to 53% higher, with a predicted combined saline groundwater inflow of 2,900 m^3/day.

Sensitivity analysis indicates that predicted inflows are most sensitive to the hydraulic conductivity of the bulk bedrock, and the upper bound scenario was selected in consideration of these results and model calibration. Conservative assumptions were made with respect to the fault extents and each fault was assumed to have enhanced permeability in the absence of site-specific data. Overall, groundwater inflow for Tiriganiaq is the largest contributor of saline groundwater inflow to the Project, and uncertainty in these inflows will have the largest effect on water management planning.

The predictions presented in this report represent the best estimate of the potential range of saline groundwater inflow to managed based on the conceptual mode and data presented in the Existing Conditions Report (Golder 2021), which includes data up the summer of 2020. Groundwater inflow predictions should be reviewed as new hydraulic data is collected and as additional operational data is collected against which the model predictions can be verified.

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1.0 INTRODUCTION

Agnico Eagle Mines Limited (Agnico Eagle) is proposing to expand the development at the Meliadine Gold Project (herein referred to as the Meliadine Extension or the Project), located approximately 25 km north from Rankin Inlet and 80 km southwest from Chesterfield Inlet in the Kivalliq Region of Nunavut. Baseline data have been collected in support of the environmental review to document existing conditions and to provide the foundation for a qualitative and quantitative assessment of Project operations and the extension of the mine development, to be evaluated in the Environmental Impact Statement (EIS) for the Project. This work is documented in the Summary of Hydrogeology Existing Conditions Report (Golder 2021c).

This report presents the results of a hydrogeological assessment of groundwater conditions that are present now and that are expected to develop in the Project area during mining. Specifically, it addresses the approaches and assumptions adopted in the estimate of the potential groundwater inflow quantity and groundwater quality (total dissolved solids [TDS] only) associated with the development of the open pits and undergrounds. In this assessment, a three-dimensional numerical groundwater model was developed using FEFLOW (V7.2). This model incorporates the mine plan provided by Agnico Eagle for the Project.

2.0 BACKGROUND AND HISTORICAL HYDROGEOLOGICAL PREDICTIONS

The numerical groundwater model developed in this assessment was built to support the proposed mine plan for the Project. In consideration of the expanded number and location of undergrounds, the model domain is larger than the model developed for the 2014 FEIS for the Tiriganiaq underground. The model also incorporates an updated conceptual model relative to the 2014 FEIS, as described in the Summary of Hydrogeology Existing Conditions (Golder 2021c).

The numerical hydrogeological model is constructed in FEFLOW, which is the same software used in past versions of the numerical model. The FEFLOW model developed for the 2014 FEIS (Agnico Eagle 2014) was adjusted in subsequent years as new information was collected to provide revised inflow predictions and was further refined for this assessment in consideration of the layout of proposed pits and undergrounds. Groundwater inflows predicted to the underground using the 2014 FEIS Model and mine plan are summarized in Table 1. These inflows considered the presence of three regional faults (the Lower Fault Zone, Pike Fault and North Fault) and conceptualized the bedrock as a single hydrostratigraphic unit.

In 2016 the numerical and conceptual model for Tiriganiaq was updated following an extensive field campaign by Agnico Eagle Limited (Agnico) in 2015 to fill in data gaps. This field campaign was conducted utilizing two independent technical advisors, Dr. Shaun Frape and Dr. Walter A. Illman (both of the University of Waterloo), to provide advice and comments throughout the development of the field work plan. Documentation of the field program and results of updated modelling that incorporated these test data is presented in two Golder reports (Golder 2016a; 2016b).

The conceptual model developed for the 2016 Model assumed the following structures were present:

- Lower Fault Zone, North Fault and Pyke Fault
- RM-175
- a series of Northwest Trending Faults

The model also assessed the potential influence of two additional structures (referred to as Wesmeg and ENE faults) through sensitivity analysis. At the time of the 2016 Model update, mining was predominantly within permafrost and observations of groundwater inflow associated with potential structures could not be assessed. Predicted groundwater inflows to the underground based on the 2016 Model and mine plan (V5) are presented in Table 1. The V5 mine plan incorporates the updates to the mine plan by Agnico Eagle as the Tiriganiaq development is built and changes are made to the sequencing of mining in consideration of progress to date (for example priority of stope development).

Since the completion of the above predictions and as the underground has been developed below the permafrost, Golder and Agnico Eagle have periodically reviewed the location of groundwater inflows and observed that potentially not all the faults assumed in the 2016 Conceptual Model are contributing to observed inflow underground, and that instead other faults, such as the ENE trending structures and splays associated with the Lower Fault may be contributing to groundwater inflow.

The most recent update of the model and predictions of groundwater inflow to Tiriganiaq Underground was completed in 2019 and included calibration to inflow data collected up to January 2019. Structures considered in the model based on consultation with Agnico Eagle and review of water intersections, included:

- Lower Fault, Pyke Fault and North Fault
- REM175, which had an observed inflow along the exploration ramp in the 2016 study
- ENE Fault and Lower Fault Splay

The predicted groundwater inflow rates from 2019 analysis were near to those groundwater inflow predictions in the FEIS, which ranged from 420 m^3/day to 640 m^3/day and somewhat higher than values predicted using the 2016 model (280 to 420 m^3/day) (Table 1). For each set of predicted inflows, the mitigation of groundwater inflows by grouting was not considered.

Included in the summary table of groundwater inflows are the results of sensitivity analysis. The sensitivity scenarios selected for 2019 considered the knowledge of the groundwater flow system at the time of the 2019 modelling, and the results of past sensitivity analyses. Supplemental hydraulic testing and monitoring during mining since the 2014 FEIS have reduced the uncertainty in bedrock properties and smaller ranges of uncertainty (three times versus ten times changes) are now considered appropriate. Application of a factor of ten change in bedrock hydraulic conductivity (from 3×10^{-9} m/s to 3×10^{-10} m/s), for example, would result in an unrealistically high predicted inflow to the underground under current conditions relative to what is being observed underground.

Table 1: Summary of Historical Groundwater Inflow Predictions for the Tiriganiaq Underground (grouting effects not considered)

Mine Year	Year		Predicted Groundwater Inflow (m^3/day) 2014 FEIS (FEIS Mine Plan)			Predicted Groundwater Inflow (m^3/day) 2016 Model (V5 Mine Plan)					Predicted Groundwater Inflow (m^3/day) 2019 Model				
			Base Case	Lower Fault K Decreased to Match Surrounding Bedrock	Lower Fault K Increased by Factor of ten	Base Case	Inclusion of Wesmeg EW and ENE Faults	Inclusion of Open Taliks below Lakes B5 and A8	K of Lower Fault Factor of 3 Lower	K of Lower Fault Factor of 3 Higher	Base Case	Inclusion of Open Talik below Lakes B5 and A8	K of Lower Fault Splay Factor of 3 Higher	K of ENE and Lower Fault Splay Factor of 3 Higher	K of Bulk Bedrock Factor of 3 Higher
-1	2019	Q1	420	360	750	280	330	290	250	360	380	380	620	670	510
		Q2									400	400	630	700	540
		Q3									430	430	670	740	600
		Q4									420	420	650	710	590
0	2020	Q1				300	350	310	270	390	410	410	630	680	590
		Q2									410	410	620	670	590
		Q3									420	420	640	690	610
		Q4									420	430	650	700	630
1	2021	Q1				340	410	350	300	440	420	430	640	680	630
		Q2									430	440	640	680	650
		Q3									440	450	640	690	680
		Q4									460	470	650	700	700
2	2022	Q1&2	540	460	970	340	410	360	300	450	480	500	680	720	750
		Q3&4									510	540	700	750	810
3	2023	-				420	510	460	360	550	530	570	720	760	840
4	2024	-									540	580	750	780	850
5	2025	-	640	580	970	380	480	440	330	500	580	620	770	810	930
6	2026	-									570	620	750	790	950
7	2027	-				390	480	570	340	510	530	590	700	730	900
8	2028	-									510	570	670	700	870
9	2029	-				380	460	570	330	490	490	550	650	680	860
10	2030	-									480	540	630	660	840
11	2031	-				360	450	560	320	470	470	530	610	640	830
12	2032	-									460	530	600	630	820
13	2033	-									450	520	590	620	810

Note: Base case is the best estimate predicted by the model in consideration of the conceptual model and support hydraulic test data available at the time. Additional information on the scenarios is presented in the 2014 FEIS, Golder 2016 and Golder 2020.

3.0 CONCEPTUAL HYDROGEOLOGICAL MODEL

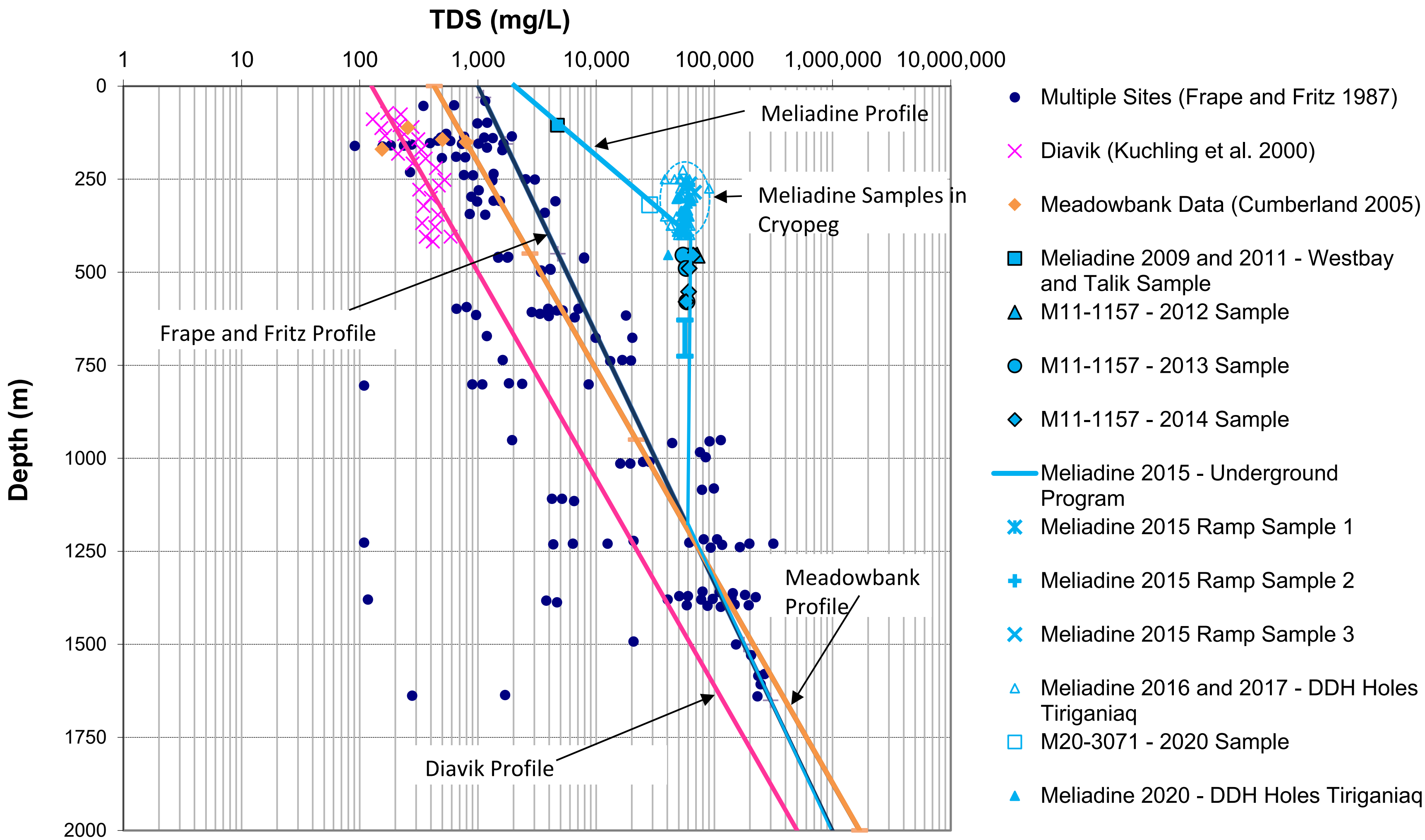
Prior to model development for the Project, a conceptual hydrogeological model was developed to aid in the construction of the numerical groundwater model. A conceptual hydrogeological model is a pictorial and descriptive representation of the groundwater regime that organizes and simplifies the site conditions so they can be readily modelled. The conceptual model must retain sufficient complexity so that the analytical or numerical models developed from it adequately reproduce or simulate the actual components of the groundwater flow system to the degree necessary to satisfy the objectives of the modelling study.

This conceptual model developed to describe key features of the pre-mining hydrogeological regime in the environmental study area is discussed in the Summary of Hydrogeology Existing Conditions (Golder 2021c). The key features included in this conceptual model are the hydostratigraphy, groundwater flow quantity and quality, and dominant groundwater flow directions. The following section summarizes the conceptual hydrogeological models for each stage of mining: predevelopment, mining, and closure. For further detail on the data used to develop the conceptual model components, the reader is referred to the Summary of Hydrogeology Existing Conditions Report (Golder 2021c)

3.1 Permafrost Depth

The Meliadine Project is located within the zone of continuous permafrost (AEM 2014a). Thermal modelling indicates the depth to permafrost varies between 285 and 430 m depth, with the interpreted depth dependent on the proximity to nearby lakes. Based on the groundwater quality (salinity) data for the Project (Figure 1), and the results of thermal modelling, the depth to the basal cryopeg where unfrozen groundwater may first be encountered is expected to be approximately 280 to 290 m bgs.

Open taliks are present beneath portions of each of the following lakes near the open pits and undergrounds: Lake B4, Lake B5, Lake B7, Lake A6, Lake A8, Lake CH6 and Lake D4, along with other more regional lakes further the mine developments.



Notes:
TDS result plotted as midpoint of sample interval depth where applicable;
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CLIENT
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YYYY-MM-DD	2021-11-04
PREPARED	DH
DESIGN	–
REVIEW	JL
APPROVED	VJB

PROJECT
AGNICO EAGLE MINES LIMITED
MELIADINE EXTENSION
NUNAVUT

TITLE
GROUNDWATER SALINITY PROFILE WITH DEPTH

PROJECT No.	Phase	Rev.	Figure
20136436	2300	1	1

3.2 Hydostratigraphy

Table 2 and Table 3 present a summary of the hydrostratigraphic units defined for the Project Area and their estimated hydraulic properties based on hydraulic testing and observations made in the underground mine workings. Where test data was unavailable, the properties were defined based on published data for similar lithologies.

The shallow bedrock at the site is primarily within the frozen permafrost except in areas of taliks underlying lakes. The deeper competent bedrock has been subdivided into two separate units: Mafic Volcanic Rock formations and Sedimentary Rock formations. The Mafic Volcanic Rock formations are present between the Lower Fault and Pyke Fault and are inferred to transition to Sedimentary Rock formations to the east. Sedimentary Rock formations are present to the North of the Lower Fault, and South of Pyke Fault. Synthesis of the hydraulic testing results up to the end of 2020, indicates that the Mafic Volcanic Rocks has lower hydraulic conductivity than the Sedimentary Rocks (Golder 2021c). The hydraulic conductivity of competent bedrock determined from the hydraulic testing has been assumed to remain constant with depth below 120 m depth. It is expected that a further reduction in hydraulic conductivity with depth would occur below the depth of testing; however, the rate of this reduction is unknown without further testing.

In crystalline rocks, fault zones may act as groundwater flow conduits, barriers, or a combination of the two in different regions of the fault depending on the direction of groundwater flow and the fault zone architecture (Gleeson and Novakowski 2009). Within the Project area, three regional faults (North, Lower and Pyke) are present. In addition, review of structures in the Project area by Agnico Eagle identified 17 additional faults that have been incorporated into the conceptual hydostratigraphy near the underground developments. Each of these faults have been assumed to have enhanced permeability relative to the surrounding competent bedrock. The additional structures are generally located between the Lower Fault and Pyke Fault within the Mafic Volcanic Rock formations and range in thickness from 2 to 6 m. An exception is the KMS Fault corridor, located in the sedimentary rock formations to the north of the Lower Fault at the Tiriganiaq Underground. This corridor is a wider zone of rock located between the KMS Fault and Lower Fault that is associated with poor rock quality. The continuity of this corridor is unknown but based on rock quality is interpreted to thin to the east and west.

The hydraulic conductivity of the competent bedrock and faults is assumed to be linearly reduced by an order of magnitude between the top of the cryopeg and base of permafrost (zero-degree isotherm). This assumption reflects that this portion of the permafrost, which will contain partially unfrozen groundwater due to freezing point depression, is expected to have reduced hydraulic conductivity relative to the unfrozen bedrock reflecting the presence of isolated pockets of frozen groundwater within this zone. These frozen zones will result in a decrease in the hydraulic conductivity of the rock compared to that of the entirely unfrozen rock.

Table 2: Estimated Hydraulic Properties - Competent Bedrock

Hydrostratigraphic Unit	Depth Interval (m)	Hydraulic Conductivity (m/s) (a)	Specific Storage (1/m) (b)	Effective Porosity (-) (c)
Shallow Rock	0 to 60	3×10^{-7}	1×10^{-6}	0.001
	60 to 120	3×10^{-8}	1×10^{-6}	0.001
Sedimentary Rock Formations	120 to 1500	3×10^{-9}	2×10^{-6}	0.001
Mafic Volcanic Rock Formations	120 to 1500	3×10^{-10}	2×10^{-7}	0.001

Hydraulic conductivity within the unfrozen permafrost zone is assumed to be lower than in the deeper unfrozen rock. Linearly decreasing. hydraulic conductivity with temperature is assumed within this zone with a full order of magnitude decrease assumed at the top of the basal cryopeg, and hydraulic conductivity equivalent to unfrozen rock at the bottom of the basal cryopeg.

(a) Parameter values based on in-situ testing and 2019 Model Calibration (Golder 2020).

(b) Parameter values based on in-situ testing and values documented in literature (Maidment 1992; Stober and Bucher 2007).

(c) Values consistent with literature values (Guimerà J, Carrera J. 2000).

Table 3: Estimated Hydraulic Properties - Enhanced Permeability Zones

Hydrostratigraphic Unit	Depth Interval (m) (e)	Thickness (m)(d)	Hydraulic Conductivity (m/s) (a)	Specific Storage (1/m) (b)	Effective Porosity (-) (c)	Source of Transmissivity Estimate (a)
Lower Fault Zone	0 to 1000	5	1×10^{-7}	2×10^{-7}	0.005	2019 Calibration
RM-175	0 to 1000	5	5×10^{-8}	2×10^{-7}	0.005	In-Situ and 2019 Calibration
KMS Fault Corridor	0 to 1000	100	4×10^{-7}	2×10^{-7}	0.005	In-Situ Testing
North Fault	0 to 1000	5	1×10^{-7}	2×10^{-7}	0.005	Assumed T Equal to Fault 2
WM-A	0 to 1000	6	1×10^{-6}	2×10^{-7}	0.005	Assumed T Equal to Fault 2
WM-B	0 to 1000	5	1×10^{-6}	2×10^{-7}	0.005	Assumed T Equal to Fault 2
WM-C	0 to 1000	3	2×10^{-6}	2×10^{-7}	0.005	Assumed T Equal to Fault 2
WM-D	0 to 1000	5	1×10^{-6}	2×10^{-7}	0.005	Assumed T Equal to Fault 2
Pyke Fault	0 to 1000	15	4×10^{-7}	2×10^{-7}	0.005	Assumed T Equal to Fault 2
PU-AP0	0 to 1000	3	2×10^{-6}	2×10^{-7}	0.005	Assumed T Equal to Fault 2
PU-ENE-1	0 to 1000	5	1×10^{-6}	2×10^{-7}	0.005	Assumed T Equal to Fault 2
PU-ENE-2	0 to 1000	3	2×10^{-6}	2×10^{-7}	0.005	Assumed T Equal to Fault 2
UM2	0 to 1000	6	1×10^{-6}	2×10^{-7}	0.005	Assumed T Equal to Fault 2
PU-NW-1	0 to 1000	5	1×10^{-6}	2×10^{-7}	0.005	Assumed T Equal to Fault 2
FZ-WNW-1	0 to 1000	3	2×10^{-6}	2×10^{-7}	0.005	Assumed T Equal to Fault 2
FZ-WNW-2	0 to 1000	3	2×10^{-6}	2×10^{-7}	0.005	Assumed T Equal to Fault 2
FZ-UAU2	0 to 1000	2	3×10^{-6}	2×10^{-7}	0.005	Assumed T Equal to Fault 2
Fault 1	0 to 1000	5	1×10^{-6}	2×10^{-7}	0.005	Assumed T Equal to Fault 2
Fault 2	0 to 1000	5	1×10^{-6}	2×10^{-7}	0.005	In-Situ Testing
Fault 3	0 to 1000	5	1×10^{-6}	2×10^{-7}	0.005	Assumed T Equal to Fault 2

(a) Hydraulic conductivity within the unfrozen permafrost zone is assumed to be lower than in the deeper unfrozen rock. Linearly decreasing hydraulic conductivity with temperature is assumed within this zone with a full order of magnitude decrease assumed at the top of the basal cryopeg, and hydraulic conductivity equivalent to unfrozen rock at the bottom of the basal cryopeg.

(b) Assumed parameter in consideration of competent bedrock testing.

(c) Values consistent with literature values (Guimerà J, Carrera J. 2000).

(d) Width of structures estimated by Agnico Eagle from review of borehole records.

(e) Where fault hydraulic conductivity is less than shallow rock, the fault was excluded from 0 to 60 m depth interval. Where fault hydraulic conductivity is greater than shallow rock, fault was be included within 0 to 60 m depth interval.

3.3 Conceptual Groundwater Flow – Pre-Mining

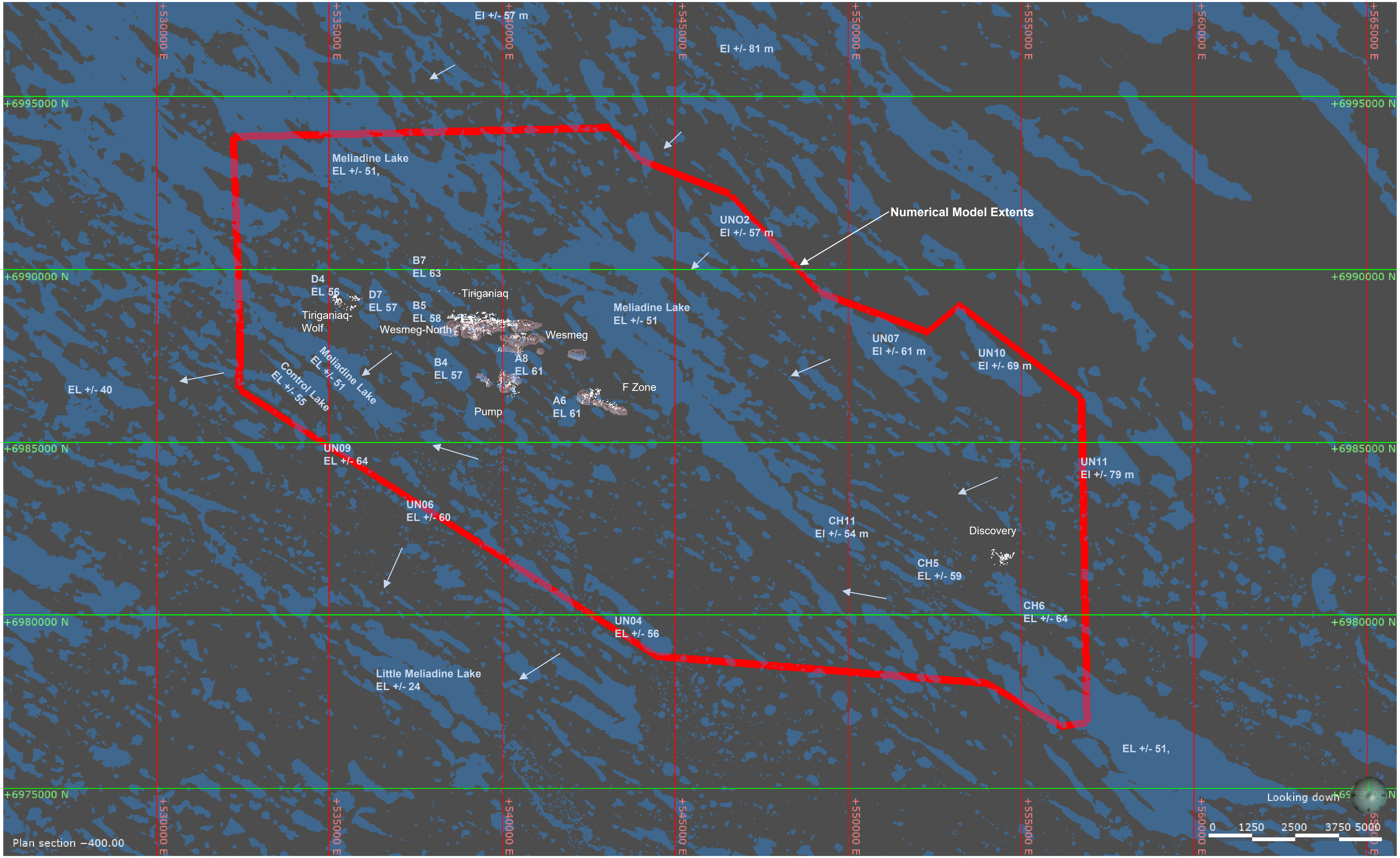
The conceptual hydrogeological model for pre-disturbance conditions is presented on Figure 2 through Figure 5.

In areas of continuous permafrost there are generally two groundwater flow regimes; a deep groundwater flow regime beneath the base of the permafrost and a shallow flow regime located in an active (seasonally thawed) layer near ground surface (Figure 3). Permafrost reduces the hydraulic conductivity of the rock by several orders of magnitude (McCauley et al. 2002; Burt and Williams 1976), therefore the shallow groundwater flow regime has little to no hydraulic connection with the groundwater regime located below the permafrost. Taliks (areas of unfrozen ground surrounded by permafrost) may be present in the permafrost in areas underlying lakes. Depending on lake size, depth, and thermal storage capacity, the taliks beneath lakes may fully penetrate the permafrost layer resulting in an open talik providing a hydraulic connection between surface water and the deep groundwater flow regime.

The elevations of the lakes underlain by open taliks provide the driving force for deep groundwater flow (Figure 2). The presence of thick permafrost beneath land masses results in negligible recharge to the deep groundwater flow regime from these areas. Consequently, recharge to the deep groundwater flow regime is predominantly limited to areas of taliks beneath large, surface water bodies. Generally, deep groundwater will flow from higher-elevation lakes to lower-elevation lakes. Groundwater beneath the permafrost is also influenced by density differences due to the upward diffusion of deep-seated brines (density-driven flow).

The Westbay multi-level monitoring system that was installed in borehole M11-1257 (Figure 6) is situated between Lake B7 and D7, and directly underneath Lake B5. Each of these lakes are predicted to be connected to the deep groundwater flow regime through open taliks. The multi-level sampling intervals in the Westbay system were installed beneath permafrost in the deep groundwater flow regime at vertical depths ranging from approximately 440 to 640 m below ground surface. Due to the inclination of this installation, these ports are located beneath Lake B5. Groundwater pressures and quality collected from the Westbay installation are considered representative of the deep groundwater flow regime, which is expected to be driven by the hydraulic gradients between Lakes B7 and D7 and Meliadine, and by density gradients.

Groundwater pressures recorded in the intervals of the Westbay system, and the approximate direction of vertical groundwater flow estimated using these recorded pressures (freshwater heads) corrected for buoyancy effects due to density contrasts were presented in the Golder (2021c). Results of this analysis indicated that relative to Lake D7 (Lake Elevation of 62 m), a general downward groundwater flow direction is observed, which would be consistent with flow from high elevation lakes (Lake D7) to low elevation lakes (Lake B5 at 58 masl or Lake D7 at 57 masl). Relative to Lake B5, a variable vertical groundwater flow direction was observed. This may reflect that Lake B5 is both a recharge and discharge boundary given the relative elevation of the surrounding lakes.



Note: Lake elevations presented in masl.

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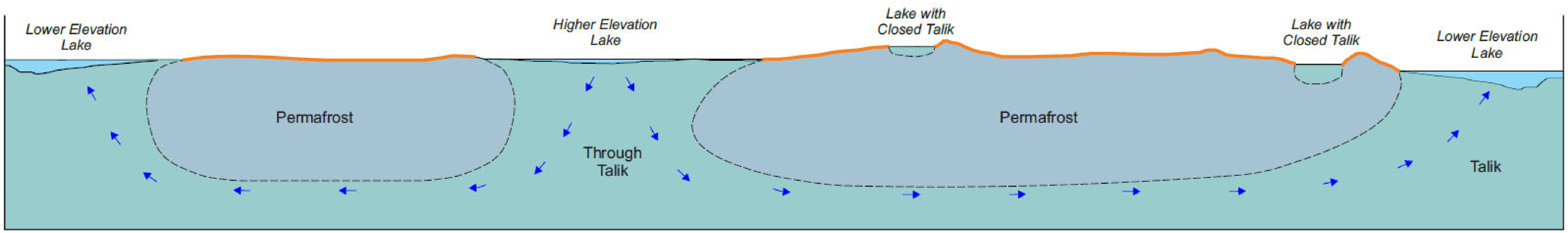
YYYY-MM-DD	2021-11-04
PREPARED	HG
DESIGNED	HG
REVIEWED	JL
APPROVED	DC

PROJECT
AGNICO EAGLE MINES LIMITED
MELIADINE EXTENSION
NUNAVUT

TITLE
HYDROGEOLOGY MODEL EXTENTS AND CONCEPTUAL REGIONAL GROUNDWATER FLOW DIRECTIONS

PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	3	2



CROSS SECTION

Schematic Only
Not to Scale

LEGEND

- Conceptual Groundwater Flow Direction
- Active Layer

CLIENT

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YYYY-MM-DD	2021-11-04
PREPARED	HG
DESIGNED	HG
REVIEWED	JL
APPROVED	DC

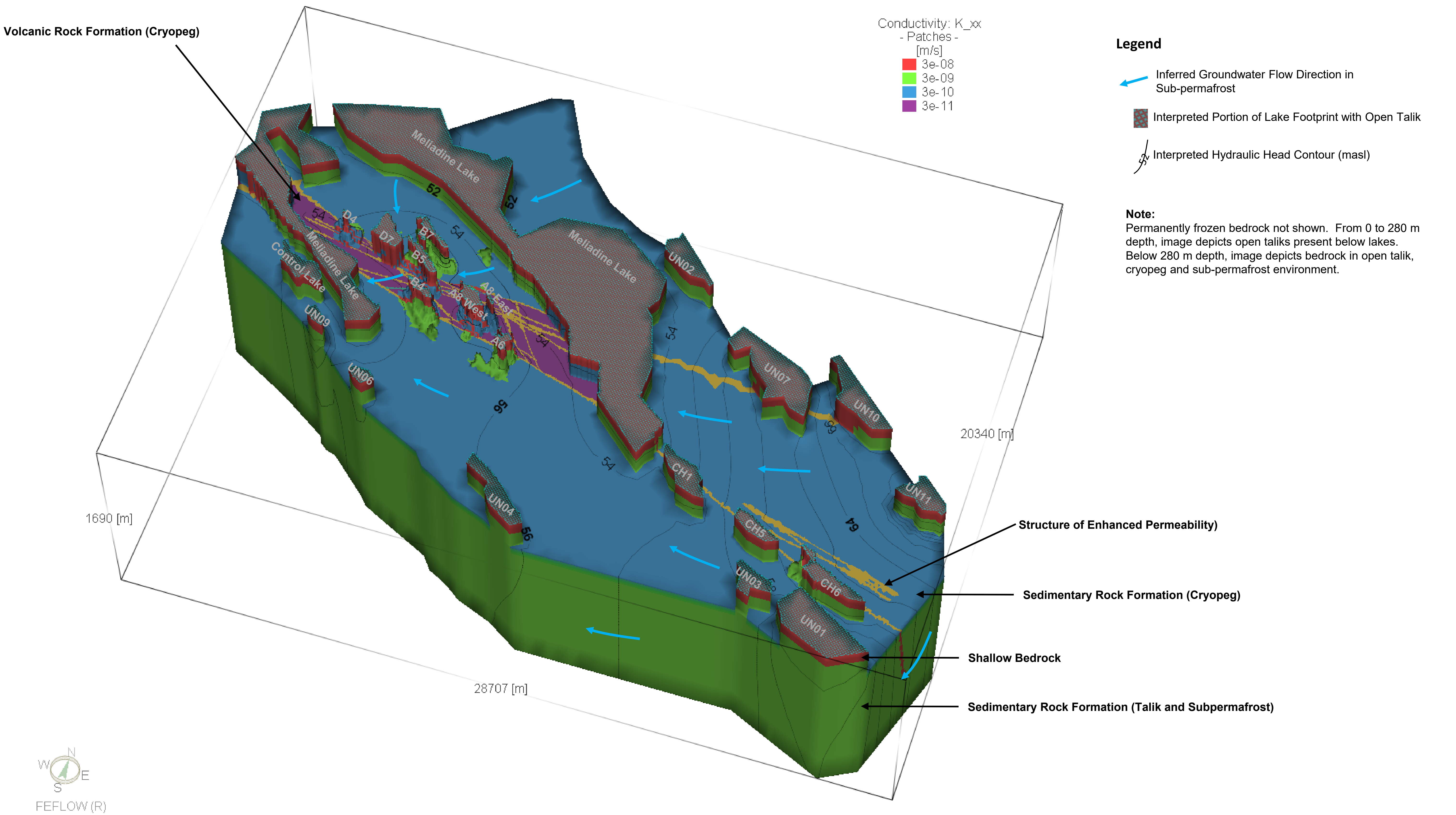
PROJECT

AGNICO EAGLE MINES LIMITED
MELIADINE EXTENSION
NUNAVUT

TITLE

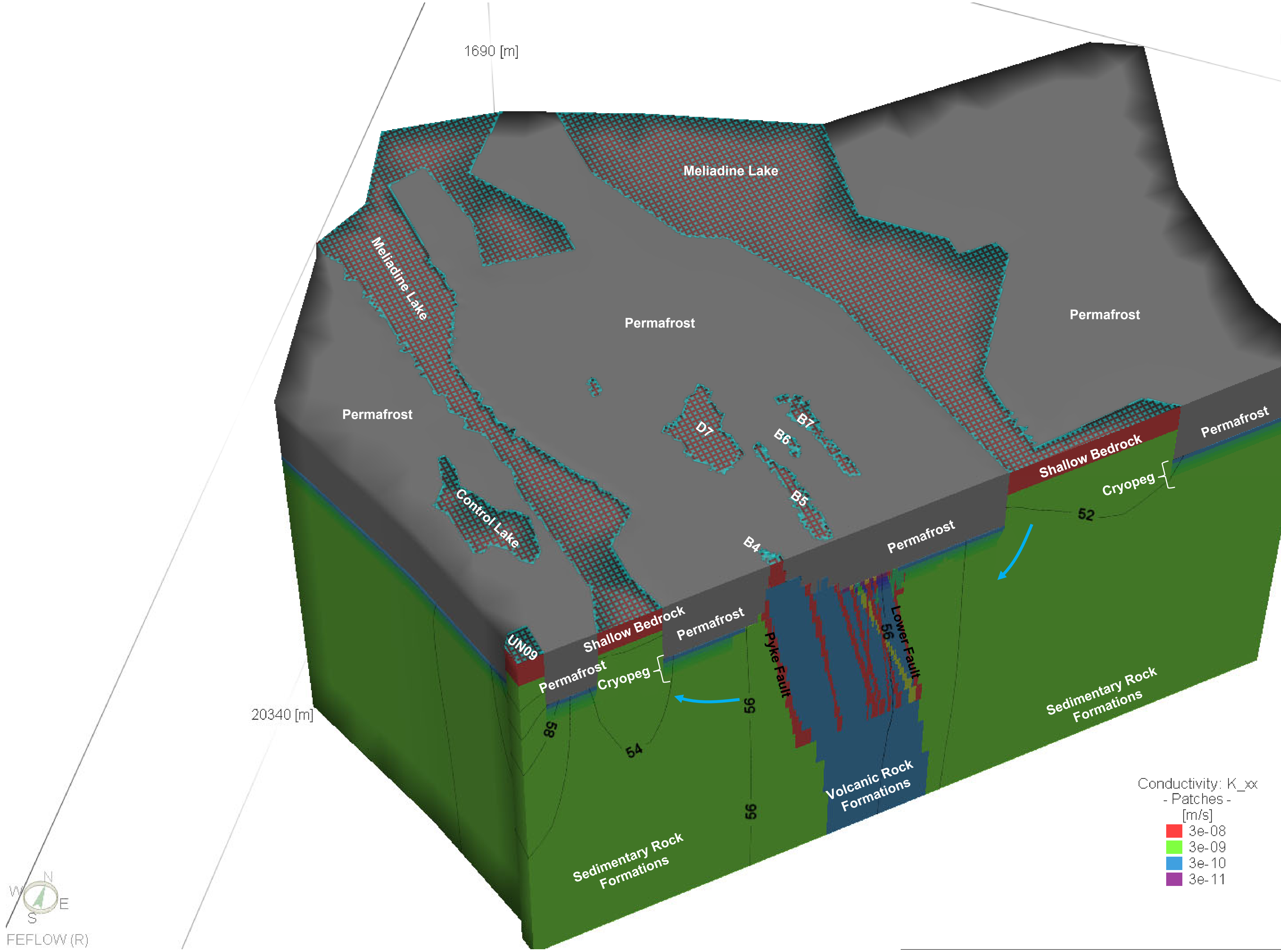
SCHEMATIC OF CONCEPTUAL PERMAFROST AND GROUNDWATER FLOW CONDITIONS IN AREAS OF CONTINOUS PERMAFROST

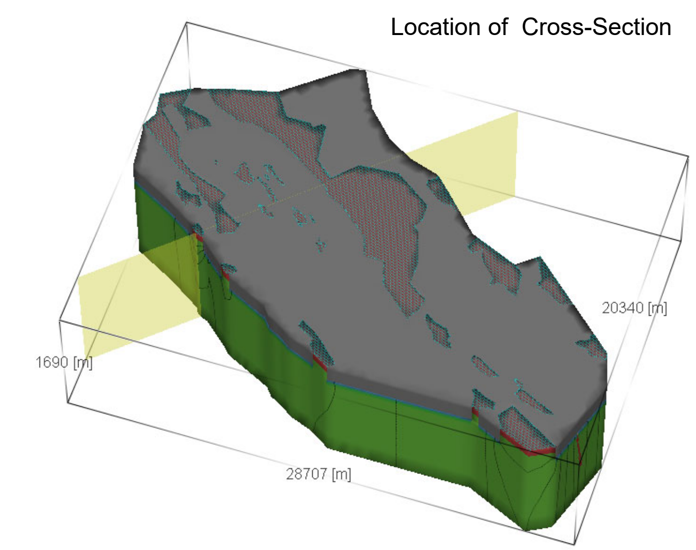
PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	1	3



5x Vertical Exaggeration

CLIENT: AGNICO EAGLE		PROJECT: AGNICO EAGLE MINES LIMITED MELIADINE EXTENSION NUNAVUT	
CONSULTANT: GOLDER MEMBER OF WSP	YYYY-MM-DD: 2021-11-04	TITLE: PRE-MINING CONCEPTUAL GROUNDWATER FLOW DIRECTIONS AND DISTRIBUTION OF HYDROSTRATIGRAPHIC UNITS	
	PREPARED: HG		
	DESIGNED: HG		
	REVIEWED: JL		
	APPROVED: DC	PROJECT NO.: 20136436 · PHASE: 2300	REV.: 1 · FIGURE: 4





CLIENT

AGNICO EAGLE

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MEMBER OF WSP

YYYY-MM-DD	2021-11-04
PREPARED	HG
DESIGNED	HG
REVIEWED	JL
APPROVED	DC

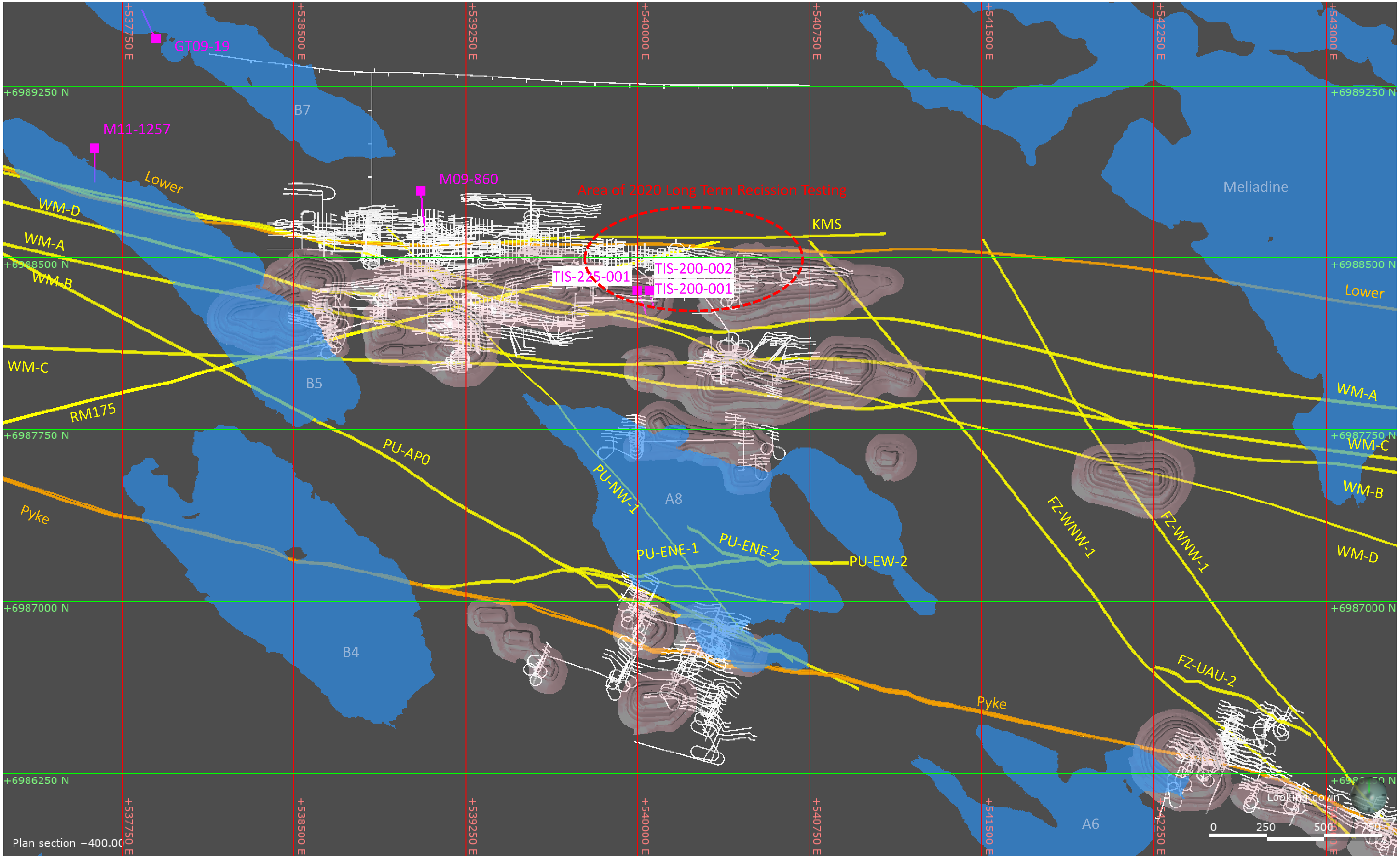
PROJECT

AGNICO EAGLE MINES LIMITED
MELIADINE EXTENSION
NUNAVUT

TITLE

CROSS-SECTION VIEW OF PRE-MINING CONCEPTUAL GROUNDWATER FLOW DIRECTIONS NEAR TIRIGANIAQ

PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	1	5



LEGEND

- Inferred Lake with Open Talik
- Regional Fault
- Supplemental Faults Based on 2020 Agnico Eagle Review
- Borehole Collar / Borehole Trace

Fault traces are shown for an elevation of -400 masl.

CLIENT	AGNICO EAGLE	PROJECT	AGNICO EAGLE MINES LIMITED MELIADINE EXTENSION NUNAVUT
CONSULTANT	GOLDER MEMBER OF WSP	TITLE	BOREHOLE LOCATIONS FOR HYDRAULIC TESTING AND GROUNDWATER SAMPLING – MAIN AREA
YYYY-MM-DD	2021-11-04	PROJECT NO.	20136436
PREPARED	HG	PHASE	2300
DESIGNED	HG	REV.	1
REVIEWED	JL	FIGURE	6
APPROVED	DC		

3.4 Conceptual Groundwater Flow – Existing Conditions

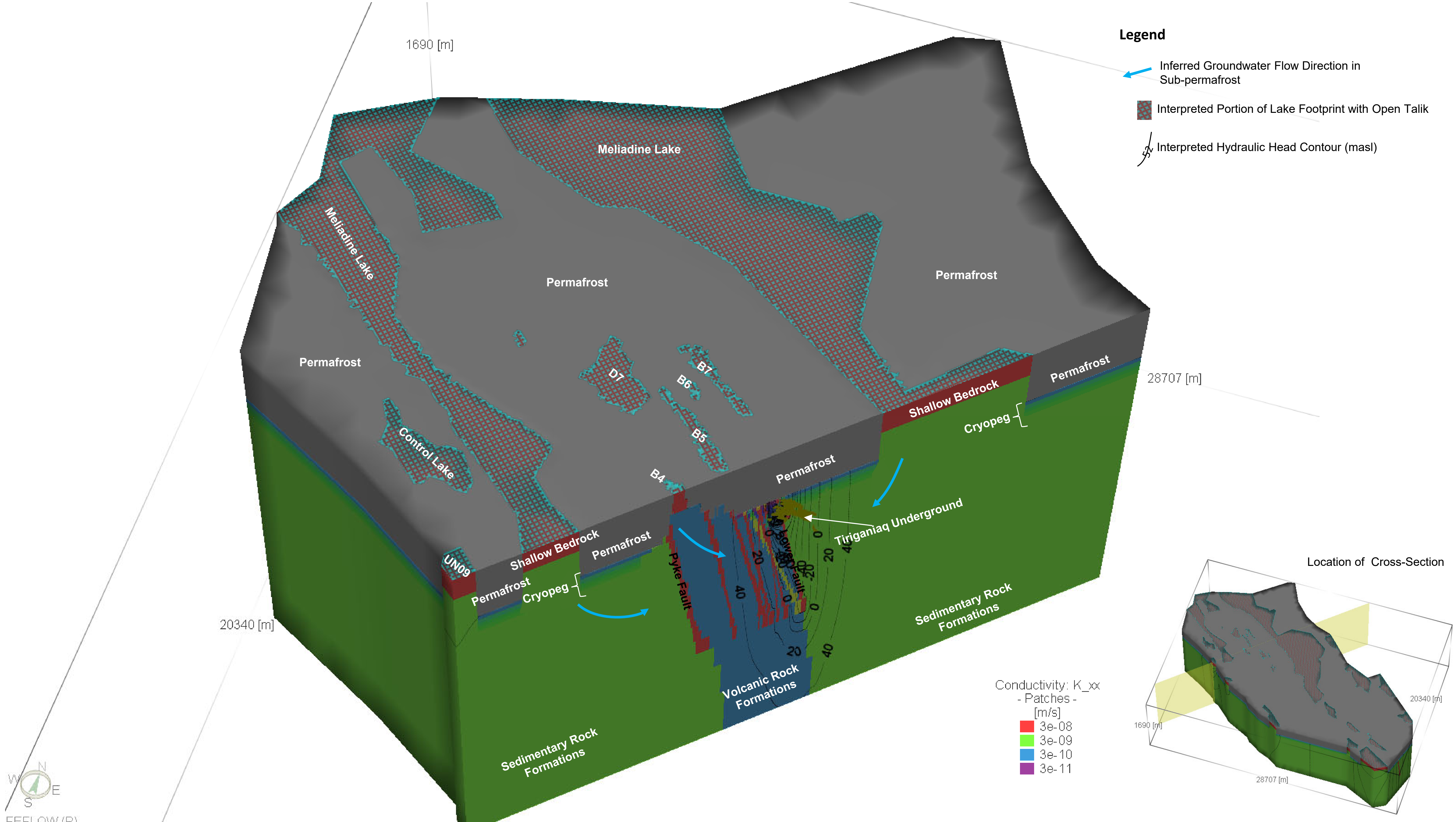
Groundwater inflows are presently intercepted at the Tiriganiaq Underground, where mining has extended into the cryopeg and sub-permafrost groundwater flow system. As described in Section 3.1, thermal modelling suggests that basal cryopeg may be first encountered approximately 280 to 290 mbgs, and the depth to the base of permafrost ranges between 285 m and 430 m depth, depending on the proximity to nearby lakes. In September of 2015, the mine development extended to approximately 280 m depth which corresponds to the estimated top of the cryopeg. Groundwater inflows were low (approximately 15 m^3/day in the fourth quarter of 2015) but have since increased to an average of between 200 m^3/day and 300 m^3/day in 2020. As of October 2020, the mine development at Tiriganiaq extended to approximately 425 m depth (-370 masl). Groundwater inflows are mitigated by active grouting which locally reduces the effective hydraulic conductivity of structures adjacent to the development.

The Tiriganiaq underground acts as a sink for groundwater flow, with water induced to flow through the bedrock to the underground mine workings once the mine has advanced into and below the basal cryopeg, or into the open talik below a lake. At Tiriganiaq, local depressurization of over 350 m has been observed at piezometers installed near the underground and immediately adjacent to the depressurized developments. To date, no mining in bedrock connected to open taliks has occurred. Tir02 pit is located at the south end of CP5. A shallow closed talik may be present below the pond resulting in some seepage to the open pit. This seepage, if present, would not be expected to significantly increase given the pit depth is likely already past the base of the closed talik.

3.5 Groundwater Flow – Mining

Like existing conditions near the Tiriganiaq underground, each of the Project proposed undergrounds and pits in connection with open taliks or the sub-permafrost groundwater flow system will act a sink for groundwater flow. Excavation will induce the water to flow through the bedrock to the mine workings once the mine has advanced below the base of the permafrost or into open talik.

Thermal modelling has shown that each of the underground developments will extend into the sub-permafrost groundwater flow system. Except for NOR01, WES05, and PUM04, none of the other open pits are interpreted to intersect the cryopeg or the deep groundwater regime below the permafrost. Portions of the pits may intersect small lakes that may have limited unfrozen groundwater within closed taliks. Lake dewatering is planned for each pit that may have such a hydraulic connection. This may result in freeze-back of the pit slopes, limiting the seepage of local groundwater from closed taliks into the open pits.



CLIENT

AGNICO EAGLE

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-11-04
PREPARED	HG
DESIGNED	HG
REVIEWED	JL
APPROVED	DC

PROJECT
AGNICO EAGLE MINES LIMITED
MELIADINE EXTENSION
NUNAVUT

TITLE
CROSS-SECTION VIEW OF CONCEPTUAL GROUNDWATER FLOW DIRECTIONS NEAR TIRIGANIAQ – YEAR 2020 (EXISTING CONDITIONS)

PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	1	7

4.0 NUMERICAL HYDROGEOLOGICAL MODEL

4.1 Code Selection

The numerical groundwater model was constructed using FEFLOW (Version 7.2). This numerical code was selected because it is capable of simulating transient, saturated-unsaturated groundwater flow, and density-coupled solute transport in heterogeneous and anisotropic porous media under a variety of hydrogeologic boundaries and stresses. FEFLOW is well suited for development of the site model because it allows for simultaneous predictions of groundwater flow and solute transport and has been successfully used for simulated groundwater inflow to the Tiriganiaq underground as part assessments (Section 2.0).

Specific assumptions and limitations adopted in the model are summarized below, with additional detail presented in Section 4.2 to 4.6 and the model calibration is described in Section 5.0.

- The model predictions assumed fully saturated confined conditions. Hydraulic head measurements between 2015 and 2020 indicate saturated conditions are present near the underground developments, and with respect to the future inflow predictions this assumption will likely bias prediction high because if unconfined conditions are encountered later in the mine life, these conditions would tend to reduce inflows. However, under continuous permafrost conditions the seepage from above is already very small and unconfined conditions may not reduce inflows much from what are predicted with confined conditions.
- The model treats the bedrock as an equivalent porous medium (EPM), although flexibility exists to introduce discrete structures as warranted to evaluate potential preferential flow paths along discrete faults. Flow in bedrock is assumed to be laminar, steady, and governed by Darcy’s Law.
- Horizontal and vertical mesh discretization of approximately 10 m to 25 m was considered to provide sufficient spatial resolution for simulation of groundwater flow and transport near the underground mine.
- Initial values of model input parameters were based on the results of permeability testing across the Project and previous modelling in the area of Tiriganiaq. Where testing results were not available, initial model properties were based on typical values published in the literature.
- Surface waterbodies were simulated using specified head boundaries. It was assumed that the permeability of lake bed sediments beneath these waterbodies is the same as those of the underlying geologic strata. Thus, no restriction of flow between the surface water and individual hydrostratigraphic units was simulated.
- Groundwater flow deeper than approximately 1.7 km below ground surface (800 m deeper than the deepest mine) was assumed to be negligible and to have negligible influence on model predictions.

4.2 Model Domain and Discretization

The extent of the numerical hydrogeological model was based on the understanding of groundwater flow conditions, with model boundaries set sufficiently distant from the mine workings to allow adequate representation of groundwater conditions near the open pits and undergrounds. As part of the prediction scenarios, checks were completed to verify that the predicted extent of depressurization from the underground dewatering did not extend to the lateral model boundaries.

The model domain is approximately 305 km^2 and consisted of over 2.8 million triangular elements (Figure 8). The element size is refined in the areas of the underground developments, ranging between 10 to 25 m, and increases in size towards the periphery of the model where elements are approximately 500 m. The model domain encompasses potential areas where open pits and underground developments may influence the sub-permafrost groundwater flow system.

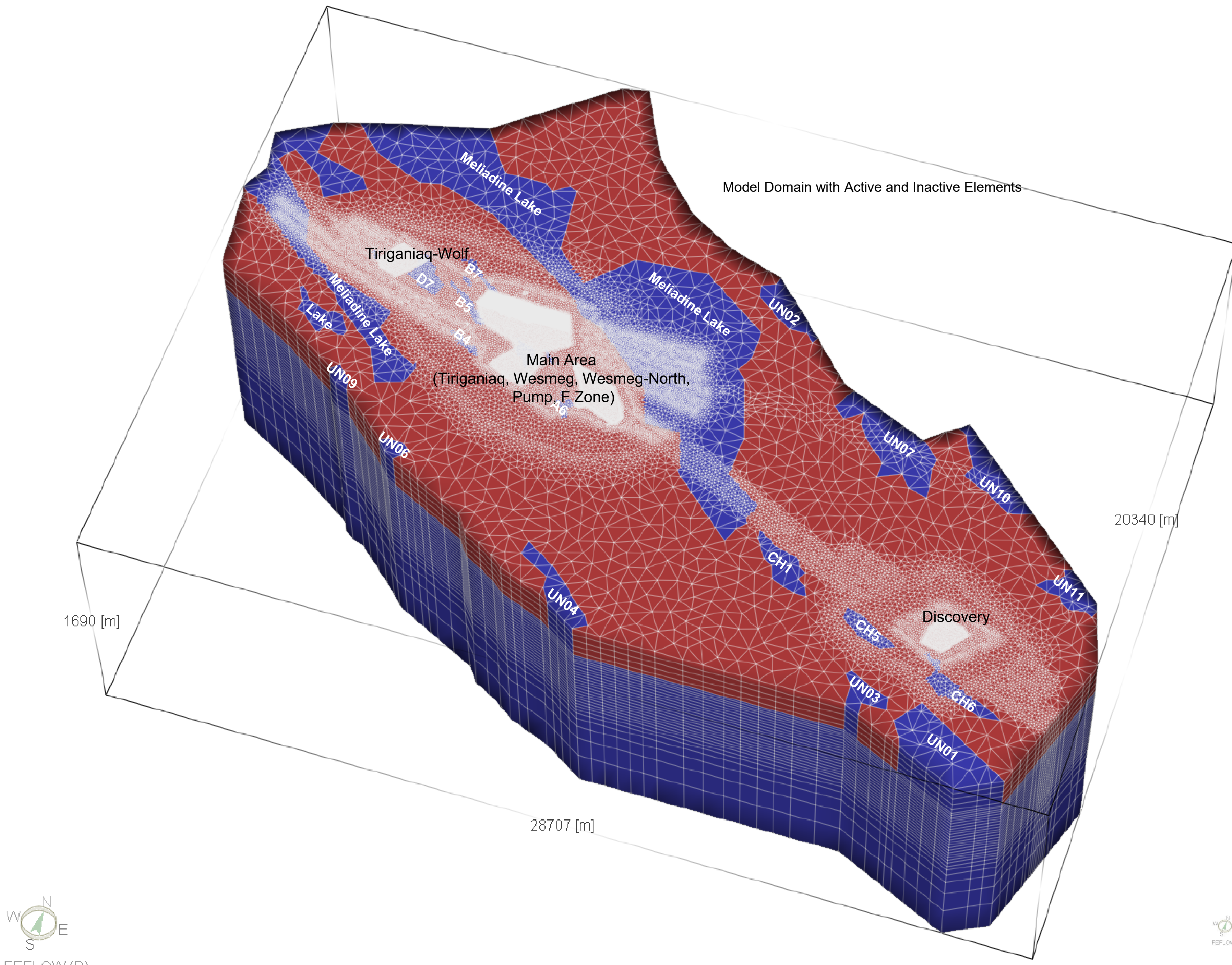
Vertically, the model domain is discretized into 32 layers. The top of Layer 1 is generally set to approximately 55 masl, the ground surface elevation in the Tiriganiaq area, with local adjustment under lakes with open talik in consideration of lake elevations. The bottom of layer 32 was set to a constant elevation of -1635 masl (approximately 1.7 km below ground surface and approximately 800 m below the deepest proposed underground).

4.3 Hydostratigraphy and Initial Model Parameters

Table 2 and Table 3 of Section 3.2 present a summary of the hydrostratigraphic units and their estimated hydraulic properties. These parameters were later adjusted as part of model calibration, as described in Section 5.0. Figure 4 presents the relative location of the hydrostratigraphic units, with more detail on the fault locations presented on Figure 9 and Figure 10.

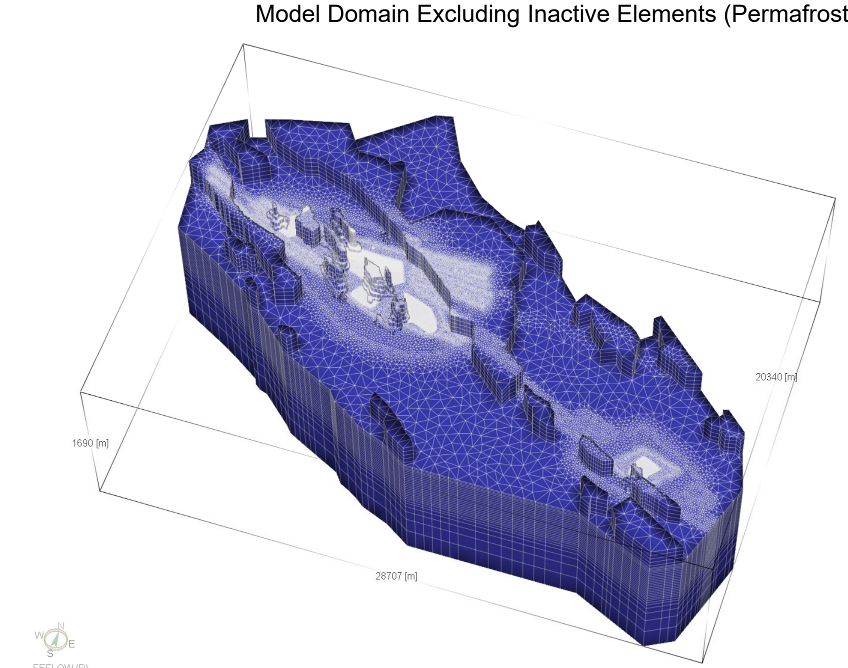
Faults within the Project area generally range from 2 to 6 m thick, which is less than the element size near the undergrounds (10 to 25 m). An exception of the Pyke Fault and KMS corridor that have larger interpreted widths (15 to 100 m). Faults were simulated in model by assigning an effective hydraulic conductivity representative of the combined transmissivity of the fault and competent bedrock to elements parallel to the fault alignment, with the fault set to be approximately two elements wide. The faults have been conservatively assumed to extend several kilometres away from the underground development and to extend to a depth of approximately one kilometre (-1025 m elevation).

To mitigate groundwater inflows, Agnico Eagle actively grouts faults, joints and other structures within the rock that contribute to inflow to the underground. To simulate this grouting, elements representative of the faults within 30 m of the underground were assigned an effective hydraulic conductivity of 1×10^{-8} m/s. This parameter was then iteratively adjusted in the model to improve the match between measured and predicted inflows to the underground.



Legend

- Active Model Elements (Cryopeg and Unfrozen Bedrock)
- Inactive Model Elements (Permafrost Excluding Cryopeg)

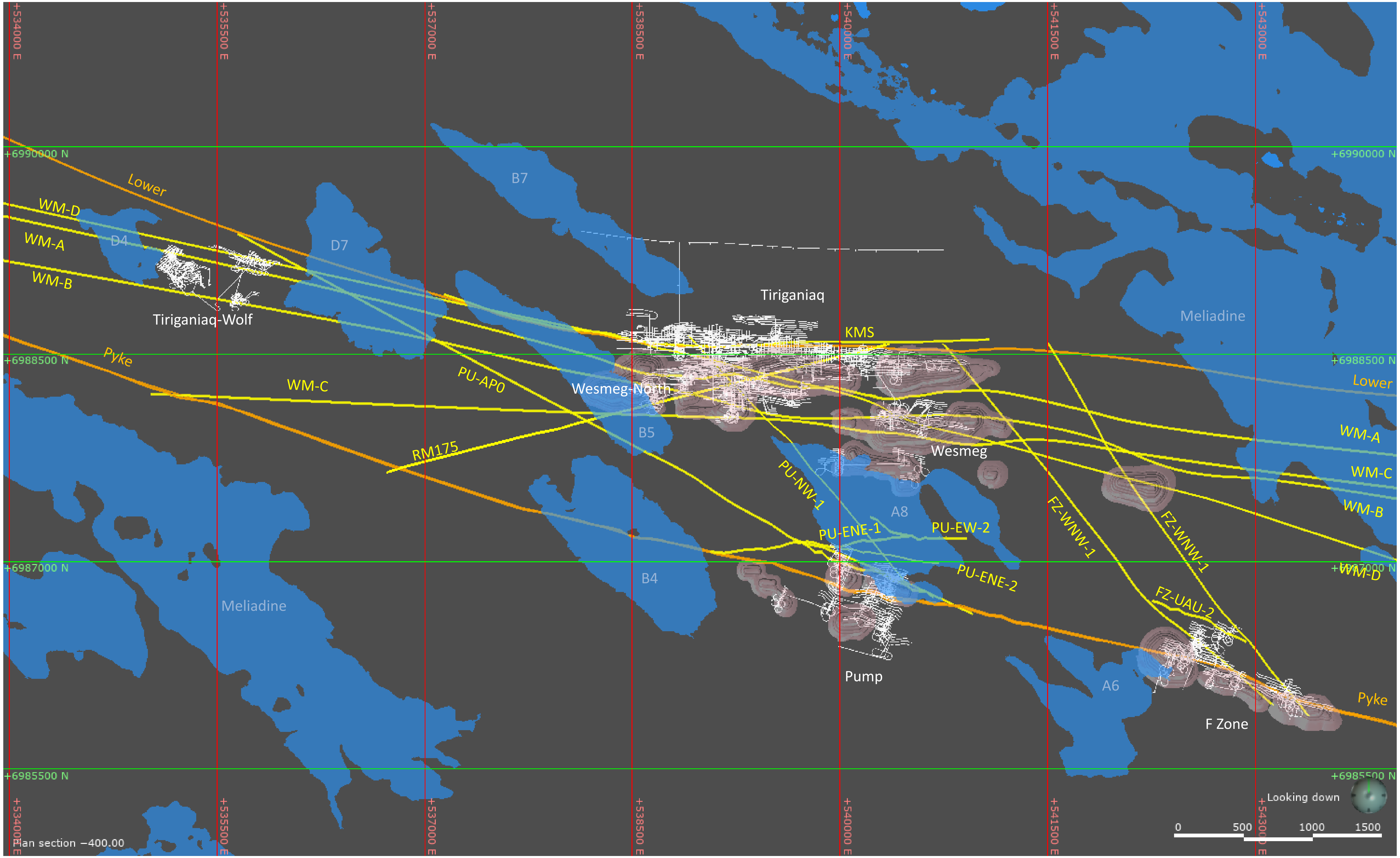


5x Vertical Exaggeration

CLIENT	AGNICO EAGLE	PROJECT	AGNICO EAGLE MINES LIMITED MELIADINE EXTENSION NUNAVUT
CONSULTANT	GOLDER MEMBER OF WSP	YYYY-MM-DD	2021-11-04
		PREPARED	HG
		DESIGNED	HG
		REVIEWED	JL
		APPROVED	DC

TITLE
FINITE ELEMENT MESH AND ACTIVE MODEL DOMAIN

PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	3	8



LEGEND

Inferred Lake with Open Talik

Regional Fault

Supplemental Faults Based on 2020 Agnico Eagle Review

Fault traces are shown for an elevation of -400 masl.

CLIENT

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YYYY-MM-DD	2021-11-04
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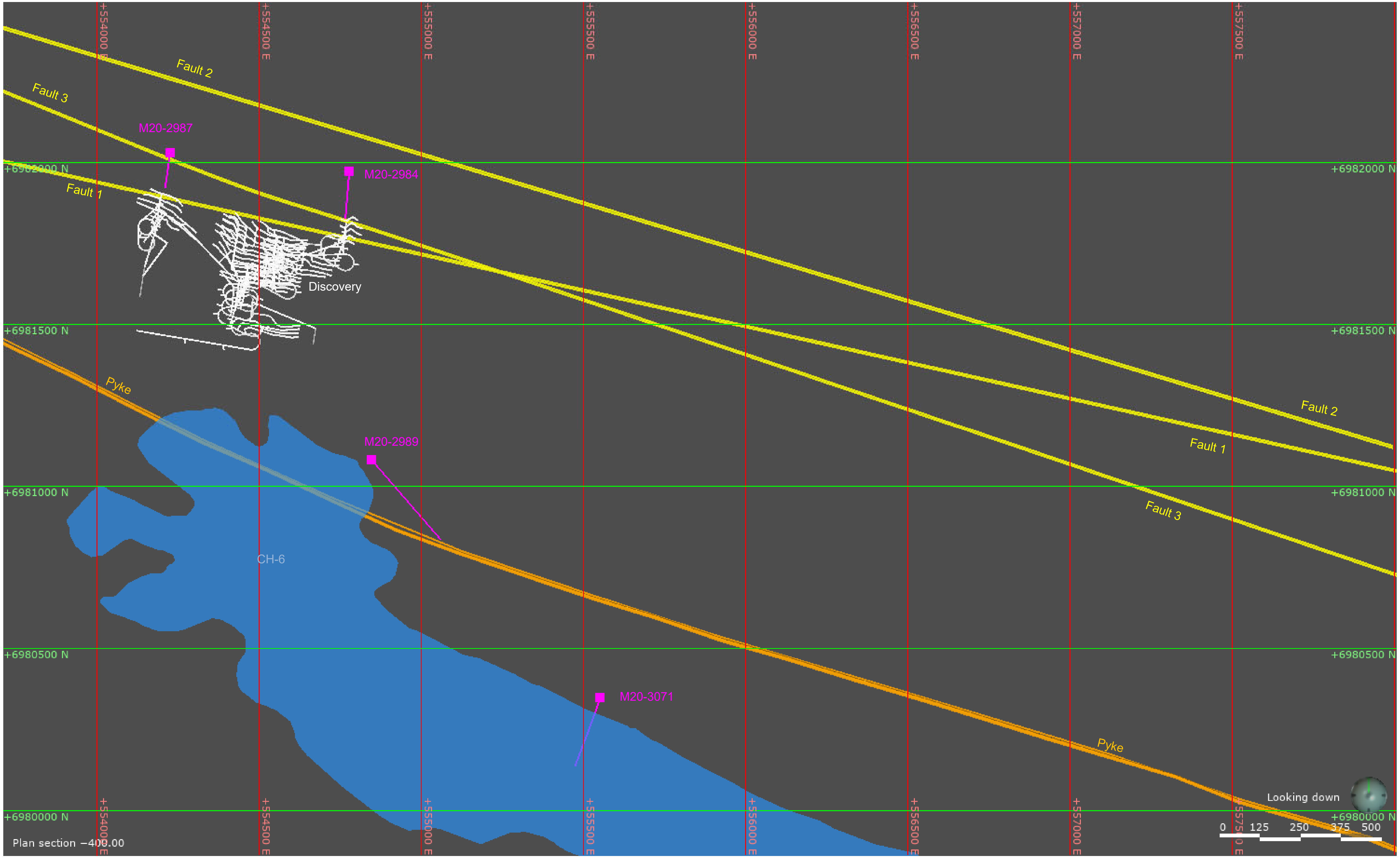
DESIGNED	HG
REVIEWED	JL
APPROVED	DC

PROJECT
AGNICO EAGLE MINES LIMITED
MELIADINE EXTENSION
NUNAVUT

TITLE
STRUCTURES OF ENHANCED PERMEABILITY – MAIN AREA AND TIRIGANIAQ-NORTH

PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	3	9



LEGEND

- Inferred Lake with Open Talik
- Regional Fault
- Supplemental Faults Based on 2020 Agnico Eagle Review
- Borehole Location

Fault traces are shown for an elevation of -400 masl.

CLIENT
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MEMBER OF WSP

YYYY-MM-DD	2021-11-04
PREPARED	HG
DESIGNED	HG
REVIEWED	JL
APPROVED	DC

PROJECT
AGNICO EAGLE MINES LIMITED
MELIADINE EXTENSION
NUNAVUT

TITLE
STRUCTURES OF ENHANCED PERMEABILITY – DISCOVERY

PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	1	10

4.4 Mine Schedule

This model incorporates the mine plan provided by Agnico Eagle, as summarized in Table 4 for the lowest elevation of the underground development.

Table 4: Lowest Elevation of Underground Development

Year	Lowest Elevation of Underground Development (masl)						
	Tiriganiaq	Wesmeg	Wesmeg-North	F Zone	Pump	Tiriganiaq-Wolf	Discovery
2021	-490	-395	-	-	-	-	-
2022	-560	-395	-	-	-	-	-
2023	-640	-395	-245	-	-	-	-
2024	-735	-395	-245	-	-	-	-
2025	-845	-395	-245	-	-	-	-110
2026	-845	-465	-245	-	-	-	-255
2027	-845	-585	-275	-	-	-	-315
2028	-845	-590	-275	-	-	-	-395
2029	-845	-590	-275	-	-170	-	-400
2030	-845	-590	-275	-	-340	-	-400
2031	-845	-590	-275	-	-340	-	-400
2032	-845	-590	-395	-	-340	-	-
2033	-845	-590	-395	-150	-340	-20	-
2034	-845	-590	-395	-310	-340	-140	-
2035	-845	-590	-395	-460	-340	-280	-
2036	-845	-590	-395	-460	-	-400	-
2037	-845	-590	-395	-460	-	-400	-
2038	-	-	-	-500	-	-400	-
2039	-	-	-	-500	-	-400	-
2040	-	-	-	-	-	-400	-
2041	-	-	-	-	-	-480	-
2042	-	-	-	-	-	-480	-
2043	-	-	-	-	-	-480	-

Based on permafrost limits (Golder 2021a), open pits in the F Zone, Pump and Discovery, which vary in depth between 70 and 140 mbgs, will be within permafrost and/or intersect shallow closed taliks in adjacent lakes. Where open pits in the F Zone, Pump and Discovery intersect lakes, these taliks are planned to be dewatered in advance of mining.

Wesmeg-North Pit is planned to be about 130 m deep with the ultimate base of the pit at -65 masl and is under a portion of Lake B5 where thermal models predict the existence of an open talik (Golder 2021a).

Pump Pit PUM04pit is planned to be about 40 m deep with the ultimate pit at -20 masl and is under the southern portion of Lake A8 West

Wesmeg Pit Wes05 pit is planned to be about 120 m deep with the ultimate base of the pit at -55 masl and is partially under the north side of Lake A8 West, where thermal models predict the presence of an open talik (Golder 2021a). For purposes of this hydrogeological model, it was assumed that Lake B5 and Lake A8 West would be dewatered in advance of both underground and open-pit mining in these areas.

4.5 Model Boundary Conditions - Flow

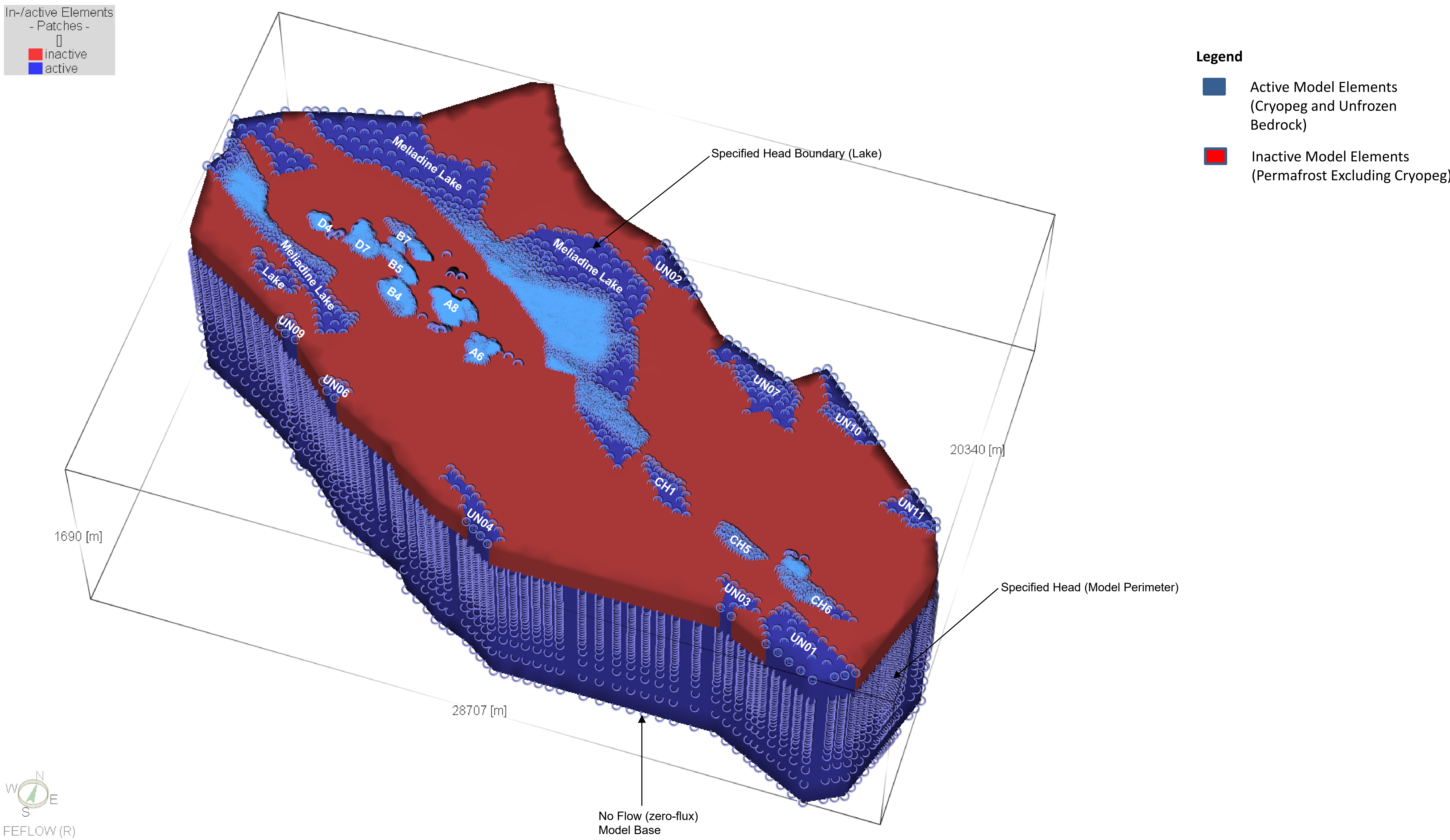
Model boundary conditions provide a link between the model domain and the surrounding hydrologic and hydrogeologic systems. Two types of flow boundary conditions were used in the model: specified head and no-flow (zero-flux) boundaries. The locations of these boundaries are shown in Figure 11 and are summarized below.

Specified head boundaries were assigned to Layer 1 of the model to represent all lakes assumed to have open taliks connected to the deep groundwater flow regime. Each of these boundaries was set to the lake elevation derived from site topographic data. It was conservatively assumed that the surface water/groundwater interaction at all lakes is not impeded by lower-permeability lakebed sediments that may exist on the bottom of some of these lakes. Specified head boundaries were also assigned beneath the permafrost along the perimeter of the model along inferred flow lines. Overall, model limits are set sufficient far enough from the mine developments to not influence model predicted inflow.

During operations, time-variable specified head boundaries were assigned to Layer 1 of the model to represent dewatering of Lake A8 West and Lake B5. Lake A8 West is located over the Wesmeg and Pump undergrounds and overlaps with open pits WES05 and PUM04. Lake B5 is located over the Wesmeg underground and overlaps with the NOR01 open pit. For one month of the year, it was assumed that dewatering would not keep up with freshet inflows and standing water would be present in the lakes; the remaining 11 months it assumed that the lake is fully dewatered and that any water reporting to the dewatered lake footprint would report as runoff to the open pit or dewatering system, which is not a predicted component of the groundwater flow model.

Mine workings in unfrozen bedrock (open pits and undergrounds) were simulated in the model using time-variable specific head boundaries. At each mesh node within the perimeter of the open pit and/or along the underground development, a specified head boundary was assigned and the head value at this boundary was varied over time to represent progressive expansion of the mine development according to the mine schedule described in Section 21. In addition, all boundaries representing mine workings during mining were constrained to allow only outflow from surrounding sediments/bedrock into the mine (i.e., these boundaries act as seepage faces).

A no-flow boundary also applied along the bottom of the model at a depth of 1.7 km below ground surface (-1,635 masl). Flow at greater depth is expected to be negligible in comparison to lateral inflow above this elevation, and therefore is expected to have negligible impact on model predictions. No-flow boundaries were also assigned along the edges of the permafrost as the permafrost is essentially impermeable. Mesh elements representing permafrost (excluding the cryopeg) were deactivated in all model simulations (Figure 8).



5x Vertical Exaggeration

CLIENT	AGNICO EAGLE	PROJECT	AGNICO EAGLE MINES LIMITED MELIADINE EXTENSION NUNAVUT
CONSULTANT	GOLDER MEMBER OF WSP	TITLE	**MODEL BOUNDARY CONDITIONS FOR GROUNDWATER FLOW**
YYYY-MM-DD	2021-11-04		
PREPARED	HG		
DESIGNED	HG		
REVIEWED	JL		
APPROVED	DC		

PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	1	11

Initial groundwater flow conditions in the model were established by running the model in steady state with no active mine developments. This simulation represents the pre-mining flow regime described in the Summary of Hydrogeology Existing Conditions (Golder 2021c), where the groundwater flow pattern is controlled by the water elevations of the large lakes (Figure 2). The predicted groundwater flow contours from this simulation are presented on the conceptual flow model shown on Figure 5 and is consistent with the interpreted flow pattern interpreted from Lake Elevations associated with open taliks (Figure 2).

4.6 Model Boundary Conditions – Transport

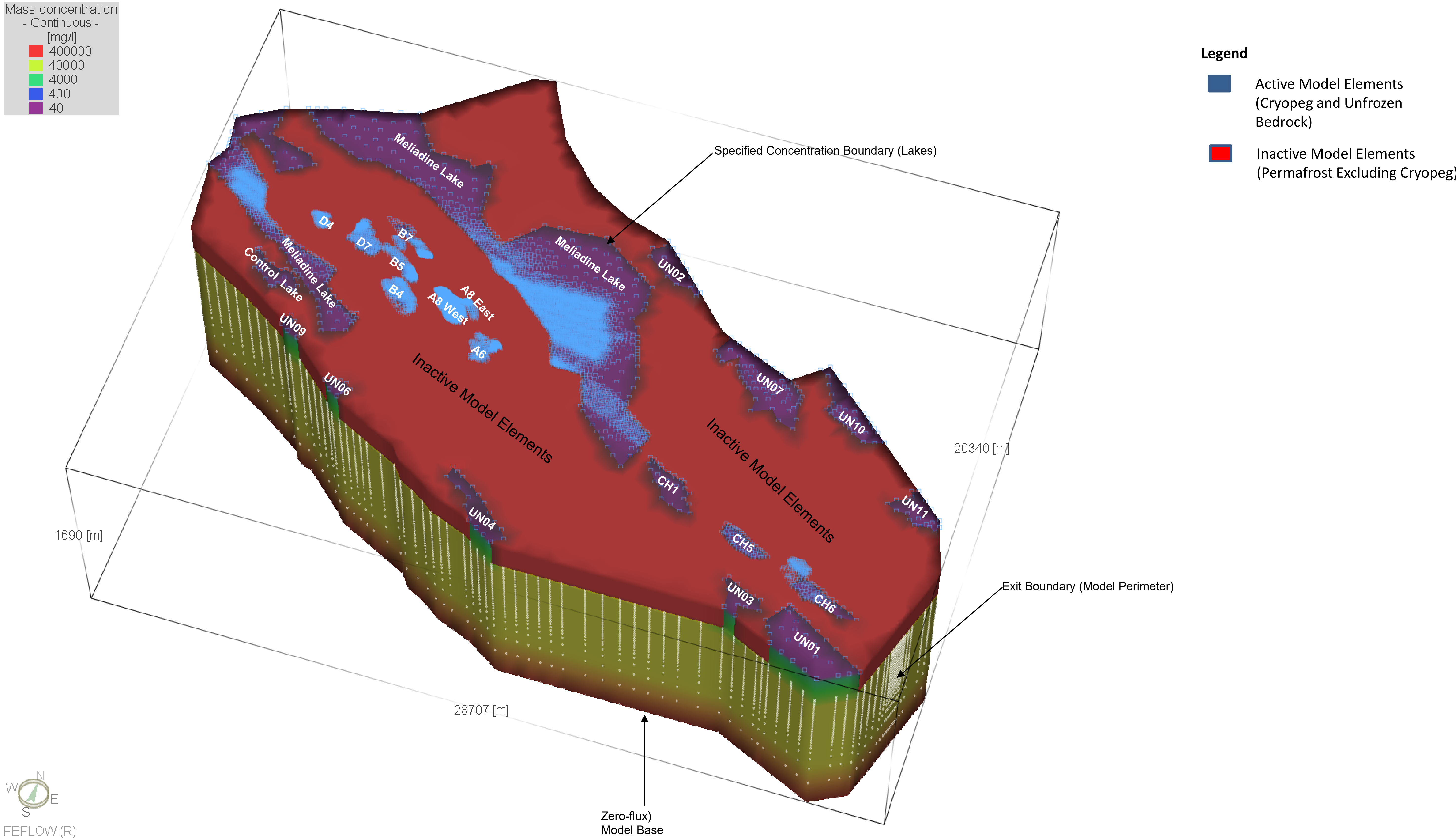
Initial TDS concentrations in each model layer were assigned based on the assumed concentrations of TDS versus depth shown on Figure 1.

Three types of boundary conditions were used to simulate transport of TDS in groundwater: specified concentration boundaries, zero flux boundaries, and exit (Cauchy type) boundaries. The location of these boundaries is shown Figure 12.

Specified concentration boundaries of zero milligrams per litre (mg/L) (freshwater) were assigned along the bottom of all lakes assumed to have open taliks in connection with the deep groundwater flow regime. TDS predictions in the model do not account for changes in the TDS concentrations in these lakes; TDS from these sources will be accounted for the in the Site Wide Water Quality Analysis. The numerical hydrogeologic model provides estimates of the groundwater flow from lakes over time to a specified underground or open pit for this purpose.

Zero flux boundaries were assigned along the model bottom, which corresponds to the no flow boundaries described in Section 4.5.

Exit (Cauchy type) boundaries were assigned to the nodes representing the pit walls and underground developments. These boundaries simulated the movement of TDS mass out of the surrounding groundwater system and into the mine workings. Exit boundaries were also assigned to specified head boundaries along the perimeter of the model, allowing groundwater to enter or exit the model domain according to the predicted groundwater quality in the area of the specified head boundary.



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MEMBER OF WSP

YYYY-MM-DD	2021-11-04
PREPARED	HG
DESIGNED	HG
REVIEWED	JL
APPROVED	DC

PROJECT
AGNICO EAGLE MINES LIMITED
MELIADINE EXTENSION
NUNAVUT

TITLE
MODEL BOUNDARY CONDITIONS FOR TRANSPORT

PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	1	12

5.0 MODEL CALIBRATION

The calibration process involves refining the numerical model parameters to achieve the desired degree of correspondence between the model simulation results and the observations of the groundwater flow system, while reasonably representing the conceptual groundwater model. It consists of adjustments to hydraulic parameters within a reasonable range of values. If the hydraulic property adjustment fails to provide adequate calibration results, the conceptual model may be reviewed and refined, and the iterative adjustments of model parameters repeated.

The following sub-sections presents the calibration approach, targets and results of calibration. As documented in these sub-sections, a reasonable calibration is achieved to measured inflow and hydraulic heads, increasing model prediction confidence for predictions of groundwater inflow.

5.1 Calibration Approach

Due to the size of the model mesh and complexity of hydrostratigraphic units and boundary conditions, an automatic parameter estimation method was not appropriate for the model calibration, and calibration was carried out manually using professional judgement and observation to guide the trial-and-error changes to successive iterations during model calibration.

During this calibration, the model was run repeatedly in transient model to simulate the development of the Tiriganiaq Underground between 2015 (first year where groundwater inflow was observed) and 2020 (the most recent full year of mining) available prior to initiating this modelling study, and the model parameters (hydraulic conductivity and specific storage) were iteratively adjusted until a reasonable agreement between predicted and observed hydraulic heads and groundwater inflow rates near the Tiriganiaq Underground were achieved. Model parameter adjustments were limited to values considered reasonable for a given hydrostratigraphic unit in consideration of the measured data.

For the transient run, it is not practical to simulate the continual daily expansion of the underground development. Instead, the model boundaries were set to reflect six development stages provided by Agnico Eagle for which calibration data is available. These stages included:

- Q4 2015
- June 2016
- June 2017
- November 2018
- January 2019
- April 2020

5.2 Calibration Targets

Three data sets were used to assess the overall quality of calibration, as follows:

- Changes in hydraulic head observed in response to mining between 2015 and 2020 at piezometers installed from the Tiriganiaq Underground.
- Changes in hydraulic head observed in response to the long-term recession test in the KMS Corridor at piezometers installed from the Tiriganiaq Underground.
- Estimated groundwater inflow to the Tiriganiaq Underground between 2015 and 2020 (Table 5).

Table 5: Measured Groundwater Inflows – Tiriganiaq Underground

Month and Year	Estimated Average Monthly Inflow (m^3/day)
Q4 2015	15
January 2017	35
October 2018	155
November 2018	175
December 2018	200
2019	160 to 470[a]
2020	190 to 295[a]

[a] Measured inflow in 2019 ranged from 160 to 470 m^3/day and in 2020 from 190 to 295 m^3/day. Peak monthly flows in 2019 and 2020 reflect periods where the boreholes were allowed to free drain into the underground as part of recession testing.

5.3 Calibration Results

5.3.1 Post-Calibration Hydraulic Parameters

As described in Section 5.1, hydraulic parameters (hydraulic conductivity, specific storage, and grouting properties) were adjusted from the initial values presented on Table 2 and Table 3 to achieve a suitable match between predicted and observed hydraulic heads and Tiriganiaq Underground inflows. Table 6 and Table 7 summarizes the final parameters for hydraulic conductivity and storage that provide the best fit to the measured data.

Table 6: Post-Calibration Hydraulic Properties - Competent Bedrock

Hydrostratigraphic Unit	Depth Interval (m)	Hydraulic Conductivity (m/s) [(a)]	Specific Storage (1/m)
Shallow Sedimentary Rock Formations	0 to 60	3×10^{-7}	1×10^{-6}
	60 to 120	3×10^{-8}	1×10^{-6}
Sedimentary Rock Formations(d)	120 to 1500	3×10^{-9}	1×10^{-6}
Shallow Mafic Volcanic Rock Formations	0 to 60	3×10^{-7}	1×10^{-7}
	60 to 120	3×10^{-8}	1×10^{-7}
Mafic Volcanic Rock Formations(d)	120 to 1500	3×10^{-10}	1×10^{-7}

(a) Hydraulic conductivity within the unfrozen permafrost zone is assumed to be lower than in the deeper unfrozen rock. Linearly decreasing hydraulic conductivity with temperature is assumed within this zone with a full order of magnitude decrease assumed at the top of the basal cryopeg, and hydraulic conductivity equivalent to unfrozen rock at the bottom of the basal cryopeg.

Table 7: Post-Calibration Hydraulic Properties - Enhanced Permeability Zones

Hydrostratigraphic Unit	Primary Deposit Area	Depth Interval (m)[b]	Thickness (m)	Hydraulic Conductivity (m^2/s)[a]	Specific Storage (1/m)	Effective Porosity (-)
Lower Fault Zone (Outside of KMS Corridor)	Tiriganiaq	0 to 1000	20	2×10^{-7}	1×10^{-7}	0.001
Lower Fault Zone (in KMS Corridor)	Tiriganiaq	0 to 1000	5	4×10^{-7}	1×10^{-7}	0.001
RM-175	Tiriganiaq	0 to 1000	5	5×10^{-8}	1×10^{-7}	0.001
KMS Fault Corridor	Tiriganiaq	0 to 1000	100 (variable)	4×10^{-7}	1×10^{-7}	0.001
North Fault	Tiriganiaq	0 to 1000	5	1×10^{-6}	1×10^{-7}	0.001
A	Wesmeg	0 to 1000	6	1×10^{-6}	1×10^{-7}	0.001
B	Wesmeg	0 to 1000	5	1×10^{-6}	1×10^{-7}	0.001
C	Wesmeg	0 to 1000	3	2×10^{-6}	1×10^{-7}	0.001
D	Wesmeg	0 to 1000	5	1×10^{-6}	1×10^{-7}	0.001
Pyke Fault	Pump	0 to 1000	15	4×10^{-7}	1×10^{-7}	0.001
AP0	Pump	0 to 1000	3	2×10^{-6}	1×10^{-7}	0.001
ENE2	Pump	0 to 1000	5	1×10^{-6}	1×10^{-7}	0.001
ENE3	Pump	0 to 1000	3	2×10^{-6}	1×10^{-7}	0.001
UM2	Pump	0 to 1000	6	1×10^{-6}	1×10^{-7}	0.001
NW1	Pump	0 to 1000	5	1×10^{-6}	1×10^{-7}	0.001
WNW1	F Zone	0 to 1000	3	2×10^{-6}	1×10^{-7}	0.001
WNW2	F Zone	0 to 1000	3	2×10^{-6}	1×10^{-7}	0.001
UAU2	F Zone	0 to 1000	2	3×10^{-6}	1×10^{-7}	0.001
Fault 1	Discovery	0 to 1000	5	1×10^{-6}	1×10^{-7}	0.001
Fault 2	Discovery	0 to 1000	5	1×10^{-6}	1×10^{-7}	0.001
Fault 3	Discovery	0 to 1000	5	1×10^{-6}	1×10^{-7}	0.001

(a) Hydraulic conductivity within the unfrozen permafrost zone is assumed to be lower than in the deeper unfrozen rock. Linearly decreasing hydraulic conductivity with temperature is assumed within this zone with a full order of magnitude decrease assumed at the top of the basal cryopeg, and hydraulic conductivity equivalent to unfrozen rock at the bottom of the basal cryopeg.

(b) Where fault hydraulic conductivity is less than shallow rock, the fault was excluded from 0 to 60 m depth interval. Where fault hydraulic conductivity is greater than shallow rock, fault was be included within 0 to 60 m depth interval.

In general, the following changes were made to improve the match to mine inflow and hydraulic heads:

- The specific storage of the Mafic Volcanic Rock Formation and structures within the Mafic Rock Formation was lowered from 2 x 10^{-7} to 1 x 10^{-7} to improve the match between measured and predicted hydraulic heads in the long-term flow recession test in the KMS Corridor.

- Diffusivity values from the flow recession test (Golder 2021c) indicated the corridor has some compartmentalization and is likely composed of a series of faults and joins with competent rock in between. During calibration, various concepts were evaluated in collaboration with Agnico Eagle to define the limits of this corridor. At a minimum, the corridor was inferred to exist between the KMS Fault and Lower Fault. From calibration iterations and data review with Agnico Eagle, the corridor was ultimately inferred to extend beyond these two faults and was assumed to encompass identified zones of poor rock quality designation (RQD) with RQD less than 80. RQD areas were inferred from an RQD block model provided to Golder by Agnico Eagle for the area of Tiriganiaq near the Lower Fault and corridor. This approach resulted in the most reasonable match between measured and predicted hydraulic head responses during the flow recession tests.
- The bulk hydraulic conductivity has set based on packer testing results presented in the Existing Conditions Report (Golder 2021) and not changes were found to be required as part of calibration.
- The effective hydraulic conductivity of elements representative of grouted faults within 30 metres of the Tiriganiaq underground was reduced from 1×10^{-8} m/s to 1×10^{-9} m/s to improve the match between measured and predicted groundwater inflows. Higher effective hydraulic conductivities to these elements would have required lower assigned fault hydraulic conductivity values near Tiriganiaq, particularly in the area of the KMS Corridor; however, this was not supported by the flow recession test calibration. Conceptually this would represent a grouted fault hydraulic conductivity of approximately 1×10^{-8} m/s for a 5-m-wide fault with a transmissivity of 5×10^{-6} m/s. This number should not be relied upon as an achieved permeability through grouting, however, but rather a representation of the bulk resistance achieved in the underground from the grouting program. Actual grouting underground may extend into adjacent joints within the competent bedrock, which is not captured by the numerical model. It is possible that higher grouted hydraulic conductivity, with extension into these joints, would result in the same resistance simulated in this model.
- In consideration of the KMS corridor observed near Tiriganiaq, the thickness of the lower fault was increased to 15 to 20 m to the east and west of the KMS corridor to account for other potential other zones of poor RQD along the Lower Fault.

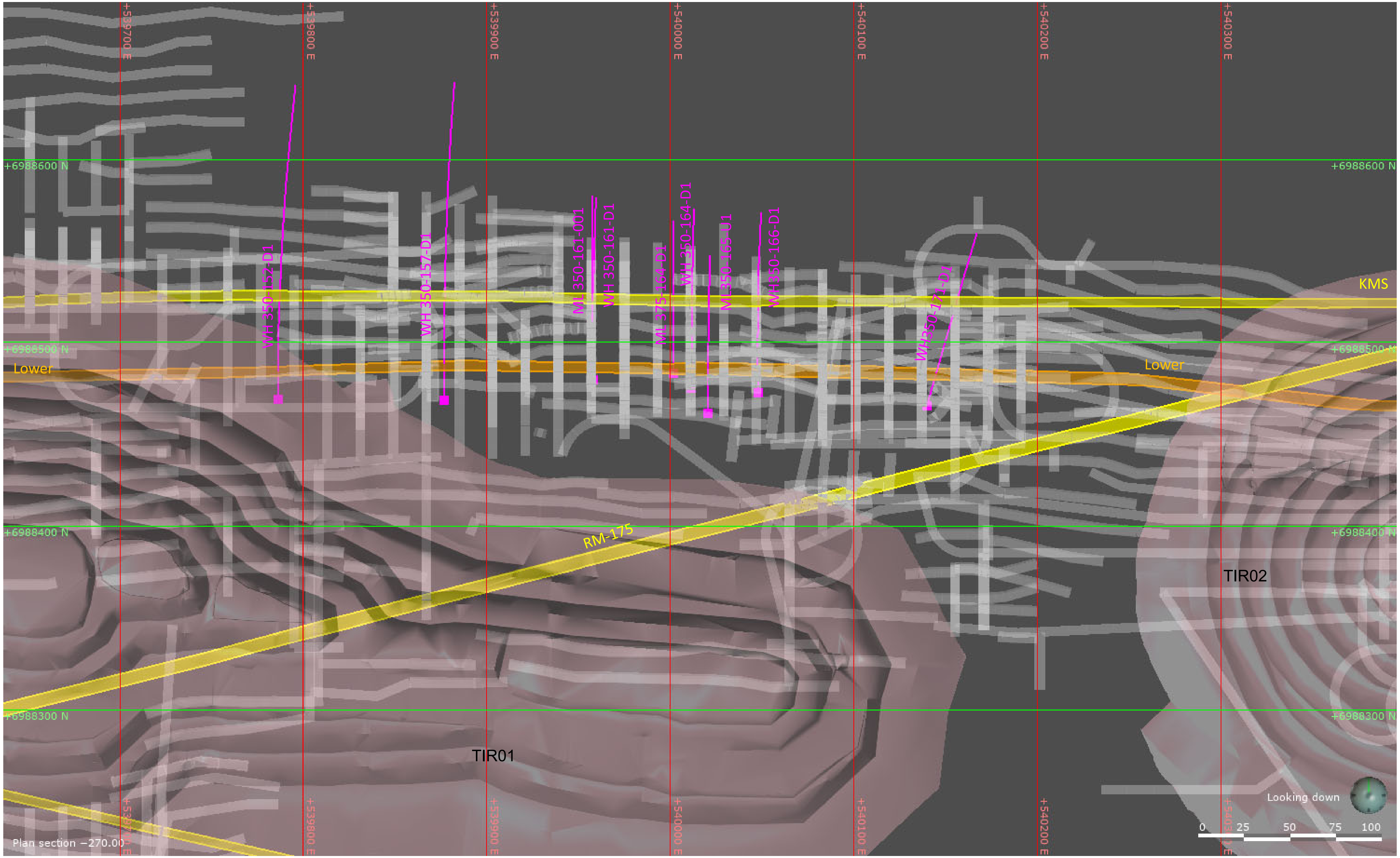
5.3.2 Measured versus Predicted Hydraulic Head

Figure 6 and Figure 13 show the locations of boreholes with vibrating wire sensors to monitor hydraulic heads. A summary of pressure monitoring data used in the calibration process is presented on Figure 7.

5.3.2.1 Flow Recession Test

Figure 6 and Figure 13 show the locations of boreholes with vibrating wire sensors to monitor hydraulic heads. Figure 15 to Figure 17 presents a summary of the measured versus predicted hydraulic head during the flow recession test in 2020. During this test, a ‘pumping well’ was allowed to flow from an open borehole for approximately 72 hrs and the change in head recorded at piezometers installed nearby. The flowing borehole was simulated in FEFLOW using discrete features elements to represent the borehole, with a specified flux boundary assigned to the collar equal to the observed flow rate.

During the test, minimal response to testing was observed in piezometer sensors at PZ-RF-200-01 and PZ-ES225-02 within the Volcanic Rock Formations, which is consistent with model predictions. For the other piezometers, responses were observed that were also reasonably reproduced by the model predictions (Figure 16 and Figure 17) indicating a good fit to the observed data. Where a response was observed, the magnitude of the response varied from less than 10 m to just under 30 m. As discussed in the existing conditions report (Golder 2021c) the responses were variable, even for sensors equidistance to the pumping well, suggesting some compartmentalization within the corridor. Given that this compartmentalization can not be accurately defined nor practically simulated in a model of this scale, the objective of the calibration was to match the general trend of data, which would indicate the model can predict the influence of this corridor on groundwater flow to the underground. This objective is considered to have been achieved.

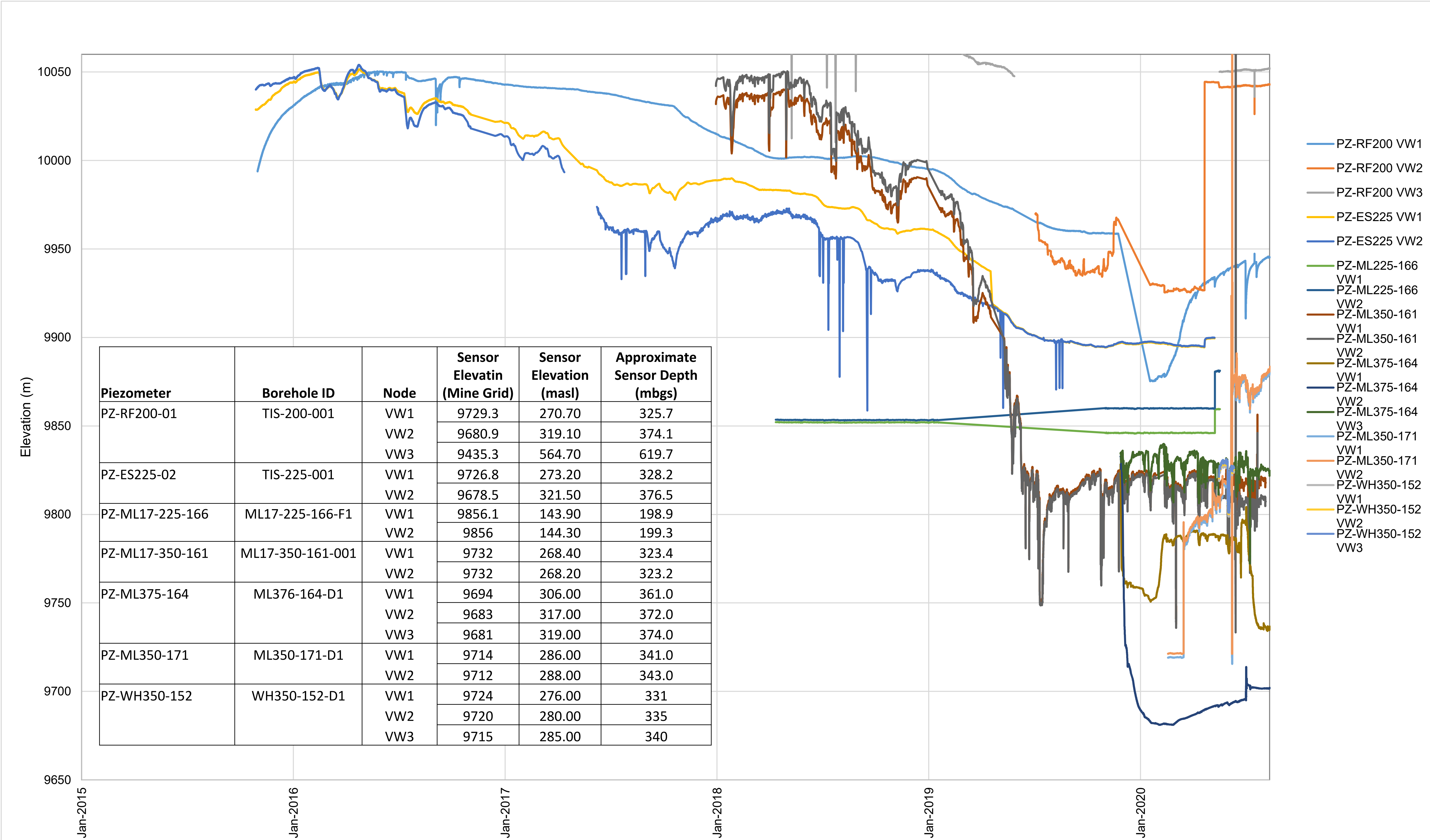


LEGEND

- Regional Fault
- Supplemental Faults Based on 2020 Agnico Eagle Review
- Borehole Collar / Borehole Trace

Fault traces are shown for an elevation of -270 masl.

CLIENT: AGNICO EAGLE		PROJECT: AGNICO EAGLE MINES LIMITED MELIADINE EXTENSION NUNAVUT	
CONSULTANT: GOLDER MEMBER OF WSP	YYYY-MM-DD: 2021-11-04	TITLE: BOREHOLE LOCATIONS FOR HYDRAULIC TESTING AND GROUNDWATER SAMPLING – KMS CORRIDOR	
	PREPARED: HG		
	DESIGNED: HG		
	REVIEWED: JL	PROJECT NO.: 20136436	PHASE: 2300
	APPROVED: DC	REV.: 1	FIGURE: 13



Piezometer	Borehole ID	Node	Sensor Elevatin (Mine Grid)	Sensor Elevation (masl)	Approximate Sensor Depth (mbgs)
PZ-RF200-01	TIS-200-001	VW1	9729.3	270.70	325.7
		VW2	9680.9	319.10	374.1
		VW3	9435.3	564.70	619.7
PZ-ES225-02	TIS-225-001	VW1	9726.8	273.20	328.2
		VW2	9678.5	321.50	376.5
PZ-ML17-225-166	ML17-225-166-F1	VW1	9856.1	143.90	198.9
		VW2	9856	144.30	199.3
PZ-ML17-350-161	ML17-350-161-001	VW1	9732	268.40	323.4
		VW2	9732	268.20	323.2
PZ-ML375-164	ML376-164-D1	VW1	9694	306.00	361.0
		VW2	9683	317.00	372.0
		VW3	9681	319.00	374.0
PZ-ML350-171	ML350-171-D1	VW1	9714	286.00	341.0
		VW2	9712	288.00	343.0
PZ-WH350-152	WH350-152-D1	VW1	9724	276.00	331
		VW2	9720	280.00	335
		VW3	9715	285.00	340

CLIENT
AGNICO EAGLE

CONSULTANT
GOLDER
MEMBER OF WSP

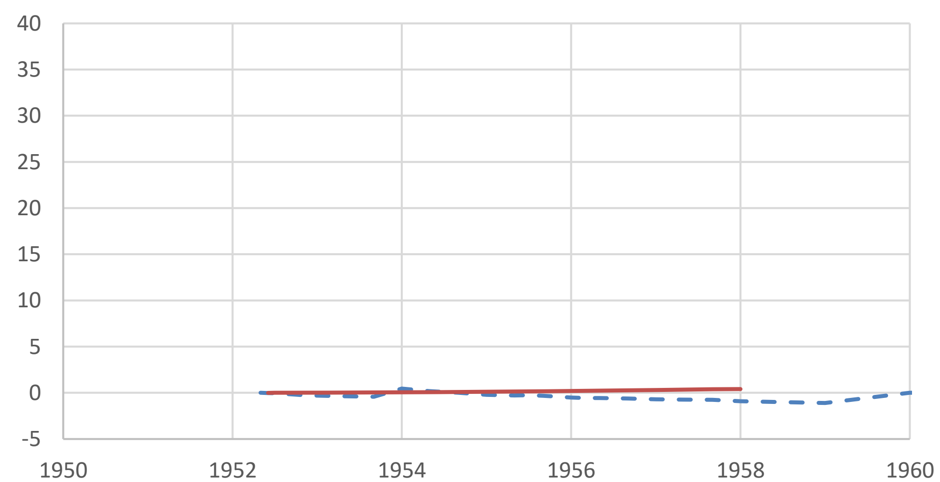
YYYY-MM-DD	2021-11-04
PREPARED	HG
DESIGNED	HG
REVIEWED	JL
APPROVED	DC

PROJECT
AGNICO EAGLE MINES LIMITED
MELIADINE EXTENSION
NUNAVUT

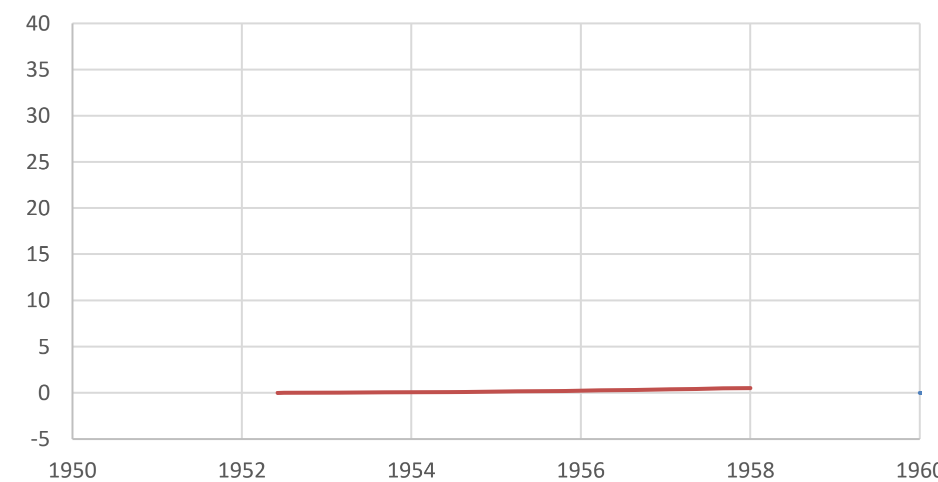
TITLE
PRESSURE MONITORING DATA – TIRIGANIAQ UNDERGROUND

PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	1	14

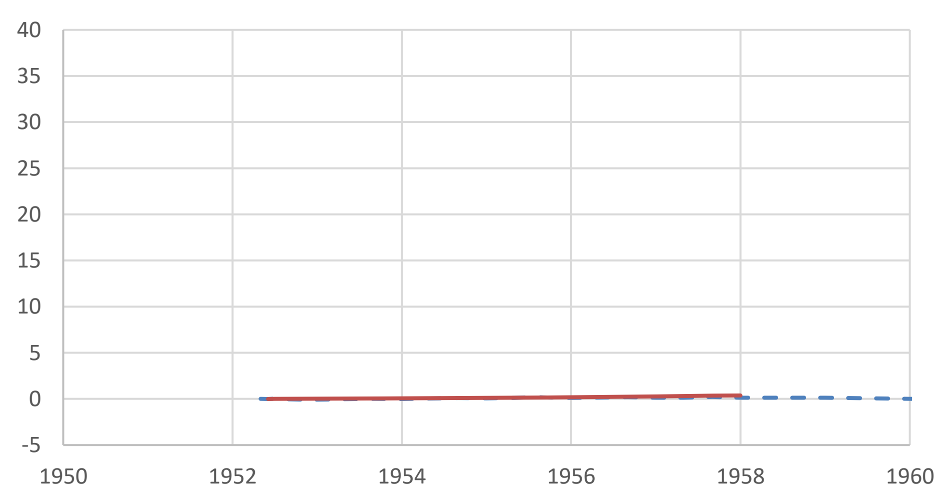
PZ-RF200-01-VW1



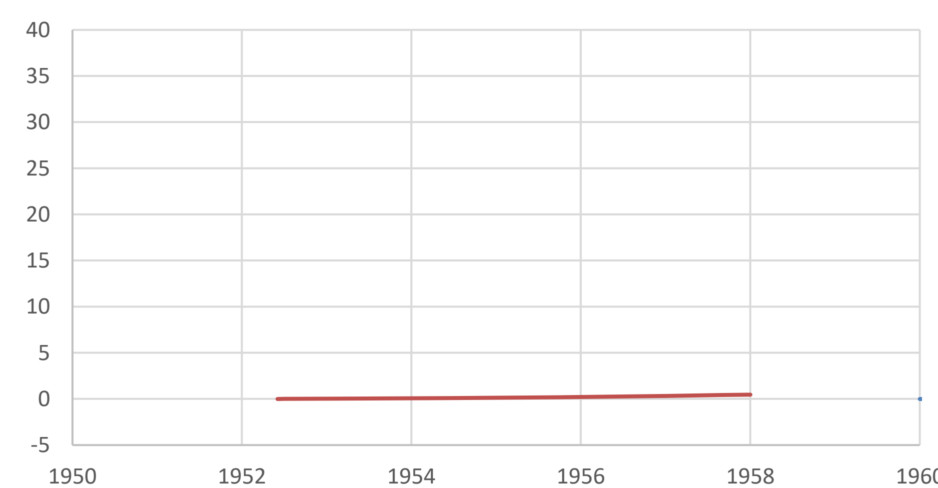
PZ-ES225-02-VW1



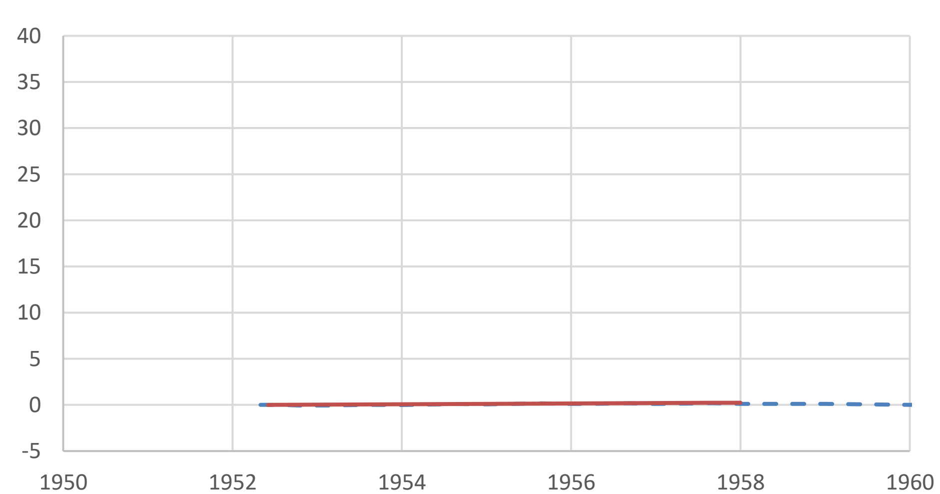
PZ-RF200-01-VW2



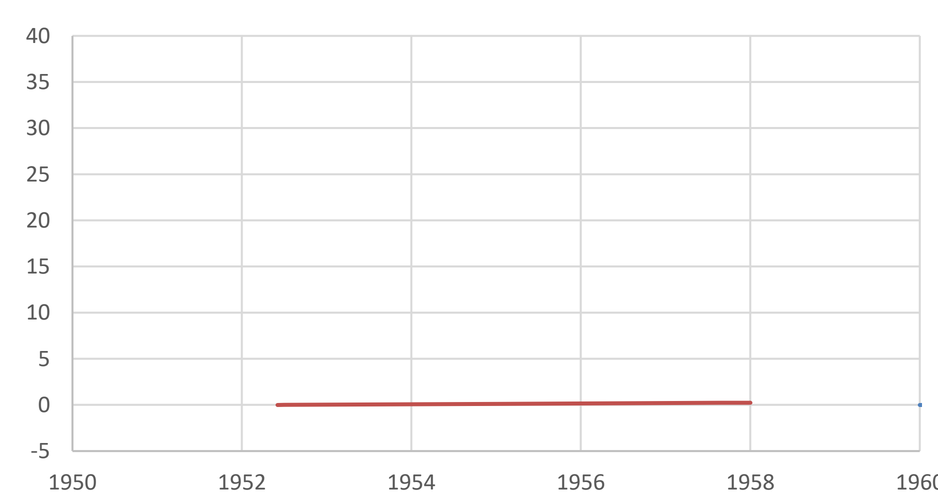
PZ-ES225-02-VW2



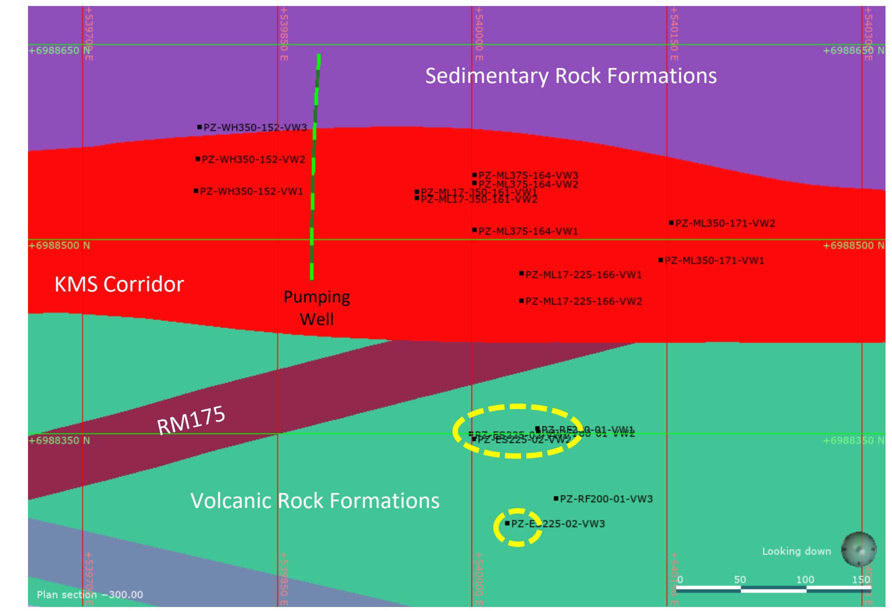
PZ-RF200-01-VW3



PZ-ES225-02-VW3



Conceptual Hydrostratigraphy (-300 mals)



Legend

- - - - Observed

—— Predicted

Notes:
X-axis on plots are model simulation time in days. Day zero corresponds to the start of Year 2015.
Y-axis on plots are predicted / measured changed in hydraulic head (masl).

Piezometer	Borehole ID	Node	Sensor Elevatin (Mine Grid)	Sensor Elevation (masl)	Approximate Sensor Depth (mbgs)
PZ-RF200-01	TIS-200-001	VW1	9729.3	270.70	325.7
		VW2	9680.9	319.10	374.1
		VW3	9435.3	564.70	619.7
PZ-ES225-02	TIS-225-001	VW1	9726.8	273.20	328.2
		VW2	9678.5	321.50	376.5

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AGNICO EAGLE

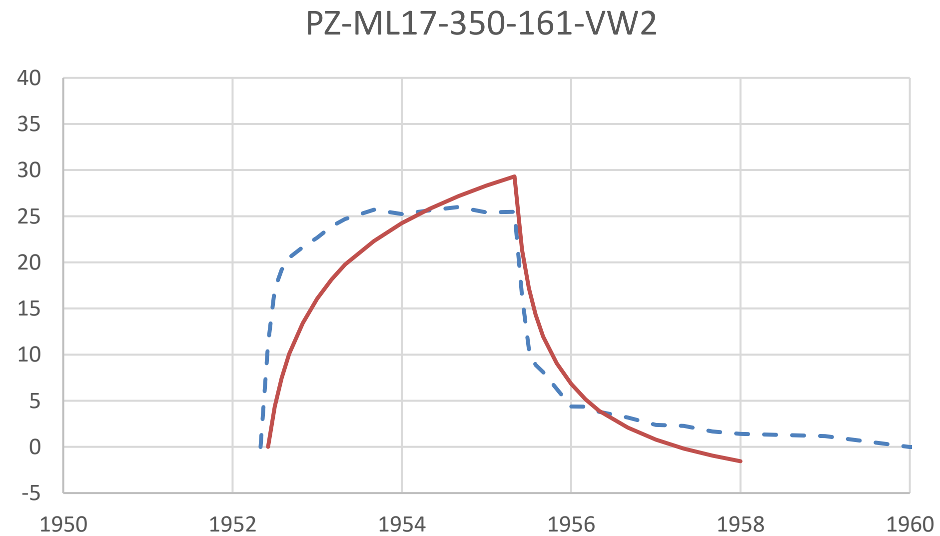
CONSULTANT
GOLDER
MEMBER OF WSP

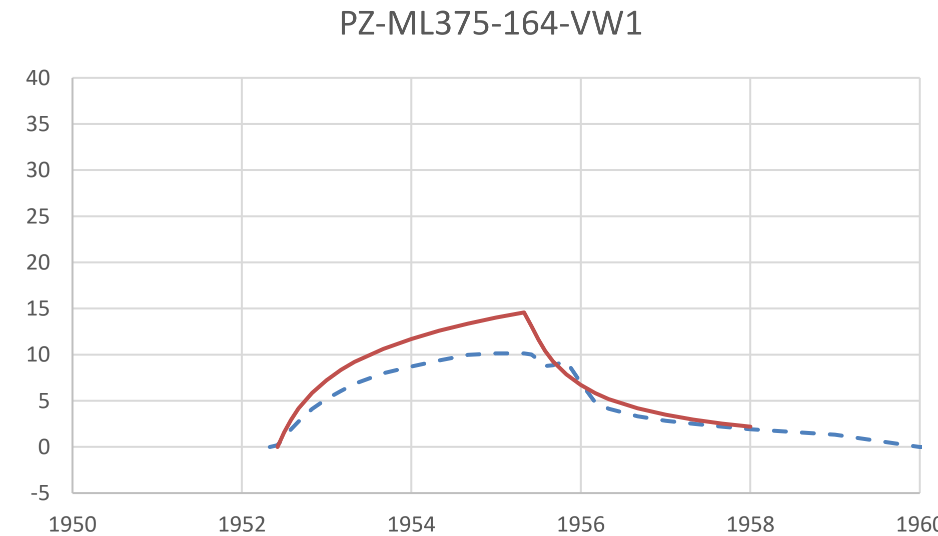
YYYY-MM-DD	2021-11-04
PREPARED	HG
DESIGNED	HG
REVIEWED	JL
APPROVED	DC

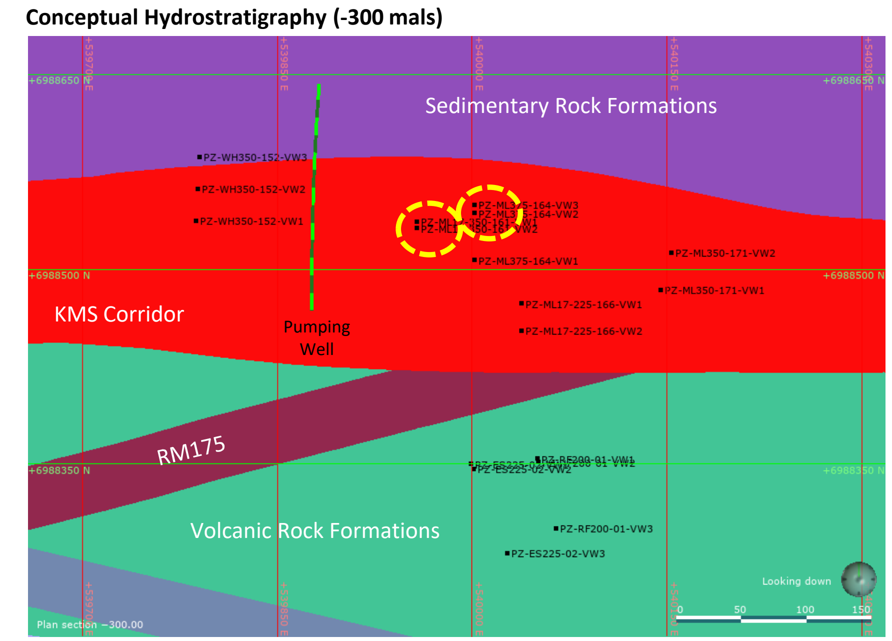
PROJECT
AGNICO EAGLE MINES LIMITED
MELIADINE EXTENSION
NUNAVUT

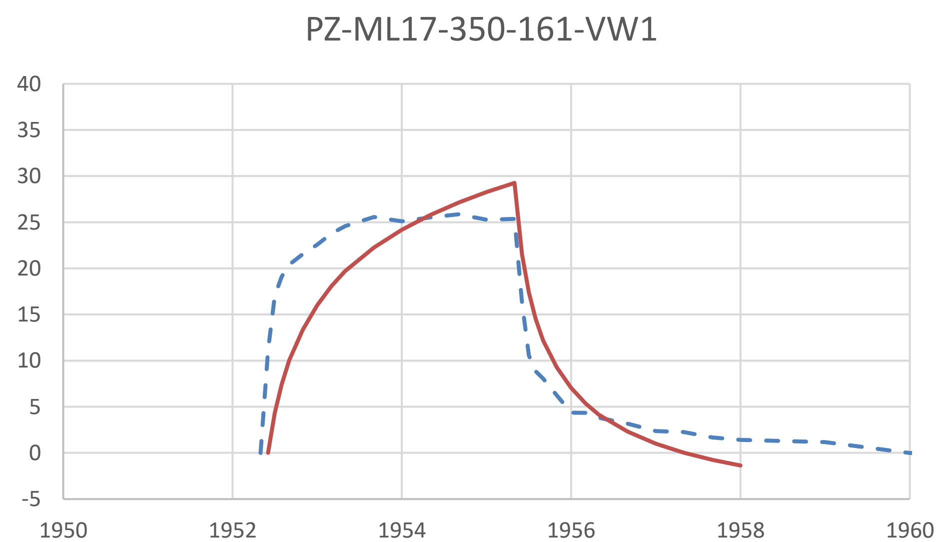
TITLE
RECESSION TEST CALIBRATION RESULTS
PZ-RF200-01 AND PZ-ES225-02

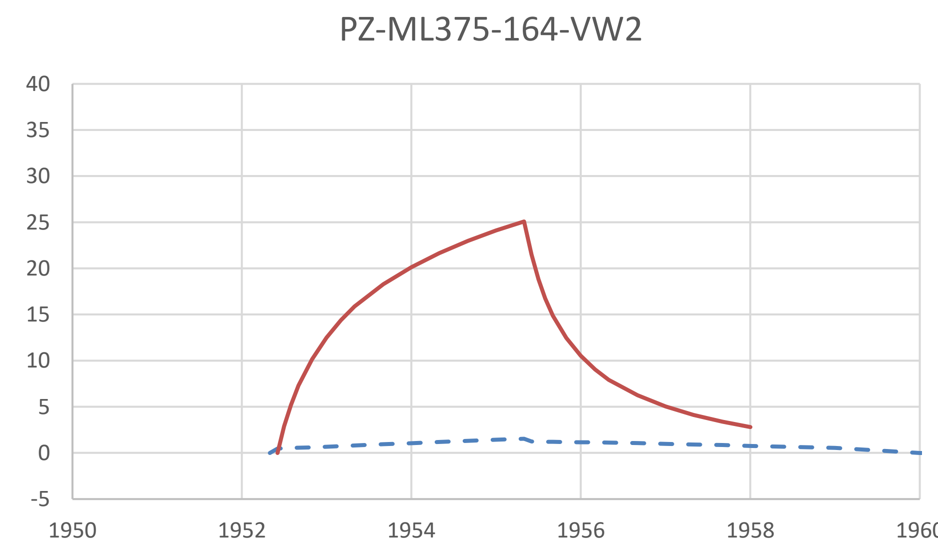
PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	1	15

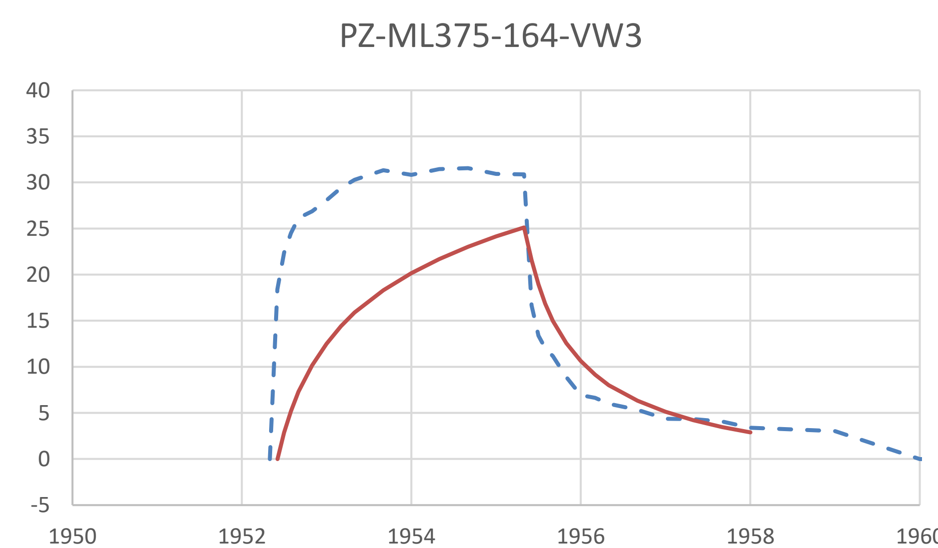












Legend

- - - - Observed

—— Predicted

Notes:
X-axis on plots are model simulation time in days. Day zero corresponds to the start of Year 2015.
Y-axis on plots are predicted / measured change in hydraulic head (masl).

Piezometer	Borehole ID	Node	Sensor Elevatin (Mine Grid)	Sensor Elevation (masl)	Approximate Sensor Depth (mbgs)
PZ-ML17-350-161	ML17-350-161-001	VW1	9732	268.40	323.4
		VW2	9732	268.20	323.2
PZ-ML375-164	ML376-164-D1	VW1	9694	306.00	361.0
		VW2	9683	317.00	372.0
		VW3	9681	319.00	374.0

CLIENT
AGNICO EAGLE

CONSULTANT
GOLDER
MEMBER OF WSP

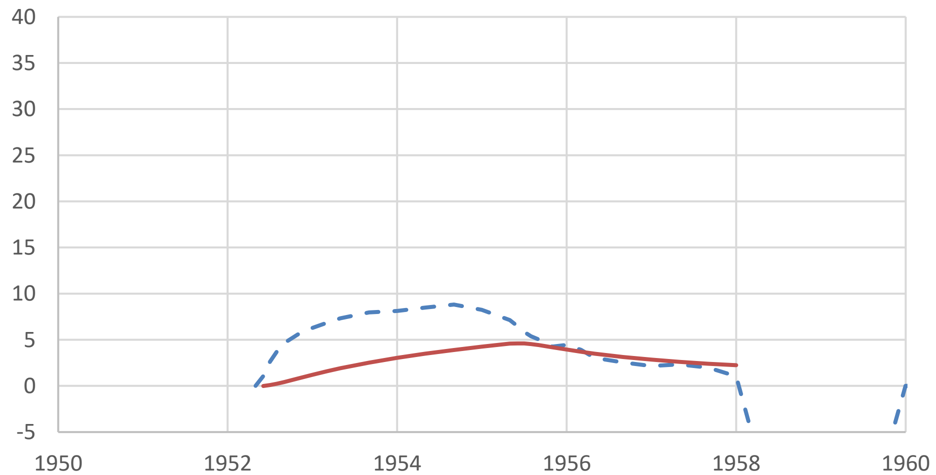
YYYY-MM-DD	2021-11-04
PREPARED	HG
DESIGNED	HG
REVIEWED	JL
APPROVED	DC

PROJECT
AGNICO EAGLE MINES LIMITED
MELIADINE EXTENSION
NUNAVUT

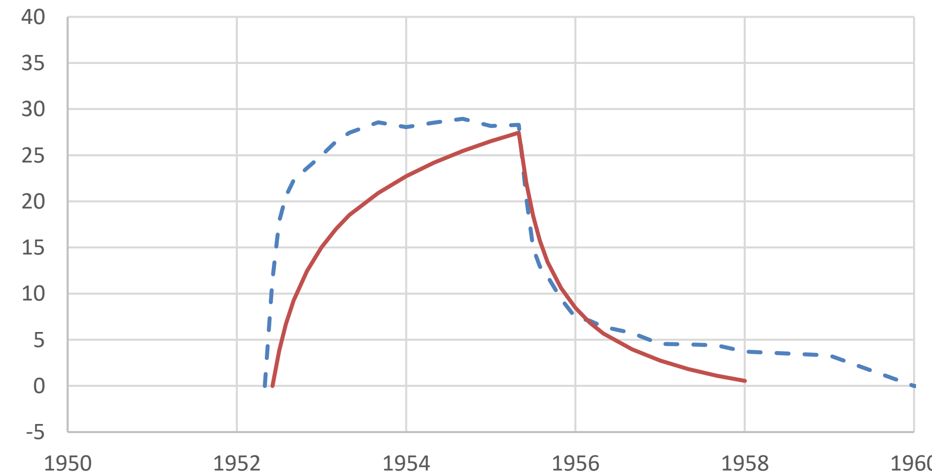
TITLE
RECESSION TEST CALIBRATION RESULTS PZ-ML177-350-161 AND PZ-ML375-164

PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	1	16

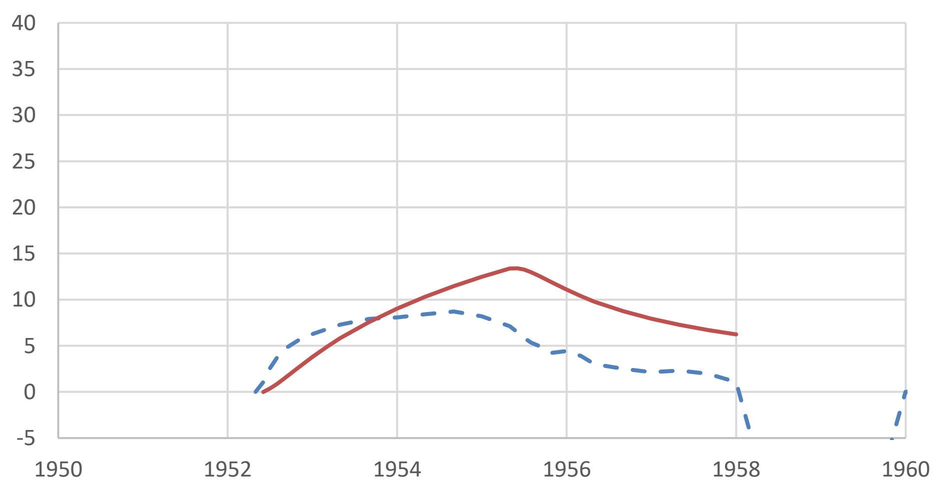
PZ-ML350-171-VW1



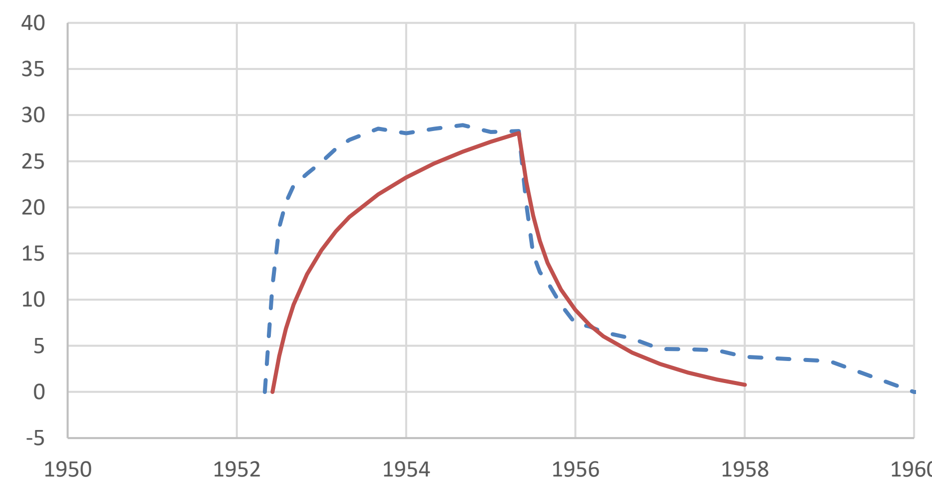
PZ-WH350-152-VW1



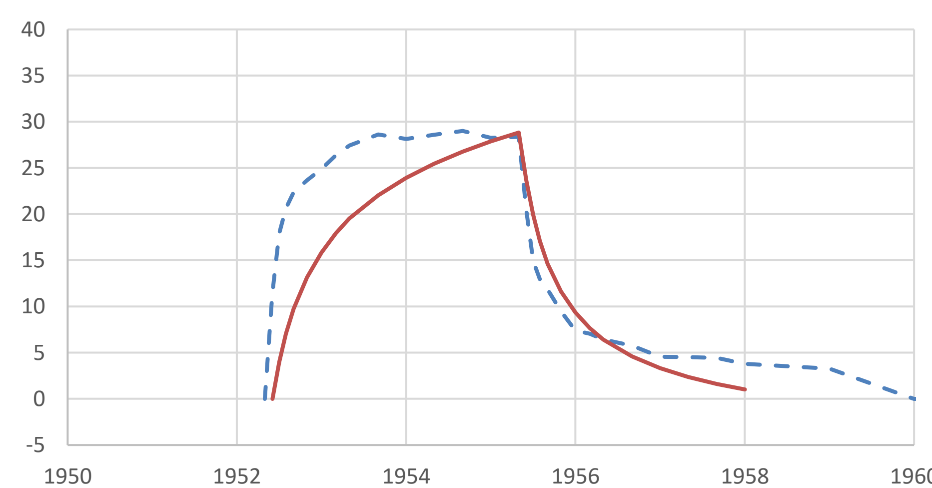
PZ-ML350-171-VW2



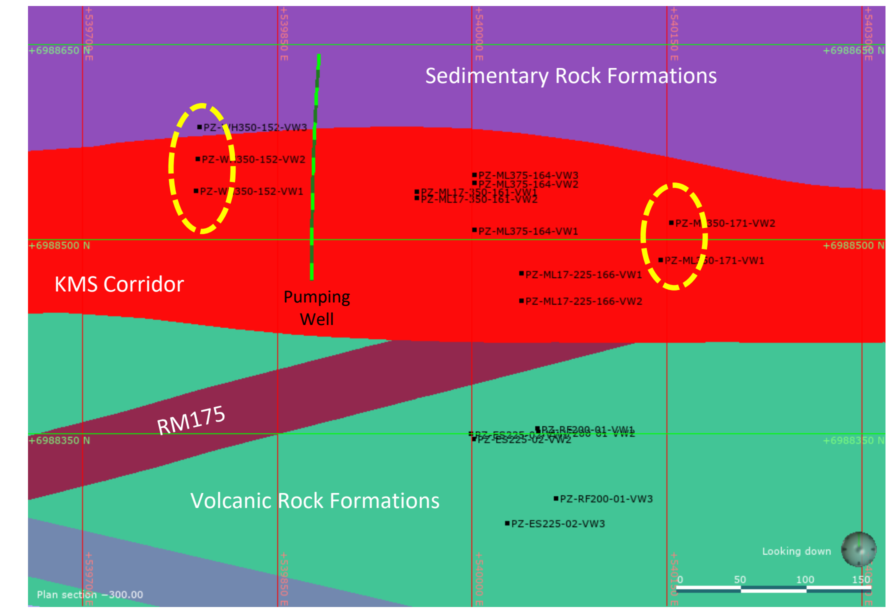
PZ-WH350-152-VW2



PZ-WH350-152-VW3



Conceptual Hydrostratigraphy (-300 mals)



Legend

Observed

Predicted

Notes:
X-axis on plots are model simulation time in days. Day zero corresponds to the start of Year 2015.
Y-axis on plots are predicted / measured change in hydraulic head (masl).

Piezometer	Borehole ID	Node	Sensor Elevatin (Mine Grid)	Sensor Elevation (masl)	Approximate Sensor Depth (mbgs)
PZ-ML350-171	ML350-171-D1	VW1	9714	286.00	341.0
		VW2	9712	288.00	343.0
PZ-WH350-152	WH350-152-D1	VW1	9724	276.00	331
		VW2	9720	280.00	335
		VW3	9715	285.00	340

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GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-11-04
PREPARED	HG
DESIGNED	HG
REVIEWED	JL
APPROVED	DC

PROJECT
AGNICO EAGLE MINES LIMITED
MELIADINE EXTENSION
NUNAVUT

TITLE
RECESSION TEST CALIBRATION RESULTS
PZ-ML350-171 AND PZ-WH350-152

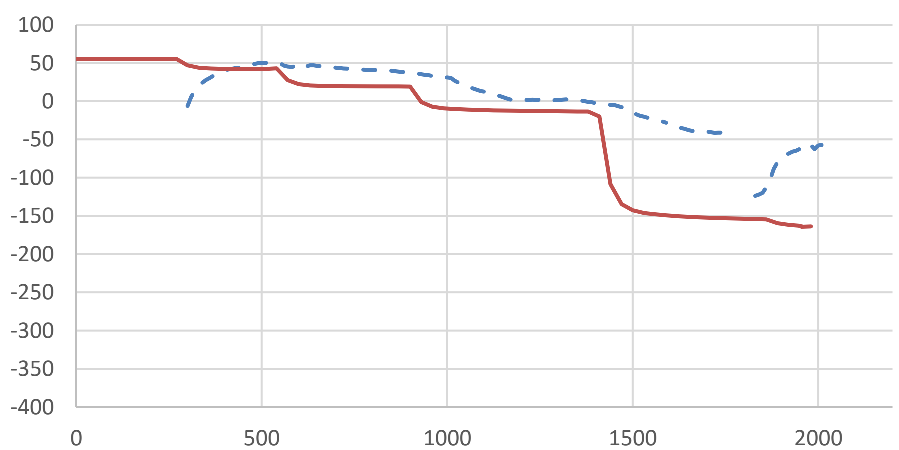
PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	1	17

5.3.2.2 Long-term Hydraulic Head Monitoring

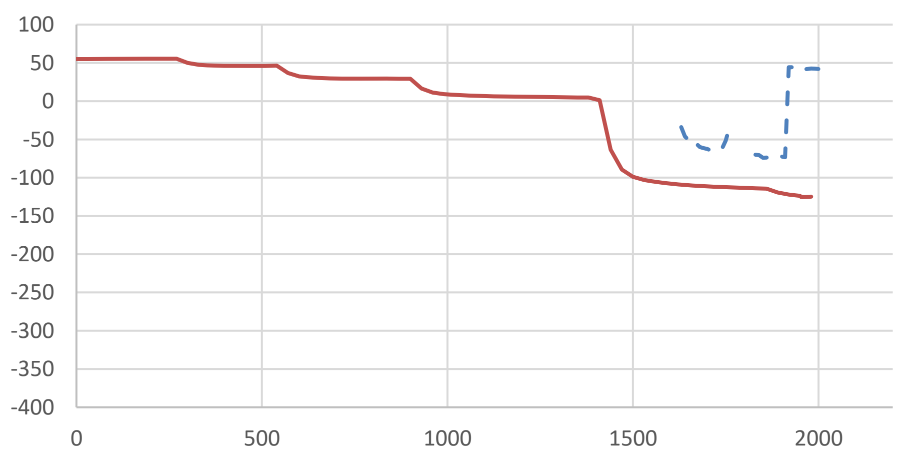
Figure 18 to Figure 20 presents the predicted versus observed hydraulic head in the piezometers installed near Tiriganiaq. The observed data in these figures has been smoothed to reflect the average trend of the data and to facilitate easier comparison to model predictions. The observed data is responsive to the actual progress of the Tiriganiaq Underground for the period of record available for the transducers. The longest data set is available for the PZ-RF200-01 and PZ-ES225, followed by PZ-ML-360-161, which was installed in the 2015 Underground Program (Golder 2016a). The remaining piezometers have shorter records, having been recently installed at the Tiriganiaq Underground in support of the 2020 flow recession testing.

The predicted data presented on Figure 18 Figure 18 to Figure 20 is representative of the progression of the underground through the six as-built development stages included in the transient calibration model. Despite this simplification of the mine plan, the trend of the predicted data reasonably matches the trend of the observed data, indicating a good calibration has been achieved. A precise fit was never considered reasonable to achieve given the simplifications of the mine plan, faults and representation of grouting in the model, however given the model reproduces the general trend of these data, the model is considered capable of reproducing groundwater flow conditions in the area of the underground for the objectives of the model.

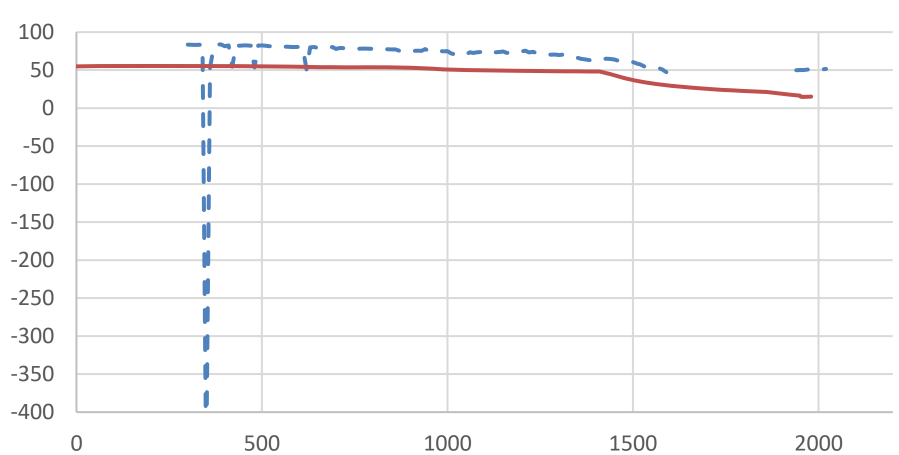
PZ-RF200-01-VW1



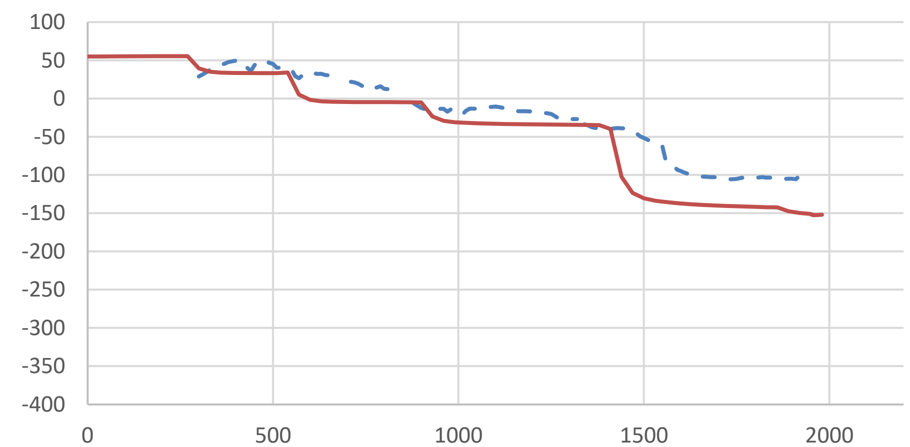
PZ-RF200-01-VW2



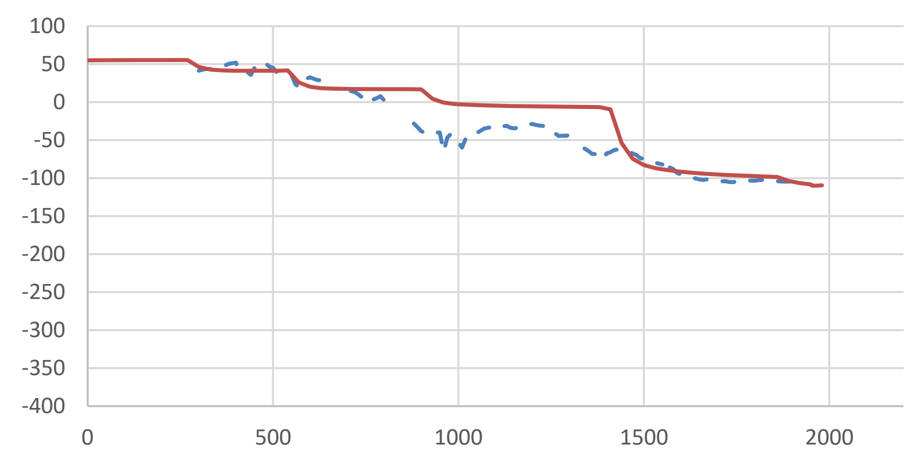
PZ-RF200-01-VW3



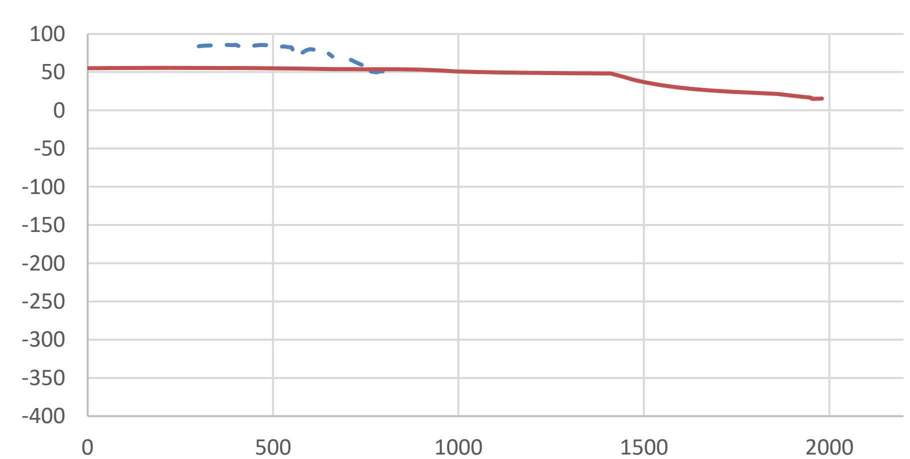
PZ-ES225-02-VW1



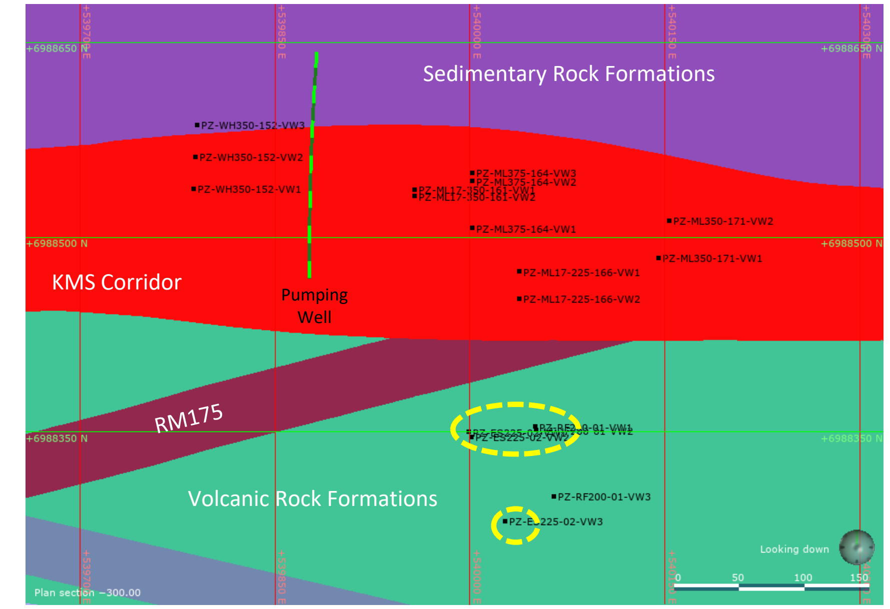
PZ-ES225-02-VW2



PZ-ES225-02-VW3



Conceptual Hydrostratigraphy (-300 mals)



Legend

- - - Observed

— Predicted

Notes:
X-axis on plots are model simulation time in days. Day zero corresponds to the start of Year 2015.
Y-axis on plots are predicted / measured hydraulic head (masl).

Piezometer	Borehole ID	Node	Sensor Elevatin (Mine Grid)	Sensor Elevation (masl)	Approximate Sensor Depth (mbgs)
PZ-RF200-01	TIS-200-001	VW1	9729.3	270.70	325.7
		VW2	9680.9	319.10	374.1
		VW3	9435.3	564.70	619.7
PZ-ES225-02	TIS-225-001	VW1	9726.8	273.20	328.2
		VW2	9678.5	321.50	376.5

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CONSULTANT
GOLDER
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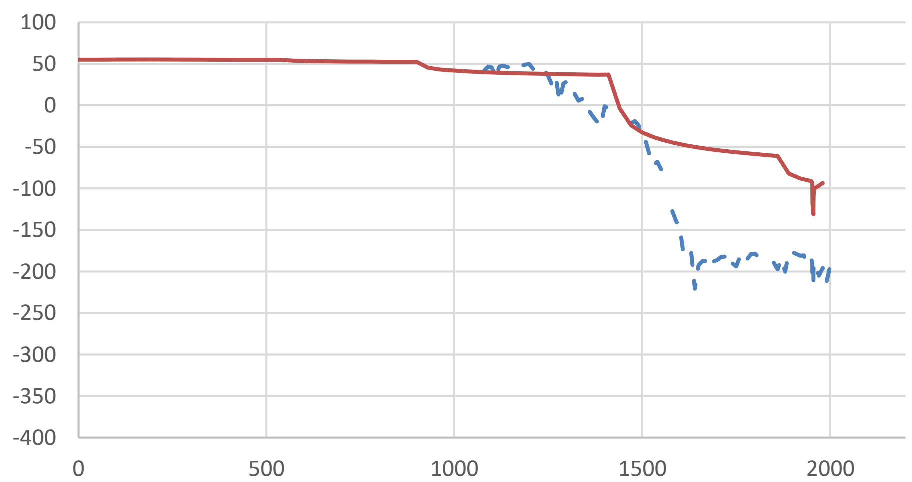
YYYY-MM-DD	2021-11-04
PREPARED	HG
DESIGNED	HG
REVIEWED	JL
APPROVED	DC

PROJECT
AGNICO EAGLE MINES LIMITED
MELIADINE EXTENSION
NUNAVUT

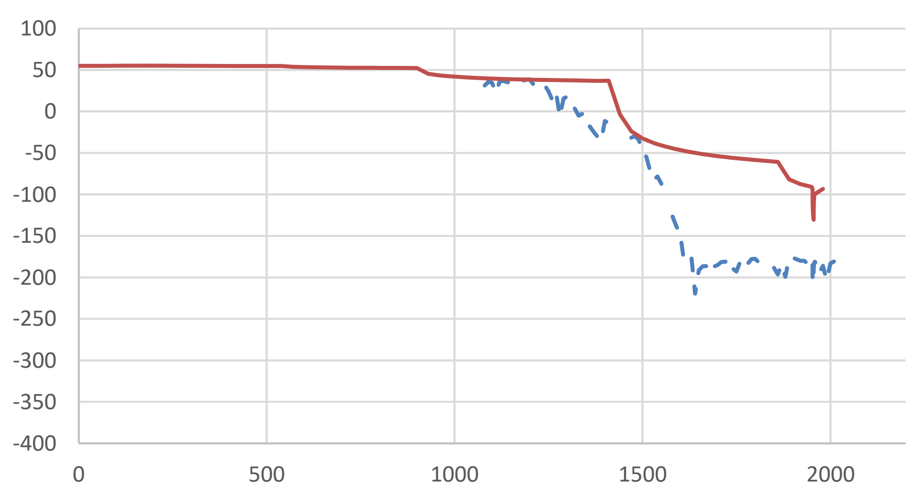
TITLE
HYDRAULIC HEAD MONITORING CALIBRATION RESULTS - PZ-RF200-01 AND PZ-ES225-02

PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	1	18

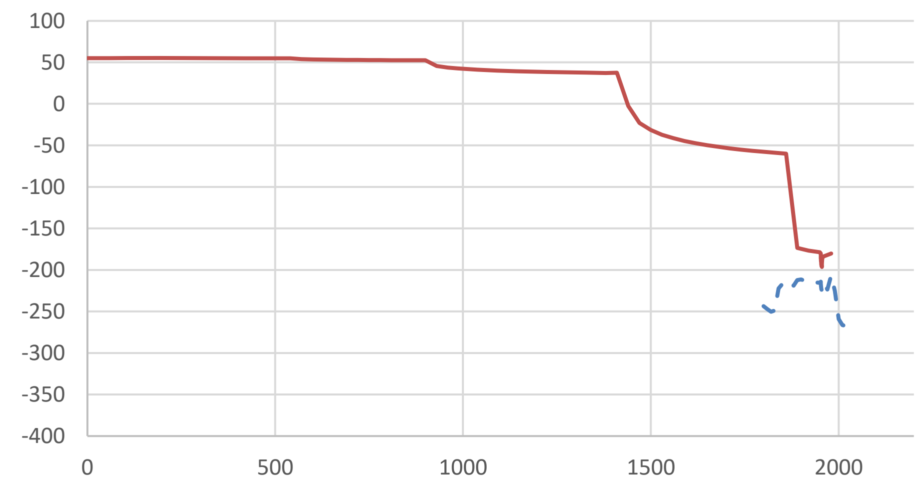
PZ-ML17-350-161-VW2



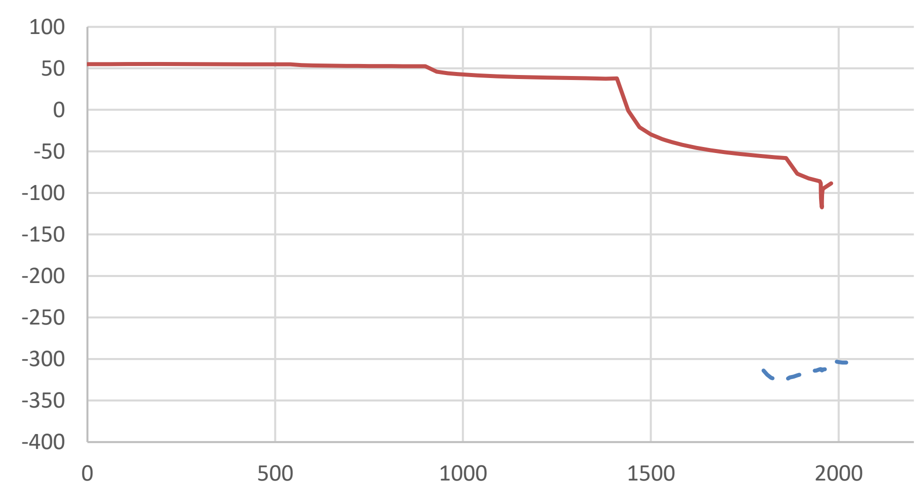
PZ-ML17-350-161-VW1



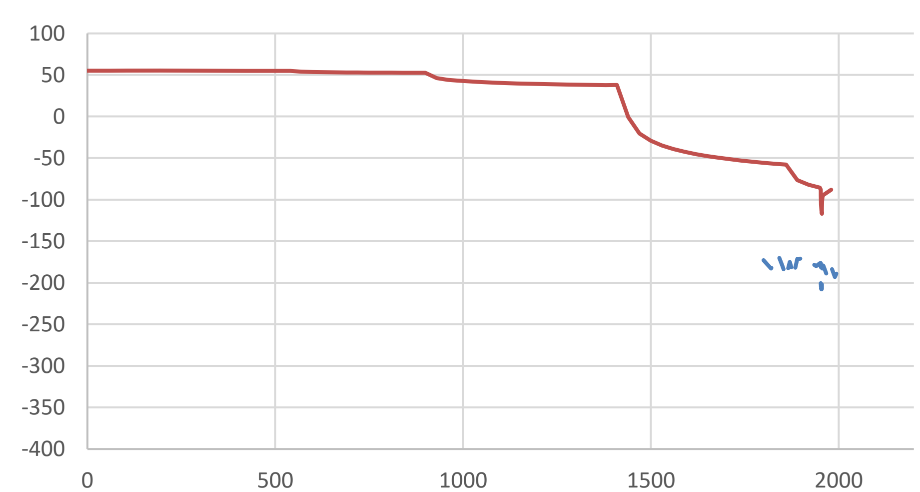
PZ-ML375-164-VW1



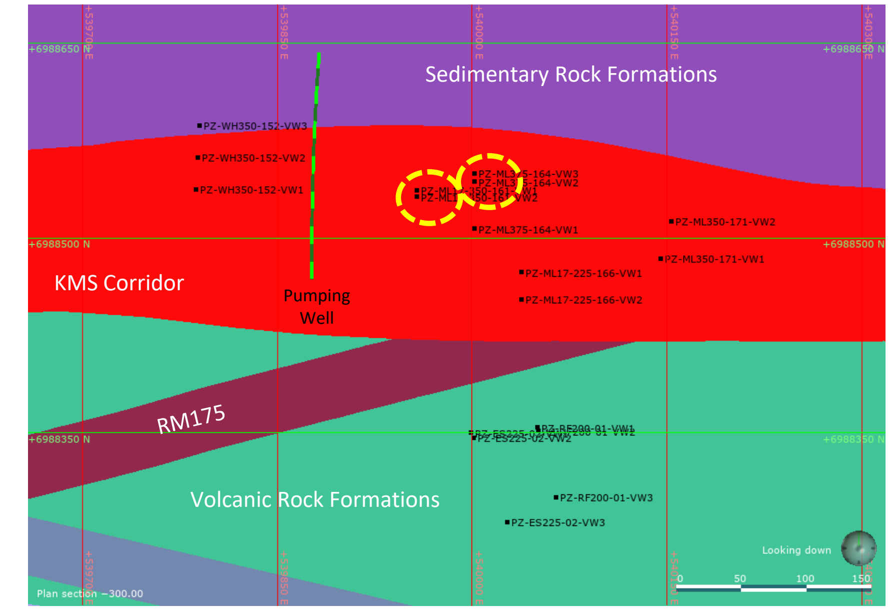
PZ-ML375-164-VW2



PZ-ML375-164-VW3



Conceptual Hydrostratigraphy (-300 mals)



Legend

- - - Observed

— Predicted

Notes:
X-axis on plots are model simulation time in days. Day zero corresponds to the start of Year 2015.
Y-axis on plots are predicted / measured hydraulic head (masl).

Piezometer	Borehole ID	Node	Sensor Elevatin (Mine Grid)	Sensor Elevation (masl)	Approximate Sensor Depth (mbgs)
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		VW3	9681	319.00	374.0

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CONSULTANT
GOLDER
MEMBER OF WSP

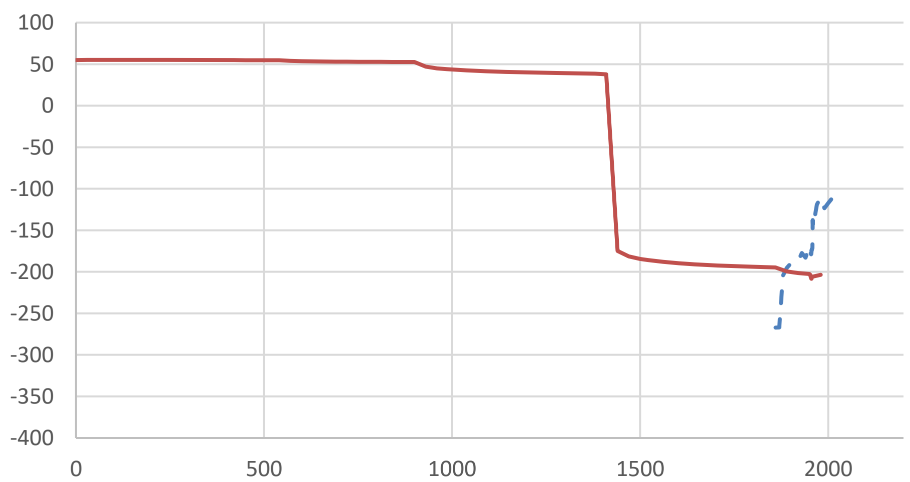
YYYY-MM-DD	2021-11-04
PREPARED	HG
DESIGNED	HG
REVIEWED	JL
APPROVED	DC

PROJECT
AGNICO EAGLE MINES LIMITED
MELIADINE EXTENSION
NUNAVUT

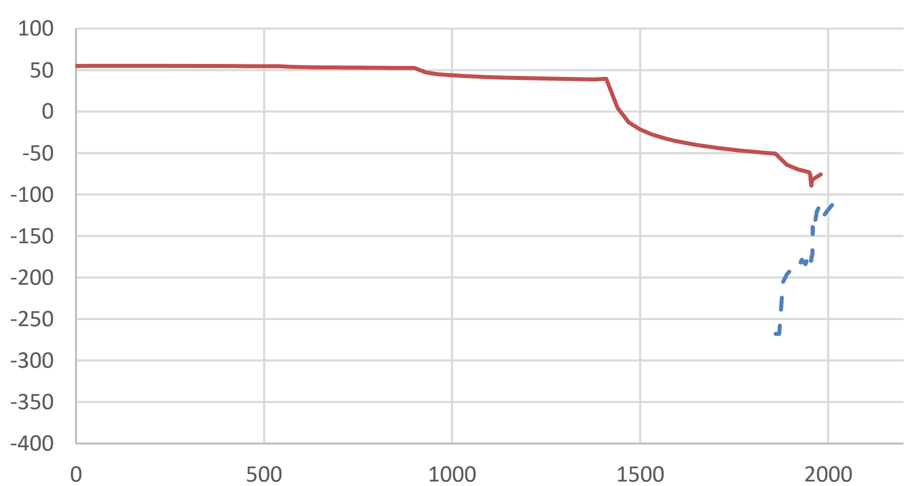
TITLE
HYDRAULIC HEAD MONITORING CALIBRATION RESULTS - PZ-ML177-350-161 AND PZ-ML375-164

PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	1	19

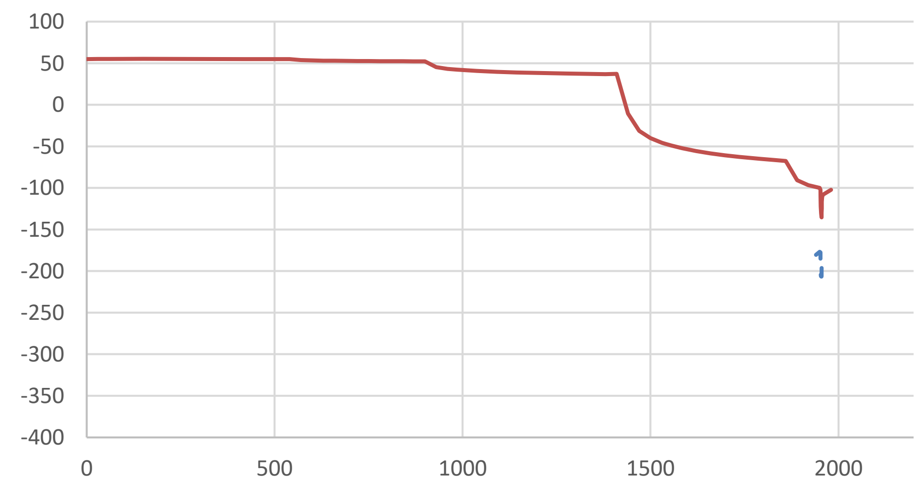
PZ-ML350-171-VW1



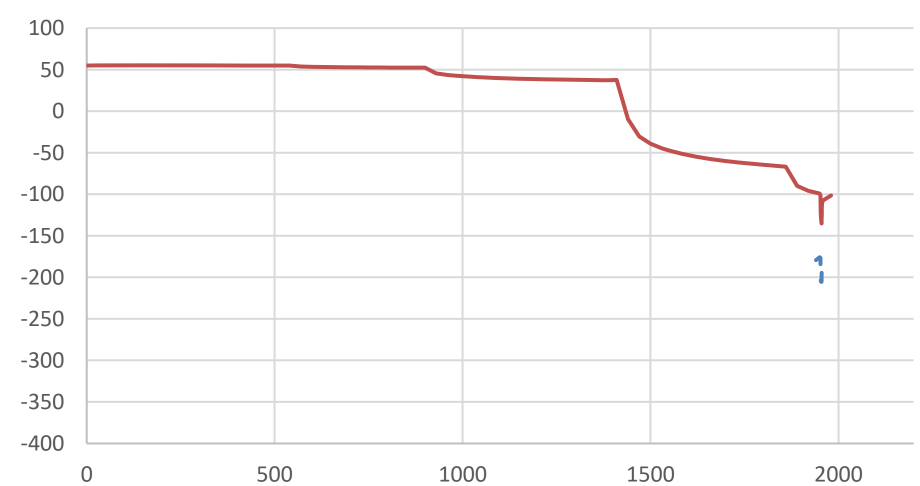
PZ-ML350-171-VW2



PZ-WH350-152-VW1



PZ-WH350-152-VW2



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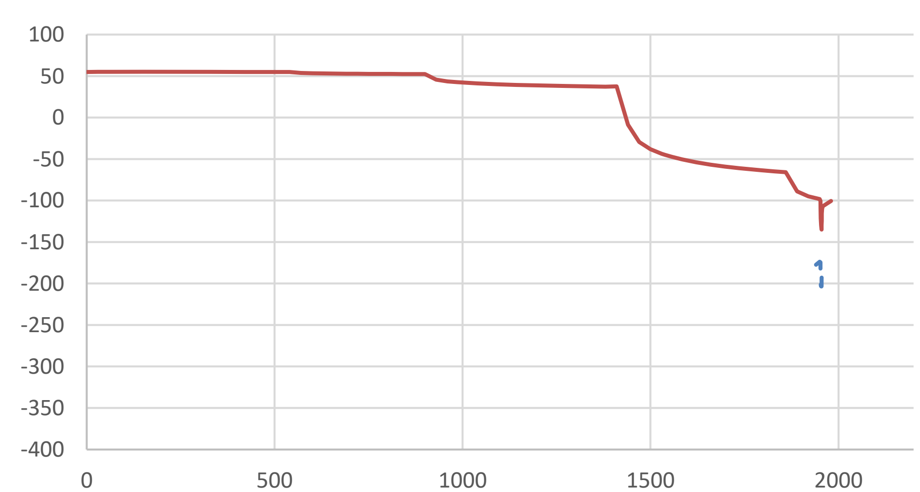
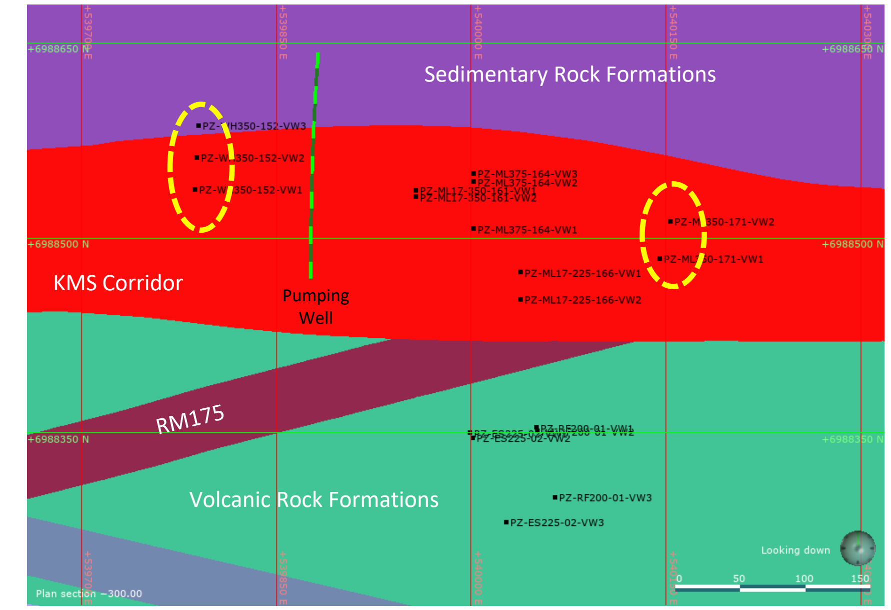


Conceptual Hydrostratigraphy (-300 mals)



Legend

- - - - Observed
—— Predicted

Notes:
X-axis on plots are model simulation time in days. Day zero corresponds to the start of Year 2015.
Y-axis on plots are predicted / measured hydraulic head (masl).

Piezometer	Borehole ID	Node	Sensor Elevatin (Mine Grid)	Sensor Elevation (masl)	Approximate Sensor Depth (mbgs)
PZ-ML350-171	ML350-171-D1	VW1	9714	286.00	341.0
		VW2	9712	288.00	343.0
PZ-WH350-152	WH350-152-D1	VW1	9724	276.00	331
		VW2	9720	280.00	335
		VW3	9715	285.00	340

CLIENT
AGNICO EAGLE

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-11-04
PREPARED	HG
DESIGNED	HG
REVIEWED	JL
APPROVED	DC

PROJECT
AGNICO EAGLE MINES LIMITED
MELIADINE EXTENSION
NUNAVUT

TITLE
HYDRAULIC HEAD MONITORING CALIBRATION RESULTS - PZ-ML350-171 AND PZ-WH350-152

PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	1	20

5.3.3 Measured versus Predicted Groundwater Inflow

Table 8 presents a summary of measured versus predicted groundwater flow to the Tiriganiaq underground at the end of calibration. Predicted inflows are within a factor of 1.5 of measured inflows, and in general are similar to, or above the estimated inflows.

Table 8: Measured versus Predicted Groundwater Inflow to Tiriganiaq Underground

<table>
<tr><th>Month and Year</th><th>Estimated Measured Inflow (m^3/day)</th><th>Predicted Inflow for Closest As-Built Mine Stage (m^3/day)</th></tr>
<tr><td>Q4 2015</td><td>15</td><td>5</td></tr>
<tr><td>January 2017</td><td>35</td><td>40</td></tr>
<tr><td>October 2018</td><td>155</td><td>180</td></tr>
<tr><td>November 2018</td><td>175</td><td rowspan="3">220</td></tr>
<tr><td>December 2018</td><td>200</td></tr>
<tr><td>January 2019</td><td>195[a]</td></tr>
<tr><td>August 2020</td><td>200[a]</td><td>280</td></tr>
</table>

[a] Value reported for month of measurement. Measured inflow in 2019 ranged from 160 to 470 m^3/day and in 2020 from 190 to 295 m^3/day. Peak monthly flows in 2019 and 2020 reflect periods where the boreholes were allowed to free drain into the underground as part of recession testing.

Overall mass balance error in the model domain was less than 0.1%, indicating numerical stability in the predicted inflows. A mass balance error of less than 0.1% indicates the total inflow to the model domain was within 0.1% of outflow to the model domain.

6.0 BASE CASE MODEL PREDICTIONS

The Base Case Scenario represents the best estimate of groundwater inflow and groundwater TDS based on the measured data and the results of the model calibration.

Model predictions were therefore undertaken using the base case calibrated model. Agnico Eagle is successfully implementing grouting, and it is a planned mitigation approach going forward. On this basis, grouting of the underground development is assumed to continue as part of future inflow predictions.

6.1 Base Case

Based on interpreted permafrost limits (Golder 2021a), three pits will intersect open taliks below lakes.

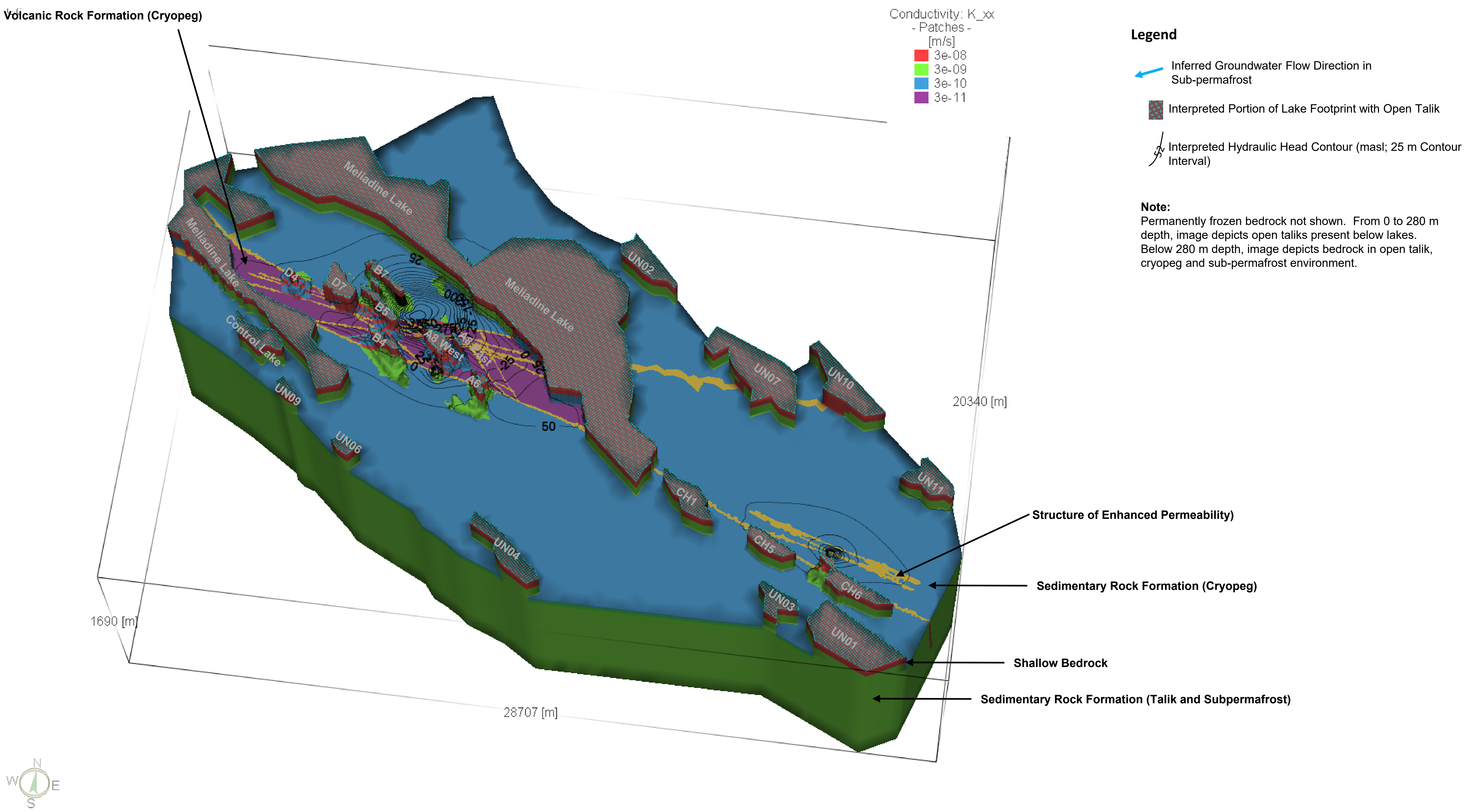
- Wesmeg-North Pit is planned to be about 130 m deep with the ultimate base of the pit at -65 masl and is under a portion of Lake B5.
- Pump Pit PUM04pit is planned to be about 40 m deep with the ultimate pit at -20 masl and is under the southern portion of Lake A8 West.
- Wesmeg Pit Wes05 pit is planned to be about 120 m deep with the ultimate base of the pit at -55 masl and is partially under the north side of Lake A8 West.

Open pit mining commences after the dewatering of Lake B5 and Lake A8, and the model predicts that with this dewatering and the underlying depressurization of the bedrock from mining at the Wesmeg-North, Wesmeg and Pump undergrounds, groundwater inflow to the open pits will not occur (zero flux). These predictions assume that any water reporting to the dewatered lake footprint would report as runoff to the open pit or dewatering system, which is not a predicted component of the groundwater flow model. This water would be relatively fresh in comparison to the saline groundwater being intercepted by the underground.

Table 9 presents a summary of the predicted groundwater inflow to the underground developments during operations for the Base Case. Figures 21 through 24 presents the predicted hydraulic heads over the operations period. The predicted groundwater inflows incorporate the effects of grouting. Like the model set-up for calibration, an effective hydraulic conductivity of 1×10^{-9} was assigned to elements representative of grouted faults within 30 m of the Tiriganiaq underground, where the element size was approximately 10 m. In other areas of the model near the underground, the element size increases from 10 m to approximately 25 m. In these areas with larger elements, the assigned effective hydraulic conductivity was increased to approximately 3×10^{-9} m/s to reflect the larger element size.

Groundwater Inflow to the Tiriganiaq Underground were predicted to increase from 350 m^3/day in 2021 to a peak inflow of 1,650 m^3/day in 2027 (Table 9). Inflows then decrease as storage effects diminish from 2027 to 2037, where the predicted inflow to the underground is 1,300 m^3/day. Future predicted groundwater inflows are not directly comparable to past groundwater inflows, as the future extent of the Tiriganiaq underground is larger and deeper. The lateral expansion of the underground includes a drift to the north of the underground development, which causes the increase in the predicted inflows in 2025.

Groundwater inflows to the other underground developments are lower than Tiriganiaq, reflecting the shallower planned mine depth (Table 4), greater proportion of the development in permafrost, and overall smaller footprint of these developments. Peak inflows at the other developments range from less than 50 m^3/day at Wesmeg-North, up to 200 m^3/day at Wesmeg and Wesmeg-North. Flows to Wesmeg, Wesmeg-North and Pump are mitigated by dewatering of Lakes B5 and A8 West. In the absence of this dewatering, higher inflows to the underground would be expected as the mine development extends below these lakes. Inflow to Wesmeg and Wesmeg-North are also affected by depressurization from the adjacent mining at Tiriganiaq, which acts a stronger hydraulic stink given its greater depth of mining (maximum base elevation of -845 masl versus -590 at Wesmeg and -395 m^3/day at Wesmeg-North).



5x Vertical Exaggeration

CLIENT

AGNICO EAGLE

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-11-04
PREPARED	HG
DESIGNED	HG
REVIEWED	JL
APPROVED	DC

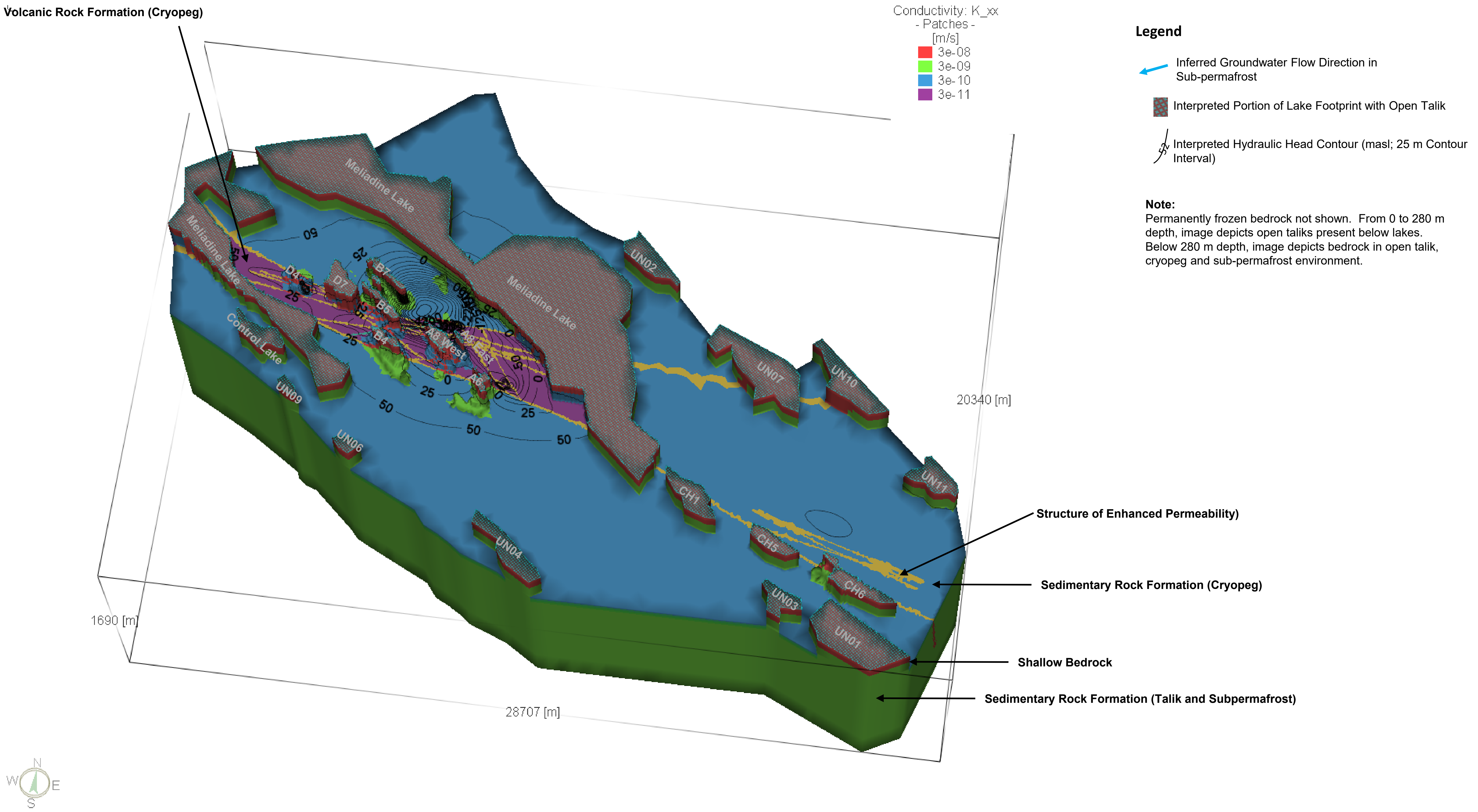
PROJECT

AGNICO EAGLE MINES LIMITED
MELIADINE EXTENSION
NUNAVUT

TITLE

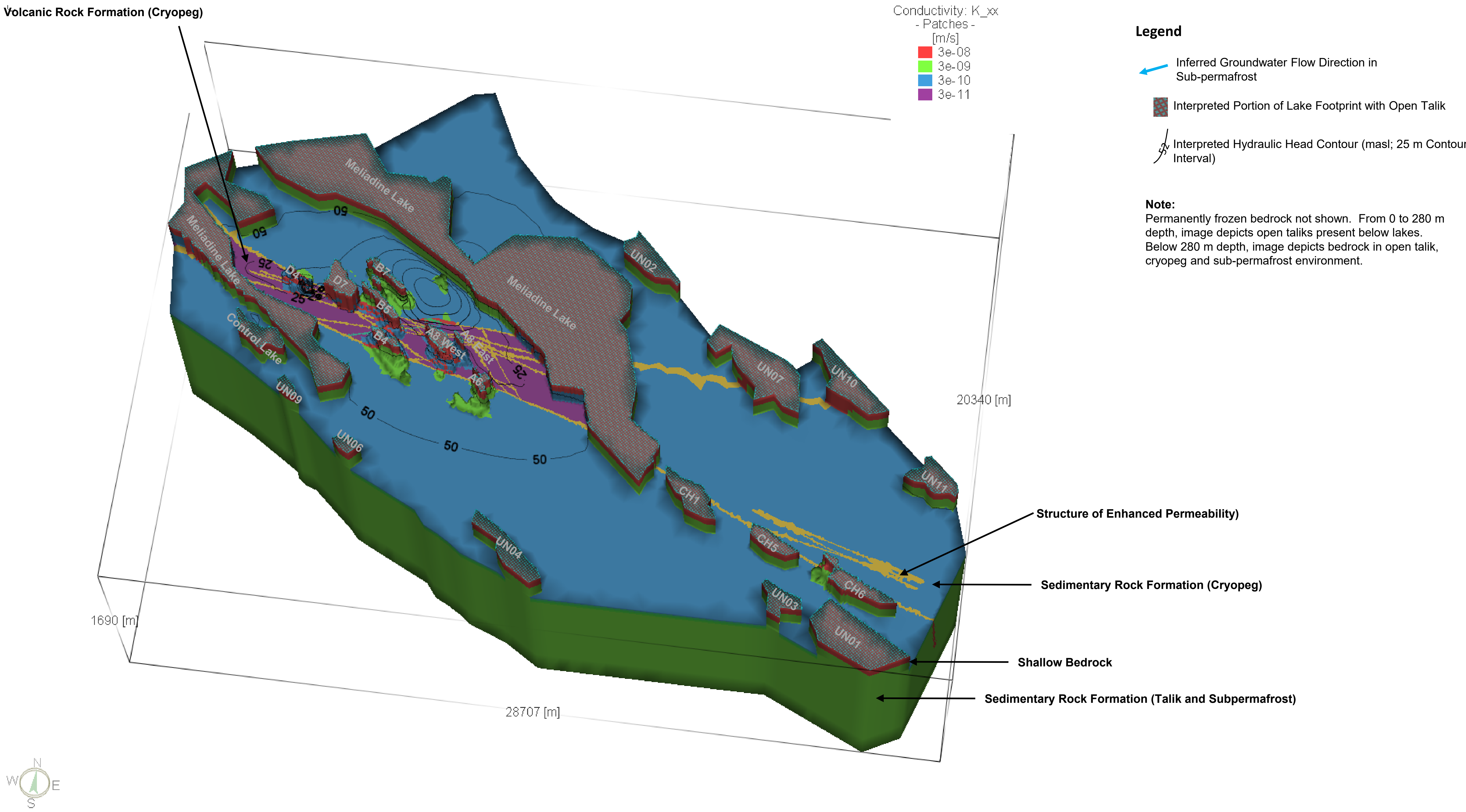
PREDICTED HYDRAULIC HEADS
END OF YEAR 2031
FINAL YEAR OF MINING AT DISCOVERY UNDERGROUND

PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	1	21



5x Vertical Exaggeration

CLIENT: AGNICO EAGLE		PROJECT	AGNICO EAGLE MINES LIMITED MELIADINE EXTENSION NUNAVUT
CONSULTANT: GOLDER MEMBER OF WSP	YYYY-MM-DD: 2021-11-04	TITLE	PREDICTED HYDRAULIC HEADS END OF YEAR 2037 - FINAL YEAR OF MINING AT TIRIGANIAQ, WESMEG AND WESTMEG-NORTH UNDERGROUNDS
	PREPARED: HG		
	DESIGNED: HG		
	REVIEWED: JL		
	APPROVED: DC	PROJECT NO. 20136436 / PHASE 2300 / REV. 1	FIGURE 22



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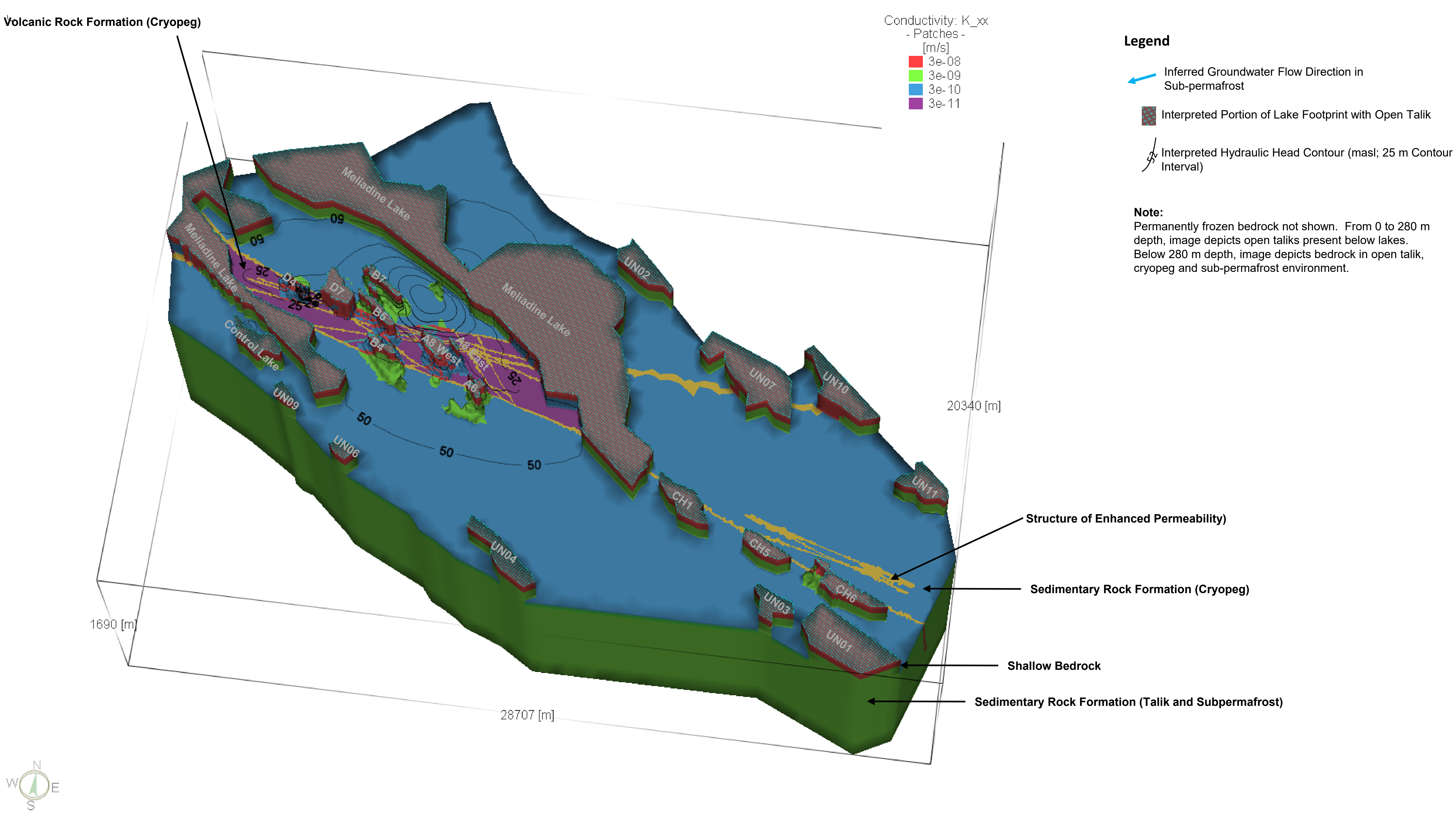
YYYY-MM-DD	2021-11-04
PREPARED	HG
DESIGNED	HG
REVIEWED	JL
APPROVED	DC

PROJECT
AGNICO EAGLE MINES LIMITED
MELIADINE EXTENSION
NUNAVUT

TITLE
PREDICTED HYDRAULIC HEADS
END OF YEAR 2039
FINAL YEAR OF MINING AT FZONE

PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	1	23



5x Vertical Exaggeration

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AGNICO EAGLE

CONSULTANT

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YYYY-MM-DD	2021-11-04
PREPARED	HG
DESIGNED	HG
REVIEWED	JL
APPROVED	DC

PROJECT
AGNICO EAGLE MINES LIMITED
MELIADINE EXTENSION
NUNAVUT

TITLE
PREDICTED HYDRAULIC HEADS
END OF YEAR 2043
FINAL YEAR OF MINING AT TIRIGANIAQ-NORTH

PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	1	**24**

Table 9: Predicted Base Case Scenario Groundwater Inflows – Groundwater Inflow, TDS Quality and Lake Water Contributions

Base Case Predictions																					
Year	Predicted Groundwater Inflow (m^3/day)							Predicted TDS in Groundwater Inflow (mg/L)							Lake Water Contribution (%)						
	Tiriganiaq Deposit				F Zone	Pump	Discovery	Tiriganiaq Deposit				F Zone	Pump	Discovery	Tiriganiaq Deposit				F Zone	Pump	Discovery
	Tiriganiaq	Wesmeg	Wesmeg-North	Tiriganiaq-Wolf				Tiriganiaq	Wesmeg	Wesmeg-North	Tiriganiaq-Wolf				Tiriganiaq	Wesmeg	Wesmeg-North	Tiriganiaq-Wolf			
2021	350	<50	-	-	-	-	-	59,500	59,500	-	-	-	-	-	<1	<1	-	-	-	-	-
2022	500	<50	-	-	-	-	-	59,500	60,000	-	-	-	-	-	<1	<1	-	-	-	-	-
2023	550	50	<50	-	-	-	-	59,500	59,000	38,000	-	-	-	-	<1	<1	<1	-	-	-	-
2024	700	100	<50	-	-	-	-	59,500	59,500	21,500	-	-	-	-	<1	<1	5	-	-	-	-
2025	1,050	100	<50	-	-	-	-	57,500	59,500	13,000	-	-	-	-	<1	<1	19	-	-	-	<1
2026	1,500	100	<50	-	-	-	50	56,000	59,000	10,000	-	-	-	59,000	<1	<1	30	-	-	-	<1
2027	1,650	150	<50	-	-	-	100	56,000	58,500	9,000	-	-	-	59,000	<1	<1	34	-	-	-	<1
2028	1,450	150	<50	-	-	-	100	56,000	58,000	10,000	-	-	-	60,000	<1	<1	36	-	-	-	<1
2029	1,400	150	<50	-	-	<50	200	56,000	58,000	9,000	-	-	59,000	59,000	1	<1	47	-	-	<1	<1
2030	1,400	150	<50	-	-	100	200	55,500	57,000	8,000	-	-	57,500	60,000	2	<1	52	-	-	<1	<1
2031	1,350	200	<50	-	-	100	200	55,500	54,500	7,500	-	-	51,500	60,000	2	1	54	-	-	<1	-
2032	1,350	150	<50	-	-	100	-	55,500	55,000	11,000	-	-	49,000	-	3	2	48	-	-	1	-
2033	1,350	150	<50	-	-	150	-	55,500	53,500	11,500	-	-	44,000	-	3	3	48	<1	<1	2	-
2034	1,300	150	<50	-	50	150	-	55,000	53,000	10,000	-	59,000	44,500	-	4	4	54	<1	<1	3	-
2035	1,300	150	<50	<50	100	100	-	55,000	52,500	8,000	56,500	59,000	45,500	-	4	5	60	<1	<1	3	-
2036	1,300	150	<50	50	150	-	-	55,000	51,500	7,500	53,000	59,500	-	-	5	6	65	<1	<1	-	-
2037	1,300	150	<50	50	150	-	-	55,000	50,500	6,500	50,500	60,000	-	-	5	8	68	<1	<1	-	-
2038	-	-	-	100	150	-	-	-	-	-	49,500	60,000	-	-	-	-	-	2	<1	-	-
2039	-	-	-	150	150	-	-	-	-	-	52,500	60,000	-	-	-	-	-	2	<1	-	-
2040	-	-	-	150	-	-	-	-	-	-	52,000	-	-	-	-	-	-	4	-	-	-
2041	-	-	-	150	-	-	-	-	-	-	52,000	-	-	-	-	-	-	5	-	-	-
2042	-	-	-	150	-	-	-	-	-	-	51,000	-	-	-	-	-	-	7	-	-	-
2043	-	-	-	150	-	-	-	-	-	-	49,500	-	-	-	-	-	-	9	-	-	-

Table 9 also presents a summary of the predicted TDS in the groundwater inflow for the Base Case and predicted lake water contribution in the underground inflow. The predicted TDS and lake water contribution will be used in the site Wide Water Quality Model to account for salinity loading from the groundwater, surface water, and other sources from the Project area.

Predicted TDS at the Tiriganiaq underground is relatively stable between 55,000 and 60,000 mg/L, reflecting the low intersection of freshwater from the lakes and from shallow groundwater in the open taliks below these lakes. Predicted TDS at Wesmeg, is slightly lower than the TDS at Tiriganiaq and ranges from approximately 60,000 mg/L at the start of mining to just above 50,000 at the end of mining. TDS concentrations at Wesmeg drop in response to the expansion of the underground below Lake A8 and interception of fresh water from Lake A8 and from less saline groundwater in its underlying talik.

TDS at F Zone is predicted to remain high at approximately 60,000 mg/L through its six-year mine life, which reflects that the underground does not extend into open taliks or intercept lake water. At Pump underground, which is west of F Zone, the TDS is lower ranging from 59,000 mg/L in the first year of mining, down to approximately 44,000 to 46,000 mg/L in the final years of mining. The decrease in TDS over the life of mine reflects the interception of fresh water from Lake A8 West and less saline groundwater from its underlying talik.

Predicted TDS at Discovery remains stable at approximately 59,000 to 60,000 mg/L and is not predicted to intercept fresh water from Lake CH6 which is 600 m to the southwest. At Tiriganiaq-Wolf, predicted TDS ranged between 56,500 mg/L at the start of mining in year 2035 and gradually decreased to 48,500 in the final year of mining in Year 2043. The decrease in TDS reflects the progressive interception of fresh water from Lake D4 and the less saline groundwater in its underlying talik.

6.2 Sensitivity Analysis

6.2.1 Sensitivity Scenarios

Due to the inherent uncertainty in the subsurface conditions and parameters controlling groundwater flow, uncertainty exists in the model predictions such that the actual inflow could be higher or lower than the Base Case values. This uncertainty was evaluated using sensitivity analysis. As part of this analysis, selected model parameters were systematically varied from the Base Case values, and the results were used to identify the parameters to which predicted groundwater inflow is most sensitive. These included:

- **Bedrock Hydraulic Conductivity** – Hydraulic conductivity of shallow and deep competent bedrock were increased by a factor of two and three from Base Case Values.
- **Specific Storage** – Specific storage of the bedrock was increased by a factor of five from Base Case Values
- **Grouting Effectiveness** – The effective hydraulic conductivity of elements representative of grouted faults within 30 metres of the Tiriganiaq underground was increased by a factor of 3 from the calibrated value of 1×10^{-9} m/s
- **Presence of Enhanced Permeability Zones** – Hydraulic conductivity of the faults within the model were increased by a factor of two from Base Case Values.
- **Permafrost** – For lakes interpreted to have open taliks, the thermal modelling did not predict that an open talik would be present below the entire lake footprint. To evaluate the sensitivity of the predictions to this result, an open talik was assumed below the full lake footprint rather than partial footprint.

- **Lake Dewatering** – Dewatering of Lake A6 was assumed to occur as of 2029. Dewatering of Lake A8 and Lake B5 was simulated in the Base Case model but Lake A6 was not. The dewatering of this lake is a potential part of the Project mine plan; therefore, its effect is consider in this sensitivity.
- **Model Boundaries** - Specified head boundaries assigned beneath the permafrost along the perimeter of the model were removed to verify the model limits are set sufficient far enough from the mine developments to not influence model predicted inflow.

6.2.2 Sensitivity Results and Selection of Upper Bound Scenario

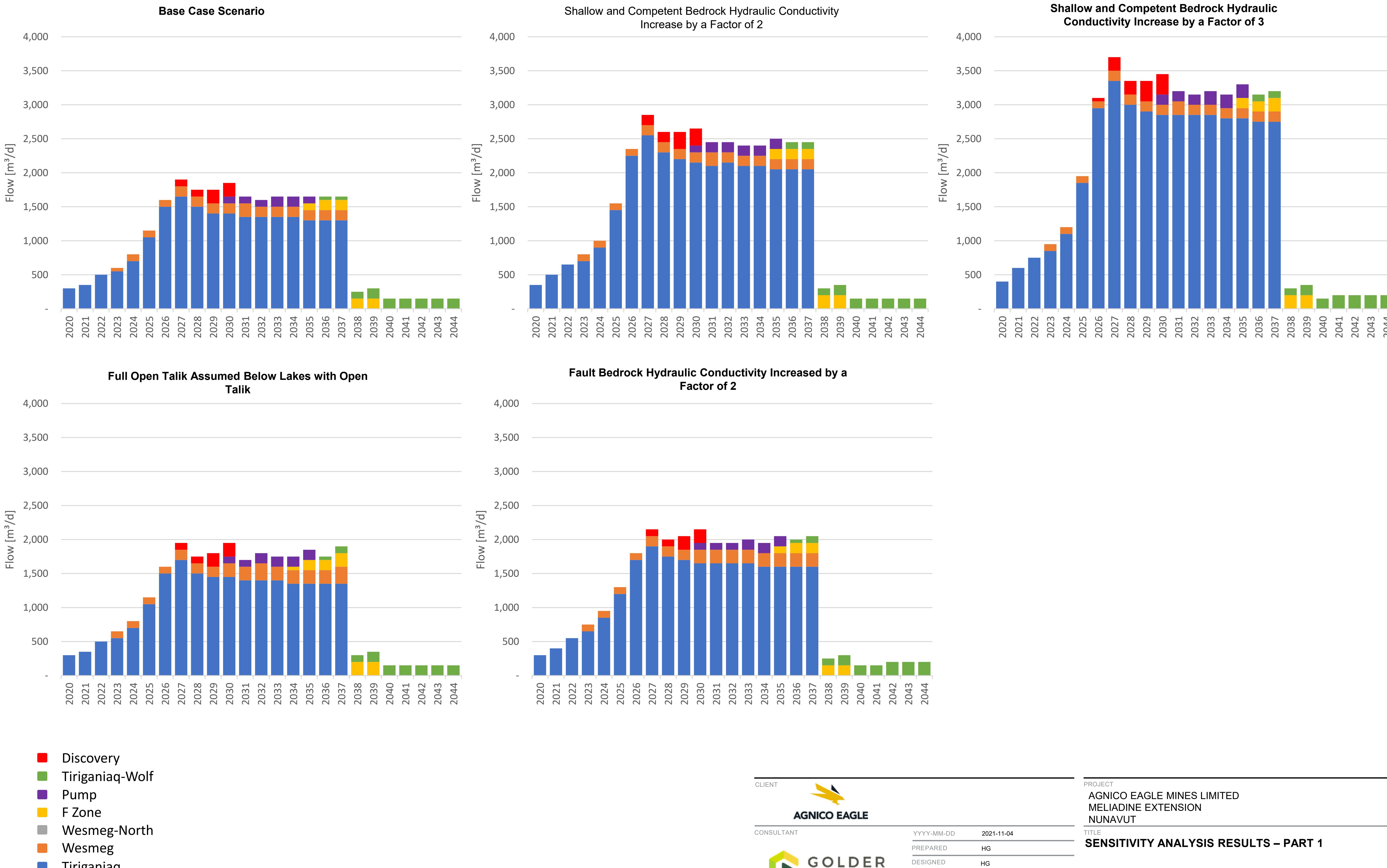
Figure 25 and Figure 26 presents a summary of the sensitivity results and Table 10 presents a comparison of the total saline groundwater inflow for the peak year of inflow (2027). Based on this analysis the following observations are noted:

- Removal of the specified head boundaries from the model perimeter did not alter the groundwater inflow predictions to the mine developments indicating the model boundaries are set sufficiently far enough from the mine developments.
- Predicted Inflow to the underground developments for the alternative dewatering scenario at Lake A6 are within 100 m^3/day of the base case predictions indicating that dewatering of Lake A6 does not significantly alter the inflow predictions.
- Groundwater inflows are relatively insensitive to the extent of open talik present below lakes. For the peak year of inflow (2027), total saline groundwater inflow when the entire lake footprint was assumed to have an open talik beneath it was within approximately 3% of the Base Case predictions. This sensitivity would be higher if dewatering under Lakes A8 and B5 did not occur.
- Groundwater inflow is somewhat sensitive to the assumed properties of the fault. For the peak year of inflow (2027), total saline groundwater inflow was approximately 13% higher than the Base Case. This sensitivity would be higher if grouting of the faults intersected by the underground did not occur. Changes in the fault properties are not recommended for development of an Upper Bound Scenario as the fault properties are already considered to be conservative. The hydraulic properties of untested faults were set equal to the highest transmissivity of discrete faults tested (Fault 2 in the Discovery Area), excluding the KMS corridor which is interpreted as a zone of poor RQD rock and discrete faults. The faults were also assumed to have enhanced permeability up to 2.5 kms away from the underground developments, and the width of the Lower Fault was increased to between 15 to 20 m to account for potential additional low RQD corridors along its length. These assumptions are considered conservative since the permeability and width of a fault zone can be heterogeneous along strike (Gleeson and Novakowski 2009) resulting potentially in zones of greater hydraulic conductivity along strike over short distances; whereas over longer distances the presence of zones infilled with fault gouge will act to decrease hydraulic connectivity along strike. Observations during testing at Fault A is indicative of this variability (Golder 2021c).
- Groundwater inflows are somewhat sensitive to the specific storage of the bedrock. For the peak year of inflow (2027) and assuming a specific storage five times higher than the base case, total saline groundwater inflow was approximately 34% higher than the Base Case predictions. The majority of the development is located within the Mafic Volcanic Rock, for which specific storage has been set in consideration of site specific testing (flow recession testing in 2015 and 2020; Golder 2021c).

- Groundwater inflows are somewhat sensitive to the grouting effectiveness. For the peak year of inflow (2027) and assuming the effective hydraulic conductivity of the grouted fault zone is a factor of three higher, total saline groundwater inflow was approximately 8% higher than the Base Case predictions. Groundwater inflows in 2020 for the Tiriganiaq underground were predicted to be 400 m^3/day for this scenario, which is unrealistically high in comparison to observed groundwater inflow in 2020 (190 to 295 m^3/day). The sensitivity of the groundwater inflow predictions to the grouting effectiveness diminishes with time as more of the Tiriganiaq underground is in bulk bedrock where grouting will be ineffective (grouting is a mitigation measured applied in the model to the fault zones [Section 4.3]).
- Total groundwater inflow is most sensitive to the hydraulic properties of the bedrock. For the peak year of inflow (2027) and a factor of 2 increase in bedrock hydraulic conductivity, total saline groundwater inflow was approximately 50% higher than the Base Case. For the peak year of inflow (2027) and a factor of 3 increase in bedrock hydraulic conductivity, total saline groundwater inflow was approximately 95% higher than the Base Case. Groundwater inflows in 2020 for the Tiriganiaq underground were predicted to be 400 m^3/day for a factor of 3 increase in bedrock hydraulic conductivity. This flow is unrealistically high in comparison to observed groundwater inflow in 2020 (190 to 295 m^3/day). This suggests that a factor of 3 increase in bedrock hydraulic conductivity near Tiriganiaq is not reasonable, and that a factor of 2 increase in bedrock hydraulic conductivity would be a more reasonable Upper Bound Prediction. For this sensitivity scenario, Tiriganiaq underground inflows were predicted to be 350 m^3/day, relative to a measured inflow of between 190 to 295 m^3/day.
- Like the base case, zero groundwater inflow was predicted to NOR01, PUM04 and Wes05 in each sensitivity scenario. Open pit mining commences after the dewatering of Lake B5 and Lake A8, and the model predicts that with this dewatering and the underlying depressurization of the bedrock from mining at the Wesmeg-North, Wesmeg and Pump undergrounds, groundwater inflow to the open pits will not occur (i.e., the predicted water table is below the pit base). These predictions assume that any water reporting to the dewatered lake footprint would report as runoff to the open pit or dewatering system, which is not a predicted component of the groundwater flow model. This water would be relatively fresh in comparison to the saline groundwater being intercepted by the underground.

Table 10: Comparison of Predicted Inflow to Combined Undergrounds in Year 2027

Scenario	Change in Hydraulic Conductivity Relative to Base Case	Predicted Inflow Year 2027 (m^3/day)	% Change from Base Case
Base Case	-	1900	-
Bedrock Hydraulic Conductivity	Factor of 3 Higher	3700	95%
	Factor of 2 Higher	2850	50%
Specific Storage	Factor of 5 Higher	2550	34%
Fault Hydraulic Conductivity	Factor of 2 Higher	2150	13%
Grouting Effectiveness	Effective Hydraulic Conductivity Factor of 3 Higher	2050	8%
Permafrost	Open Talik extended to full lake footprint	1950	3%
Lake Dewatering	Dewatering of Lake A6 Added	1900	No Change
Model Boundaries	Specified head boundaries around model perimeter removed.	1900	No Change



CLIENT

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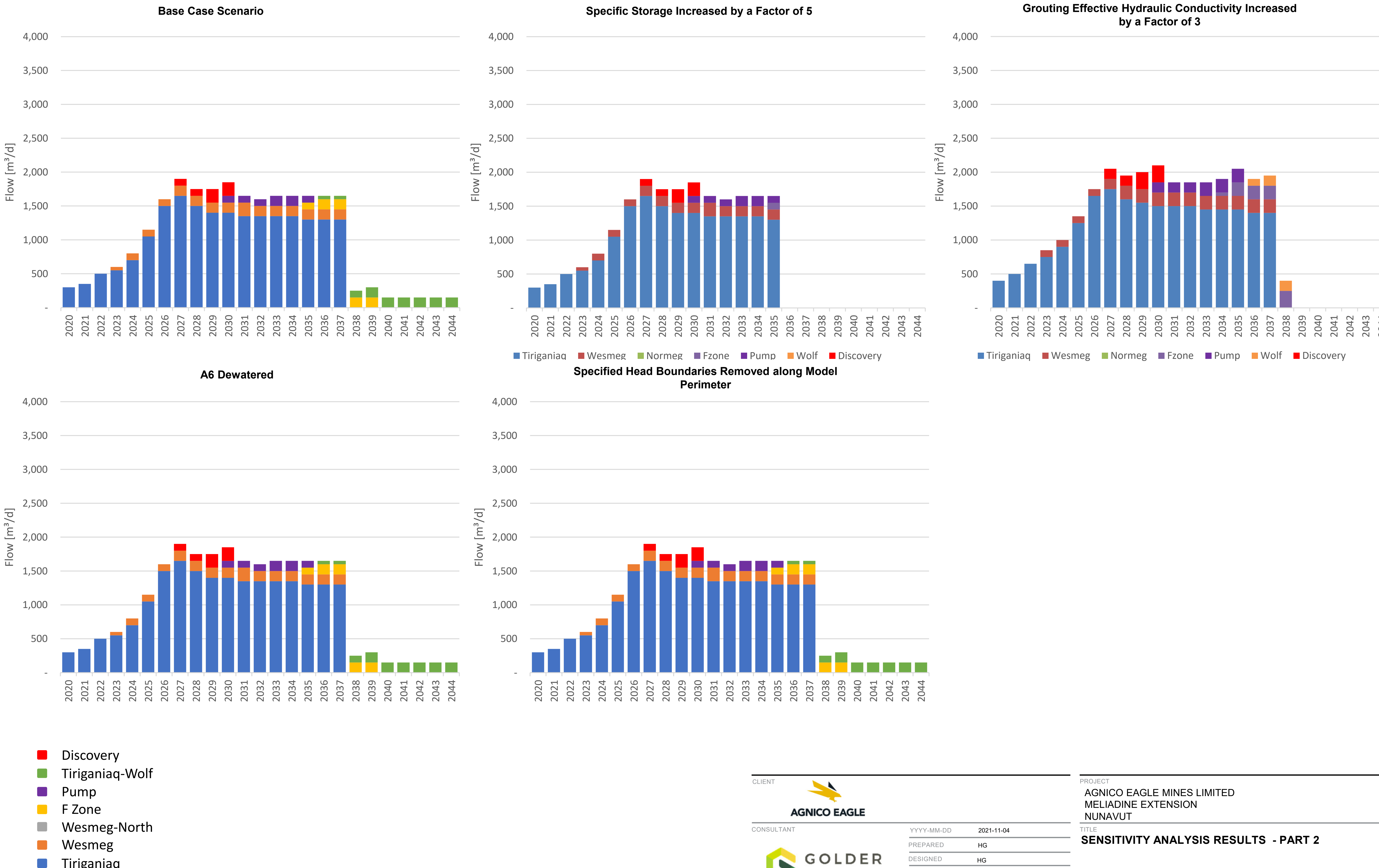
YYYY-MM-DD	2021-11-04
PREPARED	HG
DESIGNED	HG
REVIEWED	JL
APPROVED	DC

PROJECT
AGNICO EAGLE MINES LIMITED
MELIADINE EXTENSION
NUNAVUT

TITLE
SENSITIVITY ANALYSIS RESULTS – PART 1

PROJECT NO.	PHASE	REV.	FIGURE
20136436	2300	3	25



CLIENT: AGNICO EAGLE		PROJECT: AGNICO EAGLE MINES LIMITED MELIADINE EXTENSION NUNAVUT	
CONSULTANT: GOLDER MEMBER OF WSP	YYYY-MM-DD: 2021-11-04	TITLE: SENSITIVITY ANALYSIS RESULTS - PART 2	
	PREPARED: HG		
	DESIGNED: HG		
	REVIEWED: JL	PROJECT NO.: 20136436	PHASE: 2300
	APPROVED: DC	REV.: 3	FIGURE: 26

In consideration of the sensitivity results which indicate the most sensitive parameter is the bedrock hydraulic conductivity, the following inflow predictions were considered appropriate for selection of an Upper Bound Scenario for evaluation of water management at the Project.

- Tiriganiaq Underground: Groundwater inflows predicted to the Tiriganiaq Underground for a factor of 2 increase in shallow and deep competent bedrock.
- Other Undergrounds: Groundwater inflows predicted to the remaining underground areas for a factor of 3 increase in shallow and deep competent bedrock. This reflects that limited test data is available local to these developments although the geologic units are understood from Agnico Eagle to be like those observed at Tiriganiaq. Field investigations are in progress to verify model assumptions through the collection of supplemental hydraulic test data.

The Upper Bound Scenario is designed to be a reasonable, yet more conservative, assessment of potential groundwater inflow quantity and TDS quality than values that might be adopted for mine operation planning (i.e., Base Case Scenario).

7.0 UPPER BOUND PREDICTIONS

Table 11 presents a summary of the predicted groundwater inflow to the underground developments during operations for the Upper Bound Scenario. The predicted groundwater inflows incorporate the effects of grouting.

Groundwater Inflow to the Tiriganiaq Underground were predicted to increase from 500 m^3/day in 2021 to a peak inflow of 2,550 m^3/day in 2027 (Table 9). Inflows then decrease from 2027 to 2037, where the predicted inflow to the underground is 2,050 m^3/day.

Groundwater inflows to the other underground developments are lower than Tiriganiaq, reflecting the shallower planned mine depth (Table 4), greater proportion of the development in permafrost, and overall smaller footprint of these developments. Peak inflows at the other developments range from less than 50 m^3/day at Wesmeg-North, up to 300 m^3/day at Discovery. Flows to Wesmeg, Wesmeg-North and Pump undergrounds are mitigated by dewatering of Lakes B5 and A8 West in 2025. In the absence of this dewatering, higher inflows to the underground would be expected as the mine development extends below these lakes.

Predicted TDS at the Tiriganiaq underground is relatively stable between 56,000 mg/L and 60,000 mg/L, reflecting that there is little intersection of freshwater from the lakes and from shallow groundwater in the open taliks below these lakes. Predicted TDS at Wesmeg, is slightly lower than the TDS at Tiriganiaq and ranges from approximately 60,000 mg/L at the start of mining to approximately 58,000 at the end of mining. TDS concentrations at Wesmeg drop in response to the expansion of the underground below Lake A8 and interception of fresh water from the Lake A8 and less saline groundwater from its underlying talik. Relative to the base case the TDS is slightly higher for both Tiriganiaq and Wesmeg, which reflects the greater inflow of saline groundwater because of the higher bedrock hydraulic conductivity.

TDS at F Zone is predicted to remain high at approximately 60,000 mg/L through its six-year mine life, which reflects that the underground does not extend into open taliks or intercept lake water. At Pump underground to west of F Zone, TDS is lower ranging from 59,000 mg/L in the first year of mining, down to approximately 48,000 mg/L in the final years of mining. The decrease in TDS over the life of mine reflects the interception of fresh water from Lake A8 West and less saline groundwater from its underlying talik.

Predicted TDS at Discovery remains stable at approximately 59,000 to 60,000 mg/L, essentially the same as the Base Case, and is not predicted to intercept fresh water from Lake CH6 located 600 m to the southwest. At Tiriganiaq-Wolf, predicted TDS ranged between 55,000 mg/L at the start of mining in year 2035 and gradually decreased to 46,500 in the final year of mining in Year 2043. The decrease in TDS reflects the progressive interception of fresh water from Lake D4 and the less saline groundwater in its underlying talik.

Table 11: Predicted Base Case Groundwater Inflows – Groundwater Inflow, TDS Quality and Lake Water Contributions

Upper Bound Scenario Predictions																					
Year	Predicted Groundwater Inflow (m^3/day)							Predicted TDS in Groundwater Inflow (mg/L)							Lake Water Contribution (%)						
	Tiriganiaq Deposit				F Zone	Pump	Discovery	Tiriganiaq Deposit				F Zone	Pump	Discovery	Tiriganiaq Deposit				F Zone	Pump	Discovery
	Tiriganiaq	Wesmeg	Wesmeg-North	Tiriganiaq-Wolf				Tiriganiaq	Wesmeg	Wesmeg-North	Tiriganiaq-Wolf				Tiriganiaq	Wesmeg	Wesmeg-North	Tiriganiaq-Wolf			
2021	500	<50	-	-	-	-	-	59,500	59,500	-	-	-	-	-	<1	<1	-	-	-	-	-
2022	650	<50	-	-	-	-	-	59,500	60,000	-	-	-	-	-	<1	<1	-	-	-	-	-
2023	700	100	<50	-	-	-	-	59,500	59,000	35,000	-	-	-	-	<1	<1	<1	-	-	-	-
2024	900	100	<50	-	-	-	-	59,000	59,500	18,000	-	-	-	-	<1	<1	8	-	-	-	-
2025	1,450	100	<50	-	-	-	-	57,500	59,500	10,500	-	-	-	-	<1	<1	28	-	-	-	<1
2026	2,250	100	<50	-	-	-	50	56,000	58,500	6,000	-	-	-	59,500	<1	<1	52	-	-	-	<1
2027	2,550	150	<50	-	-	-	200	56,000	58,000	5,000	-	-	-	59,000	<1	<1	59	-	-	-	<1
2028	2,300	150	<50	-	-	-	200	56,500	57,500	5,500	-	-	-	60,000	<1	<1	62	-	-	-	<1
2029	2,200	150	<50	-	-	<50	300	56,500	57,500	4,000	-	-	59,500	59,500	1	<1	73	-	-	<1	<1
2030	2,150	150	<50	-	-	150	300	56,500	55,000	3,000	-	-	57,500	60,000	2	2	80	-	-	<1	<1
2031	2,100	200	<50	-	-	150	-	57,000	51,000	2,500	-	-	53,500	-	2	5	81	-	-	<1	-
2032	2,150	150	<50	-	-	150	-	57,000	50,500	4,000	-	-	51,500	-	3	6	77	-	-	1	-
2033	2,100	150	<50	-	-	200	-	57,000	49,000	4,500	-	-	48,000	-	3	9	77	<1	<1	2	-
2034	2,100	150	<50	-	<50	200	-	57,000	48,500	3,500	-	59,000	47,000	-	4	11	80	<1	<1	4	-
2035	2,050	150	<50	<50	150	200	-	57,500	47,500	3,000	55,000	59,000	48,000	-	4	12	82	<1	<1	4	-
2036	2,050	150	<50	100	150	-	-	57,500	46,000	2,500	51,000	59,500	-	-	5	14	84	<1	<1	-	-
2037	2,050	150	<50	100	200	-	-	57,500	45,000	2,500	49,000	60,000	-	-	5	16	85	2	<1	-	-
2038	-	-	-	100	200	-	-	-	-	-	48,000	60,000	-	-	-	-	-	5	<1	-	-
2039	-	-	-	150	200	-	-	-	-	-	50,500	60,000	-	-	-	-	-	5	<1	-	-
2040	-	-	-	150	-	-	-	-	-	-	50,000	-	-	-	-	-	-	8	-	-	-
2041	-	-	-	200	-	-	-	-	-	-	50,000	-	-	-	-	-	-	9	-	-	-
2042	-	-	-	200	-	-	-	-	-	-	49,000	-	-	-	-	-	-	11	-	-	-
2043	-	-	-	200	-	-	-	-	-	-	47,500	-	-	-	-	-	-	13	-	-	-

8.0 SUMMARY AND CONCLUSIONS

This report presents the development and calibration of an updated groundwater model for the Project, along with the prediction of groundwater inflow (quantity and TDS quality) for the mine developments located below the permafrost or in open taliks during operations. Relative to the 2014 FEIS, a new model was built to appropriately incorporate the new underground developments proposed as part of the project and the updated conceptual model. The model was calibrated to observed conditions since the completion of the FEIS (2015 – 2020) and to pressure responses observed during a 72-hr flow recession test in 2020.

Table 12 presents the predicted inflows to the Tiriganiaq underground as part of the 2014 FEIS in comparison to updated predictions for the Tiriganiaq underground as part of the Project. Included in Table 11 are key changes in the conceptual model since the completion of the 2014 FEIS: shallower interpreted base of permafrost, conservative inclusion of additional structures of enhanced permeability, and implementation of grouting as a mitigation measure. Overall, predicted inflows for the Project are within the range considered for the FEIS during the early years of mining when the mine plans more precisely align, although the FEIS flows did not consider mitigation by grouting (predicted inflows would have been lower if grouting had been considered).

Base case predictions of total saline groundwater inflow to be managed from the combined underground developments range from current inflows of 300 m^3/day at the Tiriganiaq Underground up to a peak inflow of 1,900 m^3/day in Year 2027, with inflow at the Tiriganiaq Underground contributing up to 87% of this total inflow. The predictions incorporate grouting, which is an ongoing mitigation measure that has been in place since 2015. For the Upper Bound predictions, the peak inflow is estimated to be up to 53% higher, with a predicted combined saline groundwater inflow of 2,900 m^3/day.

Sensitivity analysis indicates that predicted inflows are most sensitive to the hydraulic conductivity of the bulk bedrock, and the upper bound scenario was selected in consideration of these results and model calibration. Conservative assumptions were made with respect to the fault extents and each fault was assumed to have enhanced permeability in the absence of site-specific data. Overall, groundwater inflow for Tiriganiaq is the largest contributor of saline groundwater inflow to the Project, and uncertainty in these inflows will have the largest effect on water management planning.

The predictions presented in this report represent the best estimate of the potential range of saline groundwater inflow to be managed based on the conceptual model and data presented in the Existing Conditions Report (Golder 2021), which includes data up the summer of 2020. Groundwater inflow predictions should be reviewed as new hydraulic data is collected and as additional operational data is collected against which the model predictions can be verified.

Table 12: Comparison of Updated Predicted Tiriganiaq Inflows for the Project relative to 2014 FEIS

Year	Measured Flow (m^3/day)	2014 FEIS Predicted Inflow (m^3/day)			Extension Project Predicted Inflow (m^3/day)		
		Base Case	Upper Bound (Lower Fault K Increased by Factor of ten)	Key Conceptual Model Assumptions	Base Case	Upper Bound (Lower Fault K Increased by Factor of ten)	Key Conceptual Model Assumptions
2019	160 to 470 *	420	750	**Base of Permafrost:** 360 to 495 mbgs **Top of Cryopeg:** 350 mbgs **Structures:** North, Pyke and Lower Fault **Grouting:** Not Considered	250	-	**Base of Permafrost:** 285 to 430 mbgs **Top of Cryopeg:** 280 - 290 mbgs **Structures:** North, Pyke and Lower Fault plus 17 local faults approximately located between the Lower Fault and Pyke Fault **Grouting:** Considered / Actively Used to Mitigate Inflows
2020	190 to 295 *				275	350	
2021	-				350	500	
2022	-	540	970		500	650	
2023	-				550	700	
2024	-				700	900	
2025	-	640	970		1,050	1,450	
2026	-				1,500	2,250	
2027	-				1,650	2,550	
2028	-				1,450	2,300	
2029	-				1,400	2,200	
2030	-				1,400	2,150	
2031	-				1,350	2,100	
2032	-				1,350	2,150	
2033	-				1,350	2,100	
2034	-	-	-		1,300	2,100	
2035	-	-	-		1,300	2,050	
2036	-	-	-		1,300	2,050	
2037	-	-	-		1,300	2,050	

* Peak monthly flows in 2019 and 2020 reflect periods where the boreholes were allowed to free drain into the underground as part of recession testing. These high inflows are not representative of typical inflows to the underground, which will be a calibration target for the numerical groundwater model.

9.0 CLOSURE

The reader is referred to the Study Limitations, which follows the text and forms an integral part of this report. We trust the above meets your present requirements. If you have any questions or require addition information, please contact the undersigned.

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https://golderassociates.sharepoint.com/sites/120710/project files/6 deliverables/working/20136436-857-r-rev3-2300-gw model/20136436-857-r-rev3-2300-hydrogeology modelling report_1dec_21.docx

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11.0 STUDY LIMITATIONS

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