

Dominion Diamond Corporation

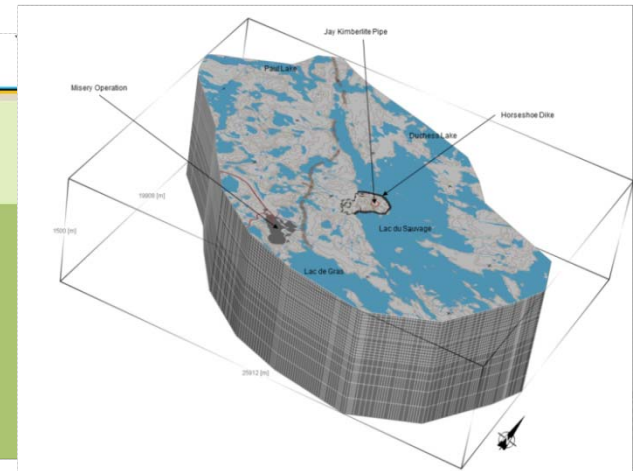
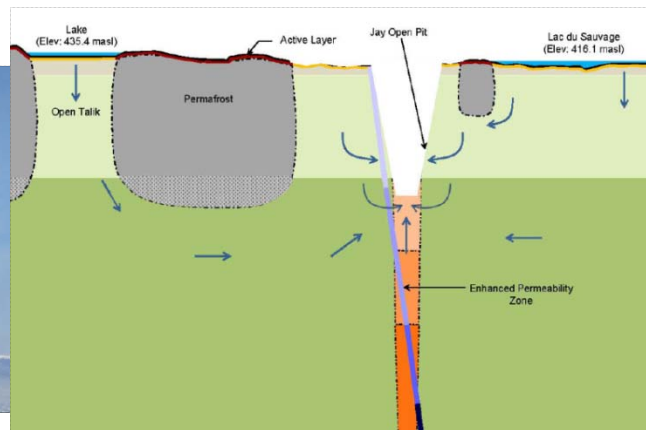
Developers Assessment
Report – Technical
Sessions, April 2015

Hydrogeology



Introduction

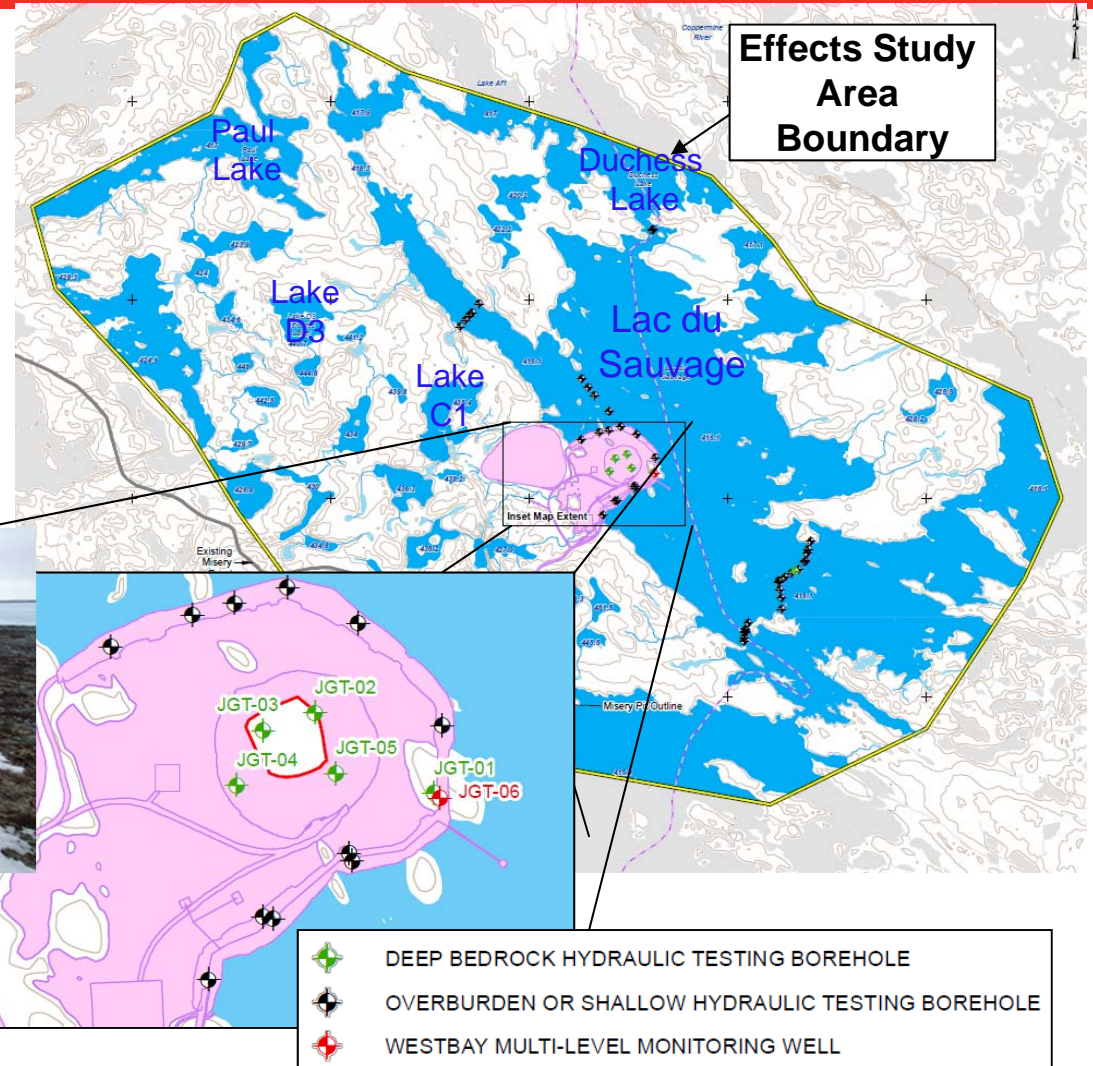
- Conservative assumptions were built into our assessment to provide a high level of confidence that effects on groundwater (quantity and quality), and surface water as a result of changes to the groundwater, have not been underestimated
- Project will result in local changes to the groundwater quantity and quality
- Negligible differences in lake volumes outside of the immediate area are projected to occur due to groundwater flow to the mine



Existing Environment - Methods

Baseline Data Collection

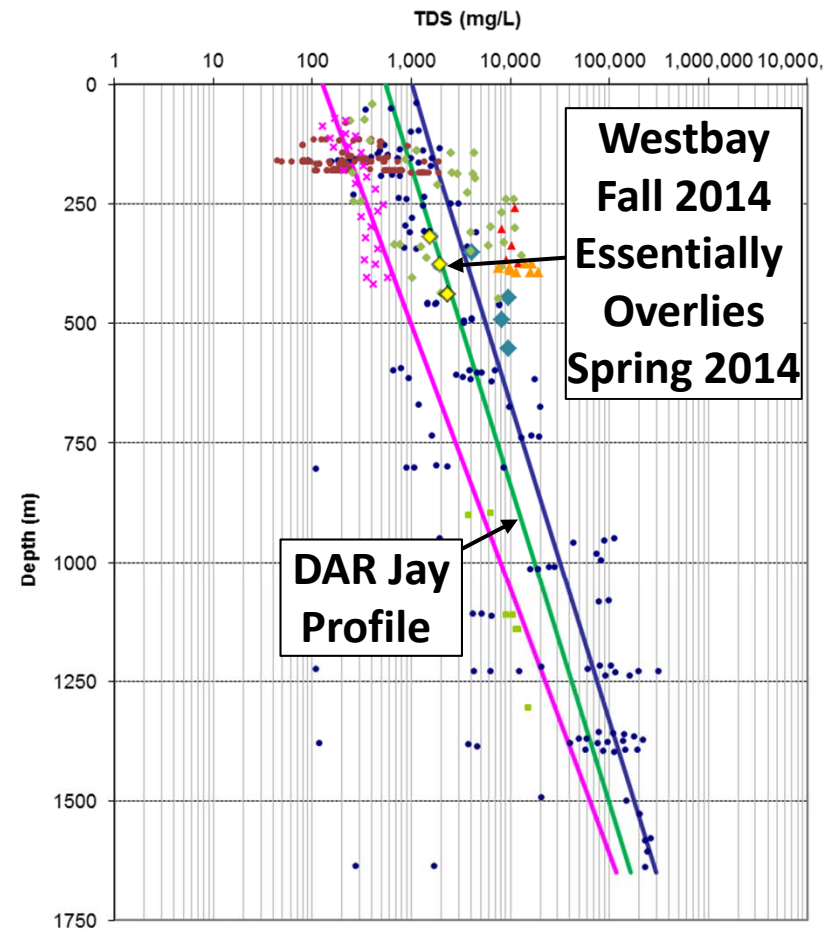
- Site data
 - Hydraulic Testing
 - Westbay Monitoring Well
- Ekati and Diavik data



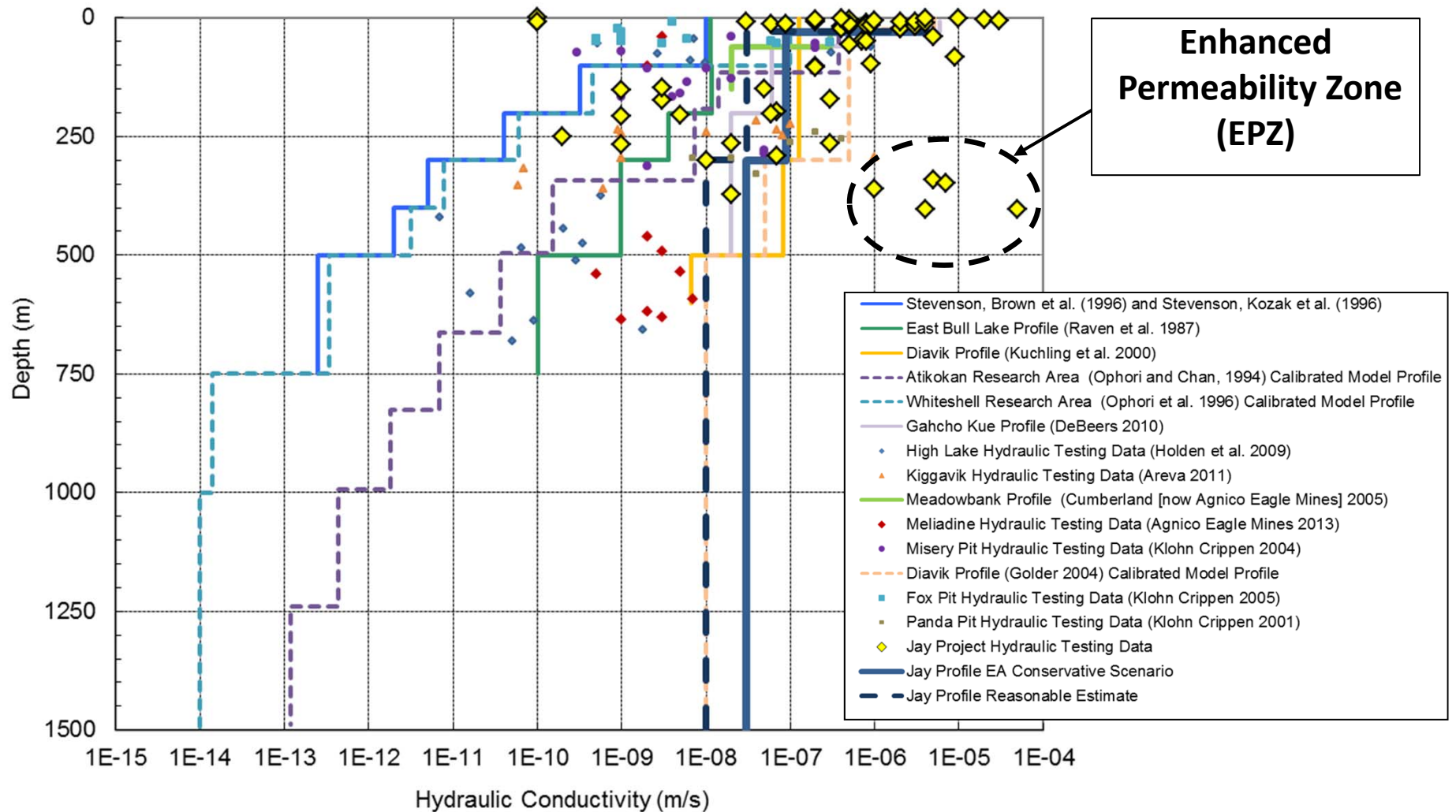
Existing Environment - Results

Baseline Groundwater Quality

- Installation and sampling in spring 2014 presented in the DAR
- Sampling in Fall 2014 in Westbay yielded concentrations of individual parameters similar to those in the DAR
- Further sampling Spring 2015



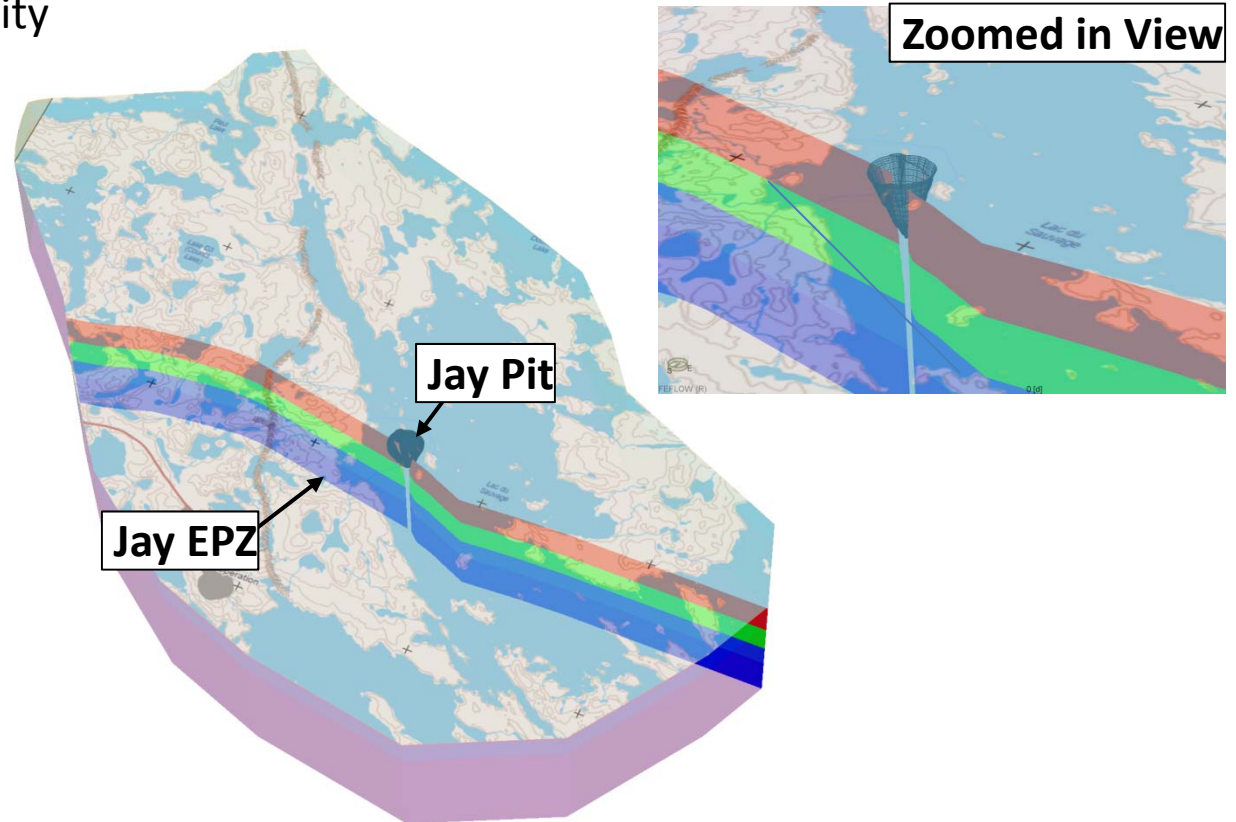
Existing Environment - Results



Assessment – Conservative Assumptions

Assumed Enhanced Permeability Zone (EPZ)

- Vertical orientation
- In direct contact with the Jay Pipe at all depth intervals
- Intersects the walls of the open pit to the pit bottom
- Vertically and laterally continuous throughout the model domain



█	EPZ (25 to 400 m depth) $K = 1 \times 10^{-5}$ m/s
█	EPZ (400 to 750 m depth) $K = 5 \times 10^{-6}$ m/s
█	EPZ (750 to 1,000 m depth) $K = 5 \times 10^{-7}$ m/s
█	EPZ (1,000 to 1,500 m depth) $K = 1 \times 10^{-7}$ m/s

Assessment – Conservative Assumptions

Reasonable Estimate Case (presented in the Compendium)

Conservative Parameter Values where uncertain
(literature, analogue sites)

Neglects Density Effects

60 m wide EPZ

Hydraulic Conductivity of Bedrock based on
Hydraulic Testing

Reasonably Conservative Predictions

EA Conservative Scenario (presented in the DAR)

Conservative Parameter Values where uncertain
(literature, analogue sites)

Neglects Density Effects

100 m wide EPZ

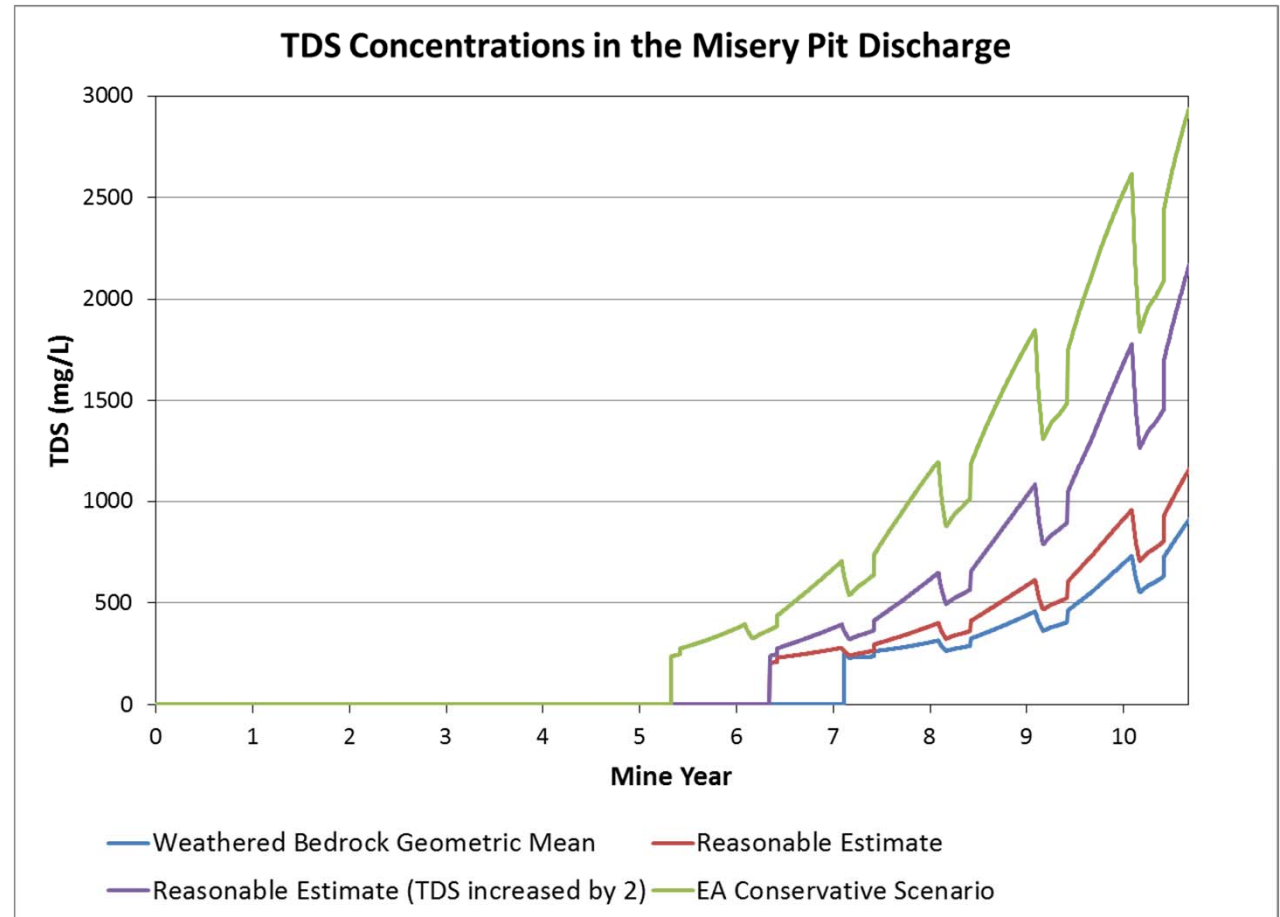
Hydraulic Conductivity of Bedrock **increased by 3 times**

**High Level of Confidence that Effects to the
Environment have not been Underestimated**

Assessment – Results

Additional Sensitivity Analysis in Response to Information Requests

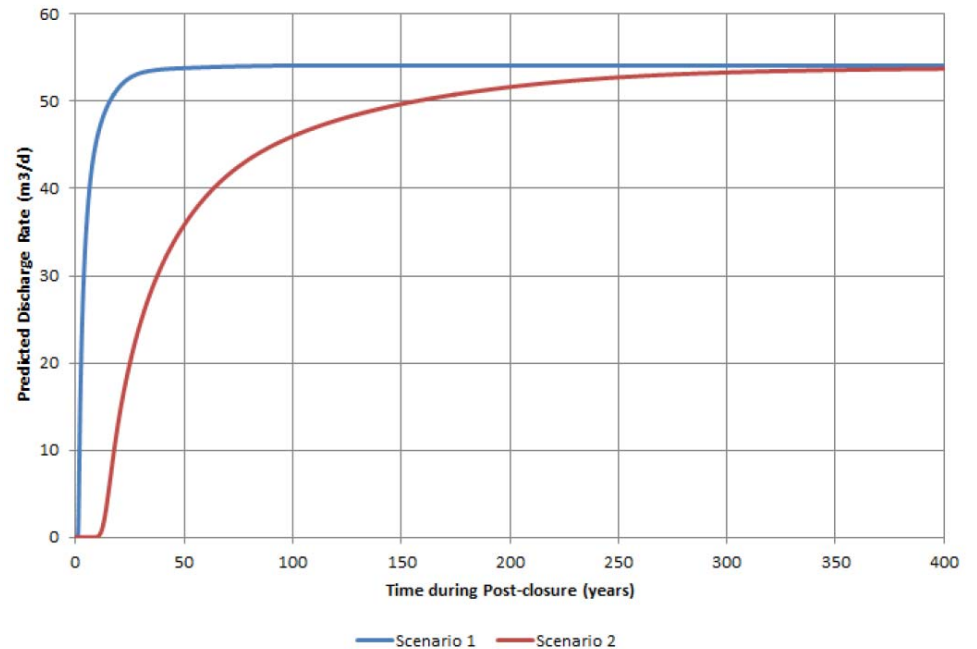
- Projections of groundwater inflow quality and quantity, together with surface water and ppt. are inputs to site wide water quality
- EA Conservative Scenario results in the earliest and highest concentrations in discharge
- Higher groundwater quantity is the dominant factor



Assessment – Results

Misery Pit

- Inflow to Misery Pit during operations at Jay will be negligible compared to minewater from Jay; therefore, modelling was performed for post-closure only
- Conservatively assumed EPZ connects Misery Pit to Lac de Gras
- Input to hydrodynamic model

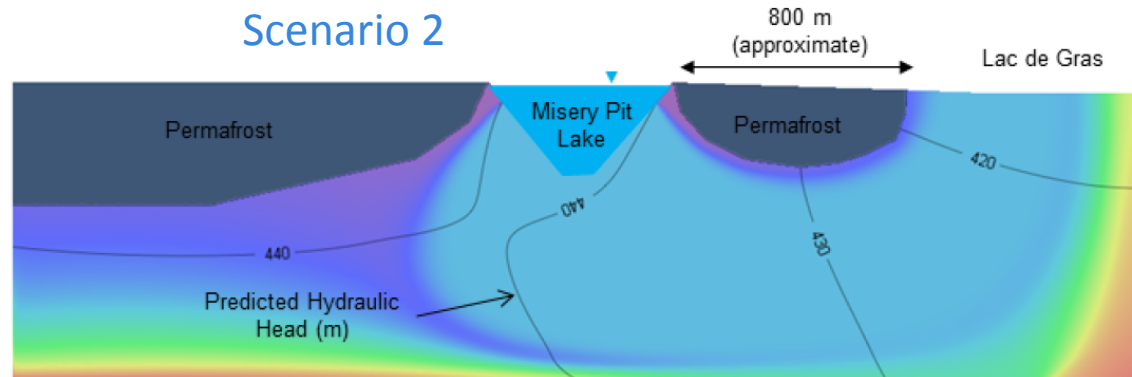


NOTES:
Shading represents
predicted TDS in mg/L.

14791.8
13319.1
11846.4
10373.7
8901.06
7428.38
5955.7
4483.03
3010.35
1537.68
65

0 200 400
[m]

Scenario 2



C. Post-Closure Year 100



Summary

- Conservative assumptions were used in the analysis
- Project results in local changes to groundwater quantity and quality
- Local changes to groundwater quality have no significant adverse effects to surface water quality
- After mining, groundwater levels (and quantity) will be near current/baseline conditions with negligible changes
- Negligible differences in lake water volumes are projected
- Predicted groundwater inflow (quantity and quality) will be validated during operational monitoring
- Monitoring programs developed in permitting phase

