

Magino Gold Project

Construction Phase Environmental Compliance Approval Application:

Groundwater Monitoring Plan (DRAFT)

TC180502

Prepared for:

Prodigy Gold Inc.

Box 209, 3 Dree Road. Dubreuilville, ON P0S 1B0

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Table of Contents

	Page
1.0 Introduction.....	1
2.0 Project description.....	1
2.1 New infrastructure.....	1
2.2 Fate of Brownfield areas.....	2
3.0 Hydrogeological setting	2
3.1 Physical Setting.....	2
3.1.1 Expected Changes during Construction/Operations	3
3.2 Groundwater Flow Regimes.....	3
4.0 Groundwater Monitoring.....	4
4.1 Monitoring Goals and Objectives.....	4
4.2 Summary of existing groundwater level monitoring data.....	4
4.3 Summary of existing groundwater quality data	5
4.4 Monitoring Locations	6
4.5 Methods.....	6
4.5.1 Frequency.....	6
4.5.2 Parameters	6
4.6 Trigger Criteria	7
4.7 Mitigation and Contingency Measures.....	7
4.8 Data Analysis and Reporting	7
5.0 References.....	8

List of Figures

- Figure 1: Site Plan
- Figure 2: Surface Water Features
- Figure 3: Surficial Geology Near Project Area
- Figure 4: Inferred Local Groundwater Flow Field
- Figure 5: Seasonal Water Level Variations Observed at HYD12-06A and HYD12-06B
- Figure 6: Seasonal Water Level Variations Observed During 2014 Mine Dewatering Trial
- Figure 7: Existing Groundwater Quality Monitoring Wells
- Figure 8: Existing and Proposed Groundwater Monitoring Stations

List of Attachments

- Attachment 1 Groundwater Piezometric Monitoring Data from 2012 to 2014
- Attachment 2 Summary of Groundwater Quality Monitoring Wells
- Attachment 3 2013 Groundwater Quality Results

1.0 INTRODUCTION

Prodigy Gold Inc. (Prodigy), a wholly-owned subsidiary of Argonaut Gold Inc., is proposing the construction, operation, decommissioning and closure of the Magino Gold Mine Project (the Project), situated at a past-producing mine site. A draft application package for an Environmental Compliance Approval (ECA) focused on activities to take place during the construction phase of the Project has been prepared by Wood Environment & Infrastructure Solutions (Wood), and was submitted to the Ministry of Environment, Conservation and Parks (MECP) on August 20, 2019 for a pre-submission review and discussion.

2.0 PROJECT DESCRIPTION

The Magino Project site ('Site') is a brownfield, past producing mine site. The most recent mining was completed in 1992, when the site was placed in care and maintenance. The site is accessed via Goudreau Road from Dubreuilville. Prodigy proposes the Project to include the construction, operation and closure of an open pit gold mine, with approximately 150 million tonnes (Mt) of ore and approximately 430 Mt of mine rock and associated infrastructure, to be developed on the historic mine footprint. The Project was designed to utilize the brownfield site area and infrastructure already in place at the site as practical, in order to minimize new environmental disturbance.

The Project will include an Open Pit, milling and processing complex, roads and pipelines, ore processing plant, a tailings management facility (TMF) and mine rock management facility, and stockpiles for the storage of overburden and waste rock.

Prodigy has completed a standard Environmental Assessment (EA) under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). Consultation and engagement was conducted during preparation of the Environmental Impact Statement Report with a wide range of stakeholders and Indigenous groups through various methods to gather feedback on the Magino Gold Project and the preliminary environmental assessment findings. Comments received during the draft Environmental Impact Statement Report reviews were responded to and as appropriate, addressed in the final Environmental Impact Statement Report. On January 24, 2019, the federal Minister of Environment and Climate Change issued a positive decision on the EA, determining that the Project was not likely to cause significant adverse environmental effects as per CEAA (2012).

In consultation with the Province of Ontario, the Ministry of Natural Resources and Forestry (MNRF) Class EA for Resource Stewardship and Facility Development Projects (RSFD) was applied to the project since the Magino site is a former mine site. Prodigy submitted a revised project description to MNRF in November 2016. On March 13, 2019 the MNRF issued the Approval of the Statement of Completion (Category B Project) and Prodigy was notified that MENDM would be applying the Ontario 'One Window' permitting coordination process to enable project permitting to proceed.

2.1 New infrastructure

Figure 1 provides the current Site plan for the proposed Magino Project. The major components of Magino Project are:

- Open Pit mine;
- Ore processing plant;
- Mine Rock Management Facility (MRMF);
- Overburden stockpiles;

- Ore stockpiles
- Tailings Management Facility (TMF);
- Site bypass road / ring road; and
- Water management infrastructure.

2.2 Fate of Brownfield areas

Existing brownfield areas will largely be overprinted by the development of the Open Pit, including the historic underground mine workings.

The existing tailings pond and polishing pond facilities cover an area of approximately 16 ha and 4.8 ha, respectively. Existing tailings will be tested to determine if they can be re-processed. The tailings will be excavated and hauled to the process plant for re-processing for gold as appropriate. In the event that these tailings are not reprocessed, they will be incorporated into the new TMF. The existing Provincially permitted tailings facility and polishing pond will initially be used for construction water management and storage in support of operations startup as these features are currently designated as a part of the existing Certificate of Authorization (C of A) – Industrial Sewage Works (CofA #4-0115-88-896). Portions of the area covered by the tailings facility will be incorporated into the Project facilities.

All rock used for the construction of the Project components will be sourced from the open pit, and potentially the historic mine rock stockpiles. Only non-acid generating mine rock will be used for construction.

3.0 HYDROGEOLOGICAL SETTING

3.1 Physical Setting

The project study area is located in the Wawa Sub-province of the Canadian Shield. The landscape at Site generally consists of ridges surrounded by low-lying areas which are dominated by lakes, stream, and wetlands (Roberston GeoConsultants, 2017). Local ground surface elevations (i.e. topography) near Site infrastructure range from approximately 480 masl at the high-point within the planned TMF to 390 masl near Spring Lake. The average annual precipitation for data gathered from the Magino Climate station for October 2011 to March 2016 was 764 mm, with mean daily temperatures ranging from -17 °C in February to 17 °C in August (SLR, 2016a).

Existing surface water features at Site, depicted in Figure 2, include numerous native lakes, ponds, and creeks, as well as an existing tailings facility pond. Surface water features are generally expected to act as either sources (i.e. losing) or sinks (i.e. gaining) to groundwater flow depending on local conditions. Streams in low-lying areas, which most features at Site represent, are typically expected to act as sinks.) Mean monthly flows from 2011 to 2016 for stations installed near Site generally had a wide range of values, with low-flows (likely representing 'base-flow' conditions) often less than 1 L/s, indicating that groundwater contributions to small creeks are likely limited (SLR, 2016a). Instantaneous flows in McVeigh Creek ranged from 10,289 L/s (May 2013 spring melt) to 0.46 L/s (July 2012). Surficial geology in the project area, depicted in Figure 3, consists of organics, colluvium, glaciofluvial sediments, and glacial till. Overburden thickness is typically approximately 2-3 m of thickness and mostly consists of glacial till (hydraulic conductivity of approximately 5×10^{-6} m/s) but is as much as 16 m in the area near the proposed Open Pit, where glaciofluvial sediments (hydraulic conductivity of approximately 3×10^{-4} m/s) are predominant (SLR, 2016b; Robertson GeoConsultants, 2017).

Permeability of the bedrock of controlled by localized fracturing and potentially by larger scale structures (i.e. faults). Hydraulic conductivity values from tests conducted in the upper 60 m were highly variable

(<10⁻⁸ to >10⁻⁴ m/s with a geometric average of approximately 8×10⁻⁷ m/s). Hydraulic conductivities generally decrease with depth (SLR, 2016b; Robertson GeoConsultants, 2017).

Two underground mines are located near the proposed Magino Open Pit Site:

1) Historic Magino Underground Mine Workings, which was mined from 1987 to 1992 and is now flooded. A mine dewatering test was conducted between July 1 and August, 2014 to assess the response of the local groundwater system to dewatering. During this test, the mine was pumped at 2,742 m³/day for 48 days, then 1,830 m³/day for 7 days. Drawdowns measured in the mine shaft during this test reached approximately 13 m after 48 days of pumping. The largest groundwater well drawdown resulting from dewatering was observed in GT12-11 (approximately 11 m); and

2) Richmond Underground Mine, which is located approximately 1.5 km northeast of the proposed Magino Open Pit (i.e. beneath Goudreau Lake) and is dewatered at approximately 1730 m³/day based on records from 2010 to 2011 (Robertson GeoConsultants, 2017).

3.1.1 Expected Changes during Construction/Operations

Construction activities primarily interact with the water table during excavation for foundations, resulting in localized depression of the groundwater surface at these locations. These excavations are usually constructed to either competent overburden material or the top of bedrock. For this site, bedrock generally occurs within 2 or 3 m of groundwater surface, which limits the amount of drawdown to minimal changes. No significant long-term changes in groundwater conditions are expected during most of the foundation excavations.

Several changes to the local physical setting are expected based on the current mine design during operations. Surface infrastructure associated with the new mine development are depicted in Figure 1. Those relevant to the Site hydrogeological setting include:

- 1) *Open Pit Development*: The development and dewatering of the Open Pit will create a sink to the local groundwater system. The predicted inflow to the Open Pit at the End of Mine Life (i.e. Year 12) is approximately 6,117 m³/day (Robertson GeoConsultants, 2017). The historical Magino Underground Mine Workings and ground which formerly contained the mine's above ground infrastructure will be 'mined-out' as part of the Open Pit development.
- 2) *Surface Water Features*: Several natural features will be displaced/offset as part of the mine development. These changes are summarized in Figure 2. Several surface water management ponds and ditches, depicted in Figure 1, will be constructed as part of the mine development (e.g. a perimeter drainage collection ditch, detention ponds, etc.).
- 3) *Mine Site Surface Infrastructure*: The site surface topography will be altered by the construction of the TMF/MRMF, several perimeter stockpiles, Mill Area, and Crusher (Figure 1). Groundwater will tend to mound within these facilities, depending on the permeability of the material contained within.

3.2 Groundwater Flow Regimes

Figure 4 shows groundwater levels in meters above sea level (masl) and inferred groundwater flow directions observed in existing monitoring wells in October 2013.

Piezometric levels are generally a subdued version of the underlying (lower permeability) bedrock topography with groundwater generally flowing from topographic highs in the centre portion of the project area towards lower elevations and surface water bodies in the southwest (Lovell, Webb and Goudreau Lakes), south (Spring Lake) and northwest (Waterbodies 9, 8, and 7).

Horizontal gradients are typically greater in areas of high topographic relief than in areas of low relief. Very low horizontal gradients are observed in the areas with glaciofluvial sediments due to the presence of the high K sediments and underlying historic mine workings, which act as a local zone with relatively higher K compared to the low permeability undisturbed bedrock.

Upward vertical gradients were observed in March 2013 in several wells in lower lying areas, indicating that groundwater likely discharges towards those local surface water bodies. In contrast, the largest downward vertical gradient (0.16 m/m) on Site was noted at the north shore of Goudreau lake, which is likely caused by depressurized underground workings in the vicinity of that well.

Additional discussion of Site-specific data are provided in Section 4.2.

4.0 GROUNDWATER MONITORING

4.1 Monitoring Goals and Objectives

The overall goal of this groundwater monitoring is to provide an early indication of seepage migration to sensitive surface water receptors and potential offsite migration of mine-site derived seepage. The objectives of groundwater monitoring are to:

- 1) Monitor changes in the hydraulic regime of subsurface flow near potential receptors due to above ground mine site construction/operations (open pit dewatering monitoring will be addressed separately);
- 2) Conform that only minor groundwater quality changes from baseline conditions occur during mine development; and
- 3) Identify areas where additional mitigation controls (e.g. recovery wells) might be needed based on flow and water quality observations.

4.2 Summary of existing groundwater level monitoring data

Monthly monitoring of groundwater levels was conducted from the period of September 2012 through March 2014 by Argonaut personnel. A summary of groundwater level measurements from October 2013 and January 2014 is provided in Attachment 1. It can be noted that groundwater levels measured in monitoring wells screened in overburden range from 0 to 2 mbgs indicating that the overburden is mostly saturated with the water table close to surface, which is typical of environments where either gradients are low (e.g. often at wetlands) or the materials of low hydraulic conductivity. Bedrock groundwater monitoring data also show, in general, that hydraulic heads within 1 to 3 m, or at the surface, even in areas of notable topographic highs, which is an indication of low permeability of the bedrock. The greatest depth below ground surface (approximately 15 to 20 m) was measured in MW/HYD 13-14 and MW/HYD 13-16, located on the north shore of Goudreau Lake on the Richmond Mine Site Property. This localized depression in the groundwater levels is considered to be related to the underground workings at the Richmond Mine Site and the influences on the shallow bedrock aquifer is likely limited to the immediate vicinity of the workings.

Figures 5 and 6 show typical seasonal variations in groundwater levels in four selected monitoring wells, which were located within and in proximity of the MRMF footprint, and not affected by pumping from the

Magino underground workings. Maximum seasonal variations in groundwater levels vary from less than 0.5 m in low-lying areas, which may be controlled by larger surface water bodies, to more than 2 m in higher elevation area e.g. at HYD-12-02A, where drainage would be limited by the low permeability of the bedrock. In general, groundwater level increases at the end of spring freshet (May-June) and during the early fall (September-October) in response to heavy precipitation. During the winter month, groundwater levels gradually decreases due to the lack of recharge.

4.3 Summary of existing groundwater quality data

Groundwater quality was monitored in 28 groundwater wells located in the project area. A summary for the groundwater quality monitoring wells is provided in Attachment 2. These wells provided groundwater quality data for the overburden, shallow bedrock (upper 60 m), and deep bedrock. Locations of these monitoring wells were identified in Figure 7, grouped by layers in different color. When analyzing, these wells were further subdivided into three groups given their locations relative to proposed mine infrastructure: TMF, MRMF and Open Pit. Groundwater quality at the Open pit footprint is potentially impacted by historical mining activities.

Groundwater at the existing mine site is not used as a source of drinking water. Groundwater quality data were compared to Provincial Water Quality Objectives (PWQO) and Ontario Drinking Water Quality Standards (ODWQS) to provide a frame of reference. (It should be noted that PWQO is typically not used for evaluating groundwater quality due to the frequent occurrence of higher metal concentrations in groundwater, which is more prone to having reducing conditions than surface water). Table 1 provides a summary of the groundwater sampling results in terms of parameters that exceeded ODWQS or PWQO limits. A summary for the full parameters is provided in Attachment 3.

Overall, groundwater quality sampling results indicate that the groundwater in the project area is of good quality. (Note that the high concentrations of total metal concentrations compared to dissolved concentrations are assumed to be due to the digestive of sediment by acid either as preservatives the sample bottles or by the lab, and only the dissolved metal concentrations are discussed here). The groundwater quality improves with depth. More specific findings were summarized below:

- Several ODWQS and PWQO parameters were exceeded from the overburden zone down to deep bedrock including Dissolved Organic Carbon (DOC), and three dissolved metals (iron, manganese and silver). Exceedances of iron and manganese were both detected throughout the site, but with higher concentrations near the area of previous mining activities, while no exceedance of silver was observed in this area.
- Limits of cyanide, cadmium, chromium, copper and nickel were only exceeded in the overburden zone and only in a few wells. Slight exceedances of nickel and copper were only observed in MW09-02, which is located in the area of previous mining activities on the north shore of Webb Lake. In wells HYD-12-02B, HYD-03B and HYD-12-04B, located to the west of the historical mine site, cyanide was reported as slightly above the PWQO limit but within the ODWQS in one out of several sampling events, which given that cyanide is generally not a naturally occurring compound and location, is likely due to analytical error more than due to contamination.
- Two wells exhibited slightly elevated values of sulphate (SO₄) at 99 mg/L for MW09-02 and 138 mg/L for HYD-12-05B. MW09-02 is located in the area of previous mining activities by Webb Lake with exposed bedrock and residual ore, while HYD-05A is located in shallow bedrock by Spring lake. The elevated sulphate is considered to be the result of the mineralization of the rock in the area (Prodigy Gold Incorporation, 2017) or in the case of MW12-09 residual ore. There is no water quality standard assigned by ODWQS or PWQO for sulphate; however, it should be noted that even for the highest sulphate level in HYD-05B, it was still considered to be relatively low.

4.4 Monitoring Locations

Existing and proposed groundwater monitoring stations at Site are depicted in Figure 8. Many of the existing groundwater monitoring stations are expected to be affected by the construction of mine site infrastructure or the Open Pit; however, several are likely to be unaffected (e.g. HYD12-12A/B), and can be utilized for future monitoring. Additional proposed monitoring wells ('MW20' series in Figure 8) are emplaced based on the locations of potential sources (e.g. TMF Supernatant Pond) and potential receptors (e.g. Unnamed Water Body 9). The main potential sources of groundwater quality changes have each been given multiple monitoring wells (up to 13 for the TMF/MRMF), with each main potential receptor having at least one monitoring well. This was thought sufficient to for a monitoring well network to identify trends in groundwater quality changes created by features as large as the TMF/MRMF.

Results from hydraulic conductivity testing conducted at site indicate that the upper 60 m of bedrock tends to have the highest hydraulic conductivity for bedrock (Robertson GeoConsultants, 2017). As such, monitoring wells should generally be installed as open hole wells cased to competent bedrock and installed to a maximum depth of 60m. In addition, twined/nested screened monitoring well installations should be made where overburden aquifers are encountered during drilling. These screened installations will be more likely in the southeastern area of site (i.e. near the Open Pit), where glaciofluvial sediments dominate the surficial geology (as opposed to the central, northwestern section of Site, where glacial till and bedrock outcrops tend to dominate the surficial geology). A description of the proposed MW20-series installations is given in Table 2.

A summary of existing groundwater monitoring wells that are not expected to be affected by mine construction is provided in Table 3. Groundwater sampling can be conducted from standard monitoring wells, but not from vibrating wire piezometers.

4.5 Methods

Sampling will be performed to industry standards and in accordance with protocols established by the MOE (1996). Initial monitoring which defines the baseline or background chemical properties of groundwater needs to be established before any mining activities (typically requires at least 12 months).

- The total depth and depth to the water level should be measured using a calibrated water level meter.
- During well purging, measurements of field parameters (pH, temperature, and conductivity) will be made, and purging will continue until the field parameters stabilize to within $\pm 10\%$ of the last measurement. If the monitoring well goes dry prior to sampling, the wells will be allowed to recover, and then purged a second time, and following recovery the sample will then be collected. Alternatively, low flow sampling techniques can be considered.
- Collections of groundwater sample will be performed following the purging of each bore. Field measurements of the final samples will be made for temperature, pH, conductivity and alkalinity. All wells are sampled directly into laboratory supplied containers, only samples for metals analysis are field filtered.

4.5.1 Frequency

Groundwater sampling will be conducted three times a year (i.e. quarterly events, excluding the frozen winter months) during the first five years, then on annual basis thereafter.

4.5.2 Parameters

Groundwater quality sampling parameters are listed in Table 6.

4.6 Trigger Criteria

If three consecutive final groundwater sampling results show a clear trend of increasing concentrations of metals or major anions above historical levels, then further investigation will be triggered.

4.7 Mitigation and Contingency Measures

The requirement for and implementation of additional mitigation measures (i.e. beyond those included as part of the mine infrastructure design) will be informed by the results of water quality and water level monitoring and subsequent evaluation of the trigger criteria. The primary control measure will be remedial pumping wells. Installation parameters of remedial pumping wells (i.e. location, target depth/unit, expected pumping level/rate) will be governed by: the inferred flow pathway from the source, the positions of nearby receptor(s), hydrostratigraphy based on nearby borehole information, and monitoring data.

Note, the current mine design includes a dug ditch collection system as well as shallow subsurface underdrains and grout walls that surround the perimeter of the TMF/MRMF. It is expected that these features will be effective at intercepting seepage from the TMF/MRMF (Robertson GeoConsultants, 2017). Furthermore, the water quality may not be expected to be poor considering the low possibilities of acid rock drainage (ARD) and low degree of chemical weathering on the site.

4.8 Data Analysis and Reporting

Monitoring data will be compiled, reviewed, and submitted to the MECP on an annual basis.

5.0 REFERENCES

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Table 1: Summary of Exceedances of ODWQS and PWQO Limits – Overburden zone.

ZONE Constituent	LIMITS		OVERBURDEN				TMF			MRMF			Open Pit		
	ODWQS	PWQO	Ave.	Min.	Max.	%	Ave.	Max.	%	Ave.	Max.	%	Ave.	Max.	%
	mg/L	mg/L	mg/L	mg/L	mg/L	Exceeded	mg/L	mg/L	Exceeded	mg/L	mg/L	Exceeded	mg/L	mg/L	Exceeded
Phosphorus (T)	-	0.03	0.026	0.005	0.03	0	0.03	0.03	0	-	-	0	0.026	0.03	0
Organic Carbon (D)	5	-	7.36	2.3	23.9	50	8.32	23.9	17	5.3	5.3	8	6.9	12.9	25
Sulfate (SO ₄)	-	-	19	2	99.2	0	6.4	7.8	0	-	0	0	31.6	99.2	0
Cyanide	0.2	0.005	0.0025	0.002	0.0054	8	0.0023	0.0036	0	0.0054	0.0054	8	0.0022	0.003	0
Cadmium (Cd)-Dissolved	0.005	0.0005	0.00098	0.00009	0.01	17	0.00009	0.00009	0	0.01	0.01	8	0.00022	0.00089	8
Chromium (Cr)-Dissolved	0.05	0.0089	1.52	0.0005	18.2	8	0.00065	0.0013	0	18.2	18.2	8	0.00058	0.00098	0
Cobalt (Co)-Dissolved	-	0.0009	0.0027	0.0005	0.023	33	0.0013	0.0021	25	0.0005	0.0005	0	0.0043	0.023	8
Copper (Cu)-Dissolved	-	0.005	0.0027	0.001	0.015	8	0.0013	0.0019	0	0.0031	0.0031	0	0.0038	0.015	8
Iron (Fe)-Dissolved	0.3	0.3	1.21	0.05	10.4	42	0.59	2.34	17	0.38	0.38	8	1.86	10.4	17
Manganese (Mn)-Dissolved	0.05	-	1.17	0.001	6.86	83	0.49	1.1	42	1.61	1.61	8	1.66	6.86	33
Nickel (Ni)-Dissolved	-	0.025	0.0044	0.001	0.027	8	0.0012	0.0016	0	0.014	0.014	0	0.0054	0.027	8
Silver (Ag)-Dissolved	-	0.0001	0.33	0.0001	4	25	0.00011	0.00013	17	4	4	8	0.0001	0.0001	0



Table 2: Summary of Exceedances of ODWQS and PWQO Limits – Shallow Bedrock.

ZONE Constituent	LIMITS		SHALLOW Bedrock				MRMF		
	ODWQS	PWQO	Ave.	Min.	Max.	%	Ave.	Max.	%
	mg/L	mg/L	mg/L	mg/L	mg/L	Exceeded	mg/L	mg/L	Exceeded
Phosphorus (T)	-	0.03	0.028	0.019	0.03	0	0.028	0.03	0
Organic Carbon (D)	5	-	9.88	3.9	22.6	80	9.88	22.6	80
Sulfate (SO ₄)	-	-	34.52	4.86	138	0	34.52	138	0
Cyanide	0.2	0.005	0.0028	0.002	0.0049	0	0.0028	0.0049	0
Cadmium (Cd)-Dissolved	0.005	0.0005	0.00016	0.00009	0.00043	0	0.00016	0.00043	0
Chromium (Cr)-Dissolved	0.05	0.0089	0.00076	0.0005	0.0018	0	0.00076	0.0018	0
Cobalt (Co)-Dissolved	-	0.0009	0.0011	0.0005	0.0027	40	0.0011	0.0027	40
Copper (Cu)-Dissolved	-	0.005	0.0019	0.001	0.0035	0	0.0019	0.0035	0
Iron (Fe)-Dissolved	0.3	0.3	1.15	0.05	2.66	60	1.15	2.66	60
Manganese (Mn)-Dissolved	0.05	-	0.28	0.0071	0.58	80	0.28	0.58	80
Nickel (Ni)-Dissolved	-	0.025	0.0016	0.001	0.0034	0	0.0016	0.0034	0
Silver (Ag)-Dissolved	-	0.0001	0.00013	0.0001	0.00024	20	0.00013	0.00024	20

Table 3: Summary of Exceedances of ODWQS and PWQO Limits – Deep Bedrock.

ZONE Constituent	LIMITS		BEDROCK				MRMF			Open pit		
	ODWQS	PWQO	Ave.	Min.	Max.	%	Ave.	Max.	%	Ave.	Max.	%
	mg/L	mg/L	mg/L	mg/L	mg/L	Exceeded	mg/L	mg/L	Exceeded	mg/L	mg/L	Exceeded
Phosphorus (T)	-	0.03	0.032	0.03	0.05	18	0.034	0.05	18	0.03	0.03	0
Organic Carbon (D)	5	-	7.6	1.5	24.5	27	8.97	24.5	18	5.2	7.8	11
Sulfate (SO ₄)	-	-	9.91	3.05	18.5		11.73	18.5		6.74	9.92	0
Cyanide	0.2	0.005	0.002	0.002	0.002	0	0.002	0.002	0	0.002	0.002	0
Cadmium (Cd)-Dissolved	0.005	0.0005	0.0001	0.00009	0.00016	0	0.0001	0.00016	0	0.0001	0.0001	0
Chromium (Cr)-Dissolved	0.05	0.0089	0.00062	0.0005	0.0015	0	0.00064	0.0015	0	0.00058	0.00083	0
Cobalt (Co)-Dissolved	-	0.0009	0.00059	0.0005	0.0009	0	0.00059	0.0009	0	0.0006	0.00088	0
Copper (Cu)-Dissolved	-	0.005	0.0013	0.001	0.0025	0	0.0014	0.0025	0	0.001	0.001	0
Iron (Fe)-Dissolved	0.3	0.3	0.32	0.05	1.04	36	0.2	0.74	9	0.54	1.04	33
Manganese (Mn)-Dissolved	0.05	-	0.18	0.047	0.36	91	0.13	0.27	55	0.26	0.36	44
Nickel (Ni)-Dissolved	-	0.025	0.0014	0.001	0.0046	0	0.0016	0.0046	0	0.0011	0.0013	0
Silver (Ag)-Dissolved	-	0.0001	0.00011	0.0001	0.00018	9	0.00011	0.00018	9	0.0001	0.0001	0



Table 4: Proposed MW20-series Monitoring Well Installations

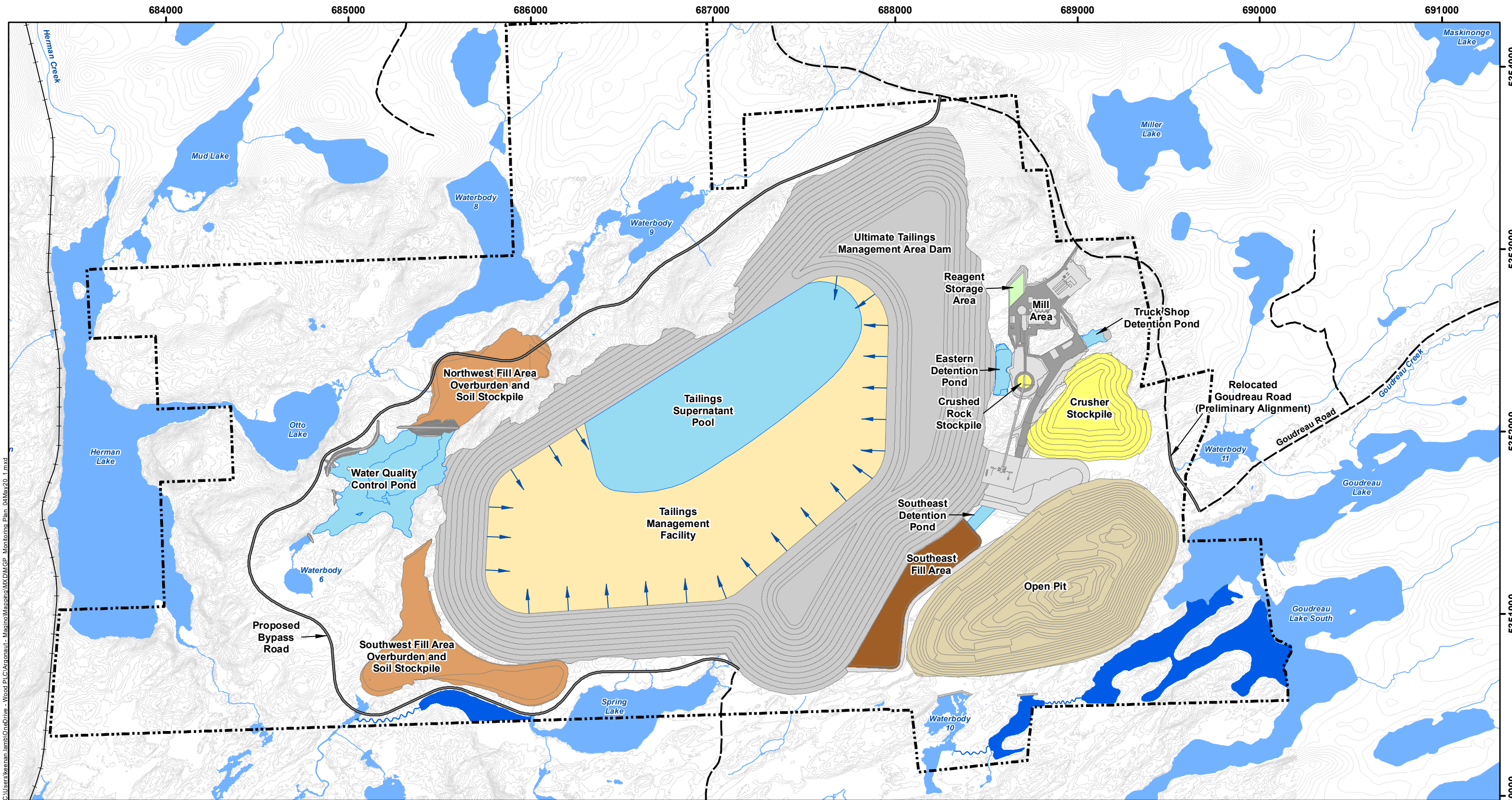
Monitoring Well ID	Justification
MW20-1	Near the Crusher Pad
MW20-2	Near the Mill Area
MW20-3	Downgradient of Mill Area
MW20-4	Downgradient of TMF/MRMF. Upgradient of Miler Lake
MW20-5	Downgradient of TMF/MRMF. Upgradient of Waterbody 8/9.
MW20-6	Downgradient of TMF/MRMF. Upgradient of Waterbody 9.
MW20-7	Downgradient of TMF/MRMF. Upgradient of tributary to Waterbody 9.
MW20-8	Downgradient of Water Quality Control Pond. Upgradient of Otto Lake.
MW20-9	Downgradient of TMF/MRMF. Upgradient of Waterbody 6.
MW20-10	Downgradient of TMF/MRMF and NW Fill Area. Upgradient of Waterbody 9.
MW20-11	Downgradient of TMF/MRMF. Upgradient of tributary to Waterbody 9.
MW20-12	Downgradient of TMF/MRMF. Upgradient of Spring Lake.
MW20-13	Downgradient of TMF/MRMF. Upgradient of Waterbody 6.
MW20-14	Near the Crusher Pad
MW20-15	Downgradient of TMF/MRMF. Upgradient of McVeigh Creek.
MW20-16	Downgradient of TMF/MRMF. Near Spring Lake.
MW20-17	Downgradient of TMF/MRMF.
MW20-18	Downgradient of Mill Area

Table 5: Existing Groundwater Monitoring Stations Likely to be Unaffected by Mine Construction

Monitoring Well ID	Installation Type	Unit	Description
HYD-12-12A/B	Twinned Monitoring Wells	Bedrock	Downgradient of TMF/MRMF. Upgradient of Waterbody 8
GEO/HYD13-03	Monitoring Well	Unknown	Downgradient of TMF/MRMF. Upgradient of Water Quality Control Pond
HYD-12-06A/B	Twinned Monitoring Wells	Bedrock	Downgradient of TMF/MRMF. Upgradient of Spring Lake
HYD-12-11A/B	Twinned Monitoring Wells	Bedrock / Overburden	Downgradient of TMF/MRMF. Near Crusher Pad. Upgradient of Open Pit.
Mw/HYD13-14a/b/c	Vibrating Wire Piezometers (3)	Bedrock	Near Open Pit. Adjacent to Goudreau Lake
MW/HYD13-16	Monitoring Well	Bedrock	Near Open Pit. Adjacent to Goudreau Lake

Table 6: Groundwater Analytical Parameters.

Field Measurements	Water level, temperature, pH, conductivity, alkalinity
Dissolved Metals	Aluminum (Al), Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Bismuth (Bi), Boron (B), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Copper (Cu), Iron (Fe), Lead (Pb), Lithium (Li), Magnesium (Mg), Manganese (Mn), Molybdenum (Mo), Nickel (Ni), Silver (Ag), Strontium (Sr), Thallium (Tl), Tin (Sn), Titanium (Ti), Tungsten (W), Uranium (U), Vanadium (V), Zinc (Zn), Zirconium (Zr)
Major Anions	Sulphate (SO ₄), Cyanide (CN), Chloride (Cl), Carbonate (CO ₃)
Major Cations	Calcium (Ca), Potassium (K), Sodium (Na),
Others	Dissolved organic carbon, phosphorus



LEGEND

Property Boundary	Fill Area	Road Realignment
Watercourse	Open Pit	Overburden and Soil Stockpile
Waterbody	Mill Site	Crushed Rock Stockpile
Existing Roads	Mill Site Roads	Reagent Storage Area
Railway	Pond	Diversion Channels and Habitat Compensation/Offsetting Areas
Contours (2 m interval)	Tailings Management Facility	Dam

NOTES:
 - Contours derived from 2013 LIDAR survey and LIO provincial digital elevation model.
 - Proposed 35 KTPD site features provided by Prodigy, April 10, 2019.
 - Property boundary based on land tenure provided by Prodigy, June 2019.
 - Bypass and access roads provided by TBTE, December 20, 2019.
 - Waterbodies and watercourses provided by Minnow.

Datum: NAD83
 Projection: UTM Zone 16N

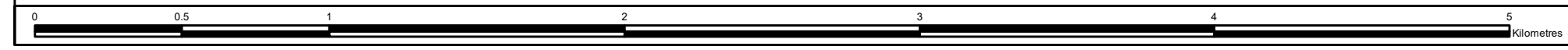
PRODIGY wood.
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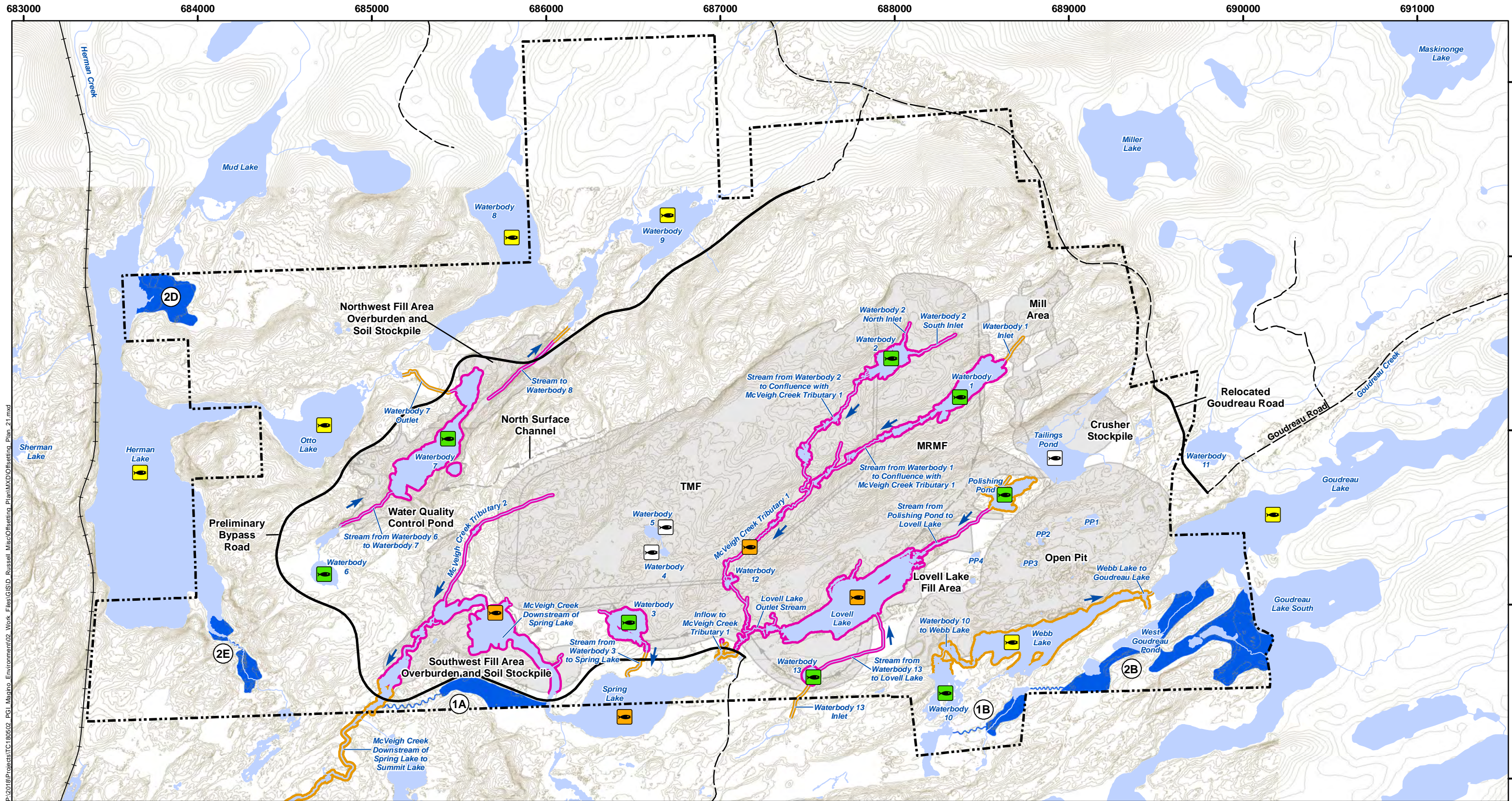
MAGINO GOLD PROJECT

Site Plan

PROJECT N°: TC180502 **FIGURE: 1**

SCALE: 1:20,000 DATE: April 2020





LEGEND

Property Boundary	Contours (2 m interval)	Habitat Offsetting Options
Schedule 2 Listing	Railway	1A: McVeigh Creek Diversion Channel between Spring Lake and McVeigh Creek Downstream of the TMF
Section 35 Authorization	Existing Roads	1B: Diversion Channel from Waterbody 10 to Goudreau Lake
Mine Infrastructure	Captured Fish Species	2B: New Lake / Basin West of Goudreau Lake South
Road Realignment	High Diversity Sportfish	2D: Contingency New Lake / Basin East of Herman Lake
Watercourse	Low Diversity Sportfish	2E: Contingency New Lake / Basin South of Herman Lake
Waterbody	Baitfish	
	None	

NOTES:

- Contours derived from 2013 LiDAR survey and LIO provincial digital elevation model.
- Proposed site features provided by SLR, May 8, 2019.
- Property boundary based on land tenure provided by Prodigy, June 2019.
- Waterbodies and watercourses provided by Minnow.

Datum: NAD83
Projection: UTM Zone 16N

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Surface Water Features

PROJECT N^o: TC180502 **FIGURE: 2**

SCALE: 1:21,000 DATE: October 2019



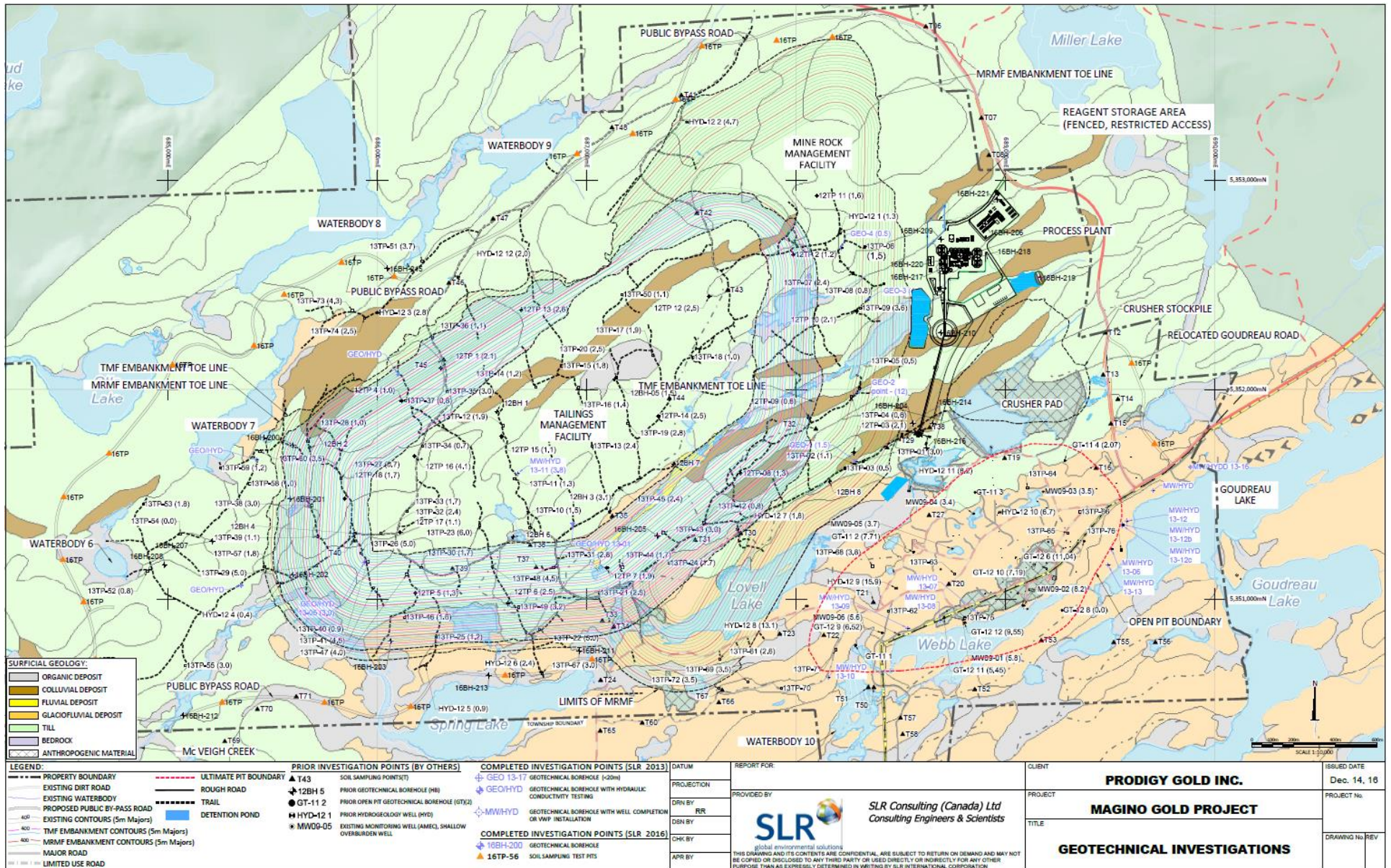


Figure 3: Surficial Geology near Project Area (from Robertson GeoConsultants, 2017).

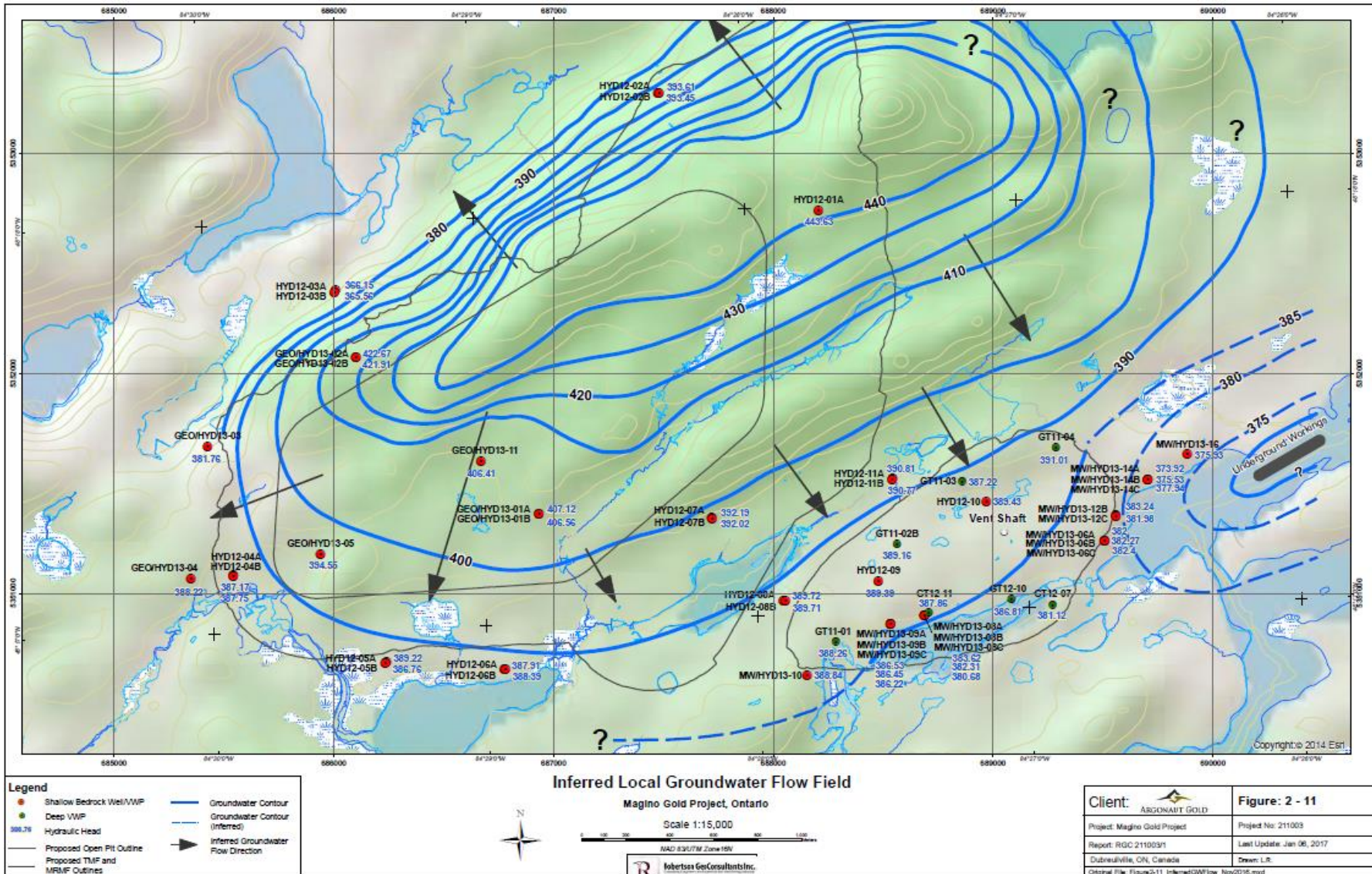


Figure 4: Inferred local groundwater flow field (from Robertson GeoConsultants, 2017).

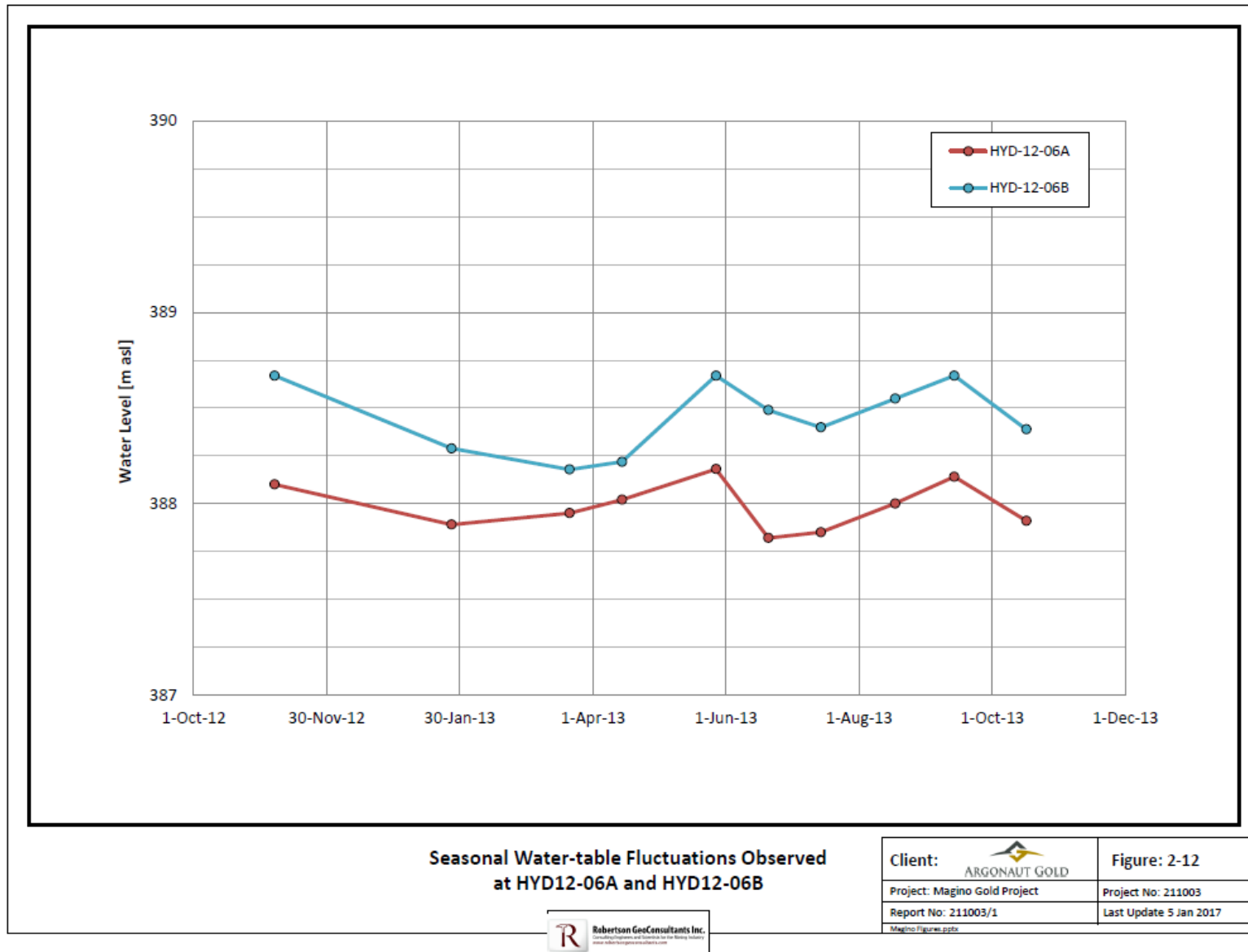


Figure 5: Seasonal water level variations observed at HYD12-06A and HYD12-06B (from Robertson GeoConsultants, 2017).

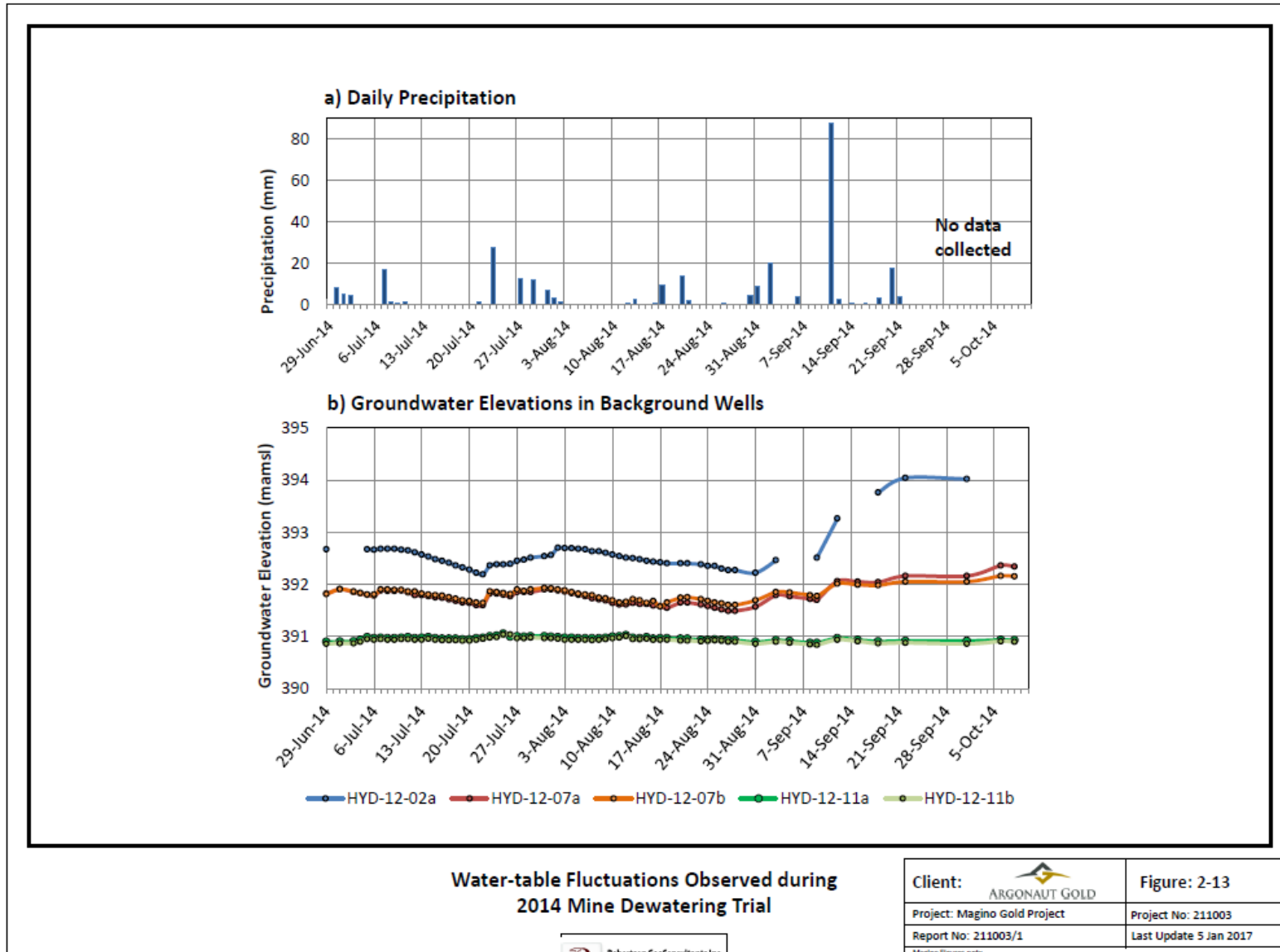
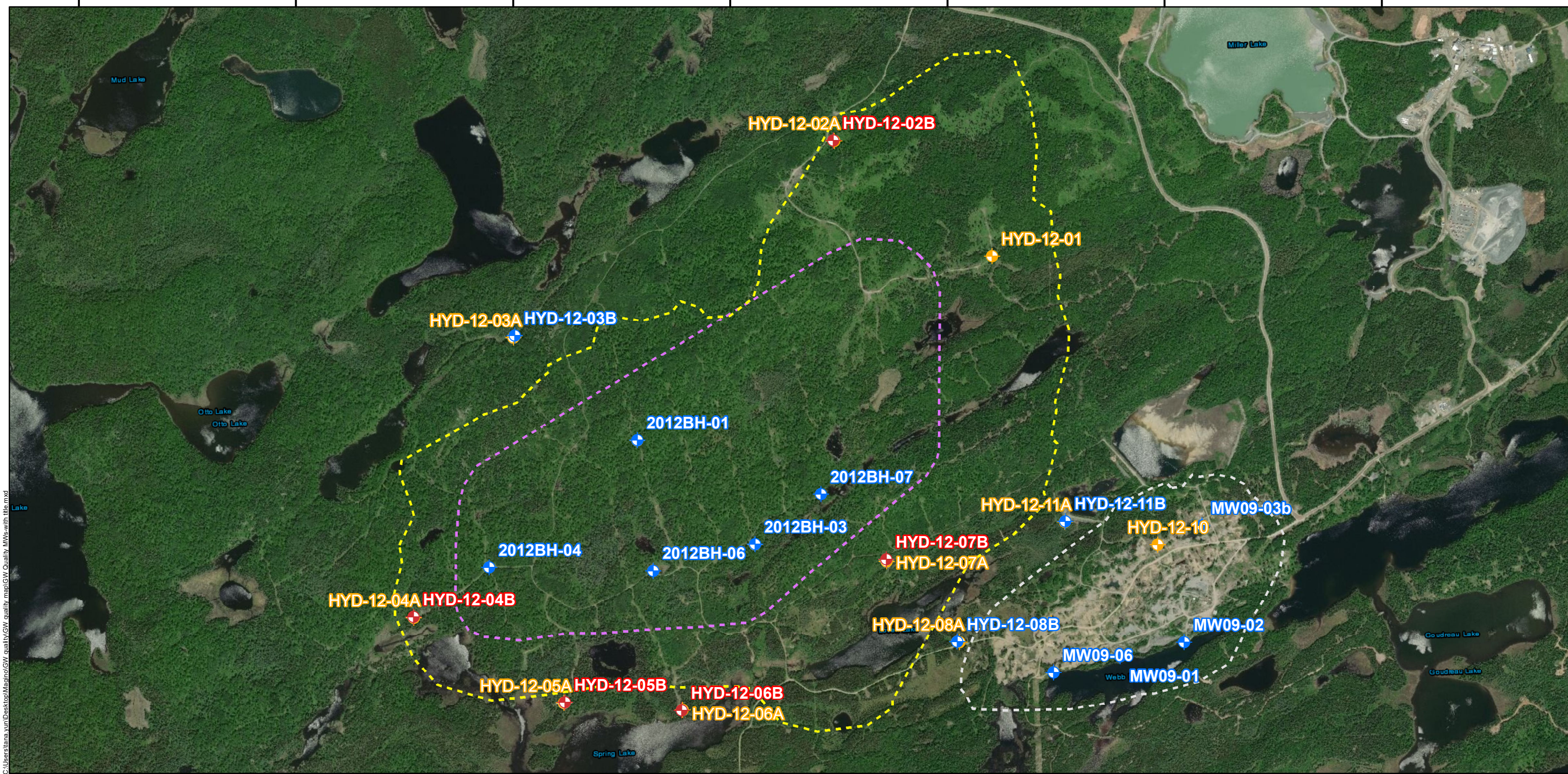


Figure 6: Seasonal water level variations observed during 2014 Mine Dewatering Trial (from Robertson GeoConsultants, 2017)

684000 685000 686000 687000 688000 689000 690000



5353000
5352000
5351000

LEGEND

	TMF Boundaries		Overburden Monitoring Wells
	MRMF Boundaries		Shallow Bedrock Monitoring Wells
	Open Pit Boundaries		Deep Bedrock Monitoring Wells

0 0.5 1 2 3 4
Kilometers

Notes:

Datum: NAD83
Projection: UTM Zone 16N



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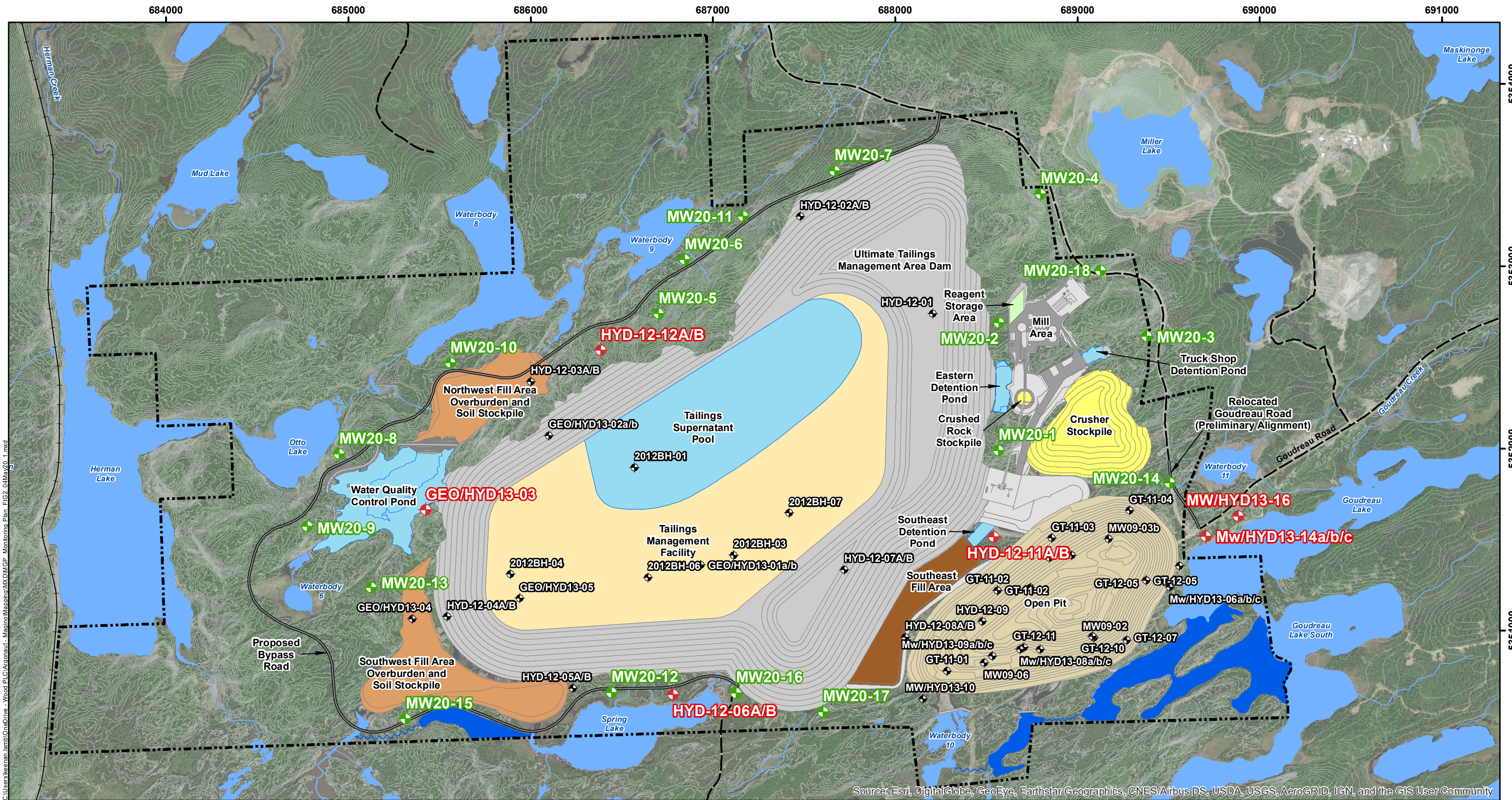
MAGINO GOLD PROJECT

Existing Groundwater Quality Monitoring Wells

PROJECT N^o: TC180502 **FIGURE: 7**

SCALE: DATE: May 2020

C:\Users\stana.vun\Desktop\Marino.GW_quality_map\GW_quality_map\MWIs-with_title.mxd



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

Property Boundary	Open Pit	Fill Area	Road Realignment
Watercourse	Mill Site	Overburden and Soil Stockpile	Proposed Monitoring Wells (to be retained)
Waterbody	Mill Site Roads	Crushed Rock Stockpile	Groundwater Monitoring Stations (to be retained)
Existing Roads	Pond	Reagent Storage Area	Groundwater Monitoring Stations (not retained)
Railway	Tailings Management Facility	Diversion Channels and Habitat Compensation/Offsetting Areas	
Contours (2 m interval)	Dam		

NOTES:
 - Contours derived from 2013 LIDAR survey and LIO provincial digital elevation model.
 - Proposed 35 KTPD site features provided by Prodigy, April 10, 2019.
 - Property boundary based on land tenure provided by Prodigy, June 2019.
 - Bypass and access roads provided by TBTE, December 20, 2019.
 - Waterbodies and watercourses provided by Minnow.

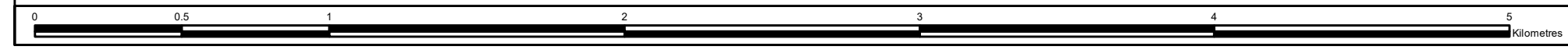
Datum: NAD83
 Projection: UTM Zone 16N

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Existing and Proposed Groundwater Monitoring Stations

PROJECT N°: TC180502	FIGURE: 8
SCALE: 1:20,000	DATE: May 2020



Attachment 1

Groundwater Piezometric Monitoring Data from 2012 to 2014

Appendix D-1 - Piezometric Level Monitoring

Borehole	UTM Coordinates		Elevation (m-amsl)	Installation ID	Monitoring Frequency	Stickup (m-ags)	Development Date	Date	Measured Water	Water Level (m)	Water Level (m)	Date	Measured Water	Water Level (m)	Water Level (m)	Date	Measured Water
	Eastings	Northing															
MW09-01	688796	5350900	387.54	-	Monthly*	0.73	November 4, 2012	3/22/2013	2.6	1.87	385.67	4/15/2013	2.62	1.89	385.65	5/28/2013	2.47
MW09-02	689091	5350964	386.63	-	Monthly*	0.76	NA	3/22/2013	.98 f	0.225	386.405	4/15/2013	1.79	1.03	385.6	5/28/2013	1.65
MW09-03b	689172	5351503	381.05	-	Monthly*	0.73	November 4, 2012	3/22/2013	0.8 f	0.075	380.975	4/15/2013	0.8 frozen	0.075	380.975	5/28/2013	under water
MW09-04	688846	5351403	389.10	-	Monthly*	0.73	NA	3/22/2013	0.5 f	-0.29	386.791	4/15/2013	0.5 frozen	-0.29	386.791	5/28/2013	under water
MW09-05	688742	5351237	388.68	-	Monthly*	0.65	NA	3/22/2013	frozen to top			4/15/2013	frozen to top			5/28/2013	under water
MW09-06	688489	5350826	386.50	-	Monthly*	0.79	NA	3/22/2013	1.53	0.74	385.761	4/15/2013	1.53	0.74	385.761	5/28/2013	0.9
HYD-12-01	688206	5352742	446.81	A	Monthly*	1.07	November 8, 2012	march22,2013	5.39	4.32	442.49	4/15/2013	5.35	4.28	442.53	5/28/2013	3.24
HYD-12-02	687480	5353274	395.84	A	Monthly*	0.97	November 9, 2012	march22,2013	5.28	4.31	391.52	4/15/2013	5.16	4.19	391.65	5/28/2013	2.90
	687475	5353276	395.52	B	Monthly*	1.02	November 9, 2012	march22,2013	5.63	4.61	390.91	4/15/2013	5.54	4.52	391.00	5/28/2013	2.03
HYD-12-03	686003	5352368	366.31	A	Monthly*	1.06	November 13, 2012	march22,2013	1.68	0.62	365.69	4/15/2013	1.61	0.55	365.76	5/28/2013	1.18
	686008	5352377	366.26	B	Monthly*	0.78	November 10, 2012	march22,2013	1.54	0.76	365.50	4/15/2013	1.53	0.75	365.51	5/28/2013	1.38
HYD-12-04	685543	5351078	388.68	A	Monthly*	1.17	November 7, 2012	march22,2013	3.20	2.03	386.65	4/15/2013	3.10	1.93	386.75	5/28/2013	2.66
	685542	5351081	388.72	B	Monthly*	1.15	November 9, 2012	march22,2013	3.48	2.33	386.39	4/15/2013	3.36	2.21	386.51	5/28/2013	2.76
HYD-12-05	686234	5350685	393.39	A	Monthly*	1.10	November 6, 2012	march22,2013	5.89	4.79	388.60	4/15/2013	5.79	4.69	388.70	5/28/2013	5.00
	686239	5350688	393.82	B	Monthly*	1.03		march22,2013	7.70	6.67	387.15	4/15/2013	7.69	6.66	387.16	5/28/2013	6.59
HYD-12-06	686781	5350653	389.79	A	Monthly*	0.79	November 5, 2012	march22,2013	2.63	1.84	387.95	4/15/2013	2.56	1.77	388.02	5/28/2013	2.40
	686776	5350652	390.05	B	Monthly*	1.12	November 5, 2012	march22,2013	2.99	1.87	388.18	4/15/2013	2.95	1.83	388.22	5/28/2013	2.50
HYD-12-07	687721	5351337	392.36	A	Monthly*	1.14	November 5, 2012	march22,2013	1.69	0.55	391.81	4/15/2013	1.52	0.38	391.98	5/28/2013	1.15
	687719	5351346	392.59	B	Monthly*	0.96	November 9, 2012	march22,2013	1.71	0.75	391.84	4/15/2013	1.59	0.63	391.96	5/28/2013	1.37
HYD-12-08	688056	5350966	391.47	A	Monthly*	1.20	November 3, 2012	march22,2013	3.38	2.18	389.29	4/15/2013	3.42	2.22	389.25	5/28/2013	2.66
	688046	5350967	391.56	B	Monthly*	1.06	November 3, 2012	march22,2013	3.32	2.26	389.30	4/15/2013	3.36	2.30	389.26	5/28/2013	2.68
HYD-12-09	688479	5351053	399.77	A	Monthly*	1.20	November 12, 2012	march22,2013	12.50	11.30	388.47	4/15/2013	12.55	11.35	388.42	5/28/2013	10.84
HYD-12-10	688969	5351415	394.93	A	Monthly*	1.10	November 12, 2012	march22,2013	7.53	6.43	388.50	4/15/2013	7.62	6.52	388.41	5/28/2013	5.79
HYD-12-11	688541	5351518	390.80	A	Monthly*	1.03	November 4, 2012	march22,2013	1.08	0.05	390.75	4/15/2013	1.00	-0.03	390.83	5/28/2013	0.69
	688542	5351522	390.92	B	Monthly*	1.01	November 4, 2012	march22,2013	1.20	0.19	390.73	4/15/2013	1.14	0.13	390.79	5/28/2013	0.82
HYD-12-12	686386	5352541	383.85	A	Monthly*	1.04		march22,2013	-			4/15/2013				5/28/2013	
	686387	5352545	383.64	B	Monthly*	0.92		march22,2013	-			4/15/2013	-			5/28/2013	
2012BH-01	686572	5351896	428.02	-	Monthly*	0.87	November 8, 2012	march22,2013	1.33	0.46	427.56	4/15/2013	2.20	1.33	426.69	5/28/2013	1.41
2012BH-03	687114	5351416	402.72	-	Monthly*	1.06	November 6, 2012	march22,2013	1.37	0.31	402.41	4/15/2013	1.34	0.28	402.44	5/28/2013	1.21
2012BH-04	685891	5351310	404.79	-	Monthly*	0.97	November 7, 2012	march22,2013	0.87 f	-0.10	404.89	4/15/2013	.87 f	-0.10	404.89	5/28/2013	0.91
2012BH-06	686645	5351294	400.54	-	Monthly*	0.80		march22,2013	0.43 f	-0.37	400.91	4/15/2013	.43 f	-0.37	400.91	5/28/2013	0.9
2012BH-07	687418	5351646	406.58	-	Monthly*	0.98	November 7, 2012	march22,2013	2.75	1.77	404.81	4/15/2013	2.7	1.72	404.86	5/28/2013	1.6
GEO/HYD 13-03	685426	5351665	383.32		Monthly*	1.16	October 2014										
GEO/HYD 13-04	685351	5351066	393.28		Monthly*	1.01	October 2014										
GEO/HYD 13-05	685940	5351178	395.36		Monthly*	1.05	October 2014										
MW/HYD 13-10	688154	5350626	394.80		Monthly*	0.20	October 2014										
MW/HYD 13-12b	689559	5351357	392.14		Monthly*	0.91	October 2014										
MW/HYD 13-12c	689558	5351352	392.16		Monthly*	1.08	October 2014										
MW/HYD 13-16	689883	5351631	395.63		Monthly*	1.00	October 2014										

Notes:

UTM Coordinates are NAD83, Zone 16.

m - metres.

m-amsl - metres above mean sea level.

m-ags - metres above ground surface.

m-bts - metres below top of stickup.

m-bgs - metres below ground surface.

NA - Not Available.

Elevations based on UTM coordinates being plotted over LIDAR survey; accuracy is limited.

*Monthly through March 2014, quarterly (with GW sampling events, thereafter)

Appendix D-1 - Piezometric Level Monitoring

Borehole	UTM Coordinates		Water Level (m)	Water Level (m)	Date	Measured Water	Water Level (m-bgs)	Water Level (m-amsl)	Date	Measured Water Level (m-bts)	Water Level (m-bgs)	Water Level (m-amsl)	Date	Measured Water Level (m-bts)	Water Level (m-bgs)	Water Level (m-amsl)	Date	Measured Water Level (m-bts)
	Easting	Northing																
MW09-01	688796	5350900	1.75	385.79	6/21/2013	2.52	1.79	385.75	7/15/2013	2.53	1.8	385.74	8/18/2013	2.5	1.77	385.77	9/14/2013	2.49
MW09-02	689091	5350964	0.89	385.74	6/21/2013	1.67	0.91	385.72	7/15/2013	1.69	0.94	385.69	8/18/2013	1.67	0.91	385.72	9/14/2013	1.65
MW09-03b	689172	5351503			6/21/2013	under water			7/15/2013	0.9	0.17	380.88	8/18/2013	0.65 under water	-0.08	381.13	9/14/2013	under water
MW09-04	688846	5351403			6/21/2013	under water			7/15/2013	under water			8/18/2013	under water			9/14/2013	under water
MW09-05	688742	5351237			6/21/2013	under water			7/15/2013	under water			8/18/2013	under water			9/14/2013	under water
MW09-06	688489	5350826	0.11	386.39	6/21/2013	1.28	0.49	386.01	7/15/2013	1.37	0.58	385.92	8/18/2013	1.26	0.47	386.03	9/14/2013	1.14
HYD-12-01	688206	5352742	2.17	444.64	6/21/2013	4.25	3.18	443.63	7/15/2013	4.84	3.77	443.04	8/18/2013	3.84	2.77	444.04	9/14/2013	3.27
HYD-12-02	687480	5353274	1.93	393.91	6/21/2013	4.16	3.19	392.65	7/15/2013	4.76	3.79	392.05	8/18/2013	2.92	1.95	393.89	9/14/2013	2.62
	687475	5353276	1.01	394.51	6/21/2013	3.51	2.49	393.03	7/15/2013	4.86	3.84	391.68	8/18/2013	2.47	1.45	394.07	9/14/2013	2.17
HYD-12-03	686003	5352368	0.12	366.19	6/21/2013	0.79	-0.27	366.58	7/15/2013	1.08	0.02	366.29	8/18/2013	1.07	0.01	366.3	9/14/2013	1.23
	686008	5352377	0.6	365.66	6/21/2013	1.52	0.74	365.52	7/15/2013	1.57	0.79	365.49	8/18/2013	1.47	0.69	365.57	9/14/2013	1.44
HYD-12-04	685543	5351078	1.49	387.19	6/21/2013	2.9	1.73	386.95	7/15/2013	3.01	1.84	386.84	8/18/2013	2.68	1.51	387.17	9/14/2013	2.59
	685542	5351081	1.61	387.11	6/21/2013	3.19	2.04	386.68	7/15/2013	3.29	2.14	386.58	8/18/2013	3.02	1.87	386.85	9/14/2013	2.89
HYD-12-05	686234	5350685	3.9	389.49	6/21/2013	9.8	8.7	384.69	7/15/2013	6.09	4.99	388.4	8/18/2013	5.51	4.41	388.98	9/14/2013	8.1
	686239	5350688	5.56	388.26	6/21/2013	7.93	6.9	386.92	7/15/2013	7.92	6.89	386.93	8/18/2013	7.86	6.83	386.99	9/14/2013	8.21
HYD-12-06	686781	5350653	1.61	388.18	6/21/2013	2.76	1.97	387.82	7/15/2013	2.73	1.94	387.85	8/18/2013	2.58	1.79	388	9/14/2013	2.44
	686776	5350652	1.38	388.67	6/21/2013	2.68	1.56	388.49	7/15/2013	2.77	1.65	388.4	8/18/2013	2.62	1.5	388.55	9/14/2013	2.5
HYD-12-07	687721	5351337	0.01	392.35	6/21/2013	1.52	0.38	391.98	7/15/2013	1.67	0.53	391.83	8/18/2013	1.27	0.13	392.23	9/14/2013	1.11
	687719	5351346	0.41	392.18	6/21/2013	1.62	0.66	391.93	7/15/2013	1.74	0.78	391.91	8/18/2013	1.45	0.49	392.1	9/14/2013	1.35
HYD-12-08	688056	5350966	1.46	390.01	6/21/2013	2.96	1.76	389.71	7/15/2013	3.06	1.86	389.61	8/18/2013	2.91	1.71	389.76	9/14/2013	2.74
	688046	5350967	1.62	389.94	6/21/2013	2.9	1.84	389.72	7/15/2013	3.03	1.97	389.59	8/18/2013	2.88	1.82	389.74	9/14/2013	2.74
HYD-12-09	688479	5351053	9.64	390.13	6/21/2013	11.32	10.12	389.65	7/15/2013	11.69	10.49	389.28	8/18/2013	11.46	10.26	389.51	9/14/2013	11.14
HYD-12-10	688969	5351415	4.69	390.24	6/21/2013	6.34	5.24	389.69	7/15/2013	6.73	5.63	389.3	8/18/2013	6.48	5.38	389.55	9/14/2013	6.11
HYD-12-11	688541	5351518	-0.34	391.14	6/21/2013	0.86	-0.17	390.97	7/15/2013	0.99	-0.04	390.76	8/18/2013	0.85	-0.18	390.98	9/14/2013	0.62
	688542	5351522	-0.19	391.11	6/21/2013	0.99	-0.02	390.94	7/15/2013	1.13	0.12	390.8	8/18/2013	0.97	-0.04	390.96	9/14/2013	0.75
HYD-12-12	686386	5352541											8/18/2013				9/14/2013	
	686387	5352545											8/18/2013				9/14/2013	
2012BH-01	686572	5351896	0.54	427.48	6/21/2013	1.84	0.97	427.05	7/15/2013	2.02	1.15	426.87	8/18/2013	1.53	0.66	427.36	9/14/2013	1.45
2012BH-03	687114	5351416	0.15	402.57	6/21/2013	1.36	0.3	402.42	7/15/2013	1.45	0.39	402.33	8/18/2013	1.25	0.19	402.53	9/14/2013	1.12
2012BH-04	685891	5351310	-0.06	404.85	6/21/2013	1.07	0.1	404.69	7/15/2013	1.27	0.3	404.49	8/18/2013	1.13	0.16	404.63	9/14/2013	1.02
2012BH-06	686645	5351294	0.1	400.44	6/21/2013	1.34	0.54	400	7/15/2013	1.45	0.65	399.89	8/18/2013	1.3	0.5	400.04	9/14/2013	1.19
2012BH-07	687418	5351646	0.62	405.96	6/21/2013	2.27	1.29	405.29	7/15/2013	2.42	1.44	405.14	8/18/2013	2.15	1.17	405.41	9/14/2013	1.91
GEO/HYD 13-03	685426	5351665																
GEO/HYD 13-04	685351	5351066																
GEO/HYD 13-05	685940	5351178																
MW/HYD 13-10	688154	5350626																
MW/HYD 13-12b	689559	5351357																
MW/HYD 13-12c	689558	5351352																
MW/HYD 13-16	689883	5351631																

Notes:

UTM Coordinates are NAD83, Zone 16.

m - metres.

m-amsl - metres above mean sea level.

m-ags - metres above ground surface.

m-bts - metres below top of stickup.

m-bgs - metres below ground surface.

NA - Not Available.

Elevations based on UTM coordinates being plotted over LIDAR sun

*Monthly through March 2014, quarterly (with GW sampling event:

Appendix D-1 - Piezometric Level Monitoring

Borehole	UTM Coordinates		Water Level (m-bgs)	Water Level (m-amsl)	Date	Measured Water Level (m-bts)	Water Level (m-bgs)	Water Level (m-amsl)	Date	Measured Water Level (m-bts)	Water Level (m-bgs)	Water Level (m-amsl)	Date	Measured Water Level (m-bts)	Water Level (m-bgs)	Water Level (m-amsl)
	Eastings	Northing														
MW09-01	688796	5350900	1.76	385.78	10/17/2013	2.48	1.75	385.79	11-Nov-13	2.47	1.74	385.8	17-Dec-13	2.558	1.828	385.712
MW09-02	689091	5350964	0.89	385.74	10/17/2013	1.66	0.9	385.73	11/11/2013	1.63	0.87	385.76	17-Dec-13	1.725	0.965	385.665
MW09-03b	689172	5351503			10/17/2013	1.3	0.57	380.48	11/11/2013	0.89	0.16	380.89	17-Dec-13	frozen		
MW09-04	688846	5351403			10/17/2013	under water			11/11/2013	under water			17-Dec-13	frozen		
MW09-05	688742	5351237			10/17/2013	under water			11/11/2013	under water			17-Dec-13	frozen		
MW09-06	688489	5350826	0.35	386.15	10/17/2013	1.31	0.52	385.98	11/11/2013	1.3	0.51	385.99	17-Dec-13	1.348	0.35	386.15
HYD-12-01	688206	5352742	2.2	444.61	10/17/2013	4.25	3.18	443.63	11/11/2013	3.69	2.62	444.19	17-Dec-13	3.855	2.785	444.025
HYD-12-02	687480	5353274	1.65	394.84	10/17/2013	3.19	2.22	393.62	11/11/2013	2.71	1.74	394.1	17-Dec-13	3.145	2.175	393.665
	687475	5353276	1.15	394.37	10/17/2013	3.09	2.07	393.45	11/11/2013	2.56	1.54	393.98	17-Dec-13	3.154	2.134	393.386
HYD-12-03	686003	5352368	0.17	366.14	10/17/2013	1.22	0.16	366.15	11/11/2013	0.91	-0.15	366.46	17-Dec-13	0.698 frozen	-0.362	366.672
	686008	5352377	0.66	365.6	10/17/2013	1.48	0.7	365.56	11/11/2013	1.41	0.63	365.63	17-Dec-13	1.545	0.765	365.495
HYD-12-04	685543	5351078	1.42	387.26	10/17/2013	2.68	1.51	387.17	11/11/2013	2.62	1.45	387.23	17-Dec-13	2.69	1.52	387.16
	685542	5351081	1.74	386.65	10/17/2013	2.12	0.97	387.75	11/11/2013	2.96	1.81	386.91	17-Dec-13	3.1	1.95	386.77
HYD-12-05	686234	5350685	7	386.39	10/17/2013	5.27	4.17	389.22	11/11/2013	4.96	3.86	389.53	17-Dec-13	6.54	5.44	387.95
	686239	5350688	7.18	386.64	10/17/2013	8.09	7.06	386.76	11/11/2013	2.02	0.99	392.83	17-Dec-13	7.91	6.88	386.94
HYD-12-06	686781	5350653	1.65	388.14	10/17/2013	2.67	1.88	387.91	11/11/2013	2.56	1.77	388.02	17-Dec-13	2.625	1.835	387.955
	686776	5350652	1.38	388.67	10/17/2013	2.78	1.66	388.39	11/11/2013	2.61	1.49	388.56	17-Dec-13	2.726	1.606	388.444
HYD-12-07	687721	5351337	-0.03	392.39	10/17/2013	1.31	0.17	392.19	11/11/2013	1.14	0	392.36	17-Dec-13	1.335	0.195	392.165
	687719	5351346	0.39	392.2	10/17/2013	1.46	0.5	392.09	11/11/2013	1.37	0.41	392.18	17-Dec-13	1.483	0.523	392.067
HYD-12-08	688056	5350966	1.54	389.93	10/17/2013	2.95	1.75	389.72	11/11/2013	2.96	1.76	391.47	17-Dec-13	2.989	1.789	389.681
	688046	5350967	1.68	389.88	10/17/2013	2.91	1.85	389.71	11/11/2013	2.92	1.86	389.7	17-Dec-13	2.96	1.9	389.66
HYD-12-09	688479	5351053	9.94	389.83	10/17/2013	11.58	10.38	389.39	11/11/2013	11.66	10.46	389.31	17-Dec-13	11.807	10.607	389.163
HYD-12-10	688969	5351415	5.01	389.92	10/17/2013	6.6	5.5	389.43	11/11/2013	6.66	5.56	389.37	17-Dec-13	6.637	5.537	389.393
HYD-12-11	688541	5351518	-0.41	391.21	10/17/2013	1.02	-0.01	390.79	11/11/2013	3.93	2.9	387.9	17-Dec-13	0.966	-0.064	390.736
	688542	5351522	-26	391.18	10/17/2013	1.16	0.15	390.77	11/11/2013	1.07	0.06	390.86	17-Dec-13	1.106	0.096	390.824
HYD-12-12	686386	5352541			10/17/2013				11/11/2013				17-Dec-13			
	686387	5352545			10/17/2013				11/11/2013				17-Dec-13			
2012BH-01	686572	5351896	0.58	427.44	10/17/2013	1.58	0.71	427.31	11/11/2013	1.47	0.6	427.42	17-Dec-13	1.65	0.78	427.24
2012BH-03	687114	5351416	0.06	402.66	10/17/2013	1.11	0.05	402.67	11/11/2013	1.09	0.03	402.69	17-Dec-13	1.060 frozen	0	402.72
2012BH-04	685891	5351310	0.05	404.74	10/17/2013	1.05	0.08	404.71	11/11/2013	0.99	0.02	404.77	17-Dec-13	1.065	0.095	404.695
2012BH-06	686645	5351294	0.39	400.15	10/17/2013	1.34	0.54	400	11/11/2013	1.23	0.43	400.11	17-Dec-13	1.391	0.591	399.949
2012BH-07	687418	5351646	0.93	405.65	10/17/2013	2.27	1.29	405.29	11/11/2013	2.14	1.16	405.42	17-Dec-13	2.225	1.245	405.335
GEO/HYD 13-03	685426	5351665			10/17/2013	2.72	1.56	381.764	11/11/2013	2.44	1.28	382.04	17-Dec-13	2.752	1.592	381.728
GEO/HYD 13-04	685351	5351066			10/17/2013	6.07	5.06	388.219	11/11/2013	5.5	4.49	388.79	17-Dec-13	5.93	4.92	388.36
GEO/HYD 13-05	685940	5351178			10/17/2013	1.86	0.81	394.55	11/11/2013	1.45	0.4	394.96	17-Dec-13	1.565	0.515	394.845
MW/HYD 13-10	688154	5350626			10/17/2013	6.16	5.96	388.84	11/11/2013	6.13	5.93	388.87	17-Dec-13	6.164	5.964	388.836
MW/HYD 13-12b	689559	5351357			10/17/2013	9.81	8.9	383.243	11/11/2013	9.76	8.85	383.29	17-Dec-13	9.752	8.842	383.298
MW/HYD 13-12c	689558	5351352			10/17/2013	11.26	10.18	381.98	11/11/2013	11.21	10.13	382.03	17-Dec-13	11.236	10.156	382.004
MW/HYD 13-16	689883	5351631			10/17/2013	20.7	19.7	375.93	11/11/2013	21.58	20.58	375.05	17-Dec-13	21.875	20.875	374.755

Notes:

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m - metres.

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m-bts - metres below top of stickup.

m-bgs - metres below ground surface.

NA - Not Available.

Elevations based on UTM coordinates being plotted over LIDAR sun

*Monthly through March 2014, quarterly (with GW sampling event:

Appendix D-1 - Piezometric Level Monitoring

Borehole	UTM Coordinates		Date	Measured Water Level (m-bts)	Water Level (m-bgs)	Water Level (m-amsl)	Date	Measured Water Level (m-bts)	Water Level (m-bgs)	Water Level (m-amsl)	Date	Measured Water Level (m-bts)	Water Level (m-bgs)	Water Level (m-amsl)
	Eastings	Northing												
MW09-01	688796	5350900	14-Jan-14	2.605	1.875	385.665	20-Feb-14	2.645	1.92	385.62	20-Mar-14	2.645	1.915	385.626
MW09-02	689091	5350964	14-Jan-14	1.778	1.018	385.612	20-Feb-14	1.823	1.07	385.56	20-Mar-14	1.83	1.08	385.56
MW09-03b	689172	5351503	14-Jan-14				20-Feb-14	.530 frozen	-0.20	381.25	20-Mar-14	.530 frozen	-0.20	381.25
MW09-04	688846	5351403	14-Jan-14				20-Feb-14	frozen			20-Mar-14	frozen		
MW09-05	688742	5351237	14-Jan-14				20-Feb-14	frozen			20-Mar-14	frozen		
MW09-06	688489	5350826	14-Jan-14	1.37	0.58	385.92	20-Feb-14	1.543	0.75	385.75	20-Mar-14	1.59	0.80	385.70
HYD-12-01	688206	5352742	14-Jan-14	4.51	3.44	443.37	20-Feb-14	5	4.25	442.56	20-Mar-14	4.896	3.83	442.98
HYD-12-02	687480	5353274	14-Jan-14	4.02	3.05	392.79	20-Feb-14	4.383	3.66	392.18	20-Mar-14	4.765	3.80	392.04
	687475	5353276	14-Jan-14	4.761	3.741	391.779	20-Feb-14	5.41	4.69	390.84	20-Mar-14	5.809	4.79	390.73
HYD-12-03	686003	5352368	14-Jan-14	.710 f	-0.35	366.66	20-Feb-14	.710 frozen	-0.35	366.66	20-Mar-14	.710 frozen	-0.35	366.66
	686008	5352377	14-Jan-14	1.6	0.82	365.44	20-Feb-14	1.645	0.86	365.40	20-Mar-14	1.665	0.89	365.37
HYD-12-04	685543	5351078	14-Jan-14	2.804	1.637	387.043	20-Feb-14	2.905	1.84	386.84	20-Mar-14	3	1.83	386.85
	685542	5351081	14-Jan-14	3.28	2.13	386.59	20-Feb-14	3.379	2.41	386.31	20-Mar-14	3.455	2.31	386.42
HYD-12-05	686234	5350685	14-Jan-14	5.845	4.745	388.645	20-Feb-14	5.875	4.86	388.54	20-Mar-14	5.945	4.85	388.55
	686239	5350688	14-Jan-14	7.88	6.85	386.97	20-Feb-14	7.854	6.79	387.03	20-Mar-14	7.825	6.80	387.02
HYD-12-06	686781	5350653	14-Jan-14	2.73	1.94	387.85	20-Feb-14	2.77	1.99	387.80	20-Mar-14	2.77	1.98	387.81
	686776	5350652	14-Jan-14	2.865	1.745	388.305	20-Feb-14	2.99	1.82	388.23	20-Mar-14	3.05	1.93	388.12
HYD-12-07	687721	5351337	14-Jan-14	1.485	0.345	392.015	20-Feb-14	1.65	0.50	391.86	20-Mar-14	1.745	0.61	391.76
	687719	5351346	14-Jan-14	1.565	0.605	391.985	20-Feb-14	1.65	0.55	392.04	20-Mar-14	1.7	0.74	391.85
HYD-12-08	688056	5350966	14-Jan-14	3.125	1.925	389.545	20-Feb-14	3.271	2.24	389.22	20-Mar-14	3.357	2.16	389.31
	688046	5350967	14-Jan-14	3.08	2.02	389.54	20-Feb-14	3.222	2.43	389.13	20-Mar-14	3.304	2.24	389.31
HYD-12-09	688479	5351053	14-Jan-14	11.95	10.75	389.02	20-Feb-14	12.29	11.17	388.60	20-Mar-14	12.483	11.28	388.49
HYD-12-10	688969	5351415	14-Jan-14	7	5.9	389.03	20-Feb-14	7.39	6.25	388.68	20-Mar-14	7.61	6.51	388.42
HYD-12-11	688541	5351518	14-Jan-14	1.04	0.01	390.79	20-Feb-14	1.12	0.16	390.64	20-Mar-14	1.16	0.13	390.67
	688542	5351522	14-Jan-14	1.18	0.17	390.75	20-Feb-14	1.26	0.06	390.86	20-Mar-14	1.31	0.30	390.62
HYD-12-12	686386	5352541	14-Jan-14				20-Feb-14				20-Mar-14			
	686387	5352545	14-Jan-14				20-Feb-14				20-Mar-14			
2012BH-01	686572	5351896	14-Jan-14	1.811	0.941	427.079	20-Feb-14	2.08	0.98	427.04	20-Mar-14	2.33	1.46	426.56
2012BH-03	687114	5351416	14-Jan-14	1.07 f	0.01	402.71	20-Feb-14	1.075 frozen	0.02	402.70	20-Mar-14	1.075 frozen	0.02	402.70
2012BH-04	685891	5351310	14-Jan-14	1.11	0.14	400.4	20-Feb-14	1.195	0.19	404.61	20-Mar-14	1.27	0.30	404.49
2012BH-06	686645	5351294	14-Jan-14	1.455	0.655	399.885	20-Feb-14	1.49	0.45	400.09	20-Mar-14	1.495	0.70	399.85
2012BH-07	687418	5351646	14-Jan-14	2.435	1.455	405.125	20-Feb-14	2.52	1.60	404.98	20-Mar-14	2.57	1.59	404.99
GEO/HYD 13-03	685426	5351665	14-Jan-14	3.025	1.865	381.455	20-Feb-14	3.3	2.43	380.89	20-Mar-14	3.565	2.41	380.92
GEO/HYD 13-04	685351	5351066	14-Jan-14	6.75	5.74	387.54	20-Feb-14	7.456	6.40	386.88	20-Mar-14	7.745	6.74	386.54
GEO/HYD 13-05	685940	5351178	14-Jan-14	1.85	0.8	394.56	20-Feb-14	2.09	1.12	394.24	20-Mar-14	2.22	1.17	394.19
MW/HYD 13-10	688154	5350626	14-Jan-14	6.335	6.135	388.665	20-Feb-14	6.555	5.76	389.05	20-Mar-14	6.655	6.46	388.35
MW/HYD 13-12b	689559	5351357	14-Jan-14	10.02	9.11	383.03	20-Feb-14	10.25	9.27	382.87	20-Mar-14	13.325	12.42	379.73
MW/HYD 13-12c	689558	5351352	14-Jan-14	11.316	10.236	381.924	20-Feb-14	11.34	10.18	381.98	20-Mar-14	11.32	10.24	381.92
MW/HYD 13-16	689883	5351631	14-Jan-14	22.18	21.18	374.45	20-Feb-14	29.59	28.58	367.05	20-Mar-14	27.445	26.45	369.19

Notes:

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m-ags - metres above ground surface.

m-bts - metres below top of stickup.

m-bgs - metres below ground surface.

NA - Not Available.

Elevations based on UTM coordinates being plotted over LIDAR sun

*Monthly through March 2014, quarterly (with GW sampling event:

Appendix D.2- VWP Monitoring

Borehole	UTM Coordinates		Elevation (m-amsl)	Installation ID	Plunge (Degrees)	VWP Completion Depth (m-ab)	VWP Installation Elevation (m-amsl)	Monitoring Frequency	VWP ID	Date	B-Value (-)	Temperature (°C)	Pressure Head (MPa)
	Easting	Northing											
GT Series (EBA, 2012)													
GT-11-01	688284.8	5350780.4	389.30	-	-65	105.55	293.65	Monthly*	VW19584	1/10/2013	7285.2	5	0.928
GT-11-02	688562.8	5351223.6	395.07	A	-60	250.65	178.02	Monthly*	VW20730	1/10/2013	7898.3	5.8	0.787
				B		99.99	308.48	Monthly*	VW20726	1/10/2013	7469.7	4.8	0.791
GT-11-03	688858.4	5351508.8	395.12	-	-70	150.32	253.88	Monthly*	VW20727	1/10/2013	6534.5	4.8	1.361
GT-11-04	689286.1	5351661.0	403.51	-	-65	101.24	311.77	Monthly*	VW20725	1/10/2013	7509.9	4.8	0.763
GT-12-05	689376.8	5351277.8	398.03	A	-70	51.06	350.06	Monthly*	VW20724	-	-		0.569
				B		250.69	162.48	Monthly*	VW20731	1/10/2013	5622.8	5.8	2.901
GT-12-07	689270.1	5350948.3	394.13	-	-65	300.81	121.53	Monthly*	VW20732	1/10/2013	5854.36	6.7	2.553
GT-12-10	689082.8	5350970.8	386.55	-	-75	249.74	145.34	Monthly*	VW20729	1/10/2013	6189.5	6.8	2.371
GT-12-11	688707.7	5350910.4	389.13	-	-70	201.34	199.95	Monthly*	VW20728	1/10/2013	6925.3	6.1	1.842
GEO/HYD and MW/HYD Series (SLR 2013)			El. (TOP)										
GEO/HYD 13-01	686933.1	5351361.0	407.66	a	-70	26.7	382.57	Monthly*	VW26027				
			407.66	b	-70	14.5	394.03	Monthly*	VW26034				
GEO/HYD 13-02	686100.5	5352071.6	424.74	a	-70	14.3	411.30	Monthly*	VW26033				
			424.74	b	-70	28.4	398.05	Monthly*	VW260?				
Mw/HYD 13-06	689506.7	5351239.3	384.29	a	-70	19.2	366.25	Monthly*	VW26022				
			384.29	b	-70	40	346.70	Monthly*	VW26046				
			384.29	c	-70	59	328.85	Monthly*	VW26042				
MW/HYD 13-08	688686.8	5350900.0	387.80	a	-60	21.8	368.92	Monthly*	VW26025				
			387.80	b	-60	41	352.30	Monthly*	VW26045				
			387.80	c	-60	59.4	336.36	Monthly*	VW26041				
MW/HYD 13-09	688533.7	5350861.5	388.52	a	-70	20	369.73	Monthly*	VW26047				
			388.52	b	-70	36	354.69	Monthly*	VW26038				
			388.52	c	-70	60	332.14	Monthly*	VW26021				
MW/HYD 13-14	689704.1	5351518.7	391.35	a	-70	61.3	333.75	Monthly*	VW26040				
			391.35	b	-70	45.4	348.69	Monthly*	VW26039				
			391.35	c	-70	33.8	359.59	Monthly*	VW26044				

Notes:

UTM Coordinates are NAD83, Zone 16.

m-amsl - metres above mean sea level.

m-ab- metres along borehole (depth measured along inclined borehole)

Appendix D.2. VWP Monitoring

Borehole	UTM Coordinates		Pressure Head (m of Water)	Piezometric Elevation (m- amsl)	Date	B-Value (-)	Temperature	Pressure Head (MPa)	Pressure Head (m of Water)	Piezometric Elevation (m- amsl)	Date	B-Value (-)	Temperature (°C)	Pressure Head (MPa)
	Easting	Northing												
GT Series (EBA, 2012)														
GT-11-01	688284.8	5350780.4	94.65	99.65	3/22/2013	7292.5	5	0.924	94.21	387.86	4/15/2013	7293	5	0.924
GT-11-02	688562.8	5351223.6	80.28	86.08	3/22/2013	7742	5.8	0.922	93.99	272.02	4/15/2013	7682.9	5.8	0.973
			80.65	85.45	3/22/2013	7479.8	4.8	0.785	80.06	388.54	4/15/2013	7480.8	4.8	0.785
GT-11-03	688858.4	5351508.8	138.79	143.59	3/22/2013	6640.6	4.7	1.299	132.50	386.37	4/15/2013	6641	4.7	1.299
GT-11-04	689286.1	5351661.0	77.84	82.64	3/22/2013	7516.1	4.8	0.760	77.47	389.24	4/15/2013	7508	4.8	0.764
GT-12-05	689376.8	5351277.8	58.02	#VALUE!	3/22/2013			-		350.06	4/15/2013		10.8	-
			295.85	301.65	3/22/2013	5659.3	5.8	2.868	292.47	454.96	4/15/2013	5662.6	5.8	2.865
GT-12-07	689270.1	5350948.3	260.37	267.07	3/22/2013	5863.4	6.7	2.546	259.58	381.11	4/15/2013	5864.9	6.7	2.544
GT-12-10	689082.8	5350970.8	241.78	248.58	3/22/2013	6195.1	6.8	2.366	241.27	386.60	4/15/2013	6196.3	6.8	2.365
GT-12-11	688707.7	5350910.4	187.87	193.97	3/22/2013	6931.7	6.1	1.837	187.29	387.24	4/15/2013	6932.6	6.1	1.836
GEO/HYD and MW/HYD Series (SLR 2013)														
GEO/HYD 13-01	686933.1	5351361.0												
GEO/HYD 13-02	686100.5	5352071.6												
Mw/HYD 13-06	689506.7	5351239.3												
MW/HYD 13-08	688686.8	5350900.0												
MW/HYD 13-09	688533.7	5350861.5												
MW/HYD 13-14	689704.1	5351518.7												

Notes:
 UTM Coordinates are NAD83, Zone 16.
 m-amsl - metres above mean sea level.
 m-ab- metres along borehole (depth measured along borehole)

Appendix D.2. VWP Monitoring

Borehole	UTM Coordinates		Pressure Head (m of Water)	Piezometric Elevation (m-amsl)	Date	B-Value (-)	Temperature (°C)	Pressure Head (MPa)	Pressure Head (m of Water)	Piezometric Elevation (m-amsl)	Date	B-Value (-)	Temperature (°C)	Pressure Head (MPa)
	Easting	Northing												
GT Series (EBA, 2012)														
GT-11-01	688284.8	5350780.4	94.18	387.83	5/27/2013	water around		#VALUE!	#VALUE!	#VALUE!	6/21/2013	7280	5	0.931
GT-11-02	688562.8	5351223.6	99.18	277.20	5/27/2013	7262.04	5.8	1.334	136.01	314.03	6/21/2013	7494.7	5.8	1.134
			80.00	388.49	5/27/2013	7457.5	4.8	0.798	81.34	389.82	6/21/2013	7462.8	4.2	0.794
GT-11-03	688858.4	5351508.8	132.47	386.35	5/27/2013	6605.1	4.7	1.320	134.60	388.47	6/21/2013	6618.4	4.7	1.312
GT-11-04	689286.1	5351661.0	77.93	389.70	5/27/2013	7485.5	4.8	0.777	79.22	390.98	6/21/2013	7491.6	4.8	0.773
GT-12-05	689376.8	5351277.8		350.06	5/27/2013	5584.3	5.8	-		350.06	6/21/2013	5623.2	5.8	-
			292.17	454.65	5/27/2013		123.8	8.009	816.71	979.20	6/21/2013			7.930
GT-12-07	689270.1	5350948.3	259.45	380.98	5/27/2013	5847.6	6.7	2.559	260.94	382.47	6/21/2013	5852	6.7	2.555
GT-12-10	689082.8	5350970.8	241.16	386.50	5/27/2013	6187.5	6.8	2.373	241.94	387.28	6/21/2013	6189	6.8	2.371
GT-12-11	688707.7	5350910.4	187.21	387.16	5/27/2013	6915.4	6.1	1.851	188.73	388.68	6/21/2013	6919.9	6.1	1.847
GEO/HYD and MW/HYD Series (SLR 2013)														
GEO/HYD 13-01	686933.1	5351361.0												
GEO/HYD 13-02	686100.5	5352071.6												
Mw/HYD 13-06	689506.7	5351239.3												
MW/HYD 13-08	688686.8	5350900.0												
MW/HYD 13-09	688533.7	5350861.5												
MW/HYD 13-14	689704.1	5351518.7												

Notes:
 UTM Coordinates are NAD83, Zone 16.
 m-amsl - metres above mean sea level.
 m-ab- metres along borehole (depth measured along)

AppendixD .2. VWP Monitoring

Borehole	UTM Coordinates		Pressure Head (m of Water)	Piezometric Elevation (m-amsl)	Date	B-Value (-)	Temperature (°C)	Pressure Head (MPa)	Pressure Head (m of Water)	Piezometric Elevation (m-amsl)	Date	B-Value (-)	Temperature (°C)	Pressure Head (MPa)
	Easting	Northing												
GT Series (EBA, 2012)														
GT-11-01	688284.8	5350780.4	94.94	388.59	7/15/2013	7283.9	5	0.929	94.70	388.35	8/18/2013	7281.1	5	0.930
GT-11-02	688562.8	5351223.6	115.66	293.69	7/15/2013	7384.1	5.8	1.229	125.33	303.35	8/18/2013	7287.2	5.8	1.312
			81.01	389.49	7/15/2013	7467.9	4.8	0.792	80.73	389.21	8/18/2013	7466.4	4.8	0.793
GT-11-03	688858.4	5351508.8	133.81	387.69	7/15/2013	6627	4.7	1.307	133.29	387.17	8/18/2013	6616.2	4.7	1.313
GT-11-04	689286.1	5351661.0	78.87	390.63	7/15/2013	7503	4.8	0.767	78.21	389.97	8/18/2013	7486.8	4.8	0.776
GT-12-05	689376.8	5351277.8		350.06	7/15/2013	5643.6	5.8	-		350.06	8/18/2013	5610.3	5.8	-
			808.66	971.14	7/15/2013		113	8.002	816.00	978.48	8/18/2013		-11.5	7.923
GT-12-07	689270.1	5350948.3	260.56	382.09	7/15/2013	5885.4	6.7	2.527	257.68	379.21	8/18/2013	5854.1	6.6	2.553
GT-12-10	689082.8	5350970.8	241.81	387.15	7/15/2013	6190.8	6.8	2.370	241.64	386.98	8/18/2013	6189.9	6.8	2.370
GT-12-11	688707.7	5350910.4	188.34	388.29	7/15/2013	6923.1	6.1	1.844	188.04	387.99	8/18/2013	6921.6	6.1	1.845
GEO/HYD and MW/HYD Series (SLR 2013)														
GEO/HYD 13-01	686933.1	5351361.0												
GEO/HYD 13-02	686100.5	5352071.6												
Mw/HYD 13-06	689506.7	5351239.3												
MW/HYD 13-08	688686.8	5350900.0												
MW/HYD 13-09	688533.7	5350861.5												
MW/HYD 13-14	689704.1	5351518.7												

Notes:

UTM Coordinates are NAD83, Zone 16.
m-amsl - metres above mean sea level.
m-ab- metres along borehole (depth measured along)

Appendix D.2. VWP Monitoring

Borehole	UTM Coordinates		Pressure Head (m of Water)	Piezometric Elevation (m-amsl)	Date	B-Value (-)	Temperature (°C)	Pressure Head (MPa)	Pressure Head (m of Water)	Piezometric Elevation (m-amsl)	Date	B-Value (-)	Temperature (°C)
	Easting	Northing											
GT Series (EBA, 2012)													
GT-11-01	688284.8	5350780.4	94.87	388.52	9/14/2013	7275.9	5	0.933	95.17	388.82	10/17/2013	7285.9	5
GT-11-02	688562.8	5351223.6	133.80	311.82	9/14/2013	7212.4	5.8	1.376	140.33	318.35	10/17/2013	7149.1	5.8
			80.82	389.30	9/14/2013	7459.8	4.8	0.796	81.19	389.68	10/17/2013	7469.2	4.8
GT-11-03	688858.4	5351508.8	133.93	387.81	9/14/2013	6607.4	4.7	1.319	134.45	388.33	10/17/2013	6626.5	4.7
GT-11-04	689286.1	5351661.0	79.13	390.90	9/14/2013	7476.8	4.8	0.782	79.70	391.47	10/17/2013	7485.2	4.8
GT-12-05	689376.8	5351277.8		350.06	9/14/2013	5992.3	5.8	-		350.06	10/17/2013		5.8
			807.90	970.38	9/14/2013		122.9	8.009	816.65	979.13	10/17/2013	5637.9	132.4
GT-12-07	689270.1	5350948.3	260.36	381.89	9/14/2013	5856.5	6.7	2.551	260.16	381.69	10/17/2013	5863.4	6.7
GT-12-10	689082.8	5350970.8	241.72	387.06	9/14/2013	6188	6.8	2.372	241.89	387.23	10/17/2013	6192.9	6.8
GT-12-11	688707.7	5350910.4	188.18	388.12	9/14/2013	6918.5	6.1	1.848	188.45	388.40	10/17/2013	6924.8	6.1
GEO/HYD and MW/HYD Series (SLR 2013)													
GEO/HYD 13-01	686933.1	5351361.0									10/17/2013	7009.3	5.3
											10/17/2013	7787.8	5.7
GEO/HYD 13-02	686100.5	5352071.6									10/17/2013	7971	5.3
											10/17/2013	6749.6	5.2
Mw/HYD 13-06	689506.7	5351239.3									10/17/2013	7534.8	6.1
											10/17/2013	6785.7	6.3
												10/17/2013	5874.4
MW/HYD 13-08	688686.8	5350900.0									10/17/2013	7316.8	6.9
											10/17/2013	7100.9	6.5
												10/17/2013	6522.4
MW/HYD 13-09	688533.7	5350861.5									10/17/2013	7430.5	5.7
											10/17/2013	7105.6	6.1
MW/HYD 13-14	689704.1	5351518.7									10/17/2013	5976.3	6.1
											10/17/2013	6741.2	5.6
												10/17/2013	7461.5
										10/17/2013	7784.5	5.7	

Notes:

UTM Coordinates are NAD83, Zone 16.
m-amsl - metres above mean sea level.
m-ab- metres along borehole (depth measured along)

Appendix D.2. VWP Monitoring

Borehole	UTM Coordinates		Pressure Head (MPa)	Pressure Head (m of Water)	Piezometric Elevation (m-amsl)	Date	B-Value (-)	Temperature (°C)	Pressure Head (MPa)	Pressure Head (m of Water)	Piezometric Elevation (m-amsl)	Date
	Easting	Northing										
GT Series (EBA, 2012)												
GT-11-01	688284.8	5350780.4	0.928	94.59	388.24	11/11/2013	in water		#VALUE!	#VALUE!	#VALUE!	17-Dec-13
GT-11-02	688562.8	5351223.6	1.430	145.86	323.88	11/11/2013	7101.3	5.8	1.572	160.33	338.35	17-Dec-13
			0.791	80.66	389.14	11/11/2013	7469.1	4.8	0.892	90.96	399.45	17-Dec-13
GT-11-03	688858.4	5351508.8	1.307	133.32	387.20	11/11/2013	6621.9	4.7	1.411	143.90	397.77	17-Dec-13
GT-11-04	689286.1	5351661.0	0.777	79.22	390.99	11/11/2013	7479.5	4.8	0.881	89.85	401.62	17-Dec-13
GT-12-05	689376.8	5351277.8	-		350.06	11/11/2013	5635.7	5.8	-		350.06	17-Dec-13
			2.968	302.68	465.16	11/11/2013		126.1	8.112	827.16	989.64	17-Dec-13
GT-12-07	689270.1	5350948.3	2.546	259.57	381.10	11/11/2013	5863	6.6	2.647	269.90	391.43	17-Dec-13
GT-12-10	689082.8	5350970.8	2.368	241.45	386.79	11/11/2013	6192.2	5.9	2.469	251.77	397.11	17-Dec-13
GT-12-11	688707.7	5350910.4	1.843	187.89	387.84	11/11/2013	6924.6	6.1	1.944	198.21	398.16	17-Dec-13
GEO/HYD and MW/HYD Series (SLR 2013)												
GEO/HYD 13-01	686933.1	5351361.0	225	23	405.53	11/11/2013	6993.2	5.2	227	23	405.72	17-Dec-13
			116	12	405.82	11/11/2013	7772.3	5.8	117	12	406.00	17-Dec-13
GEO/HYD 13-02	686100.5	5352071.6	104	11	421.87	11/11/2013	7928.3	5.6	109	11	422.38	17-Dec-13
			241	25	422.59	11/11/2013	6694.2	5.2	246	25	423.18	17-Dec-13
Mw/HYD 13-06	689506.7	5351239.3	154	16	381.95	11/11/2013	7526.4	6.1	155	16	382.06	17-Dec-13
			349	36	382.27	11/11/2013	6782	6.3	349	36	382.34	17-Dec-13
			525	54	382.40	11/11/2013	5869.7	5.8	526	54	382.49	17-Dec-13
MW/HYD 13-08	688686.8	5350900.0	160	16	385.23	11/11/2013	7309.4	6.9	161	16	385.32	17-Dec-13
			324	33	385.33	11/11/2013	7097.6	6.4	325	33	385.39	17-Dec-13
			477	49	385.07	11/11/2013	6519.9	6.3	478	49	385.11	17-Dec-13
MW/HYD 13-09	688533.7	5350861.5	305	31	400.80				1684	172	541.52	17-Dec-13
			367	37	392.09				1684	172	526.49	17-Dec-13
			581	59	391.39				1684	172	503.94	17-Dec-13
MW/HYD 13-14	689704.1	5351518.7	394	40	373.92	11/11/2013	8765.2	5.4	10	1	334.81	17-Dec-13
			263	27	375.53	11/11/2013	7476.8	5.3	260	27	375.24	17-Dec-13
			180	18	377.94	11/11/2013	7795.5	5.5	178	18	377.74	17-Dec-13

Notes:

UTM Coordinates are NAD83, Zone 16.
 m-amsl - metres above mean sea level.
 m-ab- metres along borehole (depth measured along)

Appendix D.2. VWP Monitoring

Borehole	UTM Coordinates		B-Value (-)	Temperature (°C)	Pressure Head (MPa)	Pressure Head (m of Water)	Piezometric Elevation (m-amsl)	Date	B-Value (-)	Temperature (°C)	Pressure Head (MPa)	Pressure Head (m of Water)	Piezometric Elevation (m-amsl)	Date
	Easting	Northing												
GT Series (EBA, 2012)														
GT-11-01	688284.8	5350780.4	7286.6	5	1.028	104.85	398.50	14-Jan-14	7292	5	1.025	104.53	398.18	20-Feb-14
GT-11-02	688562.8	5351223.6	7045	5.7	1.620	165.23	343.26	14-Jan-14	6998.7	5.6	1.660	169.26	347.29	20-Feb-14
			7470.4	4.8	0.891	90.89	399.37	14-Jan-14	7477.9	4.8	0.887	90.46	398.95	20-Feb-14
GT-11-03	688858.4	5351508.8	6626.4	4.6	1.409	143.63	397.50	14-Jan-14	6636.6	4.7	1.403	143.03	396.90	20-Feb-14
GT-11-04	689286.1	5351661.0	7483	4.8	0.879	89.65	401.42	14-Jan-14	7492.7	4.8	0.874	89.10	400.87	20-Feb-14
GT-12-05	689376.8	5351277.8	5635.6	5.8	-		350.06	14-Jan-14	5670.9	5.8	-		350.06	20-Feb-14
					8.031	818.95	981.43	14-Jan-14			8.031	818.95	981.43	20-Feb-14
GT-12-07	689270.1	5350948.3	5863.9	6.6	2.646	269.83	391.36	14-Jan-14	5869.7	7.3	2.642	269.36	390.89	20-Feb-14
GT-12-10	689082.8	5350970.8	3186.3	6.8	5.062	516.23	661.57	14-Jan-14	6192.5	6.7	2.469	251.79	397.13	20-Feb-14
GT-12-11	688707.7	5350910.4	6925.6	6.1	1.943	198.12	398.07	14-Jan-14	6930.7	6.1	1.938	197.67	397.62	20-Feb-14
GEO/HYD and MW/HYD Series (SLR 2013)														
GEO/HYD 13-01	686933.1	5351361.0	7013.1	5.3	225	23	405.48	14-Jan-14	7060.9	5.3	219	22	404.91	20-Feb-14
			7791.7	6	115	12	405.77	14-Jan-14	7833.7	6	110	11	405.28	20-Feb-14
GEO/HYD 13-02	686100.5	5352071.6	7958.3	5.4	105	11	422.02	14-Jan-14	7995.8	5.6	101	10	421.57	20-Feb-14
			6743.3	5.2	241	25	422.65	14-Jan-14	6802.2	5.3	235	24	422.02	20-Feb-14
Mw/HYD 13-06	689506.7	5351239.3	7535.1	6	154	16	381.95	14-Jan-14	7556.4	6	151	15	381.68	20-Feb-14
			6784.8	6.2	349	36	382.29	14-Jan-14	6802.8	6.2	346	35	381.95	20-Feb-14
			5878	5.7	524	53	382.34	14-Jan-14	5887.5	5.7	523	53	382.17	20-Feb-14
MW/HYD 13-08	688686.8	5350900.0	7327.4	6.9	159	16	385.11	14-Jan-14	7346.7	6.9	157	16	384.89	20-Feb-14
			7108.4	6.4	322	33	385.19	14-Jan-14	7122.7	6.3	320	33	384.92	20-Feb-14
			6530.1	6.3	476	49	384.92	14-Jan-14	6543.6	6.2	473	48	384.65	20-Feb-14
MW/HYD 13-09	688533.7	5350861.5	7083.2	5.5	371	38	407.56	14-Jan-14	5667.5	5.3	639	65	434.92	20-Feb-14
			5955.3	5.3	585	60	414.34	14-Jan-14	7426.4	4.8	305	31	385.85	20-Feb-14
			7404.6	4.8	310	32	363.72	14-Jan-14	7095.2	5.4	369	38	369.74	20-Feb-14
MW/HYD 13-14	689704.1	5351518.7	6785.3	5.3	386	39	373.07	14-Jan-14	6808.9	5.3	381	39	372.62	20-Feb-14
			7490.7	5.3	258	26	374.98	14-Jan-14	7512.1	5.3	254	26	374.58	20-Feb-14
			7808.7	5.5	176	18	377.50	14-Jan-14	7827.9	5.1	172	18	377.14	20-Feb-14

Notes:

UTM Coordinates are NAD83, Zone 16.
m-amsl - metres above mean sea level.
m-ab- metres along borehole (depth measured along)

Attachment 2
Summary of Groundwater Quality Monitoring Wells

BOREHOLE	UTM COORDINATES		ELEVATION (masl)	INSTALLATION ID	INSTALLATION YEAR	DATA YEARS	WELL SCREEN INTERVAL	UNIT
	Easting	Northing						
MW09-01	688796	5350900	387.54	-	2010	3013	2.8-5.8	Overburden
MW09-02	689091	5350964	386.63	-	2010	2013-2015	5.1-8.2	Overburden
MW09-03b	689172	5351503	381.05	-	2010	2013	1.7-3.5	Overburden
MW09-06	688489	5350826	386.5	-	2010	2013-2019	2.3-5.3	Overburden
HYD-12-01	688206	5352742	446.81	A	2013	2013-2015	24.08-27.13	Deep Bedrock
HYD-12-02A	687480	5353274	395.84	A	2013	2013-2019	24.6-27.66	Deep Bedrock
HYD-12-02B	687475	5353276	395.52	B	2013	2013-2015	6.32-7.85	Shallow Bedrock
HYD-12-03A	686003	5352368	366.31	A	2013	2013-2015	18.52-20.60	Deep Bedrock
HYD-12-03B	686008	5352377	366.26	B	2013	2013	2.21-3.18	Overburden
HYD-12-04A	685543	5351078	388.68	A	2013	2013-2019	26.8-29.85	Deep Bedrock
HYD-12-04B	685542	5351081	388.72	B	2013	2013-2015	4.7-8.4	Shallow Bedrock
HYD-12-05A	686234	5350685	393.39	A	2013	2013-2019	4.70-6.83	Deep Bedrock
HYD-12-05B	686239	5350688	393.82	B	2013	2013	5.23-7.37	Shallow Bedrock
HYD-12-06A	686781	5350653	389.79	A	2013	2013	26.76-32.84	Deep Bedrock
HYD-12-06B	686776	5350652	390.05	B	2013	2013	7.9-10.95	Shallow Bedrock
HYD-12-07A	687721	5351337	392.36	A	2013	2013	27.05-30.1	Deep Bedrock
HYD-12-07B	687719	5351346	392.59	B	2013	2013-2015	0.96-3.47	Shallow Bedrock
HYD-12-08A	688056	5350966	391.47	A	2013	2013-2019	29.65-32.7	Deep Bedrock
HYD-12-08B	688046	5350967	391.56	B	2013	2013-2019	6.36-8.49	Overburden
HYD-12-09	688479	5351053	399.77	A	2013	2013-2015	38.88-45.64	Deep Bedrock
HYD-12-10	688969	5351415	394.93	A	2013	2013-2015	60.21-66.31	Deep Bedrock
HYD-12-11A	688541	5351518	390.8	A	2013	2013-2015	26.21-29.26	Deep Bedrock
HYD-12-11B	688542	5351522	390.92	B	2013	2013	4.89-7.01	Overburden
2012BH-01	686572	5351896	428.02	-	2013	2013	2.90-4.42	Overburden
2012BH-03	687114	5351416	402.72	-	2013	2013	1.27-2.78	Overburden
2012BH-04	685891	5351310	404.79	-	2013	2013	1.50-2.40	Overburden
2012BH-06	686645	5351294	400.54	-	2013	2013	3.15-4.64	Overburden
2012BH-07	687418	5351646	406.58	-	2013	2013	3.20-4.72	Overburden

Attachment 3

2013 Groundwater Quality Results

Table E-1: Overburden Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	MW09-01					MW09-02		
						Nov-12	Feb-13	May-13	Aug-13	Nov-13	May-13	Aug-13	Nov-13
Conductivity	umhos/cm	3		-	-			323	367	372	597	595	582
Hardness (as CaCO3)	mg/L	10		-	-			168	-	-	316	-	-
pH	pH units	0.1		6.5-8.5	6.5-8.5			7.39	7.7	7.18	6.59	6.75	6.61
Total Dissolved Solids	mg/L	10		500	-			216	248	285	410	428	454
Alkalinity, Bicarbonate (as CaCO3)	mg/L CaCO3	5 or 10		-	-			161	146	190	221	214	236
Alkalinity, Carbonate (as CaCO3)	mg/L CaCO3	5 or 10		-	-			<10	<10	<10	<10	<10	<10
Alkalinity, Hydroxide (as CaCO3)	mg/L CaCO3	5 or 10		-	-			<10	<10	<10	<10	<10	<10
Alkalinity, Total (as CaCO3)	mg/L CaCO3	5 or 10		30-500	-			162	146	191	221	214	236
Ammonia, Total (as N)	mg/L	0.02		-	-			0.06	0.072	0.106	0.384	0.322	0.302
Bromide (Br)	mg/L	0.1		-	-			-	-	<0.10	-	-	<0.10
Chloride	mg/L	0.1 or 2		-	-			<2.0	<2.0	0.16	<2.0	<2.0	0.40
Computed Conductivity													
Conductivity % Difference	%	n/a		-	-			5.6	-	-	-2.6	-	-
Fluoride (F)	mg/L	0.03		1.5	-			-	-	0.033	-	-	<0.030
Ion Balance	%	n/a		-	-			97.2	-	-	114	-	-
Nitrate-N	mg/L	0.03 or 0.1		10	-			1.25	1.12	0.965	<0.10	<0.10	<0.030
Nitrite-N	mg/L	0.02 or 0.1		1	-			<0.10	<0.10	<0.020	<0.10	<0.10	<0.020
Saturation pH	pH	n/a		-	-			7.44	-	-	7.07	-	-
Phosphate-P (ortho)	mg/L	0.003		-	-			-	-	<0.0030	-	-	<0.0030
Phosphorus, Total, Dissolved	mg/L	0.005 or 0.03		-	-			<0.030	<0.030	<0.0050	<0.030	<0.030	<0.0050
Total Phosphorus	mg/L	0.003		-	-			-	-	0.951	-	-	0.147
Phosphorus, Total	mg/L	0.03		-	0.01-0.03			1.04	1.69	-	0.093	0.779	-
TDS (Calculated)	mg/L	n/a		-	-			212	-	-	361	-	-
Sulfate (SO4)	mg/L	0.3		-	-			-	-	41.6	-	-	99.2
Sulphate	mg/L	2		500	-			42.3	45.2	-	102	102	-
Anion Sum	me/L	n/a		-	-			3.63	-	-	5.75	-	-
Cation Sum	me/L	n/a		-	-			3.53	-	-	6.54	-	-
Cation - Anion Balance	%	n/a		-	-			-1.4	-	-	6.5	-	-
Cyanide, Weak Acid Diss	mg/L	0.002		-	-			-	<0.0020	<0.0020	-	<0.0020	<0.0020
Cyanide, Total	mg/L	0.002		0.2	0.005	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Dissolved Organic Carbon	mg/L	1		5	-			1.5	1.6	1.7	9.5	6.3	7.9
Total Organic Carbon	mg/L	1		-	-			8.3	7.3	<10	10.4	7.6	9.2
Aluminum (Al)-Total	mg/L	0.01		0.1	0.075			0.015	76.6 *	33.1	0.501	37.6 *	5.73
Antimony (Sb)-Total	mg/L	0.0005		0.006	0.02			<0.00050	<0.0050 *	<0.0050	<0.00050	<0.0050 *	<0.00050
Arsenic (As)-Total	mg/L	0.001		0.025	0.005			<0.0010	0.016 *	<0.010	<0.0010	0.013 *	0.0025
Barium (Ba)-Total	mg/L	0.002		1	-			0.0253	0.410 *	0.251	0.0778	0.319 *	0.163
Beryllium (Be)-Total	mg/L	0.0005		-	1.1			<0.00050	<0.0050 *	<0.0050	<0.00050	<0.0050 *	<0.00050
Bismuth (Bi)-Total	mg/L	0.001		-	-			<0.0010	<0.010 *	<0.010	<0.0010	<0.010 *	<0.0010
Boron (B)-Total	mg/L	0.01		5	0.2			<0.010	<0.10 *	<0.10	0.045	<0.10 *	0.045
Cadmium (Cd)-Total	mg/L	0.00009		0.005	0.0005			<0.000090	<0.00090 *	<0.00090	0.000657	0.00351 *	0.00254
Calcium (Ca)-Total	mg/L	0.5		-	-			56.1	149 *	124	110	141 *	142
Chromium (Cr)-Total	mg/L	0.0005		0.05	0.0089			<0.00050	0.185 *	0.0774	0.0017	0.101 *	0.0151
Cobalt (Co)-Total	mg/L	0.0005		-	0.0009			<0.00050	0.0643 *	0.0283	0.0243	0.0745 *	0.0346
Copper (Cu)-Total	mg/L	0.001		1	0.005			<0.0010	0.335 *	0.145	0.0139	0.434 *	0.146

Table E-1: Overburden Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	MW09-01				MW09-02			
						Nov-12	Feb-13	May-13	Aug-13	Nov-13	May-13	Aug-13	Nov-13
Iron (Fe)-Total	mg/L	0.05		0.3	0.3			<0.050	109 *	51.6	0.846	63.8 *	10.5
Lead (Pb)-Total	mg/L	0.0005		0.01	0.025			<0.00050	0.0502 *	0.0221	0.00063	0.0482 *	0.0167
Lithium (Li)-Total	mg/L	0.1		-	-			<0.10	<1.0 *	<1.0	<0.10	<1.0 *	<0.10
Magnesium (Mg)-Total	mg/L	0.5		-	-			6.7	56.6 *	35.6	10.3	36.8 *	21.7
Manganese (Mn)-Total	mg/L	0.001		0.05	-			0.0377	2.25 *	0.954	6.28 *	6.38 *	6.35
Mercury (Hg)-Total	mg/L	0.00002		0.001	0.0002			-	<0.00010	<0.00010	-	<0.00010	<0.00010
Molybdenum (Mo)-Total	mg/L	0.0005		-	0.04			0.0012	<0.0050 *	<0.0050	<0.00050	<0.0050 *	<0.00050
Nickel (Ni)-Total	mg/L	0.001		-	0.025			<0.0010	0.184 *	0.077	0.0252	0.145 *	0.0398
Phosphorus (P)-Total	mg/L	0.05		-	0.01-0.03			<0.050	2.23 *	0.99	<0.050	0.95 *	0.519
Potassium (K)-Total	mg/L	1		-	-			1.6	<10 *	<10	4.1	<10 *	5.2
Selenium (Se)-Total	mg/L	0.0004		0.01	0.1			<0.00040	<0.0040 *	<0.0040	<0.00040	<0.0040 *	<0.00040
Silicon (Si)-Total	mg/L	1		-	-			4	81 *	46	7.9	58 *	13.4
Silver (Ag)-Total	mg/L	0.0001		-	0.0001			<0.00010	<0.0010 *	<0.0010	<0.00010	<0.0010 *	<0.00010
Sodium (Na)-Total	mg/L	0.5		-	-			3.03	<5.0 *	10.3	2.18	<5.0 *	2.40
Strontium (Sr)-Total	mg/L	0.001		-	-			0.0997	0.223 *	0.198	0.212	0.241 *	0.219
Thallium (Tl)-Total	mg/L	0.0003		-	0.0003			<0.00030	<0.0030 *	<0.0030	<0.00030	<0.0030 *	<0.00030
Tin (Sn)-Total	mg/L	0.001		-	-			<0.0010	<0.10 *	<0.010	<0.0010	<0.10 *	<0.0010
Titanium (Ti)-Total	mg/L	0.002		-	-			<0.0020	3.94 *	1.72	0.0259	2.22 *	0.172
Tungsten (W)-Total	mg/L	0.01		-	0.03			<0.010	<0.10 *	<0.10	<0.010	<0.10 *	<0.010
Uranium (U)-Total	mg/L	0.001		0.02	0.005			<0.0010	<0.010 *	<0.010	0.0016	<0.010 *	0.0028
Vanadium (V)-Total	mg/L	0.0005		-	0.006			<0.00050	0.218 *	0.0953	0.00169	0.122 *	0.0205
Zinc (Zn)-Total	mg/L	0.003		5	0.02			<0.0030	0.422 *	0.182	0.0181	0.371 *	0.0880
Zirconium (Zr)-Total	mg/L	0.004		-	0.004			<0.0040	<0.040 *	<0.040	<0.0040	<0.040 *	0.0062
Dissolved Metals Filtration Location		n/a		-	-			LAB	FIELD	FIELD	LAB	FIELD	FIELD
Aluminum (Al)-Dissolved	mg/L	0.01		-	0.075			0.014	<0.010	0.015	0.012	0.012	0.022
Antimony (Sb)-Dissolved	mg/L	0.0005		0.006	0.02			<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic (As)-Dissolved	mg/L	0.001		0.025	0.005	<0.0002	<0.0002	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Barium (Ba)-Dissolved	mg/L	0.002		1	-			0.0223	0.0241	0.0339	0.0667	0.0675	0.0822
Beryllium (Be)-Dissolved	mg/L	0.0005		-	1.1			<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Dissolved	mg/L	0.001		-	-			<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)-Dissolved	mg/L	0.01		5	0.2			<0.010	<0.010	<0.010	0.036	0.05	0.042
Cadmium (Cd)-Dissolved	mg/L	0.00009		0.005	0.0005			<0.000090	<0.000090	<0.000090	0.000748	0.000391	0.000894
Calcium (Ca)-Dissolved	mg/L	0.5		-	-			63.5	56.2	72.2	108	96.5	117
Chromium (Cr)-Dissolved	mg/L	0.0005		0.05	0.0089			<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt (Co)-Dissolved	mg/L	0.0005		-	0.0009			<0.00050	<0.00050	<0.00050	0.023	0.0183	0.0219
Copper (Cu)-Dissolved	mg/L	0.001		-	0.005	<0.001	<0.001	<0.0010	0.0011	0.0013	0.015	0.0029	0.0059
Iron (Fe)-Dissolved	mg/L	0.05		0.3	0.3	0.008	0.036	<0.050	<0.050	<0.050	<0.050	0.059	<0.050
Lead (Pb)-Dissolved	mg/L	0.0005		0.01	0.025			<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Lithium (Li)-Dissolved	mg/L	0.1		-	-			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Magnesium (Mg)-Dissolved	mg/L	0.5		-	-			5.72	6.44	8.31	8.06	7.9	9.78
Manganese (Mn)-Dissolved	mg/L	0.001		0.05	-			0.0138	0.0274	0.0414	6.86	5.62 *	5.92
Molybdenum (Mo)-Dissolved	mg/L	0.0005		-	0.04			0.00116	0.00069	0.00074	<0.00050	<0.00050	<0.00050
Nickel (Ni)-Dissolved	mg/L	0.001		-	0.025			<0.0010	<0.0010	<0.0010	0.0268	0.0201	0.0232
Phosphorus (P)-Dissolved	mg/L	0.05		-	0.01-0.03			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	1		-	-			1.6	1.8	2.2	3.8	4.1	4.7
Selenium (Se)-Dissolved	mg/L	0.0004		0.01	0.1			<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Silicon (Si)-Dissolved	mg/L	1		-	-			3.2	3.9	4.2	5.5	6.1	6.5
Silver (Ag)-Dissolved	mg/L	0.0001		-	0.0001			<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)-Dissolved	mg/L	0.5		-	-			2.12	1.23	2.92	1.83	1.83	2.05
Strontium (Sr)-Dissolved	mg/L	0.001		-	-			0.0964	0.0902	0.115	0.179	0.176	0.194
Thallium (Tl)-Dissolved	mg/L	0.0003		-	0.0003			<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tin (Sn)-Dissolved	mg/L	0.001		-	-			<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)-Dissolved	mg/L	0.002		-	-			<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Tungsten (W)-Dissolved	mg/L	0.01		-	0.03			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Dissolved	mg/L	0.001		0.02	0.005			0.0012	0.0011	0.0014	0.0019	0.0015	0.0018
Vanadium (V)-Dissolved	mg/L	0.0005		-	0.006			<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved	mg/L	0.003		-	0.02			<0.0030	0.0075	0.0036	0.0153	0.0181	0.0153
Zirconium (Zr)-Dissolved	mg/L	0.004		-	0.004			<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
COD	mg/L	10		-	-			167	-	-	49	-	-

Table E-1: Overburden Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	MW09-03B		MW09-06				HYD-12-03B				
						Nov-12	Nov-13	Nov-12	May-13	Aug-13	Nov-13	Nov-12	Feb-13	Jun-13	Aug-13	Nov-13
Conductivity	umhos/cm	3		-	-		203		116	166	148			-	115	109
Hardness (as CaCO3)	mg/L	10		-	-				56	-	-			86	-	
pH	pH units	0.1		6.5-8.5	6.5-8.5		7.26		7.23	7.35	7.02			6.83	7.24	6.93
Total Dissolved Solids	mg/L	10		500	-		156		98	112 *	106			86	90	75
Alkalinity, Bicarbonate (as CaCO3)	mg/L CaCO3	5 or 10		-	-		102		54	73	74			48	52.9	50
Alkalinity, Carbonate (as CaCO3)	mg/L CaCO3	5 or 10		-	-		<10		<10	<10	<10			<10	<5.0	<10
Alkalinity, Hydroxide (as CaCO3)	mg/L CaCO3	5 or 10		-	-		<10		<10	<10	<10			<10	<5.0	<10
Alkalinity, Total (as CaCO3)	mg/L CaCO3	5 or 10		30-500	-		102		54	73	74			48	52.9	50
Ammonia, Total (as N)	mg/L	0.02		-	-		0.061		0.072	0.097	0.221			0.054	0.031	0.126
Bromide (Br)	mg/L	0.1		-	-		<0.10		-	-	<0.10			-	<0.10	<0.10
Chloride	mg/L	0.1 or 2		-	-		1.31		<2.0	<2.0	0.29			<2.0	0.13	0.28
Computed Conductivity																
Conductivity % Difference	%	n/a		-	-				-3.7	-	-				-	
Fluoride (F)	mg/L	0.03		1.5	-		<0.030		-	-	<0.030			-	<0.030	<0.030
Ion Balance	%	n/a		-	-				115	-	-			-	-	-
Nitrate-N	mg/L	0.03 or 0.1		10	-		0.050		<0.10	0.17	0.070			-	<0.030	0.058
Nitrite-N	mg/L	0.02 or 0.1		1	-		<0.020		<0.10	<0.10	<0.020			<0.10	<0.020	<0.020
Saturation pH	pH	n/a		-	-				8.32	-	-			<0.10	-	-
Phosphate-P (ortho)	mg/L	0.003		-	-		<0.0030		-	-	<0.0030			-	0.004	<0.0030
Phosphorus, Total, Dissolved	mg/L	0.005 or 0.03		-	-		<0.0050		<0.030	<0.030	<0.0050			-	<0.0050	<0.010
Total Phosphorus	mg/L	0.003		-	-		0.826		-	-	2.89			0.112	0.817	3.41
Phosphorus, Total	mg/L	0.03		-	0.01-0.03				2.45	2.67				-	-	-
TDS (Calculated)	mg/L	n/a		-	-				63.4	-	-			0.449	-	-
Sulfate (SO4)	mg/L	0.3		-	-		10.4		-	-	6.95			-	3.64	3.01
Sulphate	mg/L	2		500	-				8	9.2				-	-	-
Anion Sum	me/L	n/a		-	-				1.05	-	-			5	-	-
Cation Sum	me/L	n/a		-	-				1.2	-	-			-	-	-
Cation - Anion Balance	%	n/a		-	-				6.8	-	-			-	-	-
Cyanide, Weak Acid Diss	mg/L	0.002		-	-		<0.0020		-	<0.0020	<0.0020			-	<0.0020	<0.0020
Cyanide, Total	mg/L	0.002		0.2	0.005	<0.002	<0.0020	-	<0.0020	<0.0020	<0.0020	<0.002	<0.002	-	0.0054	<0.0020
Dissolved Organic Carbon	mg/L	1		5	-		3.6		1.9	2.6	1.5			<0.0020	5.3	4.7
Total Organic Carbon	mg/L	1		-	-		7.9		10.2	2.4	10.7			4.7	9.3	-
Aluminum (Al)-Total	mg/L	0.01		0.1	0.075		14.6		0.011	98.6 *	40.6			4.4	0.046	15.6
Antimony (Sb)-Total	mg/L	0.0005		0.006	0.02	<0.0050	<0.0050	<0.00050	<0.00050	<0.00050 *	<0.0050			17.9 *	<0.00050	<0.0050
Arsenic (As)-Total	mg/L	0.001		0.025	0.005	<0.010	<0.010	<0.0010	0.053 *	0.019				<0.00050	<0.0010	<0.010
Barium (Ba)-Total	mg/L	0.002		1	-	0.191	0.191	0.0126	0.838 *	0.412				0.0033	0.0087	0.151
Beryllium (Be)-Total	mg/L	0.0005		-	1.1	<0.0050	<0.0050	<0.00050	<0.00050 *	<0.0050				0.105	<0.00050	<0.0050
Bismuth (Bi)-Total	mg/L	0.001		-	-	<0.010	<0.010	<0.0010	<0.010 *	<0.010				0.00059	<0.0010	<0.010
Boron (B)-Total	mg/L	0.01		5	0.2	<0.10	<0.10	<0.010	<0.10 *	<0.10				<0.0010	<0.010	<0.10
Cadmium (Cd)-Total	mg/L	0.00009		0.005	0.0005	<0.00090	<0.00090	<0.000090	0.00091 *		<0.00090			0.093	<0.000090	<0.00090
Calcium (Ca)-Total	mg/L	0.5		-	-	40.4	40.4	18.9	57.2 *	43.5				0.000301	18.3	33.4
Chromium (Cr)-Total	mg/L	0.0005		0.05	0.0089	0.0432	0.0432	<0.00050	0.317 *	0.122				22.9	<0.00050	0.0255
Cobalt (Co)-Total	mg/L	0.0005		-	0.0009	0.0237	0.0237	<0.00050	0.180 *	0.0713				0.0422	0.00059	0.0161
Copper (Cu)-Total	mg/L	0.001		1	0.005	0.190	0.190	<0.0010	0.961 *	0.356				0.0151	0.0018	0.113

Table E-1: Overburden Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	MW09-03B		MW09-06			HYD-12-03B					
						Nov-12	Nov-13	Nov-12	May-13	Aug-13	Nov-13	Nov-12	Feb-13	Jun-13	Aug-13	Nov-13
Iron (Fe)-Total	mg/L	0.05		0.3	0.3		20.5		<0.050	164 *	65.3			0.103	0.226	15.4
Lead (Pb)-Total	mg/L	0.0005		0.01	0.025		0.0117		<0.00050	0.0686 *	0.0248			22.1 *	<0.00050	0.0121
Lithium (Li)-Total	mg/L	0.1		-	-		<1.0		<0.10	<1.0 *	<1.0			0.0112	<0.10	<1.0
Magnesium (Mg)-Total	mg/L	0.5		-	-		9.7		2.08	47.8 *	23.7			<0.10	1.74	7.5
Manganese (Mn)-Total	mg/L	0.001		0.05	-		3.14		<0.0010	5.42 *	2.11			7.03	0.0657	0.521
Mercury (Hg)-Total	mg/L	0.00002		0.001	0.0002		<0.00010		-	<0.00010	<0.00010			0.369	<0.00010	<0.00010
Molybdenum (Mo)-Total	mg/L	0.0005		-	0.04		<0.0050		<0.00050	<0.0050 *	<0.0050			-	<0.00050	<0.0050
Nickel (Ni)-Total	mg/L	0.001		-	0.025		0.072		<0.0010	0.354 *	0.136			0.0008	<0.0010	0.019
Phosphorus (P)-Total	mg/L	0.05		-	0.01-0.03		0.56		<0.050	3.47 *	2.17			0.0367	<0.050	1.52
Potassium (K)-Total	mg/L	1		-	-		<10		1.2	14 *	<10			0.605	<1.0	<10
Selenium (Se)-Total	mg/L	0.0004		0.01	0.1		<0.0040		<0.00040	<0.0040 *	<0.0040			2.4	<0.00040	<0.0040
Silicon (Si)-Total	mg/L	1		-	-		21		4.2	99 *	58			<0.00040	4.3	13
Silver (Ag)-Total	mg/L	0.0001		-	0.0001		<0.0010		<0.00010	0.0012 *	<0.0010			25.5	<0.00010	<0.0010
Sodium (Na)-Total	mg/L	0.5		-	-		<5.0		1.13	<5.0 *	8.8			0.0003	1.52	<5.0
Strontium (Sr)-Total	mg/L	0.001		-	-		0.077		0.027	0.159 *	0.103			8.36	0.0642	0.124
Thallium (Tl)-Total	mg/L	0.0003		-	0.0003		<0.0030		<0.00030	<0.0030 *	<0.0030			0.106	<0.00030	<0.0030
Tin (Sn)-Total	mg/L	0.001		-	-		<0.010		<0.0010	<0.10 *	<0.010			<0.00030	<0.0010	<0.010
Titanium (Ti)-Total	mg/L	0.002		-	-		0.591		<0.0020	6.15 *	2.43			<0.0010	<0.0020	0.144
Tungsten (W)-Total	mg/L	0.01		-	0.03		<0.10		<0.010	<0.10 *	<0.10			0.657	<0.010	<0.10
Uranium (U)-Total	mg/L	0.001		0.02	0.005		<0.010		<0.0010	<0.010 *	<0.010			<0.010	<0.0010	<0.010
Vanadium (V)-Total	mg/L	0.0005		-	0.006		0.0345		<0.00050	0.305 *	0.117			0.0011	<0.00050	0.0437
Zinc (Zn)-Total	mg/L	0.003		5	0.02		0.084		<0.0030	0.434 *	0.168			0.0387	0.0055	0.090
Zirconium (Zr)-Total	mg/L	0.004		-	0.004		<0.040		<0.0040	<0.040 *	<0.040			0.0675	<0.0040	<0.040
Dissolved Metals Filtration Location		n/a		-	-		FIELD		LAB	FIELD	FIELD			<0.0040	LAB	FIELD
Aluminum (Al)-Dissolved	mg/L	0.01		-	0.075		0.021		<0.010	<0.010	0.015			FIELD	0.035	0.063
Antimony (Sb)-Dissolved	mg/L	0.0005		0.006	0.02		<0.00050		<0.00050	<0.00050	<0.00050			0.069	<0.00050	<0.00050
Arsenic (As)-Dissolved	mg/L	0.001		0.025	0.005	0.0004	<0.0010		<0.0010	<0.0010	<0.0010	<0.0002	0.0007	<0.00050	<0.0010	<0.0010
Barium (Ba)-Dissolved	mg/L	0.002		1	-		0.0166		0.0131	0.0188	0.0203			<0.0010	0.0108	0.0088
Beryllium (Be)-Dissolved	mg/L	0.0005		-	1.1		<0.00050		<0.00050	<0.00050	<0.00050			0.0105	<0.00050	<0.00050
Bismuth (Bi)-Dissolved	mg/L	0.001		-	-		<0.0010		<0.0010	<0.0010	<0.0010			<0.00050	<0.0010	<0.0010
Boron (B)-Dissolved	mg/L	0.01		5	0.2		0.023		<0.010	<0.010	<0.010			<0.0010	<0.010	<0.010
Cadmium (Cd)-Dissolved	mg/L	0.00009		0.005	0.0005		<0.000090		<0.000090	<0.000090	<0.000090			<0.010	<0.000090	<0.000090
Calcium (Ca)-Dissolved	mg/L	0.5		-	-		32.9		20.1	24.8	25.9			<0.000090	18.3	17.7
Chromium (Cr)-Dissolved	mg/L	0.0005		0.05	0.0089		<0.00050		<0.00050	<0.00050	<0.00050			18.2	<0.00050	<0.00050
Cobalt (Co)-Dissolved	mg/L	0.0005		-	0.0009		<0.00050		<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Copper (Cu)-Dissolved	mg/L	0.001		-	0.005	0.002	0.0030		<0.0010	<0.0010	0.0011	0.003	<0.001	0.00104	0.0031	0.0019
Iron (Fe)-Dissolved	mg/L	0.05		0.3	0.3	0.062	<0.050		<0.050	<0.050	<0.050	<0.005	0.38	0.0023	<0.050	0.219
Lead (Pb)-Dissolved	mg/L	0.0005		0.01	0.025		<0.00050		<0.00050	<0.00050	<0.00050			0.151	<0.00050	<0.00050
Lithium (Li)-Dissolved	mg/L	0.1		-	-		<0.10		<0.10	<0.10	<0.10			<0.00050	<0.10	<0.10
Magnesium (Mg)-Dissolved	mg/L	0.5		-	-		3.41		2.17	2.67	2.83			<0.10	1.77	1.73
Manganese (Mn)-Dissolved	mg/L	0.001		0.05	-		1.41		<0.0010	<0.0010	<0.0010			1.61	0.0617	0.0683
Molybdenum (Mo)-Dissolved	mg/L	0.0005		-	0.04		<0.00050		<0.00050	<0.00050	<0.00050			0.135	<0.00050	<0.00050
Nickel (Ni)-Dissolved	mg/L	0.001		-	0.025		0.0016		<0.0010	<0.0010	<0.0010			0.0142	<0.0010	<0.0010
Phosphorus (P)-Dissolved	mg/L	0.05		-	0.01-0.03		<0.050		<0.050	<0.050	<0.050			<0.0010	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	1		-	-		1.6		1.3	1.5	1.6			<0.050	<1.0	<1.0
Selenium (Se)-Dissolved	mg/L	0.0004		0.01	0.1		<0.00040		<0.00040	<0.00040	<0.00040			<1.0	<0.00040	<0.00040
Silicon (Si)-Dissolved	mg/L	1		-	-		2.9		3.7	4.4	5.4			<0.00040	4.1	4.0
Silver (Ag)-Dissolved	mg/L	0.0001		-	0.0001		<0.00010		<0.00010	<0.00010	<0.00010			4	<0.00010	<0.00010
Sodium (Na)-Dissolved	mg/L	0.5		-	-		3.65		1.05	1.26	1.24			<0.00010	1.6	1.49
Strontium (Sr)-Dissolved	mg/L	0.001		-	-		0.0541		0.0259	0.0342	0.0358			1.65	0.0626	0.0637
Thallium (Tl)-Dissolved	mg/L	0.0003		-	0.0003		<0.00030		<0.00030	<0.00030	<0.00030			0.0625	<0.00030	<0.00030
Tin (Sn)-Dissolved	mg/L	0.001		-	-		<0.0010		<0.0010	<0.0010	<0.0010			<0.00030	<0.0010	<0.0010
Titanium (Ti)-Dissolved	mg/L	0.002		-	-		<0.0020		<0.0020	<0.0020	<0.0020			<0.0010	<0.0020	<0.0020
Tungsten (W)-Dissolved	mg/L	0.01		-	0.03		<0.010		<0.010	<0.010	<0.010			<0.0020	<0.010	<0.010
Uranium (U)-Dissolved	mg/L	0.001		0.02	0.005		<0.0010		<0.0010	<0.0010	<0.0010			<0.010	<0.0010	<0.0010
Vanadium (V)-Dissolved	mg/L	0.0005		-	0.006		<0.00050		<0.00050	<0.00050	<0.00050			<0.0010	0.00131	0.00054
Zinc (Zn)-Dissolved	mg/L	0.003		-	0.02		0.0052		<0.0030	0.0038	<0.0030			0.00108	<0.0030	0.0093
Zirconium (Zr)-Dissolved	mg/L	0.004		-	0.004		<0.0040		<0.0040	<0.0040	<0.0040			0.0044	<0.0040	<0.0040
COD	mg/L	10		-	-				215	-	-			<0.0040	-	-

Table E-1: Overburden Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	HYD-12-08B					HYD-12-11B			
						Nov-12	Feb-13	May-13	Aug-13	Nov-13	Nov-12	Feb-13	May-13	Aug-13
Conductivity	umhos/cm	3		-	-			181	192	172			276	290
Hardness (as CaCO3)	mg/L	10		-	-			96	-	-			134	-
pH	pH units	0.1		6.5-8.5	6.5-8.5			7.81	7.95	7.79			6.96	7.4
Total Dissolved Solids	mg/L	10		500	-			116	126	108			168	178
Alkalinity, Bicarbonate (as CaCO3)	mg/L CaCO3	5 or 10		-	-			103	97	91			152	147
Alkalinity, Carbonate (as CaCO3)	mg/L CaCO3	5 or 10		-	-			<10	<10	<10			<10	<10
Alkalinity, Hydroxide (as CaCO3)	mg/L CaCO3	5 or 10		-	-			<10	<10	<10			<10	<10
Alkalinity, Total (as CaCO3)	mg/L CaCO3	5 or 10		30-500	-			104	98	92			152	148
Ammonia, Total (as N)	mg/L	0.02		-	-			0.084	0.058	0.066			0.65	0.545
Bromide (Br)	mg/L	0.1		-	-			-	-	<0.10			-	-
Chloride	mg/L	0.1 or 2		-	-			<2.0	<2.0	0.35			4.4	4.3
Computed Conductivity														
Conductivity % Difference	%	n/a		-	-			0.8	-	-			-3.9	-
Fluoride (F)	mg/L	0.03		1.5	-			-	-	<0.030			-	-
Ion Balance	%	n/a		-	-			108	-	-			121	-
Nitrate-N	mg/L	0.03 or 0.1		10	-			<0.10	<0.10	<0.030			<0.10	<0.10
Nitrite-N	mg/L	0.02 or 0.1		1	-			<0.10	<0.10	<0.020			<0.10	<0.10
Saturation pH	pH	n/a		-	-			7.81	-	-			7.54	-
Phosphate-P (ortho)	mg/L	0.003		-	-			-	-	0.0038			-	-
Phosphorus, Total, Dissolved	mg/L	0.005 or 0.03		-	-			<0.030	<0.030	<0.0050			<0.030	<0.030
Total Phosphorus	mg/L	0.003		-	-			-	-	0.0068			-	-
Phosphorus, Total	mg/L	0.03		-	0.01-0.03			0.058	0.039	-			0.059	0.163
TDS (Calculated)	mg/L	n/a		-	-			108	-	-			158	-
Sulfate (SO4)	mg/L	0.3		-	-			-	-	5.56			-	-
Sulphate	mg/L	2		500	-			6.5	6.9	-			<2.0	<2.0
Anion Sum	me/L	n/a		-	-			1.85	-	-			2.62	-
Cation Sum	me/L	n/a		-	-			2	-	-			3.17	-
Cation - Anion Balance	%	n/a		-	-			3.9	-	-			9.6	-
Cyanide, Weak Acid Diss	mg/L	0.002		-	-			-	<0.0020	<0.0020			-	<0.0020
Cyanide, Total	mg/L	0.002		0.2	0.005	<0.002	<0.002	<0.0020	<0.0020	<0.0020	0.003	0.002	<0.0020	<0.0020
Dissolved Organic Carbon	mg/L	1		5	-			1.8	2.4	3.6			5.8	12.9
Total Organic Carbon	mg/L	1		-	-			2	2.7	2.6			6.9	11
Aluminum (Al)-Total	mg/L	0.01		0.1	0.075			<0.010	2.13	0.147			<0.010	8.04 *
Antimony (Sb)-Total	mg/L	0.0005		0.006	0.02			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050
Arsenic (As)-Total	mg/L	0.001		0.025	0.005			<0.0010	<0.0010	<0.0010			0.0016	0.003
Barium (Ba)-Total	mg/L	0.002		1	-			0.037	0.0543	0.0416			0.0271	0.0707
Beryllium (Be)-Total	mg/L	0.0005		-	1.1			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050
Bismuth (Bi)-Total	mg/L	0.001		-	-			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010
Boron (B)-Total	mg/L	0.01		5	0.2			<0.010	<0.010	<0.010			0.091	0.061
Cadmium (Cd)-Total	mg/L	0.00009		0.005	0.0005			<0.000090	<0.000090	<0.000090			<0.000090	<0.000090
Calcium (Ca)-Total	mg/L	0.5		-	-			33.4	35.3	33.8			45.5	51.1
Chromium (Cr)-Total	mg/L	0.0005		0.05	0.0089			<0.00050	0.0078	0.00061			0.00106	0.0241
Cobalt (Co)-Total	mg/L	0.0005		-	0.0009			<0.00050	0.00302	<0.00050			0.0006	0.0101
Copper (Cu)-Total	mg/L	0.001		1	0.005			<0.0010	0.013	0.0017			<0.0010	0.068

Table E-1: Overburden Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	HYD-12-08B					HYD-12-11B			
						Nov-12	Feb-13	May-13	Aug-13	Nov-13	Nov-12	Feb-13	May-13	Aug-13
Iron (Fe)-Total	mg/L	0.05		0.3	0.3			0.38	3.96	0.813			9.97	24.1 *
Lead (Pb)-Total	mg/L	0.0005		0.01	0.025			<0.00050	0.00093	<0.00050			<0.00050	0.0051
Lithium (Li)-Total	mg/L	0.1		-	-			<0.10	<0.10	<0.10			<0.10	<0.10
Magnesium (Mg)-Total	mg/L	0.5		-	-			3.14	4.3	3.17			4.94	9.78
Manganese (Mn)-Total	mg/L	0.001		0.05	-			0.169	0.196	0.157			1.29	1.27
Mercury (Hg)-Total	mg/L	0.00002		0.001	0.0002			-	<0.00010	<0.00010			-	<0.00010
Molybdenum (Mo)-Total	mg/L	0.0005		-	0.04			<0.00050	<0.00050	<0.00050			0.00051	0.00051
Nickel (Ni)-Total	mg/L	0.001		-	0.025			<0.0010	0.0068	<0.0010			<0.0010	0.0256
Phosphorus (P)-Total	mg/L	0.05		-	0.01-0.03			<0.050	0.054	<0.050			<0.050	0.153
Potassium (K)-Total	mg/L	1		-	-			1.2	1.6	1.1			2.9	4.6
Selenium (Se)-Total	mg/L	0.0004		0.01	0.1			<0.00040	<0.00040	<0.00040			<0.00040	0.00049
Silicon (Si)-Total	mg/L	1		-	-			6.2	9.3	6.0			4.6	16.8
Silver (Ag)-Total	mg/L	0.0001		-	0.0001			<0.00010	<0.00010	<0.00010			<0.00010	0.0001
Sodium (Na)-Total	mg/L	0.5		-	-			0.94	0.99	0.93			8.65	7.78
Strontium (Sr)-Total	mg/L	0.001		-	-			0.0417	0.0392	0.0382			0.0991	0.0965
Thallium (Tl)-Total	mg/L	0.0003		-	0.0003			<0.00030	<0.00030	<0.00030			<0.00030	<0.00030
Tin (Sn)-Total	mg/L	0.001		-	-			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010
Titanium (Ti)-Total	mg/L	0.002		-	-			<0.0020	0.135	0.0079			<0.0020	0.452
Tungsten (W)-Total	mg/L	0.01		-	0.03			<0.010	<0.010	<0.010			<0.010	<0.010
Uranium (U)-Total	mg/L	0.001		0.02	0.005			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010
Vanadium (V)-Total	mg/L	0.0005		-	0.006			0.00121	0.00777	0.00237			0.00409	0.0331
Zinc (Zn)-Total	mg/L	0.003		5	0.02			<0.0030	0.017	<0.0030			<0.0030	0.0378
Zirconium (Zr)-Total	mg/L	0.004		-	0.004			<0.0040	<0.0040	<0.0040			<0.0040	0.0045
Dissolved Metals Filtration Location		n/a		-	-			LAB	FIELD	FIELD			LAB	FIELD
Aluminum (Al)-Dissolved	mg/L	0.01		-	0.075			<0.010	<0.010	0.015			<0.010	<0.010
Antimony (Sb)-Dissolved	mg/L	0.0005		0.006	0.02			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050
Arsenic (As)-Dissolved	mg/L	0.001		0.025	0.005	0.0004	0.0002	<0.0010	<0.0010	<0.0010	0.002	0.0018	<0.0010	0.0018
Barium (Ba)-Dissolved	mg/L	0.002		1	-			0.0355	0.035	0.0371			0.0206	0.023
Beryllium (Be)-Dissolved	mg/L	0.0005		-	1.1			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050
Bismuth (Bi)-Dissolved	mg/L	0.001		-	-			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010
Boron (B)-Dissolved	mg/L	0.01		5	0.2			<0.010	<0.010	<0.010			0.08	0.094
Cadmium (Cd)-Dissolved	mg/L	0.00009		0.005	0.0005			<0.000090	<0.000090	<0.000090			<0.000090	<0.000090
Calcium (Ca)-Dissolved	mg/L	0.5		-	-			33.9	34	31.3			47.5	44.8
Chromium (Cr)-Dissolved	mg/L	0.0005		0.05	0.0089			<0.00050	<0.00050	<0.00050			<0.00050	0.00098
Cobalt (Co)-Dissolved	mg/L	0.0005		-	0.0009			<0.00050	<0.00050	<0.00050			<0.00050	0.0005
Copper (Cu)-Dissolved	mg/L	0.001		-	0.005	<0.001	<0.001	0.0016	<0.0010	<0.0010	<0.001	<0.001	<0.0010	<0.0010
Iron (Fe)-Dissolved	mg/L	0.05		0.3	0.3	0.234	0.275	<0.050	0.445	0.516	10.2	10.4	0.083	9.22
Lead (Pb)-Dissolved	mg/L	0.0005		0.01	0.025			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050
Lithium (Li)-Dissolved	mg/L	0.1		-	-			<0.10	<0.10	<0.10			<0.10	<0.10
Magnesium (Mg)-Dissolved	mg/L	0.5		-	-			2.95	2.99	2.87			4.65	4.51
Manganese (Mn)-Dissolved	mg/L	0.001		0.05	-			0.183	0.136	0.132			1.44	1.17
Molybdenum (Mo)-Dissolved	mg/L	0.0005		-	0.04			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050
Nickel (Ni)-Dissolved	mg/L	0.001		-	0.025			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010
Phosphorus (P)-Dissolved	mg/L	0.05		-	0.01-0.03			<0.050	<0.050	<0.050			<0.050	<0.050
Potassium (K)-Dissolved	mg/L	1		-	-			1.3	1.2	1.1			3.4	3.2
Selenium (Se)-Dissolved	mg/L	0.0004		0.01	0.1			<0.00040	<0.00040	<0.00040			<0.00040	<0.00040
Silicon (Si)-Dissolved	mg/L	1		-	-			5.3	5.7	5.9			3.9	4.3
Silver (Ag)-Dissolved	mg/L	0.0001		-	0.0001			<0.00010	<0.00010	<0.00010			<0.00010	<0.00010
Sodium (Na)-Dissolved	mg/L	0.5		-	-			0.9	0.89	0.89			8.23	8.05
Strontium (Sr)-Dissolved	mg/L	0.001		-	-			0.0383	0.0351	0.0365			0.0908	0.0827
Thallium (Tl)-Dissolved	mg/L	0.0003		-	0.0003			<0.00030	<0.00030	<0.00030			<0.00030	<0.00030
Tin (Sn)-Dissolved	mg/L	0.001		-	-			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010
Titanium (Ti)-Dissolved	mg/L	0.002		-	-			<0.0020	<0.0020	<0.0020			<0.0020	<0.0020
Tungsten (W)-Dissolved	mg/L	0.01		-	0.03			<0.010	<0.010	<0.010			<0.010	<0.010
Uranium (U)-Dissolved	mg/L	0.001		0.02	0.005			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010
Vanadium (V)-Dissolved	mg/L	0.0005		-	0.006			0.00079	0.00144	0.00177			<0.00050	0.00354
Zinc (Zn)-Dissolved	mg/L	0.003		-	0.02			<0.0030	0.0055	<0.0030			<0.0030	<0.0030
Zirconium (Zr)-Dissolved	mg/L	0.004		-	0.004			<0.0040	<0.0040	<0.0040			<0.0040	<0.0040
COD	mg/L	10		-	-			32	-	-			53	-

Table E-1: Overburden Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	12-BH01						12-BH03			
						Nov-13	Nov-12	Feb-13	May-13	Aug-13	Nov-13	Nov-12	Feb-13	May-13	Aug-13
Conductivity	umhos/cm	3		-	-	230			-	210	209			-	250
Hardness (as CaCO3)	mg/L	10		-	-				98	-				131	-
pH	pH units	0.1		6.5-8.5	6.5-8.5	7.21			7.81	7.54	7.59			7.65	7.52
Total Dissolved Solids	mg/L	10		500	-	151			112	115	109			154	182
Alkalinity, Bicarbonate (as CaCO3)	mg/L CaCO3	5 or 10		-	-	124			129	105	112			131	128
Alkalinity, Carbonate (as CaCO3)	mg/L CaCO3	5 or 10		-	-	<10			<10	<5.0	<10			<10	<10
Alkalinity, Hydroxide (as CaCO3)	mg/L CaCO3	5 or 10		-	-	<10			<10	<5.0	<10			<10	<10
Alkalinity, Total (as CaCO3)	mg/L CaCO3	5 or 10		30-500	-	124			130	105	112			132	129
Ammonia, Total (as N)	mg/L	0.02		-	-	0.629			<0.050	0.051	<0.020			<0.050	0.097
Bromide (Br)	mg/L	0.1		-	-	<0.10			-	<0.10	<0.10			-	-
Chloride	mg/L	0.1 or 2		-	-	3.27			<2.0	0.41	0.25			<2.0	<2.0
Computed Conductivity															
Conductivity % Difference	%	n/a		-	-				-	-				-	-
Fluoride (F)	mg/L	0.03		1.5	-	0.076			-	<0.030	<0.030			-	-
Ion Balance	%	n/a		-	-				-	-				-	-
Nitrate-N	mg/L-N	0.03 or 0.1		10	-	<0.030			0.24	0.345	0.245			<0.10	<0.10
Nitrite-N	mg/L	0.02 or 0.1		1	-	<0.020			<0.10	<0.020	<0.020			<0.10	<0.10
Saturation pH	pH	n/a		-	-				-	-				-	-
Phosphate-P (ortho)	mg/L	0.003		-	-	<0.0030			-	0.0041 *	<0.0030			-	-
Phosphorus, Total, Dissolved	mg/L	0.005 or 0.03		-	-	<0.0050			<0.030	<0.0050	<0.0050			<0.030	<0.030
Total Phosphorus	mg/L	0.003		-	-	0.195			-	0.449	0.106			-	-
Phosphorus, Total	mg/L	0.03		-	0.01-0.03				<0.030	-				0.042	0.151
TDS (Calculated)	mg/L	n/a		-	-				-	-				-	-
Sulfate (SO4)	mg/L	0.3		-	-	2.69			-	6.41	5.41			-	-
Sulphate	mg/L	2		500	-				6.1	-				6.4	5.4
Anion Sum	me/L	n/a		-	-				-	-				-	-
Cation Sum	me/L	n/a		-	-				-	-				-	-
Cation - Anion Balance	%	n/a		-	-				-	-				-	-
Cyanide, Weak Acid Diss	mg/L	0.002		-	-	<0.0020			-	<0.0020	<0.0020			-	<0.0020
Cyanide, Total	mg/L	0.002		0.2	0.005	0.0029	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.0020	<0.0020
Dissolved Organic Carbon	mg/L	1		5	-	7.2			2.4	2.9	5.0			5.7	5.9
Total Organic Carbon	mg/L	1		-	-	8.3			2.4	3.4	3.5			5.6	6.2
Aluminum (Al)-Total	mg/L	0.01		0.1	0.075	2.26			<0.010	0.015	1.29			0.042	34.6 *
Antimony (Sb)-Total	mg/L	0.0005		0.006	0.02	<0.00050			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050 *
Arsenic (As)-Total	mg/L	0.001		0.025	0.005	0.0028			<0.0010	<0.0010	<0.0010			0.0024	<0.010 *
Barium (Ba)-Total	mg/L	0.002		1	-	0.0501			0.0232	0.0233	0.0601			0.0393	0.299 *
Beryllium (Be)-Total	mg/L	0.0005		-	1.1	<0.00050			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050 *
Bismuth (Bi)-Total	mg/L	0.001		-	-	<0.0010			<0.0010	<0.0010	<0.0010			<0.0010	<0.010 *
Boron (B)-Total	mg/L	0.01		5	0.2	0.074			<0.010	<0.010	<0.010			<0.010	<0.10 *
Cadmium (Cd)-Total	mg/L	0.00009		0.005	0.0005	<0.000090			<0.000090	<0.000090	<0.000090			<0.000090	<0.00090 *
Calcium (Ca)-Total	mg/L	0.5		-	-	52.0			31.1	35.9	40.9			44.7	98.6 *
Chromium (Cr)-Total	mg/L	0.0005		0.05	0.0089	0.00937			<0.00050	<0.00050	0.00648			0.00108	0.0638 *
Cobalt (Co)-Total	mg/L	0.0005		-	0.0009	0.00517			<0.00050	<0.00050	0.00346			<0.00050	0.0389 *
Copper (Cu)-Total	mg/L	0.001		1	0.005	0.0198			<0.0010	0.0019	0.0151			<0.0010	0.273 *

Table E-1: Overburden Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	12-BH01						12-BH03			
						Nov-13	Nov-12	Feb-13	May-13	Aug-13	Nov-13	Nov-12	Feb-13	May-13	Aug-13
Iron (Fe)-Total	mg/L	0.05		0.3	0.3	13.7			<0.050	<0.050	2.76			1.63	72.6 *
Lead (Pb)-Total	mg/L	0.0005		0.01	0.025	0.00350			<0.00050	<0.00050	0.00186			<0.00050	0.0168 *
Lithium (Li)-Total	mg/L	0.1		-	-	<0.10			<0.10	<0.10	<0.10			<0.10	<1.0 *
Magnesium (Mg)-Total	mg/L	0.5		-	-	7.68			5.83	5.17	7.34			5.82	36.6 *
Manganese (Mn)-Total	mg/L	0.001		0.05	-	1.10			0.0889	0.0859	0.316			0.112	0.711 *
Mercury (Hg)-Total	mg/L	0.00002		0.001	0.0002	<0.00010			-	<0.00010	<0.00010			-	<0.00010
Molybdenum (Mo)-Total	mg/L	0.0005		-	0.04	<0.00050			<0.00050	<0.00050	<0.00050			0.00168	<0.0050 *
Nickel (Ni)-Total	mg/L	0.001		-	0.025	0.0107			0.0011	<0.0010	0.0061			0.001	0.045 *
Phosphorus (P)-Total	mg/L	0.05		-	0.01-0.03	0.218			<0.050	<0.050	0.168			<0.050	1.20 *
Potassium (K)-Total	mg/L	1		-	-	3.1			1.5	1.8	2.0			1.5	<10 *
Selenium (Se)-Total	mg/L	0.0004		0.01	0.1	<0.00040			<0.00040	<0.00040	<0.00040			<0.00040	<0.0040 *
Silicon (Si)-Total	mg/L	1		-	-	6.0			5.1	4.9	6.3			6.6	53 *
Silver (Ag)-Total	mg/L	0.0001		-	0.0001	<0.00010			<0.00010	<0.00010	<0.00010			<0.00010	<0.0010 *
Sodium (Na)-Total	mg/L	0.5		-	-	6.59			2.71	2.4	2.32			1.93	<5.0 *
Strontium (Sr)-Total	mg/L	0.001		-	-	0.0833			0.0956	0.0889	0.0994			0.079	0.148 *
Thallium (Tl)-Total	mg/L	0.0003		-	0.0003	<0.00030			<0.00030	<0.00030	<0.00030			<0.00030	<0.0030 *
Tin (Sn)-Total	mg/L	0.001		-	-	<0.0010			<0.0010	<0.0010	<0.0010			<0.0010	<0.010 *
Titanium (Ti)-Total	mg/L	0.002		-	-	0.0709			<0.0020	<0.0020	0.0538			<0.0020	1.83 *
Tungsten (W)-Total	mg/L	0.01		-	0.03	<0.010			<0.010	<0.010	<0.010			<0.010	<0.10 *
Uranium (U)-Total	mg/L	0.001		0.02	0.005	<0.0010			<0.0010	<0.0010	<0.0010			<0.0010	<0.010 *
Vanadium (V)-Total	mg/L	0.0005		-	0.006	0.0207			<0.00050	<0.00050	0.00714			0.0032	0.186 *
Zinc (Zn)-Total	mg/L	0.003		5	0.02	0.0197			0.005	0.0087	0.0139			0.0131	0.193 *
Zirconium (Zr)-Total	mg/L	0.004		-	0.004	<0.0040			<0.0040	<0.0040	<0.0040			<0.0040	<0.040 *
Dissolved Metals Filtration Location		n/a		-	-	FIELD			LAB	FIELD	FIELD			LAB	FIELD
Aluminum (Al)-Dissolved	mg/L	0.01		-	0.075	<0.010			<0.010	<0.010	0.016			0.029	0.046
Antimony (Sb)-Dissolved	mg/L	0.0005		0.006	0.02	<0.00050			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050
Arsenic (As)-Dissolved	mg/L	0.001		0.025	0.005	0.0017	<0.0002	0.0003	<0.0010	<0.0010	<0.0010	0.0013	0.0028	0.0021	0.0028
Barium (Ba)-Dissolved	mg/L	0.002		1	-	0.0205			0.0222	0.0249	0.0253			0.0366	0.0315
Beryllium (Be)-Dissolved	mg/L	0.0005		-	1.1	<0.00050			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050
Bismuth (Bi)-Dissolved	mg/L	0.001		-	-	<0.0010			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010
Boron (B)-Dissolved	mg/L	0.01		5	0.2	0.077			<0.010	<0.010	<0.010			<0.010	<0.010
Cadmium (Cd)-Dissolved	mg/L	0.00009		0.005	0.0005	<0.000090			<0.000090	<0.000090	<0.000090			<0.000090	<0.000090
Calcium (Ca)-Dissolved	mg/L	0.5		-	-	33.3			30.8	35.4	35.0			44	37.6
Chromium (Cr)-Dissolved	mg/L	0.0005		0.05	0.0089	0.00072			<0.00050	<0.00050	<0.00050			0.0009	0.00127
Cobalt (Co)-Dissolved	mg/L	0.0005		-	0.0009	<0.00050			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050
Copper (Cu)-Dissolved	mg/L	0.001		-	0.005	<0.0010	<0.001	<0.001	0.0011	0.0019	0.0015	<0.001	<0.001	<0.0010	<0.0010
Iron (Fe)-Dissolved	mg/L	0.05		0.3	0.3	7.65	0.025	0.056	<0.050	<0.050	<0.050	2.34	2.23	1.27	1.59
Lead (Pb)-Dissolved	mg/L	0.0005		0.01	0.025	<0.00050			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050
Lithium (Li)-Dissolved	mg/L	0.1		-	-	<0.10			<0.10	<0.10	<0.10			<0.10	<0.10
Magnesium (Mg)-Dissolved	mg/L	0.5		-	-	3.38			5.09	4.69	5.48			5.17	4.32
Manganese (Mn)-Dissolved	mg/L	0.001		0.05	-	0.968			0.0828	0.0786	0.0267			0.112	0.107
Molybdenum (Mo)-Dissolved	mg/L	0.0005		-	0.04	<0.00050			<0.00050	<0.00050	<0.00050			0.00128	0.00114
Nickel (Ni)-Dissolved	mg/L	0.001		-	0.025	<0.0010			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010
Phosphorus (P)-Dissolved	mg/L	0.05		-	0.01-0.03	<0.050			<0.050	<0.050	<0.050			<0.050	<0.050
Potassium (K)-Dissolved	mg/L	1		-	-	2.7			1.5	1.7	1.6			1.5	1.3
Selenium (Se)-Dissolved	mg/L	0.0004		0.01	0.1	<0.00040			<0.00040	<0.00040	<0.00040			<0.00040	<0.00040
Silicon (Si)-Dissolved	mg/L	1		-	-	3.7			4	5.1	4.9			5.2	5.7
Silver (Ag)-Dissolved	mg/L	0.0001		-	0.0001	<0.00010			0.00013	<0.00010	<0.00010			0.00013	<0.00010
Sodium (Na)-Dissolved	mg/L	0.5		-	-	6.91			2.22	2.39	2.06			1.53	1.78
Strontium (Sr)-Dissolved	mg/L	0.001		-	-	0.0644			0.0821	0.0919	0.0909			0.0655	0.0606
Thallium (Tl)-Dissolved	mg/L	0.0003		-	0.0003	<0.00030			<0.00030	<0.00030	<0.00030			<0.00030	<0.00030
Tin (Sn)-Dissolved	mg/L	0.001		-	-	<0.0010			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010
Titanium (Ti)-Dissolved	mg/L	0.002		-	-	<0.0020			<0.0020	<0.0020	<0.0020			<0.0020	<0.0020
Tungsten (W)-Dissolved	mg/L	0.01		-	0.03	<0.010			<0.010	<0.010	<0.010			<0.010	<0.010
Uranium (U)-Dissolved	mg/L	0.001		0.02	0.005	<0.0010			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010
Vanadium (V)-Dissolved	mg/L	0.0005		-	0.006	0.00379			<0.00050	<0.00050	<0.00050			0.00258	0.00532
Zinc (Zn)-Dissolved	mg/L	0.003		-	0.02	<0.0030			0.0039	<0.0030	<0.0030			0.0064	0.006
Zirconium (Zr)-Dissolved	mg/L	0.004		-	0.004	<0.0040			<0.0040	<0.0040	<0.0040			<0.0040	<0.0040
COD	mg/L	10		-	-	-			21	-	-			40	-

Table E-1: Overburden Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	Nov-13
Conductivity	umhos/cm	3		-	-	246
Hardness (as CaCO3)	mg/L	10		-	-	-
pH	pH units	0.1		6.5-8.5	6.5-8.5	7.18
Total Dissolved Solids	mg/L	10		500	-	170
Alkalinity, Bicarbonate (as CaCO3)	mg/L CaCO3	5 or 10		-	-	149
Alkalinity, Carbonate (as CaCO3)	mg/L CaCO3	5 or 10		-	-	<10
Alkalinity, Hydroxide (as CaCO3)	mg/L CaCO3	5 or 10		-	-	<10
Alkalinity, Total (as CaCO3)	mg/L CaCO3	5 or 10		30-500	-	149
Ammonia, Total (as N)	mg/L	0.02		-	-	0.211
Bromide (Br)	mg/L	0.1		-	-	<0.10
Chloride	mg/L	0.1 or 2		-	-	0.48
Computed Conductivity						
Conductivity % Difference	%	n/a		-	-	
Fluoride (F)	mg/L	0.03		1.5	-	<0.030
Ion Balance	%	n/a		-	-	
Nitrate-N	mg/L	0.03 or 0.1		10	-	<0.030
Nitrite-N	mg/L	0.02 or 0.1		1	-	<0.020
Saturation pH	pH	n/a				
Phosphate-P (ortho)	mg/L	0.003		-	-	<0.0030
Phosphorus, Total, Dissolved	mg/L	0.005 or 0.03		-	-	<0.0050
Total Phosphorus	mg/L	0.003		-	-	1.38
Phosphorus, Total	mg/L	0.03		-	0.01-0.03	
TDS (Calculated)	mg/L	n/a				
Sulfate (SO4)	mg/L	0.3		-	-	5.27
Sulphate	mg/L	2		500	-	
Anion Sum	me/L	n/a		-	-	
Cation Sum	me/L	n/a		-	-	
Cation - Anion Balance	%	n/a		-	-	
Cyanide, Weak Acid Diss	mg/L	0.002		-	-	<0.0020
Cyanide, Total	mg/L	0.002		0.2	0.005	<0.0020
Dissolved Organic Carbon	mg/L	1		5	-	7.8
Total Organic Carbon	mg/L	1		-	-	50.8
Aluminum (Al)-Total	mg/L	0.01		0.1	0.075	38.7
Antimony (Sb)-Total	mg/L	0.0005		0.006	0.02	<0.0050
Arsenic (As)-Total	mg/L	0.001		0.025	0.005	<0.010
Barium (Ba)-Total	mg/L	0.002		1	-	0.340
Beryllium (Be)-Total	mg/L	0.0005		-	1.1	<0.0050
Bismuth (Bi)-Total	mg/L	0.001		-	-	<0.010
Boron (B)-Total	mg/L	0.01		5	0.2	<0.10
Cadmium (Cd)-Total	mg/L	0.00009		0.005	0.0005	<0.00090
Calcium (Ca)-Total	mg/L	0.5		-	-	110
Chromium (Cr)-Total	mg/L	0.0005		0.05	0.0089	0.0721
Cobalt (Co)-Total	mg/L	0.0005		-	0.0009	0.0475
Copper (Cu)-Total	mg/L	0.001		1	0.005	0.257

Table E-1: Overburden Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	Nov-13
Iron (Fe)-Total	mg/L	0.05		0.3	0.3	84.8
Lead (Pb)-Total	mg/L	0.0005		0.01	0.025	0.0190
Lithium (Li)-Total	mg/L	0.1		-	-	<1.0
Magnesium (Mg)-Total	mg/L	0.5		-	-	40.8
Manganese (Mn)-Total	mg/L	0.001		0.05	-	0.754
Mercury (Hg)-Total	mg/L	0.00002		0.001	0.0002	<0.00010
Molybdenum (Mo)-Total	mg/L	0.0005		-	0.04	<0.0050
Nickel (Ni)-Total	mg/L	0.001		-	0.025	0.051
Phosphorus (P)-Total	mg/L	0.05		-	0.01-0.03	1.23
Potassium (K)-Total	mg/L	1		-	-	<10
Selenium (Se)-Total	mg/L	0.0004		0.01	0.1	<0.0040
Silicon (Si)-Total	mg/L	1		-	-	62
Silver (Ag)-Total	mg/L	0.0001		-	0.0001	<0.0010
Sodium (Na)-Total	mg/L	0.5		-	-	8.5
Strontium (Sr)-Total	mg/L	0.001		-	-	0.164
Thallium (Tl)-Total	mg/L	0.0003		-	0.0003	<0.0030
Tin (Sn)-Total	mg/L	0.001		-	-	<0.010
Titanium (Ti)-Total	mg/L	0.002		-	-	2.29
Tungsten (W)-Total	mg/L	0.01		-	0.03	<0.10
Uranium (U)-Total	mg/L	0.001		0.02	0.005	<0.010
Vanadium (V)-Total	mg/L	0.0005		-	0.006	0.217
Zinc (Zn)-Total	mg/L	0.003		5	0.02	0.198
Zirconium (Zr)-Total	mg/L	0.004		-	0.004	<0.040
Dissolved Metals Filtration Location		n/a		-	-	FIELD
Aluminum (Al)-Dissolved	mg/L	0.01		-	0.075	0.068
Antimony (Sb)-Dissolved	mg/L	0.0005		0.006	0.02	<0.00050
Arsenic (As)-Dissolved	mg/L	0.001		0.025	0.005	0.0025
Barium (Ba)-Dissolved	mg/L	0.002		1	-	0.0428
Beryllium (Be)-Dissolved	mg/L	0.0005		-	1.1	<0.00050
Bismuth (Bi)-Dissolved	mg/L	0.001		-	-	<0.0010
Boron (B)-Dissolved	mg/L	0.01		5	0.2	<0.010
Cadmium (Cd)-Dissolved	mg/L	0.00009		0.005	0.0005	<0.000090
Calcium (Ca)-Dissolved	mg/L	0.5		-	-	47.6
Chromium (Cr)-Dissolved	mg/L	0.0005		0.05	0.0089	0.00115
Cobalt (Co)-Dissolved	mg/L	0.0005		-	0.0009	0.00140
Copper (Cu)-Dissolved	mg/L	0.001		-	0.005	<0.0010
Iron (Fe)-Dissolved	mg/L	0.05		0.3	0.3	1.83
Lead (Pb)-Dissolved	mg/L	0.0005		0.01	0.025	<0.00050
Lithium (Li)-Dissolved	mg/L	0.1		-	-	<0.10
Magnesium (Mg)-Dissolved	mg/L	0.5		-	-	5.17
Manganese (Mn)-Dissolved	mg/L	0.001		0.05	-	0.130
Molybdenum (Mo)-Dissolved	mg/L	0.0005		-	0.04	0.00089
Nickel (Ni)-Dissolved	mg/L	0.001		-	0.025	<0.0010
Phosphorus (P)-Dissolved	mg/L	0.05		-	0.01-0.03	<0.050
Potassium (K)-Dissolved	mg/L	1		-	-	1.6
Selenium (Se)-Dissolved	mg/L	0.0004		0.01	0.1	<0.00040
Silicon (Si)-Dissolved	mg/L	1		-	-	5.9
Silver (Ag)-Dissolved	mg/L	0.0001		-	0.0001	<0.00010
Sodium (Na)-Dissolved	mg/L	0.5		-	-	1.56
Strontium (Sr)-Dissolved	mg/L	0.001		-	-	0.0723
Thallium (Tl)-Dissolved	mg/L	0.0003		-	0.0003	<0.00030
Tin (Sn)-Dissolved	mg/L	0.001		-	-	<0.0010
Titanium (Ti)-Dissolved	mg/L	0.002		-	-	<0.0020
Tungsten (W)-Dissolved	mg/L	0.01		-	0.03	<0.010
Uranium (U)-Dissolved	mg/L	0.001		0.02	0.005	<0.0010
Vanadium (V)-Dissolved	mg/L	0.0005		-	0.006	0.00535
Zinc (Zn)-Dissolved	mg/L	0.003		-	0.02	0.0046
Zirconium (Zr)-Dissolved	mg/L	0.004		-	0.004	<0.0040
COD	mg/L	10		-	-	-

Table E-1: Overburden Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	2012-BH-04				2012-BH-06			
						Feb-13	Jun-13	Aug-13	Nov-13	Nov-12	Feb-13	Jun-13	Aug-13
Conductivity	umhos/cm	3		-	-		-	200	183			-	235
Hardness (as CaCO3)	mg/L	10		-	-		91	-				230	-
pH	pH units	0.1		6.5-8.5	6.5-8.5		8.17	7.98	8.01			7.9	7.48
Total Dissolved Solids	mg/L	10		500	-		108	129	115			154	163
Alkalinity, Bicarbonate (as CaCO3)	mg/L CaCO3	5 or 10		-	-		96	93.7	94			116	113
Alkalinity, Carbonate (as CaCO3)	mg/L CaCO3	5 or 10		-	-		<10	<5.0	<10			<10	<5.0
Alkalinity, Hydroxide (as CaCO3)	mg/L CaCO3	5 or 10		-	-		<10	<5.0	<10			<10	<5.0
Alkalinity, Total (as CaCO3)	mg/L CaCO3	5 or 10		30-500	-		97	93.7	95			117	113
Ammonia, Total (as N)	mg/L	0.02		-	-		<0.050	0.033	0.150			0.066	0.036
Bromide (Br)	mg/L	0.1		-	-		-	<0.10	<0.10			-	<0.10
Chloride	mg/L	0.1 or 2		-	-		<2.0	0.37	0.22			<2.0	0.28
Computed Conductivity													
Conductivity % Difference	%	n/a		-	-		-	-				-	-
Fluoride (F)	mg/L	0.03		1.5	-		-	0.033	<0.030			-	0.034
Ion Balance	%	n/a		-	-		-	-				-	-
Nitrate-N	mg/L	0.03 or 0.1		10	-		<0.10	0.039	0.044			<0.10	<0.030
Nitrite-N	mg/L	0.02 or 0.1		1	-		<0.10	<0.020	<0.020			<0.10	<0.020
Saturation pH	pH	n/a		-	-		-	-				-	-
Phosphate-P (ortho)	mg/L	0.003		-	-		-	<0.0030	<0.0030			-	<0.0030
Phosphorus, Total, Dissolved	mg/L	0.005 or 0.03		-	-		<0.030	<0.0050	<0.0050			0.03	<0.0050
Total Phosphorus	mg/L	0.003		-	-		-	0.0707	0.291			-	0.13
Phosphorus, Total	mg/L	0.03		-	0.01-0.03		0.476	-				1.18	-
TDS (Calculated)	mg/L	n/a		-	-		-	-				-	-
Sulfate (SO4)	mg/L	0.3		-	-		-	9.18	7.63			-	6.85
Sulphate	mg/L	2		500	-		7.8	-				6	-
Anion Sum	me/L	n/a		-	-		-	-				-	-
Cation Sum	me/L	n/a		-	-		-	-				-	-
Cation - Anion Balance	%	n/a		-	-		-	-				-	-
Cyanide, Weak Acid Diss	mg/L	0.002		-	-		-	<0.0020	<0.0020			-	<0.0020
Cyanide, Total	mg/L	0.002		0.2	0.005		-	<0.0020	<0.0020			<0.0020	0.0036
Dissolved Organic Carbon	mg/L	1		5	-		1.8	<1.0	2.6			23.9	2.5
Total Organic Carbon	mg/L	1		-	-		2.6	1.1	2.3			27	5.1
Aluminum (Al)-Total	mg/L	0.01		0.1	0.075		0.013	4.45	3.52			41.5 *	7.23 *
Antimony (Sb)-Total	mg/L	0.0005		0.006	0.02		<0.00050	<0.00050	<0.00050			<0.00050	<0.00050
Arsenic (As)-Total	mg/L	0.001		0.025	0.005		<0.0010	0.0011	0.0012			0.0118	0.0029
Barium (Ba)-Total	mg/L	0.002		1	-		0.0236	0.0526	0.0666			0.19	0.0864
Beryllium (Be)-Total	mg/L	0.0005		-	1.1		<0.00050	<0.00050	<0.00050			0.00084	<0.00050
Bismuth (Bi)-Total	mg/L	0.001		-	-		<0.0010	<0.0010	<0.0010			<0.0010	<0.0010
Boron (B)-Total	mg/L	0.01		5	0.2		<0.010	<0.010	<0.010			0.014	<0.010
Cadmium (Cd)-Total	mg/L	0.00009		0.005	0.0005		<0.000090	0.000141	0.000310			0.00083	0.000328
Calcium (Ca)-Total	mg/L	0.5		-	-		36.1	39.3	45.0			53.9	47
Chromium (Cr)-Total	mg/L	0.0005		0.05	0.0089		<0.00050	0.0225	0.0209			0.0598	0.0134
Cobalt (Co)-Total	mg/L	0.0005		-	0.0009		<0.00050	0.00636	0.00696			0.0596	0.0188
Copper (Cu)-Total	mg/L	0.001		1	0.005		<0.0010	0.027	0.0292			0.274	0.0892

Table E-1: Overburden Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	2012-BH-04				2012-BH-06			
						Feb-13	Jun-13	Aug-13	Nov-13	Nov-12	Feb-13	Jun-13	Aug-13
Iron (Fe)-Total	mg/L	0.05		0.3	0.3		<0.050	9.39	7.51			86.8 *	13.2
Lead (Pb)-Total	mg/L	0.0005		0.01	0.025		<0.00050	0.00208	0.00325			0.0275	0.0111
Lithium (Li)-Total	mg/L	0.1		-	-		<0.10	<0.10	<0.10			<0.10	<0.10
Magnesium (Mg)-Total	mg/L	0.5		-	-		2.52	5.35	5.23			23.3	8.84
Manganese (Mn)-Total	mg/L	0.001		0.05	-		0.362	0.368	0.590			2.27	1.32
Mercury (Hg)-Total	mg/L	0.00002		0.001	0.0002		-	<0.00010	<0.00010			-	<0.00010
Molybdenum (Mo)-Total	mg/L	0.0005		-	0.04		0.00252	0.00131	0.00086			0.00686	0.00103
Nickel (Ni)-Total	mg/L	0.001		-	0.025		0.0012	0.0158	0.0155			0.0779	0.0167
Phosphorus (P)-Total	mg/L	0.05		-	0.01-0.03		<0.050	0.13	0.173			1	0.541
Potassium (K)-Total	mg/L	1		-	-		4.1	3.5	2.6			4.1	1.6
Selenium (Se)-Total	mg/L	0.0004		0.01	0.1		<0.00040	<0.00040	<0.00040			<0.00040	0.00086
Silicon (Si)-Total	mg/L	1		-	-		3.5	10.8	8.9			63 *	13.4
Silver (Ag)-Total	mg/L	0.0001		-	0.0001		<0.00010	0.00044	0.00019			0.001	0.00013
Sodium (Na)-Total	mg/L	0.5		-	-		1.25	1.32	1.23			6.75	2.61
Strontium (Sr)-Total	mg/L	0.001		-	-		0.0509	0.0533	0.0588			0.125	0.0791
Thallium (Tl)-Total	mg/L	0.0003		-	0.0003		<0.00030	<0.00030	<0.00030			0.00093	0.00033
Tin (Sn)-Total	mg/L	0.001		-	-		<0.0010	<0.0010	<0.0010			<0.0010	<0.0010
Titanium (Ti)-Total	mg/L	0.002		-	-		<0.0020	0.274	0.175			3.04	0.343
Tungsten (W)-Total	mg/L	0.01		-	0.03		<0.010	<0.010	<0.010			0.015	<0.010
Uranium (U)-Total	mg/L	0.001		0.02	0.005		<0.0010	<0.0010	<0.0010			0.0022	<0.0010
Vanadium (V)-Total	mg/L	0.0005		-	0.006		0.00066	0.0253	0.0210			0.129	0.0235
Zinc (Zn)-Total	mg/L	0.003		5	0.02		0.0031	0.0408	0.0556			0.262	0.0633
Zirconium (Zr)-Total	mg/L	0.004		-	0.004		<0.0040	<0.0040	<0.0040			0.0105	<0.0040
Dissolved Metals Filtration Location		n/a		-	-		LAB	FIELD	FIELD			FIELD	FIELD
Aluminum (Al)-Dissolved	mg/L	0.01		-	0.075		0.014	0.013	0.020			0.013	0.011
Antimony (Sb)-Dissolved	mg/L	0.0005		0.006	0.02		<0.00050	<0.00050	<0.00050			<0.00050	<0.00050
Arsenic (As)-Dissolved	mg/L	0.001		0.025	0.005	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010
Barium (Ba)-Dissolved	mg/L	0.002		1	-		<0.0281	0.0232	0.0217			0.015	0.0158
Beryllium (Be)-Dissolved	mg/L	0.0005		-	1.1		<0.00050	<0.00050	<0.00050			<0.00050	<0.00050
Bismuth (Bi)-Dissolved	mg/L	0.001		-	-		<0.0010	<0.0010	<0.0010			<0.0010	<0.0010
Boron (B)-Dissolved	mg/L	0.01		5	0.2		<0.010	<0.010	<0.010			<0.010	<0.010
Cadmium (Cd)-Dissolved	mg/L	0.00009		0.005	0.0005		<0.000090	<0.000090	<0.000090			<0.000090	<0.000090
Calcium (Ca)-Dissolved	mg/L	0.5		-	-		32.6	35.3	35.0			35.8	40
Chromium (Cr)-Dissolved	mg/L	0.0005		0.05	0.0089		<0.00050	<0.00050	<0.00050			<0.00050	<0.00050
Cobalt (Co)-Dissolved	mg/L	0.0005		-	0.0009		<0.00050	<0.00050	<0.00050			0.00208	0.00196
Copper (Cu)-Dissolved	mg/L	0.001		-	0.005		<0.0010	<0.0010	<0.0010			<0.0010	<0.0010
Iron (Fe)-Dissolved	mg/L	0.05		0.3	0.3	-	<0.050	<0.050	<0.050	-	-	0.241	0.364
Lead (Pb)-Dissolved	mg/L	0.0005		0.01	0.025		<0.00050	<0.00050	<0.00050			<0.00050	<0.00050
Lithium (Li)-Dissolved	mg/L	0.1		-	-		<0.10	<0.10	<0.10			<0.10	<0.10
Magnesium (Mg)-Dissolved	mg/L	0.5		-	-		2.37	2.38	2.24			4.39	5.25
Manganese (Mn)-Dissolved	mg/L	0.001		0.05	-		0.339	0.145	0.0666			1.1	0.827
Molybdenum (Mo)-Dissolved	mg/L	0.0005		-	0.04		0.00258	0.00104	0.00074			0.0139	0.00101
Nickel (Ni)-Dissolved	mg/L	0.001		-	0.025		<0.0010	<0.0010	<0.0010			0.0016	0.0015
Phosphorus (P)-Dissolved	mg/L	0.05		-	0.01-0.03		<0.050	<0.050	<0.050			<0.050	<0.050
Potassium (K)-Dissolved	mg/L	1		-	-		4	3.2	2.4			<1.0	<1.0
Selenium (Se)-Dissolved	mg/L	0.0004		0.01	0.1		<0.00040	0.00047	<0.00040			<0.00040	<0.00040
Silicon (Si)-Dissolved	mg/L	1		-	-		3.5	5.2	4.5			5	6.4
Silver (Ag)-Dissolved	mg/L	0.0001		-	0.0001		<0.00010	<0.00010	<0.00010			<0.00010	<0.00010
Sodium (Na)-Dissolved	mg/L	0.5		-	-		1.24	1.46	1.19			5.45	2.44
Strontium (Sr)-Dissolved	mg/L	0.001		-	-		0.0544	0.0448	0.0444			0.0598	0.0591
Thallium (Tl)-Dissolved	mg/L	0.0003		-	0.0003		<0.00030	<0.00030	<0.00030			<0.00030	<0.00030
Tin (Sn)-Dissolved	mg/L	0.001		-	-		<0.0010	<0.0010	<0.0010			<0.0010	<0.0010
Titanium (Ti)-Dissolved	mg/L	0.002		-	-		<0.0020	<0.0020	<0.0020			<0.0020	<0.0020
Tungsten (W)-Dissolved	mg/L	0.01		-	0.03		<0.010	<0.010	<0.010			<0.010	<0.010
Uranium (U)-Dissolved	mg/L	0.001		0.02	0.005		<0.0010	<0.0010	<0.0010			<0.0010	<0.0010
Vanadium (V)-Dissolved	mg/L	0.0005		-	0.006		0.00101	0.00096	0.00063			<0.00050	0.00054
Zinc (Zn)-Dissolved	mg/L	0.003		-	0.02		<0.0030	0.0062	0.0035			<0.0030	0.0085
Zirconium (Zr)-Dissolved	mg/L	0.004		-	0.004		<0.0040	<0.0040	<0.0040			<0.0040	<0.0040
COD	mg/L	10		-	-		72	-	-			99	-

Table E-1: Overburden Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	12-BH 07				
						Nov-13	Feb-13	May-13	Aug-13	Nov-13
Conductivity	umhos/cm	3		-	-	199		-	155	142
Hardness (as CaCO3)	mg/L	10		-	-	-		59	-	-
pH	pH units	0.1		6.5-8.5	6.5-8.5	7.22		7.85	7.82	7.59
Total Dissolved Solids	mg/L	10		500	-	146		76	106	88
Alkalinity, Bicarbonate (as CaCO3)	mg/L CaCO3	5 or 10		-	-	118		54	77	70
Alkalinity, Carbonate (as CaCO3)	mg/L CaCO3	5 or 10		-	-	<10		<10	<10	<10
Alkalinity, Hydroxide (as CaCO3)	mg/L CaCO3	5 or 10		-	-	<10		<10	<10	<10
Alkalinity, Total (as CaCO3)	mg/L CaCO3	5 or 10		30-500	-	118		55	78	70
Ammonia, Total (as N)	mg/L	0.02		-	-	0.030		<0.050	0.084	<0.020
Bromide (Br)	mg/L	0.1		-	-	<0.10		-	-	<0.10
Chloride	mg/L	0.1 or 2		-	-	0.18		<2.0	<2.0	0.20
Computed Conductivity										
Conductivity % Difference	%	n/a		-	-			-	-	
Fluoride (F)	mg/L	0.03		1.5	-	0.033		-	-	0.035
Ion Balance	%	n/a		-	-			-	-	
Nitrate-N	mg/L	0.03 or 0.1		10	-	<0.030		<0.10	<0.10	<0.030
Nitrite-N	mg/L	0.02 or 0.1		1	-	<0.020		<0.10	<0.10	<0.020
Saturation pH	pH	n/a		-	-			-	-	
Phosphate-P (ortho)	mg/L	0.003		-	-	0.0030		-	-	<0.0030
Phosphorus, Total, Dissolved	mg/L	0.005 or 0.03		-	-	<0.0050		<0.030	<0.030	<0.0050
Total Phosphorus	mg/L	0.003		-	-	0.133		-	-	0.339
Phosphorus, Total	mg/L	0.03		-	0.01-0.03			<0.030	0.933	
TDS (Calculated)	mg/L	n/a		-	-			-	-	
Sulfate (SO4)	mg/L	0.3		-	-	6.70		-	-	5.19
Sulphate	mg/L	2		500	-			5.1	5.7	
Anion Sum	me/L	n/a		-	-			-	-	
Cation Sum	me/L	n/a		-	-			-	-	
Cation - Anion Balance	%	n/a		-	-			-	-	
Cyanide, Weak Acid Diss	mg/L	0.002		-	-	<0.0020		-	<0.0020	<0.0020
Cyanide, Total	mg/L	0.002		0.2	0.005	<0.0020	<0.002	<0.0020	<0.0020	<0.0020
Dissolved Organic Carbon	mg/L	1		5	-	2.6		2.3	2.2	2.2
Total Organic Carbon	mg/L	1		-	-	3.0		2.3	2.5	3.3
Aluminum (Al)-Total	mg/L	0.01		0.1	0.075	1.82		<0.010	30.8 *	11.1
Antimony (Sb)-Total	mg/L	0.0005		0.006	0.02	<0.00050		<0.00050	<0.0050 *	<0.00050
Arsenic (As)-Total	mg/L	0.001		0.025	0.005	0.0011		<0.0010	0.017 *	0.0094
Barium (Ba)-Total	mg/L	0.002		1	-	0.0400		0.0083	0.141 *	0.0745
Beryllium (Be)-Total	mg/L	0.0005		-	1.1	<0.00050		<0.00050	<0.0050 *	<0.00050
Bismuth (Bi)-Total	mg/L	0.001		-	-	<0.0010		<0.0010	<0.010 *	<0.0010
Boron (B)-Total	mg/L	0.01		5	0.2	<0.010		<0.010	<0.10 *	<0.010
Cadmium (Cd)-Total	mg/L	0.00009		0.005	0.0005	<0.000090		<0.000090	<0.00090 *	0.000111
Calcium (Ca)-Total	mg/L	0.5		-	-	38.5		19.7	37.0 *	28.3
Chromium (Cr)-Total	mg/L	0.0005		0.05	0.0089	0.00293		<0.00050	0.0860 *	0.0315
Cobalt (Co)-Total	mg/L	0.0005		-	0.0009	0.00660		0.00056	0.0613 *	0.0232
Copper (Cu)-Total	mg/L	0.001		1	0.005	0.0290		0.0015	0.140 *	0.0572

Table E-1: Overburden Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	12-BH 07				
						Nov-13	Feb-13	May-13	Aug-13	Nov-13
Iron (Fe)-Total	mg/L	0.05		0.3	0.3	3.30		<0.050	51.6 *	18.9
Lead (Pb)-Total	mg/L	0.0005		0.01	0.025	0.00347		<0.00050	0.0146 *	0.00612
Lithium (Li)-Total	mg/L	0.1		-	-	<0.10		<0.10	<1.0 *	<0.10
Magnesium (Mg)-Total	mg/L	0.5		-	-	6.00		2.81	23.2 *	9.72
Manganese (Mn)-Total	mg/L	0.001		0.05	-	0.968		0.0023	1.29 *	0.468
Mercury (Hg)-Total	mg/L	0.00002		0.001	0.0002	<0.00010		-	<0.00010	<0.00010
Molybdenum (Mo)-Total	mg/L	0.0005		-	0.04	0.00089		0.0006	<0.0050 *	0.00057
Nickel (Ni)-Total	mg/L	0.001		-	0.025	0.0053		<0.0010	0.072 *	0.0278
Phosphorus (P)-Total	mg/L	0.05		-	0.01-0.03	0.148		<0.050	0.86 *	0.296
Potassium (K)-Total	mg/L	1		-	-	<1.0		<1.0	<10 *	1.9
Selenium (Se)-Total	mg/L	0.0004		0.01	0.1	<0.00040		<0.00040	<0.0040 *	<0.00040
Silicon (Si)-Total	mg/L	1		-	-	7.6		6.4	50 *	24.0
Silver (Ag)-Total	mg/L	0.0001		-	0.0001	<0.00010		<0.00010	<0.0010 *	0.00031
Sodium (Na)-Total	mg/L	0.5		-	-	3.22		1.45	10.6 *	2.22
Strontium (Sr)-Total	mg/L	0.001		-	-	0.0665		0.0327	0.080 *	0.0547
Thallium (Tl)-Total	mg/L	0.0003		-	0.0003	<0.00030		<0.00030	<0.0030 *	<0.00030
Tin (Sn)-Total	mg/L	0.001		-	-	<0.0010		<0.0010	<0.010 *	<0.0010
Titanium (Ti)-Total	mg/L	0.002		-	-	0.0988		<0.0020	1.79 *	0.613
Tungsten (W)-Total	mg/L	0.01		-	0.03	<0.010		<0.010	<0.10 *	<0.010
Uranium (U)-Total	mg/L	0.001		0.02	0.005	<0.0010		<0.0010	<0.010 *	<0.0010
Vanadium (V)-Total	mg/L	0.0005		-	0.006	0.00607		<0.00050	0.0785 *	0.0289
Zinc (Zn)-Total	mg/L	0.003		5	0.02	0.0157		0.0058	0.150 *	0.0512
Zirconium (Zr)-Total	mg/L	0.004		-	0.004	<0.0040		<0.0040	<0.040 *	<0.0040
Dissolved Metals Filtration Location		n/a		-	-	FIELD		LAB	FIELD	FIELD
Aluminum (Al)-Dissolved	mg/L	0.01		-	0.075	0.018		<0.010	<0.010	0.016
Antimony (Sb)-Dissolved	mg/L	0.0005		0.006	0.02	<0.00050		<0.00050	<0.00050	<0.00050
Arsenic (As)-Dissolved	mg/L	0.001		0.025	0.005	<0.0010	0.0003	<0.0010	0.0012	0.0012
Barium (Ba)-Dissolved	mg/L	0.002		1	-	0.0153		0.0086	0.0097	0.0092
Beryllium (Be)-Dissolved	mg/L	0.0005		-	1.1	<0.00050		<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Dissolved	mg/L	0.001		-	-	<0.0010		<0.0010	<0.0010	<0.0010
Boron (B)-Dissolved	mg/L	0.01		5	0.2	<0.010		<0.010	<0.010	<0.010
Cadmium (Cd)-Dissolved	mg/L	0.00009		0.005	0.0005	<0.000090		<0.000090	<0.000090	<0.000090
Calcium (Ca)-Dissolved	mg/L	0.5		-	-	36.5		19.5	22.7	24.4
Chromium (Cr)-Dissolved	mg/L	0.0005		0.05	0.0089	<0.00050		<0.00050	<0.00050	<0.00050
Cobalt (Co)-Dissolved	mg/L	0.0005		-	0.0009	0.00197		<0.00050	0.00071	0.00112
Copper (Cu)-Dissolved	mg/L	0.001		-	0.005	<0.0010	0.001	0.0013	0.0015	0.0015
Iron (Fe)-Dissolved	mg/L	0.05		0.3	0.3	0.151	0.017	<0.050	<0.050	<0.050
Lead (Pb)-Dissolved	mg/L	0.0005		0.01	0.025	<0.00050		<0.00050	<0.00050	<0.00050
Lithium (Li)-Dissolved	mg/L	0.1		-	-	<0.10		<0.10	<0.10	<0.10
Magnesium (Mg)-Dissolved	mg/L	0.5		-	-	4.82		2.54	2.67	3.00
Manganese (Mn)-Dissolved	mg/L	0.001		0.05	-	0.816		0.0019	0.0014	0.0013
Molybdenum (Mo)-Dissolved	mg/L	0.0005		-	0.04	0.00096		<0.00050	<0.00050	<0.00050
Nickel (Ni)-Dissolved	mg/L	0.001		-	0.025	0.0013		<0.0010	<0.0010	<0.0010
Phosphorus (P)-Dissolved	mg/L	0.05		-	0.01-0.03	<0.050		<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	1		-	-	<1.0		<1.0	<1.0	<1.0
Selenium (Se)-Dissolved	mg/L	0.0004		0.01	0.1	<0.00040		<0.00040	<0.00040	<0.00040
Silicon (Si)-Dissolved	mg/L	1		-	-	5.3		5.4	5.4	6.0
Silver (Ag)-Dissolved	mg/L	0.0001		-	0.0001	<0.00010		<0.00010	<0.00010	<0.00010
Sodium (Na)-Dissolved	mg/L	0.5		-	-	2.68		1.19	1.27	1.46
Strontium (Sr)-Dissolved	mg/L	0.001		-	-	0.0617		0.0297	0.0326	0.0350
Thallium (Tl)-Dissolved	mg/L	0.0003		-	0.0003	<0.00030		<0.00030	<0.00030	<0.00030
Tin (Sn)-Dissolved	mg/L	0.001		-	-	<0.0010		<0.0010	<0.0010	<0.0010
Titanium (Ti)-Dissolved	mg/L	0.002		-	-	<0.0020		<0.0020	<0.0020	<0.0020
Tungsten (W)-Dissolved	mg/L	0.01		-	0.03	<0.010		<0.010	<0.010	<0.010
Uranium (U)-Dissolved	mg/L	0.001		0.02	0.005	<0.0010		<0.0010	<0.0010	<0.0010
Vanadium (V)-Dissolved	mg/L	0.0005		-	0.006	<0.00050		<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved	mg/L	0.003		-	0.02	0.0061		0.0052	0.006	0.0034
Zirconium (Zr)-Dissolved	mg/L	0.004		-	0.004	<0.0040		<0.0040	<0.0040	<0.0040
COD	mg/L	10		-	-			38	-	-

Table E.2 Shallow bedrock Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	HYD-12-02B				
						Nov-12	Feb-13	Jun-13	Aug-13	Nov-13
Conductivity (EC)	uS/cm	3		-	-			-	138	143
Hardness (as CaCO3)	mg/L	10		-	-			55	-	
pH	pH units	0.1		6.5-8.5	6.5-8.5			7.04	7.21	6.81
Total Dissolved Solids	mg/L	10		500	-			94	101	108
Alkalinity, Bicarbonate (as CaCO3)	mg/L	5		-	-			44	62.6	71
Alkalinity, Carbonate (as CaCO3)	mg/L	5		-	-			<10	<5.0	<10
Alkalinity, Hydroxide (as CaCO3)	mg/L CaCO3	5		-	-			<10	<5.0	<10
Alkalinity, Total (as CaCO3)	mg/L CaCO3	5		30-500	-			44	62.6	72
Ammonia, Total (as N)	mg/L	0.02		-	-			<0.050	<0.020	<0.020
Bromide (Br)	mg/L	0.1		-	-			-	<0.10	<0.10
Chloride	mg/L	0.1		-	-			<2.0	0.18	0.21
Computed Conductivity										
Conductivity % Difference	%	n/a		-	-			-	-	
Fluoride (F)	mg/L	0.03		1.5	-			-	<0.030	<0.030
Ion Balance	%	n/a		-	-			-	-	
Nitrate (as N)	mg/L	0.03 or 0.1		10	-			0.22	0.385	0.202
Nitrite (as N)	mg/L	0.02 or 0.1		1	-			<0.10	<0.020	<0.020
Saturation pH										
Phosphate-P (ortho)	mg/L	0.003		-	-			-	<0.0030 *	<0.0030
Phosphorus (P)-Total Dissolved	mg/L	0.005 or 0.03		-	-			<0.030	<0.0050	<0.0050
Total Phosphorus	mg/L	0.003		-	-			-	0.246	0.158
Phosphorus, Total	mg/L	0.03		-	0.01-0.03			0.225	-	
TDS (Calculated)										
Sulfate (SO4)	mg/L	0.3		-	-			-	4.86	4.07
Sulphate	mg/L	2		500	-			4.2	-	
Anion Sum	me/L	n/a		-	-			-	-	
Cation Sum	me/L	n/a		-	-			-	-	
Cation - Anion Balance	%	n/a		-	-			-	-	
Cyanide, Weak Acid Diss	mg/L	0.002		-	-			-	<0.0020	<0.0020
Cyanide, Total	mg/L	0.002		0.2	0.005	<0.002	<0.002	<0.0020	0.0049	<0.0020
Dissolved Organic Carbon	mg/L	1		5	-			4.5	4	6.4
Total Organic Carbon	mg/L	1		-	-			7.1	5.8	8.4
Aluminum (Al)-Total	mg/L	0.01		0.1	0.075			0.055	0.038	2.42
Antimony (Sb)-Total	mg/L	0.0005		0.006	0.02			<0.00050	<0.00050	<0.00050
Arsenic (As)-Total	mg/L	0.001		0.025	0.005			<0.0010	<0.0010	0.0011
Barium (Ba)-Total	mg/L	0.002		1	-			0.0052	0.0063	0.0452
Beryllium (Be)-Total	mg/L	0.0005		-	1.1			<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Total	mg/L	0.001		-	-			<0.0010	<0.0010	<0.0010
Boron (B)-Total	mg/L	0.01		5	0.2			<0.010	<0.010	<0.010
Cadmium (Cd)-Total	mg/L	0.00009		0.005	0.0005			<0.000090	<0.000090	0.000139
Calcium (Ca)-Total	mg/L	0.5		-	-			19.1	23.9	28.8
Chromium (Cr)-Total	mg/L	0.0005		0.05	0.0089			<0.00050	<0.00050	0.00407
Cobalt (Co)-Total	mg/L	0.0005		-	0.0009			<0.00050	<0.00050	0.00427
Copper (Cu)-Total	mg/L	0.001		1	0.005			0.0035	0.0032	0.0482
Iron (Fe)-Total	mg/L	0.05		0.3	0.3			<0.050	<0.050	3.01
Lead (Pb)-Total	mg/L	0.0005		0.01	0.025			<0.00050	<0.00050	<0.00050
Lithium (Li)-Total	mg/L	0.1		-	-			<0.10	<0.10	<0.10
Magnesium (Mg)-Total	mg/L	0.5		-	-			1.07	1.39	2.09

Table E.2 Shallow bedrock Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	HYD-12-02B				
						Nov-12	Feb-13	Jun-13	Aug-13	Nov-13
Manganese (Mn)-Total	mg/L	0.001		0.05	-			0.0049	0.002	0.617
Mercury (Hg)-Total	mg/L	0.00002		0.001	0.0002			-	<0.00010	<0.00010
Molybdenum (Mo)-Total	mg/L	0.0005		-	0.04			0.00591	<0.00050	<0.00050
Nickel (Ni)-Total	mg/L	0.001		-	0.025			<0.0010	0.001	0.0061
Phosphorus (P)-Total	mg/L	0.05		-	0.01-0.03			<0.050	<0.050	0.084
Potassium (K)-Total	mg/L	1		-	-			<1.0	<1.0	1.1
Selenium (Se)-Total	mg/L	0.0004		0.01	0.1			<0.00040	<0.00040	<0.00040
Silicon (Si)-Total	mg/L	1		-	-			3.9	4.4	7.1
Silver (Ag)-Total	mg/L	0.0001		-	0.0001			<0.00010	<0.00010	0.00041
Sodium (Na)-Total	mg/L	0.5		-	-			0.91	1.17	1.41
Strontium (Sr)-Total	mg/L	0.001		-	-			0.0894	0.113	0.149
Thallium (Tl)-Total	mg/L	0.0003		-	0.0003			<0.00030	<0.00030	<0.00030
Tin (Sn)-Total	mg/L	0.001		-	-			<0.0010	<0.0010	<0.0010
Titanium (Ti)-Total	mg/L	0.002		-	-			<0.0020	<0.0020	0.0552
Tungsten (W)-Total	mg/L	0.01		-	0.03			<0.010	<0.010	<0.010
Uranium (U)-Total	mg/L	0.001		0.02	0.005			<0.0010	<0.0010	<0.0010
Vanadium (V)-Total	mg/L	0.0005		-	0.006			<0.00050	<0.00050	0.00600
Zinc (Zn)-Total	mg/L	0.003		5	0.02			0.0106	0.0056	0.0142
Zirconium (Zr)-Total	mg/L	0.004		-	0.004			<0.0040	<0.0040	<0.0040
Dissolved Metals Filtration Location		n/a		-	-			LAB	LAB	FIELD
Aluminum (Al)-Dissolved	mg/L	0.01		-	0.075			0.053	0.032	0.052
Antimony (Sb)-Dissolved	mg/L	0.0005		0.006	0.02			<0.00050	<0.00050	<0.00050
Arsenic (As)-Dissolved	mg/L	0.001		0.025	0.005	0.0003	0.0003	<0.0010	<0.0010	<0.0010
Barium (Ba)-Dissolved	mg/L	0.002		1	-			0.0053	0.006	0.0071
Beryllium (Be)-Dissolved	mg/L	0.0005		-	1.1			<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Dissolved	mg/L	0.001		-	-			<0.0010	<0.0010	<0.0010
Boron (B)-Dissolved	mg/L	0.01		5	0.2			<0.010	<0.010	<0.010
Cadmium (Cd)-Dissolved	mg/L	0.00009		0.005	0.0005			<0.000090	<0.000090	<0.000090
Calcium (Ca)-Dissolved	mg/L	0.5		-	-			20	23.9	27.4
Chromium (Cr)-Dissolved	mg/L	0.0005		0.05	0.0089			<0.00050	<0.00050	<0.00050
Cobalt (Co)-Dissolved	mg/L	0.0005		-	0.0009			<0.00050	<0.00050	<0.00050
Copper (Cu)-Dissolved	mg/L	0.001		-	0.005	0.003	0.003	0.003	0.003	0.0035
Iron (Fe)-Dissolved	mg/L	0.05		0.3	0.3	0.008	0.014	<0.050	<0.050	<0.050
Lead (Pb)-Dissolved	mg/L	0.0005		0.01	0.025			<0.00050	<0.00050	<0.00050
Lithium (Li)-Dissolved	mg/L	0.1		-	-			<0.10	<0.10	<0.10
Magnesium (Mg)-Dissolved	mg/L	0.5		-	-			1.18	1.4	1.55
Manganese (Mn)-Dissolved	mg/L	0.001		0.05	-			0.0071	0.0035	0.0014
Molybdenum (Mo)-Dissolved	mg/L	0.0005		-	0.04			<0.00050	<0.00050	<0.00050
Nickel (Ni)-Dissolved	mg/L	0.001		-	0.025			<0.0010	<0.0010	<0.0010
Phosphorus (P)-Dissolved	mg/L	0.05		-	0.01-0.03			<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	1		-	-			<1.0	<1.0	<1.0
Selenium (Se)-Dissolved	mg/L	0.0004		0.01	0.1			<0.00040	<0.00040	<0.00040
Silicon (Si)-Dissolved	mg/L	1		-	-			3.9	4.3	4.7
Silver (Ag)-Dissolved	mg/L	0.0001		-	0.0001			<0.00010	<0.00010	<0.00010
Sodium (Na)-Dissolved	mg/L	0.5		-	-			1.02	1.24	1.35
Strontium (Sr)-Dissolved	mg/L	0.001		-	-			0.0968	0.138	0.134
Thallium (Tl)-Dissolved	mg/L	0.0003		-	0.0003			<0.00030	<0.00030	<0.00030
Tin (Sn)-Dissolved	mg/L	0.001		-	-			<0.0010	<0.0010	<0.0010
Titanium (Ti)-Dissolved	mg/L	0.002		-	-			<0.0020	<0.0020	<0.0020
Tungsten (W)-Dissolved	mg/L	0.01		-	0.03			<0.010	<0.010	<0.010
Uranium (U)-Dissolved	mg/L	0.001		0.02	0.005			<0.0010	<0.0010	<0.0010
Vanadium (V)-Dissolved	mg/L	0.0005		-	0.006			<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved	mg/L	0.003		-	0.02			<0.0030	<0.0030	<0.0030
Zirconium (Zr)-Dissolved	mg/L	0.004		-	0.004			<0.0040	<0.0040	<0.0040
COD	mg/L	10		-	-			116	-	

Table E.2 Shallow bedrock Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	HYD-12-04B					HYD12-05B			
						Nov-12	Feb-13	Jun-13	Aug-13	Nov-13	Nov-12	Feb-13	Aug-13	Nov-12
Conductivity (EC)	uS/cm	3		-	-			-	262	390			908	
Hardness (as CaCO3)	mg/L	10		-	-			109	-					
pH	pH units	0.1		6.5-8.5	6.5-8.5			7.18	7.14	7.84			8.17	
Total Dissolved Solids	mg/L	10		500	-			134	173	237			577	
Alkalinity, Bicarbonate (as CaCO3)	mg/L	5		-	-			117	127	219			319	
Alkalinity, Carbonate (as CaCO3)	mg/L	5		-	-			<10	<5.0	<10			<5.0	
Alkalinity, Hydroxide (as CaCO3)	mg/L CaCO3	5		-	-			<10	<5.0	<10			<5.0	
Alkalinity, Total (as CaCO3)	mg/L CaCO3	5		30-500	-			117	127	220			319	
Ammonia, Total (as N)	mg/L	0.02		-	-			<0.050	0.035	0.056			0.392	
Bromide (Br)	mg/L	0.1		-	-			-	<0.10	<0.10			<0.10	
Chloride	mg/L	0.1		-	-			<2.0	0.49	4.40			19.7	
Computed Conductivity														
Conductivity % Difference	%	n/a		-	-			-	-					
Fluoride (F)	mg/L	0.03		1.5	-			-	0.035	0.057			0.23	
Ion Balance	%	n/a		-	-			-	-					
Nitrate (as N)	mg/L	0.03 or 0.1		10	-			<0.10	<0.030	<0.030			<0.15	
Nitrite (as N)	mg/L	0.02 or 0.1		1	-			<0.10	<0.020	<0.020			<0.10	
Saturation pH														
Phosphate-P (ortho)	mg/L	0.003		-	-			-	<0.0030 *	<0.0030			<0.0030	
Phosphorus (P)-Total Dissolved	mg/L	0.005 or 0.03		-	-			<0.030	<0.0050	<0.0050			0.0192	
Total Phosphorus	mg/L	0.003		-	-			-	0.024	0.0087			4.32	
Phosphorus, Total	mg/L	0.03		-	0.01-0.03			0.327	-					
TDS (Calculated)														
Sulfate (SO4)	mg/L	0.3		-	-			-	7.78	9.92			138	
Sulphate	mg/L	2		500	-			8.6	-					
Anion Sum	me/L	n/a		-	-			-	-					
Cation Sum	me/L	n/a		-	-			-	-					
Cation - Anion Balance	%	n/a		-	-			-	-					
Cyanide, Weak Acid Diss	mg/L	0.002		-	-			-	<0.0020	<0.0020			<0.0020	
Cyanide, Total	mg/L	0.002		0.2	0.005	<0.002	0.002	<0.0020	0.0029	<0.0020	<0.002	<0.002	<0.0020	<0.002
Dissolved Organic Carbon	mg/L	1		5	-			4.5	5.8	4.1			22.6	
Total Organic Carbon	mg/L	1		-	-			7.3	6.4	2.8			23.1	
Aluminum (Al)-Total	mg/L	0.01		0.1	0.075			0.015	2.39	0.200			<0.010	
Antimony (Sb)-Total	mg/L	0.0005		0.006	0.02			<0.00050	<0.00050	<0.00050			<0.00050	
Arsenic (As)-Total	mg/L	0.001		0.025	0.005			0.002	0.0118	<0.0010			0.0017	
Barium (Ba)-Total	mg/L	0.002		1	-			0.0729	0.113	0.0255			0.0163	
Beryllium (Be)-Total	mg/L	0.0005		-	1.1			<0.00050	<0.00050	<0.00050			<0.00050	
Bismuth (Bi)-Total	mg/L	0.001		-	-			<0.0010	<0.0010	<0.0010			<0.0010	
Boron (B)-Total	mg/L	0.01		5	0.2			<0.010	0.012	0.041			0.193	
Cadmium (Cd)-Total	mg/L	0.00009		0.005	0.0005			<0.000090	0.00013	<0.000090			0.000585	
Calcium (Ca)-Total	mg/L	0.5		-	-			41.2	56.3	75.9			32.3	
Chromium (Cr)-Total	mg/L	0.0005		0.05	0.0089			<0.00050	0.00693	0.00130			<0.00050	
Cobalt (Co)-Total	mg/L	0.0005		-	0.0009			0.00115	0.00622	<0.00050			0.00389	
Copper (Cu)-Total	mg/L	0.001		1	0.005			0.0032	0.0253	0.0024			0.0045	
Iron (Fe)-Total	mg/L	0.05		0.3	0.3			0.456	6.84	0.484			<0.050	
Lead (Pb)-Total	mg/L	0.0005		0.01	0.025			<0.00050	0.00407	<0.00050			<0.00050	
Lithium (Li)-Total	mg/L	0.1		-	-			<0.10	<0.10	<0.10			<0.10	
Magnesium (Mg)-Total	mg/L	0.5		-	-			1.99	3.9	8.39			8.56	

Table E.2 Shallow bedrock Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	HYD-12-04B					HYD12-05B			
						Nov-12	Feb-13	Jun-13	Aug-13	Nov-13	Nov-12	Feb-13	Aug-13	Nov-12
Manganese (Mn)-Total	mg/L	0.001		0.05	-			0.394	0.854	0.360			0.272	
Mercury (Hg)-Total	mg/L	0.00002		0.001	0.0002			-	<0.00010	<0.00010			0.000047	
Molybdenum (Mo)-Total	mg/L	0.0005		-	0.04			0.00134	0.00246	0.00075			0.112	
Nickel (Ni)-Total	mg/L	0.001		-	0.025			0.002	0.0071	0.0011			0.0029	
Phosphorus (P)-Total	mg/L	0.05		-	0.01-0.03			<0.050	0.268	<0.050			0.050	
Potassium (K)-Total	mg/L	1		-	-			<1.0	1.4	2.1			6.2	
Selenium (Se)-Total	mg/L	0.0004		0.01	0.1			<0.00040	<0.00040	<0.00040			<0.00040	
Silicon (Si)-Total	mg/L	1		-	-			5.7	9.1	7.5			3.6	
Silver (Ag)-Total	mg/L	0.0001		-	0.0001			<0.00010	<0.00010	<0.00010			<0.00010	
Sodium (Na)-Total	mg/L	0.5		-	-			4.93	5.08	8.10			171	
Strontium (Sr)-Total	mg/L	0.001		-	-			0.0962	0.139	0.369			0.158	
Thallium (Tl)-Total	mg/L	0.0003		-	0.0003			<0.00030	<0.00030	<0.00030			<0.00030	
Tin (Sn)-Total	mg/L	0.001		-	-			<0.0010	<0.0010	<0.0010			<0.0010	
Titanium (Ti)-Total	mg/L	0.002		-	-			<0.0020	0.0891	0.0026			0.0022	
Tungsten (W)-Total	mg/L	0.01		-	0.03			<0.010	<0.010	<0.010			<0.010	
Uranium (U)-Total	mg/L	0.001		0.02	0.005			<0.0010	<0.0010	0.0016			0.0014	
Vanadium (V)-Total	mg/L	0.0005		-	0.006			<0.00050	0.0146	<0.00050			0.00050	
Zinc (Zn)-Total	mg/L	0.003		5	0.02			0.0108	0.0726	0.0108			0.0235	
Zirconium (Zr)-Total	mg/L	0.004		-	0.004			<0.0040	<0.0040	<0.0040			<0.0040	
Dissolved Metals Filtration Location		n/a		-	-			LAB	FIELD	FIELD			LAB	
Aluminum (Al)-Dissolved	mg/L	0.01		-	0.075			<0.010	0.026	0.014			0.021	
Antimony (Sb)-Dissolved	mg/L	0.0005		0.006	0.02			<0.00050	<0.00050	<0.00050			0.00079	
Arsenic (As)-Dissolved	mg/L	0.001		0.025	0.005	0.0025	0.0049	0.0023	0.005	<0.0010	0.0017	0.0042	0.0015	0.0006
Barium (Ba)-Dissolved	mg/L	0.002		1	-			0.067	0.0809	0.0216			0.0175	
Beryllium (Be)-Dissolved	mg/L	0.0005		-	1.1			<0.00050	<0.00050	<0.00050			<0.00050	
Bismuth (Bi)-Dissolved	mg/L	0.001		-	-			<0.0010	<0.0010	<0.0010			<0.0010	
Boron (B)-Dissolved	mg/L	0.01		5	0.2			0.011	0.013	0.040			0.212	
Cadmium (Cd)-Dissolved	mg/L	0.00009		0.005	0.0005			<0.000090	<0.000090	<0.000090			0.000426	
Calcium (Ca)-Dissolved	mg/L	0.5		-	-			40.3	47.5	76.5			34.5	
Chromium (Cr)-Dissolved	mg/L	0.0005		0.05	0.0089			<0.00050	<0.00050	<0.00050			0.00178	
Cobalt (Co)-Dissolved	mg/L	0.0005		-	0.0009			0.00126	0.001	<0.00050			0.00274	
Copper (Cu)-Dissolved	mg/L	0.001		-	0.005	0.003	<0.001	0.0019	0.0019	<0.0010	0.002	<0.001	0.0017	<0.001
Iron (Fe)-Dissolved	mg/L	0.05		0.3	0.3	0.469	1.79	<0.050	1.11	0.141	0.262	1.16	<0.050	0.218
Lead (Pb)-Dissolved	mg/L	0.0005		0.01	0.025			<0.00050	<0.00050	<0.00050			<0.00050	
Lithium (Li)-Dissolved	mg/L	0.1		-	-			<0.10	<0.10	<0.10			<0.10	
Magnesium (Mg)-Dissolved	mg/L	0.5		-	-			2.11	2.7	8.54			9.11	
Manganese (Mn)-Dissolved	mg/L	0.001		0.05	-			0.44	0.578	0.318			0.315	
Molybdenum (Mo)-Dissolved	mg/L	0.0005		-	0.04			0.00229	0.00245	0.00061			0.114	
Nickel (Ni)-Dissolved	mg/L	0.001		-	0.025			0.0015	0.0013	<0.0010			0.0034	
Phosphorus (P)-Dissolved	mg/L	0.05		-	0.01-0.03			<0.050	<0.050	<0.050			<0.050	
Potassium (K)-Dissolved	mg/L	1		-	-			<1.0	1.2	2.1			6.7	
Selenium (Se)-Dissolved	mg/L	0.0004		0.01	0.1			<0.00040	<0.00040	<0.00040			<0.00040	
Silicon (Si)-Dissolved	mg/L	1		-	-			5.3	7.4	6.8			6.6	
Silver (Ag)-Dissolved	mg/L	0.0001		-	0.0001			0.00024	<0.00010	<0.00010			<0.00010	
Sodium (Na)-Dissolved	mg/L	0.5		-	-			4.77	5.62	8.56			186	
Strontium (Sr)-Dissolved	mg/L	0.001		-	-			0.0961	0.114	0.368			0.163	
Thallium (Tl)-Dissolved	mg/L	0.0003		-	0.0003			<0.00030	<0.00030	<0.00030			<0.00030	
Tin (Sn)-Dissolved	mg/L	0.001		-	-			<0.0010	<0.0010	<0.0010			<0.0010	
Titanium (Ti)-Dissolved	mg/L	0.002		-	-			<0.0020	<0.0020	<0.0020			0.0022	
Tungsten (W)-Dissolved	mg/L	0.01		-	0.03			<0.010	<0.010	<0.010			<0.010	
Uranium (U)-Dissolved	mg/L	0.001		0.02	0.005			<0.0010	<0.0010	0.0015			0.0012	
Vanadium (V)-Dissolved	mg/L	0.0005		-	0.006			<0.00050	0.00101	<0.00050			<0.00050	
Zinc (Zn)-Dissolved	mg/L	0.003		-	0.02			0.0118	0.0083	0.0052			0.0092	
Zirconium (Zr)-Dissolved	mg/L	0.004		-	0.004			<0.0040	<0.0040	<0.0040			<0.0040	
COD	mg/L	10		-	-			51	-	-			-	

Table E.2 Shallow bedrock Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	HYD-12-06B				HYD-12-07B				
						Feb-13	Jun-13	Aug-13	Nov-13	Nov-12	Feb-13	Jun-13	Aug-13	Nov-13
Conductivity (EC)	uS/cm	3		-	-		-	231	221			-	298	290
Hardness (as CaCO3)	mg/L	10		-	-		115	-				129	-	
pH	pH units	0.1		6.5-8.5	6.5-8.5		8.09	7.97	8.04			7.76	7.89	7.54
Total Dissolved Solids	mg/L	10		500	-		150	150	142			178	183	167
Alkalinity, Bicarbonate (as CaCO3)	mg/L	5		-	-		114	105	111			156	-	160
Alkalinity, Carbonate (as CaCO3)	mg/L	5		-	-		<10	<10	<10			<10	<5.0	<10
Alkalinity, Hydroxide (as CaCO3)	mg/L CaCO3	5		-	-		<10	<10	<10			<10	-	<10
Alkalinity, Total (as CaCO3)	mg/L CaCO3	5		30-500	-		115	106	113			157	149	161
Ammonia, Total (as N)	mg/L	0.02		-	-		<0.050	0.076	0.132			0.052	0.049	0.063
Bromide (Br)	mg/L	0.1		-	-		-	-	<0.10			-	<0.10	<0.10
Chloride	mg/L	0.1		-	-		<2.0	<2.0	0.21			5.8	0.83	0.71
Computed Conductivity														
Conductivity % Difference	%	n/a		-	-		-	-				-	-	
Fluoride (F)	mg/L	0.03		1.5	-		-	-	0.062			-	0.075	0.048
Ion Balance	%	n/a		-	-		-	-				-	-	
Nitrate (as N)	mg/L	0.03 or 0.1		10	-		<0.10	<0.10	<0.030			<0.10	<0.030	<0.030
Nitrite (as N)	mg/L	0.02 or 0.1		1	-		<0.10	<0.10	<0.020			<0.10	<0.020	<0.020
Saturation pH														
Phosphate-P (ortho)	mg/L	0.003		-	-		-	-	<0.0030			-	<0.0030 *	<0.0030
Phosphorus (P)-Total Dissolved	mg/L	0.005 or 0.03		-	-		<0.030	<0.030	<0.0050			<0.030	<0.0050	<0.0050
Total Phosphorus	mg/L	0.003		-	-		-	-	0.619			-	0.0671	0.129
Phosphorus, Total	mg/L	0.03		-	0.01-0.03		1.14	1.13				0.363	-	
TDS (Calculated)														
Sulfate (SO4)	mg/L	0.3		-	-		-	-	12.7			-	7.11	5.30
Sulphate	mg/L	2		500	-		14.5	14				39.8	-	
Anion Sum	me/L	n/a		-	-		-	-				-	-	
Cation Sum	me/L	n/a		-	-		-	-				-	-	
Cation - Anion Balance	%	n/a		-	-		-	-				-	-	
Cyanide, Weak Acid Diss	mg/L	0.002		-	-		-	<0.0020	<0.0020			-	<0.0020	<0.0020
Cyanide, Total	mg/L	0.002		0.2	0.005		<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.0020	<0.0020	<0.0020
Dissolved Organic Carbon	mg/L	1		5	-		1.5	1.6	3.9			10.1	3.2	6.7
Total Organic Carbon	mg/L	1		-	-		2.1	2.3	3.3			9.2	3.6	4.1
Aluminum (Al)-Total	mg/L	0.01		0.1	0.075		0.033	84.8 *	12.9			<0.010	<0.010	0.430
Antimony (Sb)-Total	mg/L	0.0005		0.006	0.02		<0.00050	<0.0050 *	<0.00050			<0.00050	<0.00050	<0.00050
Arsenic (As)-Total	mg/L	0.001		0.025	0.005		0.0015	<0.010 *	0.0013			<0.0010	<0.0010	<0.0010
Barium (Ba)-Total	mg/L	0.002		1	-		0.037	0.913 *	0.168			0.0071	0.0053	0.0062
Beryllium (Be)-Total	mg/L	0.0005		-	1.1		<0.00050	<0.0050 *	<0.00050			<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Total	mg/L	0.001		-	-		<0.0010	<0.010 *	<0.0010			<0.0010	<0.0010	<0.0010
Boron (B)-Total	mg/L	0.01		5	0.2		<0.010	<0.10 *	<0.010			0.049	0.014	0.012
Cadmium (Cd)-Total	mg/L	0.00009		0.005	0.0005		<0.000090	<0.00090 *	0.000230			<0.000090	<0.000090	0.000119
Calcium (Ca)-Total	mg/L	0.5		-	-		42.2	200 *	111			48	60.9	61.1
Chromium (Cr)-Total	mg/L	0.0005		0.05	0.0089		0.00123	0.164 *	0.0276			<0.00050	<0.00050	0.00171
Cobalt (Co)-Total	mg/L	0.0005		-	0.0009		<0.00050	0.0946 *	0.0131			<0.00050	<0.00050	0.00119
Copper (Cu)-Total	mg/L	0.001		1	0.005		<0.0010	0.164 *	0.0230			<0.0010	<0.0010	0.0034
Iron (Fe)-Total	mg/L	0.05		0.3	0.3		<0.050	180 *	28.8			0.473	2.96	3.01
Lead (Pb)-Total	mg/L	0.0005		0.01	0.025		<0.00050	0.0051 *	0.00490			<0.00050	<0.00050	0.00229
Lithium (Li)-Total	mg/L	0.1		-	-		<0.10	<1.0 *	<0.10			<0.10	<0.10	<0.10
Magnesium (Mg)-Total	mg/L	0.5		-	-		3.97	61.6 *	11.7			2.92	2.53	2.83

Table E.2 Shallow bedrock Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	HYD-12-06B				HYD-12-07B				
						Feb-13	Jun-13	Aug-13	Nov-13	Nov-12	Feb-13	Jun-13	Aug-13	Nov-13
Manganese (Mn)-Total	mg/L	0.001		0.05	-		0.0828	4.09 *	1.20			0.28	0.442	0.542
Mercury (Hg)-Total	mg/L	0.00002		0.001	0.0002		-	<0.00010	<0.00010			-	<0.000020	<0.00010
Molybdenum (Mo)-Total	mg/L	0.0005		-	0.04		0.00345	0.0056 *	0.00091			0.0184	0.00062	0.00121
Nickel (Ni)-Total	mg/L	0.001		-	0.025		0.0022	0.102 *	0.0142			<0.0010	<0.0010	0.0018
Phosphorus (P)-Total	mg/L	0.05		-	0.01-0.03		<0.050	1.66 *	0.561			<0.050	<0.050	0.146
Potassium (K)-Total	mg/L	1		-	-		1.8	13 *	3.3			1.4	<1.0	1.0
Selenium (Se)-Total	mg/L	0.0004		0.01	0.1		<0.00040	<0.0040 *	<0.00040			<0.00040	<0.00040	<0.00040
Silicon (Si)-Total	mg/L	1		-	-		4.5	105 *	21.8			5.6	7.1	7.2
Silver (Ag)-Total	mg/L	0.0001		-	0.0001		<0.00010	<0.0010 *	<0.00010			<0.00010	<0.00010	<0.00010
Sodium (Na)-Total	mg/L	0.5		-	-		2.87	11.4 *	1.88			33.0 *	3.96	5.04
Strontium (Sr)-Total	mg/L	0.001		-	-		0.0984	0.218 *	0.135			0.0902	0.0793	0.0822
Thallium (Tl)-Total	mg/L	0.0003		-	0.0003		<0.00030	<0.0030 *	<0.00030			<0.00030	<0.00030	<0.00030
Tin (Sn)-Total	mg/L	0.001		-	-		<0.0010	<0.010 *	<0.0010			<0.0010	<0.0010	<0.0010
Titanium (Ti)-Total	mg/L	0.002		-	-		<0.0020	7.56 *	1.14			<0.0020	<0.0020	0.0028
Tungsten (W)-Total	mg/L	0.01		-	0.03		<0.010	<0.10 *	<0.010			<0.010	<0.010	<0.010
Uranium (U)-Total	mg/L	0.001		0.02	0.005		0.0017	<0.010 *	<0.0010			0.0011	<0.0010	<0.0010
Vanadium (V)-Total	mg/L	0.0005		-	0.006		0.00128	0.539 *	0.109			<0.00050	<0.00050	0.00206
Zinc (Zn)-Total	mg/L	0.003		5	0.02		0.0038	0.439 *	0.166			<0.0030	0.0052	0.0333
Zirconium (Zr)-Total	mg/L	0.004		-	0.004		<0.0040	<0.040 *	<0.0040			<0.0040	<0.0040	<0.0040
Dissolved Metals Filtration Location		n/a		-	-		LAB	FIELD	FIELD			LAB	LAB	FIELD
Aluminum (Al)-Dissolved	mg/L	0.01		-	0.075		0.014	0.015	<0.010			<0.010	<0.010	0.013
Antimony (Sb)-Dissolved	mg/L	0.0005		0.006	0.02		<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Arsenic (As)-Dissolved	mg/L	0.001		0.025	0.005	0.0006	0.0011	0.0016	<0.0010	0.0003	0.0004	<0.0010	<0.0010	<0.0010
Barium (Ba)-Dissolved	mg/L	0.002		1	-		0.0818	0.0705	0.0332			0.0064	0.0043	0.0045
Beryllium (Be)-Dissolved	mg/L	0.0005		-	1.1		<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Dissolved	mg/L	0.001		-	-		<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010
Boron (B)-Dissolved	mg/L	0.01		5	0.2		<0.010	<0.010	<0.010			0.041	0.016	0.015
Cadmium (Cd)-Dissolved	mg/L	0.00009		0.005	0.0005		<0.000090	<0.000090	<0.000090			<0.000090	<0.000090	<0.000090
Calcium (Ca)-Dissolved	mg/L	0.5		-	-		40.6	40.5	43.5			46.5	57.7	60.2
Chromium (Cr)-Dissolved	mg/L	0.0005		0.05	0.0089		<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Cobalt (Co)-Dissolved	mg/L	0.0005		-	0.0009		<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Copper (Cu)-Dissolved	mg/L	0.001		-	0.005	<0.001	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.0010	<0.0010	<0.0010
Iron (Fe)-Dissolved	mg/L	0.05		0.3	0.3	0.07	<0.050	<0.050	<0.050	2.47	2.66	<0.050	<0.050	1.94
Lead (Pb)-Dissolved	mg/L	0.0005		0.01	0.025		<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Lithium (Li)-Dissolved	mg/L	0.1		-	-		<0.10	<0.10	<0.10			<0.10	<0.10	<0.10
Magnesium (Mg)-Dissolved	mg/L	0.5		-	-		3.43	3.44	3.46			3.05	2.47	2.92
Manganese (Mn)-Dissolved	mg/L	0.001		0.05	-		0.0774	0.086	0.0833			0.277	0.389	0.393
Molybdenum (Mo)-Dissolved	mg/L	0.0005		-	0.04		0.00356	0.00156	0.00072			0.0181	0.00273	0.00212
Nickel (Ni)-Dissolved	mg/L	0.001		-	0.025		<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010
Phosphorus (P)-Dissolved	mg/L	0.05		-	0.01-0.03		<0.050	<0.050	<0.050			<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	1		-	-		2.9	2.3	1.9			1.3	1.2	1.1
Selenium (Se)-Dissolved	mg/L	0.0004		0.01	0.1		<0.00040	<0.00040	<0.00040			<0.00040	<0.00040	<0.00040
Silicon (Si)-Dissolved	mg/L	1		-	-		4.3	4.3	4.4			5.6	7.4	6.7
Silver (Ag)-Dissolved	mg/L	0.0001		-	0.0001		<0.00010	<0.00010	<0.00010			<0.00010	<0.00010	<0.00010
Sodium (Na)-Dissolved	mg/L	0.5		-	-		2.34	1.86	1.77			34.1 *	7.55	7.16
Strontium (Sr)-Dissolved	mg/L	0.001		-	-		0.0861	0.0845	0.0877			0.0929	0.0855	0.0844
Thallium (Tl)-Dissolved	mg/L	0.0003		-	0.0003		<0.00030	<0.00030	<0.00030			<0.00030	<0.00030	<0.00030
Tin (Sn)-Dissolved	mg/L	0.001		-	-		<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010
Titanium (Ti)-Dissolved	mg/L	0.002		-	-		<0.0020	<0.0020	<0.0020			<0.0020	<0.0020	<0.0020
Tungsten (W)-Dissolved	mg/L	0.01		-	0.03		<0.010	<0.010	<0.010			<0.010	<0.010	<0.010
Uranium (U)-Dissolved	mg/L	0.001		0.02	0.005		0.002	<0.0010	<0.0010			0.0011	<0.0010	<0.0010
Vanadium (V)-Dissolved	mg/L	0.0005		-	0.006		0.00139	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved	mg/L	0.003		-	0.02		<0.0030	0.0051	<0.0030			<0.0030	0.0039	<0.0030
Zirconium (Zr)-Dissolved	mg/L	0.004		-	0.004		<0.0040	<0.0040	<0.0040			<0.0040	<0.0040	<0.0040
COD	mg/L	10		-	-		25	-				78	-	

Table E.3 Bedrock Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	HYD-12-01				
						Nov-12	Feb-13	Jun-13	Aug-13	Nov-13
Conductivity	umhos/cm	3	-	-	-	-	-	-	248	250
Hardness (as CaCO3)	mg/L	10	-	-	-	-	-	123	-	-
pH	pH units	0.1	-	6.5-8.5	6.5-8.5	-	-	8.14	8.03	7.95
Total Dissolved Solids	mg/L	10	-	500	-	-	-	154	138	158
Alkalinity, Bicarbonate (as CaCO3)	mg/L CaCO3	5 or 10	-	-	-	-	-	135	119	136
Alkalinity, Carbonate (as CaCO3)	mg/L CaCO3	5 or 10	-	-	-	-	-	<10	<5.0	<10
Alkalinity, Hydroxide (as CaCO3)	mg/L CaCO3	5 or 10	-	-	-	-	-	<10	<5.0	<10
Alkalinity, Total (as CaCO3)	mg/L CaCO3	5 or 10	-	30-500	-	-	-	137	119	138
Ammonia, Total (as N)	mg/L	0.02	-	-	0.02	-	-	<0.050	0.03	<0.020
Bromide (Br)	mg/L	0.1	-	-	-	-	-	-	<0.10	<0.10
Chloride	mg/L	0.1 or 2	-	-	-	-	-	3	0.99	0.64
Computed Conductivity	uS/cm	n/a	-	-	-	-	-	-	-	-
Conductivity % Difference	%	n/a	-	-	-	-	-	-	-	-
Fluoride (F)	mg/L	0.03	-	1.5	-	-	-	-	0.099	0.079
Ion Balance	%	n/a	-	-	-	-	-	-	-	-
Nitrate (as N)	mg/L	0.03 or 0.1	-	10	-	-	-	<0.10	<0.030	<0.030
Nitrite-N	mg/L	0.02 or 0.1	-	1	-	-	-	<0.10	<0.020	<0.020
Saturation pH	pH	n/a	-	-	-	-	-	-	-	-
Phosphate-P (ortho)	mg/L	0.003	-	-	-	-	-	-	<0.0030 *	<0.0030
Phosphorus (P)-Total Dissolved	mg/L	0.005 or 0.03	-	-	-	-	-	<0.030	<0.0050	<0.0050
Total Phosphorus	mg/L	0.003	-	-	-	-	-	-	0.0072	0.0050
Phosphorus, Total	mg/L	0.03	-	-	0.01-0.03	-	-	0.036	-	-
TDS (Calculated)	mg/L	n/a	-	-	-	-	-	-	-	-
Sulfate (SO4)	mg/L	0.3	-	-	-	-	-	-	10.8	9.08
Sulphate	mg/L	2	-	500	-	-	-	11	-	-
Anion Sum	me/L	n/a	-	-	-	-	-	-	-	-
Cation Sum	me/L	n/a	-	-	-	-	-	-	-	-
Cation - Anion Balance	%	n/a	-	-	-	-	-	-	-	-
Cyanide, Weak Acid Diss	mg/L	0.002	-	-	-	-	-	-	<0.0020	<0.0020
Cyanide, Total	mg/L	0.002	-	0.2	0.005	<0.002	<0.002	<0.0020	<0.0020	<0.0020
Dissolved Organic Carbon	mg/L	1	-	5	-	-	-	1.3	<1.0	3.2
Total Organic Carbon	mg/L	1	-	-	-	-	-	1.5	<1.0	2.5
Aluminum (Al)-Total	mg/L	0.01	-	0.1	0.075	-	-	<0.010	0.011	0.041
Antimony (Sb)-Total	mg/L	0.0005	-	0.006	0.02	-	-	<0.00050	<0.00050	<0.00050
Arsenic (As)-Total	mg/L	0.001	-	0.025	0.005	-	-	<0.0010	<0.0010	<0.0010
Barium (Ba)-Total	mg/L	0.002	-	1	-	-	-	0.0063	0.0035	0.0050
Beryllium (Be)-Total	mg/L	0.0005	-	-	1.1	-	-	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Total	mg/L	0.001	-	-	-	-	-	<0.0010	<0.0010	<0.0010
Boron (B)-Total	mg/L	0.01	-	5	0.2	-	-	0.015	0.017	0.014
Cadmium (Cd)-Total	mg/L	0.00009	-	0.005	0.0005	-	-	<0.000090	<0.000090	<0.000090
Calcium (Ca)-Total	mg/L	0.5	-	-	-	-	-	33.8	31.6	39.6
Chromium (Cr)-Total	mg/L	0.0005	-	0.05	0.0089	-	-	<0.00050	<0.00050	0.00159
Cobalt (Co)-Total	mg/L	0.0005	-	-	0.0009	-	-	<0.00050	<0.00050	<0.00050
Copper (Cu)-Total	mg/L	0.001	-	1	0.005	-	-	<0.0010	<0.0010	<0.0010
Iron (Fe)-Total	mg/L	0.05	-	0.3	0.3	-	-	<0.050	0.092	0.219
Lead (Pb)-Total	mg/L	0.0005	-	0.01	0.025	-	-	<0.00050	<0.00050	<0.00050
Lithium (Li)-Total	mg/L	0.1	-	-	-	-	-	<0.10	<0.10	<0.10
Magnesium (Mg)-Total	mg/L	0.5	-	-	-	-	-	6.3	5.79	6.87
Manganese (Mn)-Total	mg/L	0.001	-	0.05	-	-	-	0.0542	0.0437	0.0533
Mercury (Hg)-Total	mg/L	0.00002	-	0.001	0.0002	-	-	-	<0.00010	<0.00010
Molybdenum (Mo)-Total	mg/L	0.0005	-	-	0.04	-	-	0.00116	0.00076	0.00062
Nickel (Ni)-Total	mg/L	0.001	-	-	0.025	-	-	<0.0010	<0.0010	0.0014

Table E.3 Bedrock Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	HYD-12-01				
						Nov-12	Feb-13	Jun-13	Aug-13	Nov-13
Phosphorus (P)-Total	mg/L	0.05	-	-	0.01-0.03			<0.050	<0.050	<0.050
Potassium (K)-Total	mg/L	1	-	-	-			1.3	1.1	1.1
Selenium (Se)-Total	mg/L	0.0004	-	0.01	0.1			<0.00040	<0.00040	<0.00040
Silicon (Si)-Total	mg/L	1	-	-	-			5.3	5.2	5.3
Silver (Ag)-Total	mg/L	0.0001	-	-	0.0001			<0.00010	<0.00010	<0.00010
Sodium (Na)-Total	mg/L	0.5	-	-	-			13.7	12.2	11.9
Strontium (Sr)-Total	mg/L	0.001	-	-	-			0.483	0.445	0.524
Thallium (Tl)-Total	mg/L	0.0003	-	-	0.0003			<0.00030	<0.00030	<0.00030
Tin (Sn)-Total	mg/L	0.001	-	-	-			<0.0010	<0.0010	<0.0010
Titanium (Ti)-Total	mg/L	0.002	-	-	-			<0.0020	<0.0020	<0.0020
Tungsten (W)-Total	mg/L	0.01	-	-	0.03			0.043	0.023	0.014
Uranium (U)-Total	mg/L	0.001	-	0.02	0.005			<0.0010	<0.0010	<0.0010
Vanadium (V)-Total	mg/L	0.0005	-	-	0.006			<0.00050	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.003	-	5	0.02			0.004	0.0086	0.0100
Zirconium (Zr)-Total	mg/L	0.004	-	-	0.004			<0.0040	<0.0040	<0.0040
Dissolved Metals Filtration Location		n/a	-	-	-			FIELD	LAB	FIELD
Aluminum (Al)-Dissolved	mg/L	0.01	-	-	0.075			0.234	<0.010	0.017
Antimony (Sb)-Dissolved	mg/L	0.0005	-	0.006	0.02			<0.00050	<0.00050	<0.00050
Arsenic (As)-Dissolved	mg/L	0.001	-	0.025	0.005	0.0005	0.0005	<0.0010	<0.0010	<0.0010
Barium (Ba)-Dissolved	mg/L	0.002	-	1	-			0.0076	0.003	0.0045
Beryllium (Be)-Dissolved	mg/L	0.0005	-	-	1.1			<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Dissolved	mg/L	0.001	-	-	-			<0.0010	<0.0010	<0.0010
Boron (B)-Dissolved	mg/L	0.01	-	5	0.2			0.018	0.017	0.013
Cadmium (Cd)-Dissolved	mg/L	0.00009	-	0.005	0.0005			0.000161	<0.000090	<0.000090
Calcium (Ca)-Dissolved	mg/L	0.5	-	-	-			37.7	30.5	37.0
Chromium (Cr)-Dissolved	mg/L	0.0005	-	0.05	0.0089			0.00145	<0.00050	<0.00050
Cobalt (Co)-Dissolved	mg/L	0.0005	-	-	0.0009			<0.00050	<0.00050	<0.00050
Copper (Cu)-Dissolved	mg/L	0.001	-	-	0.005	<0.001	<0.001	0.002	<0.0010	<0.0010
Iron (Fe)-Dissolved	mg/L	0.05	-	0.3	0.3	0.063	0.168	0.641	<0.050	0.112
Lead (Pb)-Dissolved	mg/L	0.0005	-	0.01	0.025			<0.00050	<0.00050	<0.00050
Lithium (Li)-Dissolved	mg/L	0.1	-	-	-			<0.10	<0.10	<0.10
Magnesium (Mg)-Dissolved	mg/L	0.5	-	-	-			6.9	5.57	6.69
Manganese (Mn)-Dissolved	mg/L	0.001	-	0.05	-			0.0634	0.0418	0.0498
Molybdenum (Mo)-Dissolved	mg/L	0.0005	-	-	0.04			0.00116	0.00082	0.00051
Nickel (Ni)-Dissolved	mg/L	0.001	-	-	0.025			0.0012	<0.0010	0.0011
Phosphorus (P)-Dissolved	mg/L	0.05	-	-	0.01-0.03			<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	1	-	-	-			1.3	1.1	1.2
Selenium (Se)-Dissolved	mg/L	0.0004	-	0.01	0.1			<0.00040	<0.00040	<0.00040
Silicon (Si)-Dissolved	mg/L	1	-	-	-			5.8	5.1	5.2
Silver (Ag)-Dissolved	mg/L	0.0001	-	-	0.0001			<0.00010	<0.00010	<0.00010
Sodium (Na)-Dissolved	mg/L	0.5	-	-	-			14.5	12	12.5
Strontium (Sr)-Dissolved	mg/L	0.001	-	-	-			0.482	0.503	0.474
Thallium (Tl)-Dissolved	mg/L	0.0003	-	-	0.0003			<0.00030	<0.00030	<0.00030
Tin (Sn)-Dissolved	mg/L	0.001	-	-	-			<0.0010	<0.0010	<0.0010
Titanium (Ti)-Dissolved	mg/L	0.002	-	-	-			0.007	<0.0020	<0.0020
Tungsten (W)-Dissolved	mg/L	0.01	-	-	0.03			0.038	0.025	0.014
Uranium (U)-Dissolved	mg/L	0.001	-	0.02	0.005			<0.0010	<0.0010	<0.0010
Vanadium (V)-Dissolved	mg/L	0.0005	-	-	0.006			0.00135	<0.00050	<0.00050
Zinc (Zn)-Dissolved	mg/L	0.003	-	-	0.02			0.0189	<0.0030	0.0093
Zirconium (Zr)-Dissolved	mg/L	0.004	-	-	0.004			<0.0040	<0.0040	<0.0040
COD	mg/L	10	-	-	-			<10	-	-

Table E.3 Bedrock Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	HYD-12-02A				HYD12-02A DUPLICATE	HYD-12-03A					
						Nov-12	Feb-13	Jun-13	Aug-13	Nov-13	Aug-13	Nov-12	Feb-13	Jun-13	Aug-13	Nov-13
Conductivity	umhos/cm	3	-	-	-	-	-	-	226	254	225	-	-	-	268	260
Hardness (as CaCO3)	mg/L	10	-	-	-	127	-	-	-	-	-	98	-	-	-	-
pH	pH units	0.1	-	6.5-8.5	6.5-8.5	10.98	7.97	7.88	7.98	7.98	7.98	8.26	8.07	8.08	8.08	8.08
Total Dissolved Solids	mg/L	10	-	500	-	212	139	163	137	137	137	184	145	176	145	176
Alkalinity, Bicarbonate (as CaCO3)	mg/L CaCO3	5 or 10	-	-	-	96	112	146	112	112	112	132	130	140	130	140
Alkalinity, Carbonate (as CaCO3)	mg/L CaCO3	5 or 10	-	-	-	<10	<5.0	<10	<5.0	<5.0	<5.0	<10	<5.0	<10	<5.0	<10
Alkalinity, Hydroxide (as CaCO3)	mg/L CaCO3	5 or 10	-	-	-	<10	<5.0	<10	<5.0	<5.0	<5.0	<10	<5.0	<10	<5.0	<10
Alkalinity, Total (as CaCO3)	mg/L CaCO3	5 or 10	-	30-500	-	96	112	147	112	112	112	134	130	142	130	142
Ammonia, Total (as N)	mg/L	0.02	-	-	0.02	<0.050	0.04	0.024	0.031	0.031	0.031	0.094	<0.020	0.026	<0.10	0.026
Bromide (Br)	mg/L	0.1	-	-	-	-	<0.10	<0.10	<0.10	<0.10	<0.10	-	<0.10	<0.10	<0.10	<0.10
Chloride	mg/L	0.1 or 2	-	-	-	<2.0	0.14	<0.10	0.15	0.15	0.15	<2.0	1.25	1.18	1.25	1.18
Computed Conductivity	uS/cm	n/a	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity % Difference	%	n/a	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoride (F)	mg/L	0.03	-	1.5	-	-	0.134	0.103	0.133	0.133	0.133	-	0.318	0.281	-	0.281
Ion Balance	%	n/a	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate (as N)	mg/L	0.03 or 0.1	-	10	-	<0.10	<0.030	<0.030	<0.030	<0.030	<0.030	<0.10	<0.030	<0.030	<0.10	<0.030
Nitrite-N	mg/L	0.02 or 0.1	-	1	-	<0.10	<0.020	<0.020	<0.020	<0.020	<0.020	<0.10	<0.020	<0.020	<0.10	<0.020
Saturation pH	pH	n/a	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phosphate-P (ortho)	mg/L	0.003	-	-	-	-	<0.0030 *	<0.0030	<0.0030	<0.0030	<0.0030	-	0.0036	<0.0030	0.0036	<0.0030
Phosphorus (P)-Total Dissolved	mg/L	0.005 or 0.03	-	-	-	0.035	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.03	<0.0050	<0.0050	<0.03	<0.0050
Total Phosphorus	mg/L	0.003	-	-	-	-	0.0047	0.0031	0.0038	0.0038	0.0038	-	0.0086	0.0233	0.0086	0.0233
Phosphorus, Total	mg/L	0.03	-	-	0.01-0.03	0.173	-	-	-	-	-	<0.030	-	-	-	-
TDS (Calculated)	mg/L	n/a	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfate (SO4)	mg/L	0.3	-	-	-	-	5.83	5.36	5.85	5.85	5.85	-	13.2	10.6	-	10.6
Sulphate	mg/L	2	-	500	-	5.6	-	-	-	-	-	19.6	-	-	-	-
Anion Sum	me/L	n/a	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cation Sum	me/L	n/a	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cation - Anion Balance	%	n/a	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide, Weak Acid Diss	mg/L	0.002	-	-	-	-	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	-	<0.0020	<0.0020	<0.0020	<0.0020
Cyanide, Total	mg/L	0.002	-	0.2	0.005	<0.002	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.0020	<0.0020	<0.0020
Dissolved Organic Carbon	mg/L	1	-	5	-	4.1	2.9	4.7	3	3	3	21.5	3.4	4.9	3.4	4.9
Total Organic Carbon	mg/L	1	-	-	-	4.4	3	3.7	3.4	3.4	3.4	19.7	3.7	4.8	3.7	4.8
Aluminum (Al)-Total	mg/L	0.01	-	0.1	0.075	10.1 *	<0.010	0.081	<0.010	<0.010	<0.010	0.637	<0.010	1.06	<0.010	1.06
Antimony (Sb)-Total	mg/L	0.0005	-	0.008	0.02	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic (As)-Total	mg/L	0.001	-	0.025	0.005	0.0014	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Barium (Ba)-Total	mg/L	0.002	-	1	-	0.0188	0.0059	0.0088	0.0061	0.0061	0.0061	0.0069	0.0029	0.0055	0.0029	0.0055
Beryllium (Be)-Total	mg/L	0.0005	-	-	1.1	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Total	mg/L	0.001	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)-Total	mg/L	0.01	-	5	0.2	0.051	0.011	<0.010	0.012	0.012	0.012	0.078	0.095	0.055	0.078	0.095
Cadmium (Cd)-Total	mg/L	0.00009	-	0.005	0.0005	<0.000090	<0.000090	<0.000090	<0.000090	<0.000090	<0.000090	<0.000090	<0.000090	0.000108	<0.000090	0.000108
Calcium (Ca)-Total	mg/L	0.5	-	-	-	36.7	33.8	46.5	34.8	34.8	34.8	28.9	33.3	33.2	28.9	33.2
Chromium (Cr)-Total	mg/L	0.0005	-	0.05	0.0089	0.011	0.00051	0.00057	<0.00050	<0.00050	<0.00050	0.00139	<0.00050	0.00174	<0.00050	0.00174
Cobalt (Co)-Total	mg/L	0.0005	-	-	0.0009	0.0089	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00056	<0.00050	0.00056
Copper (Cu)-Total	mg/L	0.001	-	1	0.005	0.153	<0.0010	0.0020	<0.0010	<0.0010	<0.0010	0.0022	<0.0010	0.0092	<0.0010	0.0092
Iron (Fe)-Total	mg/L	0.05	-	0.3	0.3	16.3 *	0.12	0.295	0.123	0.123	0.123	0.528	0.055	1.03	0.528	1.03
Lead (Pb)-Total	mg/L	0.0005	-	0.01	0.025	0.00077	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00080	<0.00050	0.00080
Lithium (Li)-Total	mg/L	0.1	-	-	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Magnesium (Mg)-Total	mg/L	0.5	-	-	-	8.48	4.98	6.26	5.24	5.24	5.24	6.3	6.47	6.20	6.3	6.47
Manganese (Mn)-Total	mg/L	0.001	-	0.05	-	0.247	0.0752	0.100	0.0741	0.0741	0.0741	0.0504	0.0528	0.0609	0.0504	0.0609
Mercury (Hg)-Total	mg/L	0.00002	-	0.001	0.0002	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010
Molybdenum (Mo)-Total	mg/L	0.0005	-	-	0.04	0.00076	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00136	0.00085	0.00069	0.00136	0.00069
Nickel (Ni)-Total	mg/L	0.001	-	-	0.025	0.0256	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0015	<0.0010	0.0016	<0.0010	0.0016

Table E.3 Bedrock Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQQ	HYD-12-02A					HYD12-02A DUPLICATE		HYD-12-03A				
						Nov-12	Feb-13	Jun-13	Aug-13	Nov-13	Aug-13	Nov-12	Feb-13	Jun-13	Aug-13	Nov-13	
Phosphorus (P)-Total	mg/L	0.05	-	-	0.01-0.03			0.177	<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	
Potassium (K)-Total	mg/L	1	-	-	-			2.1	1.7	1.9	1.8			1.6	1.8	1.5	
Selenium (Se)-Total	mg/L	0.0004	-	0.01	0.1			<0.00040	<0.00040	<0.00040	<0.00040			<0.00040	<0.00040	<0.00040	
Silicon (Si)-Total	mg/L	1	-	-	-			23.2	5	5.4	5.2			8	7.4	7.2	
Silver (Ag)-Total	mg/L	0.0001	-	-	0.0001			0.0103	<0.00010	<0.00010	<0.00010			<0.00010	<0.00010	<0.00010	
Sodium (Na)-Total	mg/L	0.5	-	-	-			8.83	4.42	4.22	4.56			28.9	28.5	20.6	
Strontium (Sr)-Total	mg/L	0.001	-	-	-			0.193	0.194	0.234	0.187			0.494	0.508	0.461	
Thallium (Tl)-Total	mg/L	0.0003	-	-	0.0003			<0.00030	<0.00030	<0.00030	<0.00030			<0.00030	<0.00030	<0.00030	
Tin (Sn)-Total	mg/L	0.001	-	-	-			<0.0010	<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010	
Titanium (Ti)-Total	mg/L	0.002	-	-	-			0.857	<0.0020	0.0048	<0.0020			0.0292	<0.0020	0.0490	
Tungsten (W)-Total	mg/L	0.01	-	-	0.03			0.309	<0.010	<0.010	<0.010			0.022	0.019	0.015	
Uranium (U)-Total	mg/L	0.001	-	0.02	0.005			<0.0010	<0.0010	0.0010	<0.0010			<0.0010	<0.0010	<0.0010	
Vanadium (V)-Total	mg/L	0.0005	-	-	0.006			0.0444	<0.00050	0.00058	<0.00050			0.00148	<0.00050	0.00259	
Zinc (Zn)-Total	mg/L	0.003	-	5	0.02			0.148	0.0063	0.0070	0.0059			0.0156	0.0046	0.0142	
Zirconium (Zr)-Total	mg/L	0.004	-	-	0.004			<0.0040	<0.0040	0.0045	<0.0040			<0.0040	<0.0040	<0.0040	
Dissolved Metals Filtration Location		n/a	-	-	-			FIELD	LAB	FIELD	LAB			FIELD	FIELD	FIELD	
Aluminum (Al)-Dissolved	mg/L	0.01	-	-	0.075			0.019	<0.010	0.013	<0.010			0.016	<0.010	0.015	
Antimony (Sb)-Dissolved	mg/L	0.0005	-	0.006	0.02			<0.00050	<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050	
Arsenic (As)-Dissolved	mg/L	0.001	-	0.025	0.005	0.0009	0.0008	<0.0010	<0.0010	<0.0010	<0.0010	0.0013	0.0005	<0.0010	<0.0010	<0.0010	
Barium (Ba)-Dissolved	mg/L	0.002	-	1	-			0.0059	0.0062	0.0081	0.006			0.007	0.0029	0.0030	
Beryllium (Be)-Dissolved	mg/L	0.0005	-	-	1.1			<0.00050	<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050	
Bismuth (Bi)-Dissolved	mg/L	0.001	-	-	-			<0.0010	<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010	
Boron (B)-Dissolved	mg/L	0.01	-	5	0.2			0.013	0.012	<0.010	0.011			0.073	0.079	0.067	
Cadmium (Cd)-Dissolved	mg/L	0.00009	-	0.005	0.0005			<0.000090	<0.000090	<0.000090	<0.000090			<0.000090	<0.000090	<0.000090	
Calcium (Ca)-Dissolved	mg/L	0.5	-	-	-			28.8	34.2	44.9	34.5			28.4	27.9	31.1	
Chromium (Cr)-Dissolved	mg/L	0.0005	-	0.05	0.0089			<0.00050	<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050	
Cobalt (Co)-Dissolved	mg/L	0.0005	-	-	0.0009			<0.00050	<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050	
Copper (Cu)-Dissolved	mg/L	0.001	-	-	0.005	<0.001	<0.001	0.0025	0.0018	<0.0010	0.0013	<0.001	<0.001	<0.0010	<0.0010	<0.0010	
Iron (Fe)-Dissolved	mg/L	0.05	-	0.3	0.3	0.18	0.157	<0.050	0.058	0.184	0.054	0.042	0.02	<0.050	<0.050	<0.050	
Lead (Pb)-Dissolved	mg/L	0.0005	-	0.01	0.025			<0.00050	<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050	
Lithium (Li)-Dissolved	mg/L	0.1	-	-	-			<0.10	<0.10	<0.10	<0.10			<0.10	<0.10	<0.10	
Magnesium (Mg)-Dissolved	mg/L	0.5	-	-	-			4.33	5.25	6.06	5.27			5.72	5.52	6.11	
Manganese (Mn)-Dissolved	mg/L	0.001	-	0.05	-			0.0592	0.0718	0.0994	0.0691			0.0412	0.0417	0.0470	
Molybdenum (Mo)-Dissolved	mg/L	0.0005	-	-	0.04			0.00051	<0.00050	<0.00050	<0.00050			0.0012	0.00087	0.00069	
Nickel (Ni)-Dissolved	mg/L	0.001	-	-	0.025			<0.0010	<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010	
Phosphorus (P)-Dissolved	mg/L	0.05	-	-	0.01-0.03			<0.050	<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	
Potassium (K)-Dissolved	mg/L	1	-	-	-			1.6	1.8	1.9	1.9			1.5	1.5	1.5	
Selenium (Se)-Dissolved	mg/L	0.0004	-	0.01	0.1			<0.00040	<0.00040	<0.00040	<0.00040			<0.00040	<0.00040	<0.00040	
Silicon (Si)-Dissolved	mg/L	1	-	-	-			5.4	4.9	5.7	4.8			6.9	6.9	6.3	
Silver (Ag)-Dissolved	mg/L	0.0001	-	-	0.0001			<0.00010	<0.00010	<0.00010	<0.00010			<0.00010	<0.00010	<0.00010	
Sodium (Na)-Dissolved	mg/L	0.5	-	-	-			4.66	4.67	4.52	4.62			27.4	23.7	22.5	
Strontium (Sr)-Dissolved	mg/L	0.001	-	-	-			0.152	0.235	0.236	0.207			0.481	0.476	0.514	
Thallium (Tl)-Dissolved	mg/L	0.0003	-	-	0.0003			<0.00030	<0.00030	<0.00030	<0.00030			<0.00030	<0.00030	<0.00030	
Tin (Sn)-Dissolved	mg/L	0.001	-	-	-			<0.0010	<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010	
Titanium (Ti)-Dissolved	mg/L	0.002	-	-	-			<0.0020	<0.0020	<0.0020	<0.0020			<0.0020	<0.0020	<0.0020	
Tungsten (W)-Dissolved	mg/L	0.01	-	-	0.03			0.019	0.011	<0.010	<0.010			0.021	0.019	0.017	
Uranium (U)-Dissolved	mg/L	0.001	-	0.02	0.005			<0.0010	<0.0010	0.0010	<0.0010			<0.0010	<0.0010	<0.0010	
Vanadium (V)-Dissolved	mg/L	0.0005	-	-	0.006			<0.00050	<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050	
Zinc (Zn)-Dissolved	mg/L	0.003	-	-	0.02			0.0059	0.0032	0.0066	0.003			0.0031	<0.0030	0.0034	
Zirconium (Zr)-Dissolved	mg/L	0.004	-	-	0.004			<0.0040	<0.0040	<0.0040	<0.0040			<0.0040	<0.0040	<0.0040	
COD	mg/L	10	-	-	-			51	-	-	-			15	-	<0.0040	

Table E.3 Bedrock Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	HYD-12-04A					HYD-12-05A				
						Nov-12	Feb-13	Jun-13	Aug-13	Nov-13	Nov-12	Feb-13	Jun-13	Aug-13	Nov-13
Conductivity	umhos/cm	3	-	-	-	-	-	-	227	219	-	-	404	386	
Hardness (as CaCO3)	mg/L	10	-	-	-	113	-	-	-	-	218	-	-	-	
pH	pH units	0.1	-	6.5-8.5	6.5-8.5	8.07	8.01	8.05	-	-	7.87	7.52	7.56	-	
Total Dissolved Solids	mg/L	10	-	500	-	128	133	132	-	-	214	267	245	-	
Alkalinity, Bicarbonate (as CaCO3)	mg/L CaCO3	5 or 10	-	-	-	114	104	110	-	-	151	208	211	-	
Alkalinity, Carbonate (as CaCO3)	mg/L CaCO3	5 or 10	-	-	-	<10	<5.0	<10	-	-	<10	<5.0	<10	-	
Alkalinity, Hydroxide (as CaCO3)	mg/L CaCO3	5 or 10	-	-	-	<10	<5.0	<10	-	-	<10	<5.0	<10	-	
Alkalinity, Total (as CaCO3)	mg/L CaCO3	5 or 10	-	30-500	-	116	104	111	-	-	152	208	211	-	
Ammonia, Total (as N)	mg/L	0.02	-	-	0.02	<0.050	<0.020	<0.020	-	-	0.084	0.026	0.030	-	
Bromide (Br)	mg/L	0.1	-	-	-	-	<0.10	<0.10	-	-	-	<0.10	<0.10	-	
Chloride	mg/L	0.1 or 2	-	-	-	<2.0	0.25	0.25	-	-	<2.0	1.19	1.00	-	
Computed Conductivity	uS/cm	n/a	-	-	-	-	-	-	-	-	-	-	-	-	
Conductivity % Difference	%	n/a	-	-	-	-	-	-	-	-	-	-	-	-	
Fluoride (F)	mg/L	0.03	-	1.5	-	-	0.043	0.039	-	-	-	0.131	0.119	-	
Ion Balance	%	n/a	-	-	-	-	-	-	-	-	-	-	-	-	
Nitrate (as N)	mg/L	0.03 or 0.1	-	10	-	<0.10	<0.030	<0.030	-	-	<0.10	0.034	0.120	-	
Nitrite-N	mg/L	0.02 or 0.1	-	1	-	<0.10	<0.020	<0.020	-	-	<0.10	<0.020	<0.020	-	
Saturation pH	pH	n/a	-	-	-	-	-	-	-	-	-	-	-	-	
Phosphate-P (ortho)	mg/L	0.003	-	-	-	-	0.0033	<0.0030	-	-	-	<0.0030 *	<0.0030	-	
Phosphorus (P)-Total Dissolved	mg/L	0.005 or 0.03	-	-	-	<0.03	<0.0050	<0.0050	-	-	0.05	<0.0050	<0.0050	-	
Total Phosphorus	mg/L	0.003	-	-	-	-	<0.0030	0.0043	-	-	-	0.144	0.287	-	
Phosphorus, Total	mg/L	0.03	-	-	0.01-0.03	<0.030	-	-	-	-	0.178	-	-	-	
TDS (Calculated)	mg/L	n/a	-	-	-	-	-	-	-	-	-	-	-	-	
Sulfate (SO4)	mg/L	0.3	-	-	-	-	12.2	12.1	-	-	-	18.5	16.3	-	
Sulphate	mg/L	2	-	500	-	10.8	-	-	-	-	21	-	-	-	
Anion Sum	me/L	n/a	-	-	-	-	-	-	-	-	-	-	-	-	
Cation Sum	me/L	n/a	-	-	-	-	-	-	-	-	-	-	-	-	
Cation - Anion Balance	%	n/a	-	-	-	-	-	-	-	-	-	-	-	-	
Cyanide, Weak Acid Diss	mg/L	0.002	-	-	-	-	<0.0020	<0.0020	-	-	-	<0.0020	<0.0020	-	
Cyanide, Total	mg/L	0.002	-	0.2	0.005	<0.002	<0.002	<0.0020	<0.0020 *	<0.0020	<0.002	<0.0020	<0.0020	<0.0020	
Dissolved Organic Carbon	mg/L	1	-	5	-	<1.0	<1.0	1.5	-	-	24.5	3.4	3.8	-	
Total Organic Carbon	mg/L	1	-	-	-	1	<1.0	1.3	-	-	23.7	3.1	7.0	-	
Aluminum (Al)-Total	mg/L	0.01	-	0.1	0.075	<0.010	0.013	0.021	-	-	26.8 *	<0.010	13.9	-	
Antimony (Sb)-Total	mg/L	0.0005	-	0.006	0.02	<0.00050	<0.00050	<0.00050	-	-	<0.00050	<0.00050	<0.00050	<0.00050	
Arsenic (As)-Total	mg/L	0.001	-	0.025	0.005	0.0028	0.0025	0.0021	-	-	0.002	<0.0010	0.0016	-	
Barium (Ba)-Total	mg/L	0.002	-	1	-	0.0471	0.0472	0.0488	-	-	0.146	0.0462	0.115	-	
Beryllium (Be)-Total	mg/L	0.0005	-	-	1.1	<0.00050	<0.00050	<0.00050	-	-	0.00234	<0.00050	0.00074	-	
Bismuth (Bi)-Total	mg/L	0.001	-	-	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	-	
Boron (B)-Total	mg/L	0.01	-	5	0.2	<0.010	<0.010	<0.010	-	-	0.054	0.03	0.034	-	
Cadmium (Cd)-Total	mg/L	0.00009	-	0.005	0.0005	<0.000090	<0.000090	<0.000090	-	-	0.000185	<0.000090	0.000269	-	
Calcium (Ca)-Total	mg/L	0.5	-	-	-	41.5	42	40.2	-	-	62.6	65.3	89.8	-	
Chromium (Cr)-Total	mg/L	0.0005	-	0.05	0.0089	<0.00050	<0.00050	<0.00050	-	-	0.00794	<0.00050	0.00932	-	
Cobalt (Co)-Total	mg/L	0.0005	-	-	0.0009	0.00095	0.00054	<0.00050	-	-	0.0148	<0.00050	0.0137	-	
Copper (Cu)-Total	mg/L	0.001	-	1	0.005	<0.0010	<0.0010	<0.0010	-	-	0.136	<0.0010	0.141	-	
Iron (Fe)-Total	mg/L	0.05	-	0.3	0.3	<0.050	<0.050	<0.050	-	-	30.5 *	<0.050	25.5	-	
Lead (Pb)-Total	mg/L	0.0005	-	0.01	0.025	<0.00050	<0.00050	<0.00050	-	-	0.0163	<0.00050	0.00776	-	
Lithium (Li)-Total	mg/L	0.1	-	-	-	<0.10	<0.10	<0.10	-	-	<0.10	<0.10	<0.10	-	
Magnesium (Mg)-Total	mg/L	0.5	-	-	-	2.83	2.71	2.72	-	-	15	4.75	13.1	-	
Manganese (Mn)-Total	mg/L	0.001	-	0.05	-	0.152	0.057	0.0349	-	-	0.585	0.245	0.735	-	
Mercury (Hg)-Total	mg/L	0.00002	-	0.001	0.0002	-	<0.00010	<0.00010	-	-	-	<0.00010	<0.00010	-	
Molybdenum (Mo)-Total	mg/L	0.0005	-	-	0.04	<0.00050	<0.00050	<0.00050	-	-	0.00726	0.00491	0.00385	-	
Nickel (Ni)-Total	mg/L	0.001	-	-	0.025	0.0011	0.0015	<0.0010	-	-	0.0195	0.0027	0.0203	-	

Table E.3 Bedrock Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWGO	HYD-12-04A					HYD-12-05A				
						Nov-12	Feb-13	Jun-13	Aug-13	Nov-13	Nov-12	Feb-13	Jun-13	Aug-13	Nov-13
Phosphorus (P)-Total	mg/L	0.05	-	-	0.01-0.03			<0.050	<0.050	<0.050			0.235	<0.050	0.252
Potassium (K)-Total	mg/L	1	-	-	-			2.5	2.7	2.8			5.1	2.4	3.7
Selenium (Se)-Total	mg/L	0.0004	-	0.01	0.1			<0.00040	<0.00040	0.00042			0.00059	<0.00040	<0.00040
Silicon (Si)-Total	mg/L	1	-	-	-			4	3.9	4.0			54 *	6.5	32.3
Silver (Ag)-Total	mg/L	0.0001	-	-	0.0001			<0.00010	<0.00010	<0.00010			0.00064	<0.00010	0.00073
Sodium (Na)-Total	mg/L	0.5	-	-	-			2.03	1.94	1.85			15.3	9.8	9.97
Strontium (Sr)-Total	mg/L	0.001	-	-	-			0.0995	0.107	0.109			0.393	0.216	0.263
Thallium (Tl)-Total	mg/L	0.0003	-	-	0.0003			<0.00030	<0.00030	<0.00030			<0.00030	<0.00030	<0.00030
Tin (Sn)-Total	mg/L	0.001	-	-	-			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010
Titanium (Ti)-Total	mg/L	0.002	-	-	-			<0.0020	<0.0020	<0.0020			0.948	<0.0020	1.83
Tungsten (W)-Total	mg/L	0.01	-	-	0.03			<0.010	<0.010	<0.010			0.402	0.282	0.239
Uranium (U)-Total	mg/L	0.001	-	0.02	0.005			<0.0010	<0.0010	<0.0010			0.0049	<0.0010	0.0015
Vanadium (V)-Total	mg/L	0.0005	-	-	0.006			0.00071	0.00079	0.00084			0.0734	0.00076	0.0755
Zinc (Zn)-Total	mg/L	0.003	-	5	0.02			<0.0030	0.0046	<0.0030			0.151	0.0095	0.144
Zirconium (Zr)-Total	mg/L	0.004	-	-	0.004			<0.0040	<0.0040	<0.0040			<0.0040	<0.0040	<0.0040
Dissolved Metals Filtration Location		n/a	-	-	-			LAB	FIELD	FIELD			FIELD	LAB	FIELD
Aluminum (Al)-Dissolved	mg/L	0.01	-	-	0.075			<0.010	<0.010	0.015			0.025	<0.010	<0.010
Antimony (Sb)-Dissolved	mg/L	0.0005	-	0.006	0.02			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Arsenic (As)-Dissolved	mg/L	0.001	-	0.025	0.005	0.0028	0.0027	0.0028	0.0027	0.0021	0.0006	0.001	<0.0010	<0.0010	<0.0010
Barium (Ba)-Dissolved	mg/L	0.002	-	1	-			0.0487	0.0449	0.0444			0.0382	0.0494	0.0510
Beryllium (Be)-Dissolved	mg/L	0.0005	-	-	1.1			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Dissolved	mg/L	0.001	-	-	-			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010
Boron (B)-Dissolved	mg/L	0.01	-	5	0.2			<0.010	<0.010	<0.010			0.041	0.042	0.026
Cadmium (Cd)-Dissolved	mg/L	0.00009	-	0.005	0.0005			<0.000090	<0.000090	<0.000090			<0.000090	<0.000090	0.000099
Calcium (Ca)-Dissolved	mg/L	0.5	-	-	-			40.3	41.8	41.8			48.2	66.2	77.3
Chromium (Cr)-Dissolved	mg/L	0.0005	-	0.05	0.0089			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Cobalt (Co)-Dissolved	mg/L	0.0005	-	-	0.0009			0.0009	0.00053	<0.00050			<0.00050	<0.00050	0.00071
Copper (Cu)-Dissolved	mg/L	0.001	-	-	0.005	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.001	0.001	0.0013	0.0013	0.0011
Iron (Fe)-Dissolved	mg/L	0.05	-	0.3	0.3	<0.005	0.021	<0.050	<0.050	<0.050	0.018	<0.005	<0.050	<0.050	<0.050
Lead (Pb)-Dissolved	mg/L	0.0005	-	0.01	0.025			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Lithium (Li)-Dissolved	mg/L	0.1	-	-	-			<0.10	<0.10	<0.10			<0.10	<0.10	<0.10
Magnesium (Mg)-Dissolved	mg/L	0.5	-	-	-			2.93	3.04	2.76			5.72	5.73	5.92
Manganese (Mn)-Dissolved	mg/L	0.001	-	0.05	-			0.148	0.0529	0.0345			0.177	0.213	0.270
Molybdenum (Mo)-Dissolved	mg/L	0.0005	-	-	0.04			<0.00050	<0.00050	<0.00050			0.00677	0.00489	0.00279
Nickel (Ni)-Dissolved	mg/L	0.001	-	-	0.025			0.0011	0.0011	<0.0010			0.0028	0.0029	0.0046
Phosphorus (P)-Dissolved	mg/L	0.05	-	-	0.01-0.03			<0.050	<0.050	<0.050			<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	1	-	-	-			2.6	2.9	2.9			3	2.8	2.7
Selenium (Se)-Dissolved	mg/L	0.0004	-	0.01	0.1			<0.00040	0.00054	0.00043			<0.00040	<0.00040	<0.00040
Silicon (Si)-Dissolved	mg/L	1	-	-	-			4.1	4.7	4.0			6.9	7.6	7.3
Silver (Ag)-Dissolved	mg/L	0.0001	-	-	0.0001			0.00018	<0.00010	<0.00010			<0.00010	<0.00010	<0.00010
Sodium (Na)-Dissolved	mg/L	0.5	-	-	-			2.05	2.16	2.01			15.4	11.4	9.70
Strontium (Sr)-Dissolved	mg/L	0.001	-	-	-			0.108	0.0985	0.119			0.308	0.221	0.218
Thallium (Tl)-Dissolved	mg/L	0.0003	-	-	0.0003			<0.00030	<0.00030	<0.00030			<0.00030	<0.00030	<0.00030
Tin (Sn)-Dissolved	mg/L	0.001	-	-	-			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010
Titanium (Ti)-Dissolved	mg/L	0.002	-	-	-			<0.0020	<0.0020	<0.0020			<0.0020	<0.0020	<0.0020
Tungsten (W)-Dissolved	mg/L	0.01	-	-	0.03			<0.010	<0.010	<0.010			0.482	0.275	0.207
Uranium (U)-Dissolved	mg/L	0.001	-	0.02	0.005			<0.0010	<0.0010	<0.0010			0.0012	<0.0010	<0.0010
Vanadium (V)-Dissolved	mg/L	0.0005	-	-	0.006			0.00069	0.0011	0.00077			0.00144	0.00096	0.00062
Zinc (Zn)-Dissolved	mg/L	0.003	-	-	0.02			<0.0030	<0.0030	<0.0030			0.0094	0.0052	0.0132
Zirconium (Zr)-Dissolved	mg/L	0.004	-	-	0.004			<0.0040	<0.0040	<0.0040			<0.0040	<0.0040	<0.0040
COD	mg/L	10	-	-	-			<10	-	-			82	-	-

Table E.3 Bedrock Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	HYD 12-06A					HYD 12-07A				
						Nov-12	Feb-13	Jun-13	Aug-13	Nov-13	Nov-12	Feb-13	Jun-13	Aug-13	Nov-13
Conductivity	umhos/cm	3	-	-	-	-	-	-	300	281	-	-	298	295	
Hardness (as CaCO3)	mg/L	10	-	-	-	-	-	127	-	-	-	115	-	-	
pH	pH units	0.1	-	6.5-8.5	6.5-8.5	-	-	8.17	8.02	8.07	-	-	8.15	8.06	7.84
Total Dissolved Solids	mg/L	10	-	500	-	-	-	162	192	169	-	-	136	182	169
Alkalinity, Bicarbonate (as CaCO3)	mg/L CaCO3	5 or 10	-	-	-	-	-	141	145	150	-	-	116	149	167
Alkalinity, Carbonate (as CaCO3)	mg/L CaCO3	5 or 10	-	-	-	-	-	<10	<10	<10	-	-	<10	<5.0	<10
Alkalinity, Hydroxide (as CaCO3)	mg/L CaCO3	5 or 10	-	-	-	-	-	<10	<10	<10	-	-	<10	<5.0	<10
Alkalinity, Total (as CaCO3)	mg/L CaCO3	5 or 10	-	30-500	-	-	-	143	147	152	-	-	118	149	168
Ammonia, Total (as N)	mg/L	0.02	-	-	0.02	-	-	<0.050	0.083	0.043	-	-	<0.050	0.03	0.035
Bromide (Br)	mg/L	0.1	-	-	-	-	-	-	-	<0.10	-	-	<0.10	<0.10	<0.10
Chloride	mg/L	0.1 or 2	-	-	-	-	-	<2.0	<2.0	0.61	-	-	<2.0	0.8	0.36
Computed Conductivity	uS/cm	n/a	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity % Difference	%	n/a	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoride (F)	mg/L	0.03	-	1.5	-	-	-	-	-	0.150	-	-	-	0.038	<0.030
Ion Balance	%	n/a	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate (as N)	mg/L	0.03 or 0.1	-	10	-	-	-	<0.10	<0.10	<0.030	-	-	<0.10	<0.030	<0.030
Nitrite-N	mg/L	0.02 or 0.1	-	1	-	-	-	<0.10	<0.10	<0.020	-	-	<0.10	<0.020	<0.020
Saturation pH	pH	n/a	-	-	-	-	-	-	-	-	-	-	-	-	-
Phosphate-P (ortho)	mg/L	0.003	-	-	-	-	-	-	-	<0.0030	-	-	<0.0030 *	<0.0030	<0.0030
Phosphorus (P)-Total Dissolved	mg/L	0.005 or 0.03	-	-	-	-	-	<0.03	<0.03	<0.0050	-	-	<0.030	<0.0050	<0.0050
Total Phosphorus	mg/L	0.003	-	-	-	-	-	-	-	0.0043	-	-	-	0.0033	0.0057
Phosphorus, Total	mg/L	0.03	-	-	0.01-0.03	-	-	<0.030	0.033	-	-	-	<0.030	-	-
TDS (Calculated)	mg/L	n/a	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfate (SO4)	mg/L	0.3	-	-	-	-	-	-	-	14.2	-	-	-	7.33	5.21
Sulphate	mg/L	2	-	500	-	-	-	11.2	13.4	-	-	-	7.6	-	-
Anion Sum	me/L	n/a	-	-	-	-	-	-	-	-	-	-	-	-	-
Cation Sum	me/L	n/a	-	-	-	-	-	-	-	-	-	-	-	-	-
Cation - Anion Balance	%	n/a	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide, Weak Acid Diss	mg/L	0.002	-	-	-	-	-	-	<0.0020	<0.0020	-	-	-	<0.0020	<0.0020
Cyanide, Total	mg/L	0.002	-	0.2	0.005	-	-	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Dissolved Organic Carbon	mg/L	1	-	5	-	-	-	2.9	1.8	2.7	-	-	3.5	3.1	4.5
Total Organic Carbon	mg/L	1	-	-	-	-	-	3.3	2.2	2.2	-	-	3.3	2.8	3.7
Aluminum (Al)-Total	mg/L	0.01	-	0.1	0.075	-	-	0.01	0.087	0.014	-	-	<0.010	<0.010	0.051
Antimony (Sb)-Total	mg/L	0.0005	-	0.006	0.02	-	-	<0.00050	<0.00050	<0.00050	-	-	<0.00050	<0.00050	<0.00050
Arsenic (As)-Total	mg/L	0.001	-	0.025	0.005	-	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010
Barium (Ba)-Total	mg/L	0.002	-	1	-	-	-	0.0302	0.0355	0.0341	-	-	0.0268	0.0348	0.0381
Beryllium (Be)-Total	mg/L	0.0005	-	-	1.1	-	-	<0.00050	<0.00050	<0.00050	-	-	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Total	mg/L	0.001	-	-	-	-	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010
Boron (B)-Total	mg/L	0.01	-	5	0.2	-	-	0.032	0.034	0.027	-	-	<0.010	<0.010	<0.010
Cadmium (Cd)-Total	mg/L	0.00009	-	0.005	0.0005	-	-	<0.000090	<0.000090	<0.000090	-	-	<0.000090	<0.000090	<0.000090
Calcium (Ca)-Total	mg/L	0.5	-	-	-	-	-	34.5	34.2	39.4	-	-	41.6	57.3	60.3
Chromium (Cr)-Total	mg/L	0.0005	-	0.05	0.0089	-	-	<0.00050	0.0008	0.00063	-	-	<0.00050	<0.00050	<0.00050
Cobalt (Co)-Total	mg/L	0.0005	-	-	0.0009	-	-	<0.00050	<0.00050	<0.00050	-	-	<0.00050	<0.00050	<0.00050
Copper (Cu)-Total	mg/L	0.001	-	1	0.005	-	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	0.0010
Iron (Fe)-Total	mg/L	0.05	-	0.3	0.3	-	-	0.165	0.32	0.155	-	-	0.481	0.705	0.872
Lead (Pb)-Total	mg/L	0.0005	-	0.01	0.025	-	-	<0.00050	<0.00050	<0.00050	-	-	<0.00050	<0.00050	<0.00050
Lithium (Li)-Total	mg/L	0.1	-	-	-	-	-	<0.10	<0.10	<0.10	-	-	<0.10	<0.10	<0.10
Magnesium (Mg)-Total	mg/L	0.5	-	-	-	-	-	9.89	9.62	9.12	-	-	3.61	3.76	3.57
Manganese (Mn)-Total	mg/L	0.001	-	0.05	-	-	-	0.145	0.0929	0.0852	-	-	0.105	0.159	0.181
Mercury (Hg)-Total	mg/L	0.00002	-	0.001	0.0002	-	-	-	<0.00010	<0.00010	-	-	-	<0.000020	<0.00010
Molybdenum (Mo)-Total	mg/L	0.0005	-	-	0.04	-	-	0.00528	0.0016	0.00205	-	-	<0.00050	<0.00050	<0.00050
Nickel (Ni)-Total	mg/L	0.001	-	-	0.025	-	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	0.0012

Table E.3 Bedrock Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWGO	HYD 12-06A					HYD 12-07A				
						Nov-12	Feb-13	Jun-13	Aug-13	Nov-13	Nov-12	Feb-13	Jun-13	Aug-13	Nov-13
Phosphorus (P)-Total	mg/L	0.05	-	-	0.01-0.03			<0.050	<0.050	<0.050			<0.050	<0.050	<0.050
Potassium (K)-Total	mg/L	1	-	-	-			2.6	3.1	2.9			1.3	1.4	1.3
Selenium (Se)-Total	mg/L	0.0004	-	0.01	0.1			<0.00040	<0.00040	<0.00040			<0.00040	<0.00040	<0.00040
Silicon (Si)-Total	mg/L	1	-	-	-			5.4	6	6.0			6	5.3	6.1
Silver (Ag)-Total	mg/L	0.0001	-	-	0.0001			<0.00010	<0.00010	<0.00010			<0.00010	<0.00010	<0.00010
Sodium (Na)-Total	mg/L	0.5	-	-	-			11.8	10.9	9.68			2.78	2.32	2.19
Strontium (Sr)-Total	mg/L	0.001	-	-	-			0.312	0.366	0.346			0.0798	0.0973	0.0963
Thallium (Tl)-Total	mg/L	0.0003	-	-	0.0003			<0.00030	<0.00030	<0.00030			<0.00030	<0.00030	<0.00030
Tin (Sn)-Total	mg/L	0.001	-	-	-			<0.0010	0.0014	<0.0010			<0.0010	<0.0010	<0.0010
Titanium (Ti)-Total	mg/L	0.002	-	-	-			<0.0020	0.0087	<0.0020			<0.0020	<0.0020	<0.0020
Tungsten (W)-Total	mg/L	0.01	-	-	0.03			0.015	<0.010	<0.010			<0.010	<0.010	<0.010
Uranium (U)-Total	mg/L	0.001	-	0.02	0.005			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010
Vanadium (V)-Total	mg/L	0.0005	-	-	0.006			<0.00050	0.00057	<0.00050			<0.00050	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.003	-	5	0.02			<0.0030	0.0055	0.0035			0.0031	0.0035	<0.0030
Zirconium (Zr)-Total	mg/L	0.004	-	-	0.004			<0.0040	<0.0040	<0.0040			<0.0040	<0.0040	<0.0040
Dissolved Metals Filtration Location		n/a	-	-	-			LAB	FIELD	FIELD			LAB	LAB	FIELD
Aluminum (Al)-Dissolved	mg/L	0.01	-	-	0.075			<0.010	<0.010	<0.010			<0.010	<0.010	<0.010
Antimony (Sb)-Dissolved	mg/L	0.0005	-	0.006	0.02			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Arsenic (As)-Dissolved	mg/L	0.001	-	0.025	0.005	<0.0002	<0.0002	<0.0010	<0.0010	<0.0010	0.0003	0.0003	<0.0010	<0.0010	<0.0010
Barium (Ba)-Dissolved	mg/L	0.002	-	1	-			0.0304	0.0362	0.0324			0.0248	0.0338	0.0361
Beryllium (Be)-Dissolved	mg/L	0.0005	-	-	1.1			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Dissolved	mg/L	0.001	-	-	-			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010
Boron (B)-Dissolved	mg/L	0.01	-	5	0.2			0.027	0.035	0.028			<0.010	<0.010	<0.010
Cadmium (Cd)-Dissolved	mg/L	0.00009	-	0.005	0.0005			<0.000090	<0.000090	<0.000090			<0.000090	<0.000090	<0.000090
Calcium (Ca)-Dissolved	mg/L	0.5	-	-	-			36	37.8	42.5			40.9	58.2	63.7
Chromium (Cr)-Dissolved	mg/L	0.0005	-	0.05	0.0089			<0.00050	<0.00050	<0.00050			<0.00050	0.00053	<0.00050
Cobalt (Co)-Dissolved	mg/L	0.0005	-	-	0.0009			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Copper (Cu)-Dissolved	mg/L	0.001	-	-	0.005	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.0010	<0.0010	<0.0010
Iron (Fe)-Dissolved	mg/L	0.05	-	0.3	0.3	0.144	0.15	<0.050	0.157	0.107	0.687	0.576	<0.050	<0.050	0.739
Lead (Pb)-Dissolved	mg/L	0.0005	-	0.01	0.025			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Lithium (Li)-Dissolved	mg/L	0.1	-	-	-			<0.10	<0.10	<0.10			<0.10	<0.10	<0.10
Magnesium (Mg)-Dissolved	mg/L	0.5	-	-	-			8.98	9.51	10.1			3.25	3.84	3.87
Manganese (Mn)-Dissolved	mg/L	0.001	-	0.05	-			0.141	0.0868	0.0841			0.105	0.158	0.165
Molybdenum (Mo)-Dissolved	mg/L	0.0005	-	-	0.04			0.00395	0.00135	0.00191			<0.00050	<0.00050	<0.00050
Nickel (Ni)-Dissolved	mg/L	0.001	-	-	0.025			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010
Phosphorus (P)-Dissolved	mg/L	0.05	-	-	0.01-0.03			<0.050	<0.050	<0.050			<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	1	-	-	-			2.8	3.2	3.3			1.4	1.4	1.4
Selenium (Se)-Dissolved	mg/L	0.0004	-	0.01	0.1			<0.00040	<0.00040	<0.00040			<0.00040	<0.00040	<0.00040
Silicon (Si)-Dissolved	mg/L	1	-	-	-			5.4	6	6.0			4.8	6	6.0
Silver (Ag)-Dissolved	mg/L	0.0001	-	-	0.0001			<0.00010	<0.00010	<0.00010			<0.00010	<0.00010	<0.00010
Sodium (Na)-Dissolved	mg/L	0.5	-	-	-			9.65	11.1	11.3			2.31	2.34	2.40
Strontium (Sr)-Dissolved	mg/L	0.001	-	-	-			0.287	0.368	0.349			0.0683	0.0957	0.0921
Thallium (Tl)-Dissolved	mg/L	0.0003	-	-	0.0003			<0.00030	<0.00030	<0.00030			<0.00030	<0.00030	<0.00030
Tin (Sn)-Dissolved	mg/L	0.001	-	-	-			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010
Titanium (Ti)-Dissolved	mg/L	0.002	-	-	-			<0.0020	<0.0020	<0.0020			<0.0020	<0.0020	<0.0020
Tungsten (W)-Dissolved	mg/L	0.01	-	-	0.03			0.013	<0.010	<0.010			<0.010	<0.010	<0.010
Uranium (U)-Dissolved	mg/L	0.001	-	0.02	0.005			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010
Vanadium (V)-Dissolved	mg/L	0.0005	-	-	0.006			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved	mg/L	0.003	-	-	0.02			0.0036	0.0058	<0.0030			<0.0030	<0.0030	<0.0030
Zirconium (Zr)-Dissolved	mg/L	0.004	-	-	0.004			<0.0040	<0.0040	<0.0040			<0.0040	<0.0040	<0.0040
COD	mg/L	10	-	-	-			38	-	-			44	-	-

Table E.3 Bedrock Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	HYD-12-08A				HYD 12-09A				
						Nov-12	Feb-13	May-13	Aug-13	Nov-13	Feb-13	May-13	Aug-13	Nov-13
Conductivity	umhos/cm	3	-	-	-			217	218	204			295	279
Hardness (as CaCO3)	mg/L	10	-	-	-			85	-	-		156	-	-
pH	pH units	0.1	-	6.5-8.5	6.5-8.5			7.74	7.97	8.02		8.07	7.83	7.85
Total Dissolved Solids	mg/L	10	-	500	-			122	142	129		186	185	181
Alkalinity, Bicarbonate (as CaCO3)	mg/L CaCO3	5 or 10	-	-	-			119	111	110		152	147	151
Alkalinity, Carbonate (as CaCO3)	mg/L CaCO3	5 or 10	-	-	-			<10	<10	<10		<10	<5.0	<10
Alkalinity, Hydroxide (as CaCO3)	mg/L CaCO3	5 or 10	-	-	-			<10	<10	<10		<10	<5.0	<10
Alkalinity, Total (as CaCO3)	mg/L CaCO3	5 or 10	-	30-500	-			119	112	112		154	147	152
Ammonia, Total (as N)	mg/L	0.02	-	-	0.02			0.324	0.33	0.337		0.072	0.068	0.082
Bromide (Br)	mg/L	0.1	-	-	-			-	-	<0.10		-	<0.10	<0.10
Chloride	mg/L	0.1 or 2	-	-	-			3.6	3.7	3.22		4.9	4.69	4.32
Computed Conductivity	uS/cm	n/a	-	-	-			215	-	-		-	-	-
Conductivity % Difference	%	n/a	-	-	-			-0.9	-	-		-	-	-
Fluoride (F)	mg/L	0.03	-	1.5	-			-	-	0.166		-	0.07	0.044
Ion Balance	%	n/a	-	-	-			116	-	-		-	-	-
Nitrate (as N)	mg/L	0.03 or 0.1	-	10	-			<0.10	<0.10	<0.030		<0.10	<0.030	<0.030
Nitrite-N	mg/L	0.02 or 0.1	-	1	-			<0.10	<0.10	<0.020		<0.10	<0.020	<0.020
Saturation pH	pH	n/a	-	-	-			7.88	-	-		-	-	-
Phosphate-P (ortho)	mg/L	0.003	-	-	-			-	-	0.0055		-	<0.0030 *	0.0032
Phosphorus (P)-Total Dissolved	mg/L	0.005 or 0.03	-	-	-			<0.030	<0.030	0.0172		<0.030	<0.0050	<0.0050
Total Phosphorus	mg/L	0.003	-	-	-			-	-	0.0217		-	0.0077	-
Phosphorus, Total	mg/L	0.03	-	-	0.01-0.03			0.049	0.034	-		<0.030	-	-
TDS (Calculated)	mg/L	n/a	-	-	-			128	-	-		-	-	-
Sulfate (SO4)	mg/L	0.3	-	-	-			-	-	3.05		-	6.18	5.01
Sulphate	mg/L	2	-	500	-			4.1	3.8	-		6.3	-	-
Anion Sum	me/L	n/a	-	-	-			2.15	-	-		-	-	-
Cation Sum	me/L	n/a	-	-	-			2.49	-	-		-	-	-
Cation - Anion Balance	%	n/a	-	-	-			7.4	-	-		-	-	-
Cyanide, Weak Acid Diss	mg/L	0.002	-	-	-			-	<0.0020	<0.0020		-	<0.0020	<0.0020
Cyanide, Total	mg/L	0.002	-	0.2	0.005	<0.002	0.002	<0.0020	<0.0020	<0.0020	<0.002	<0.0020	<0.0020	<0.0020
Dissolved Organic Carbon	mg/L	1	-	5	-			6.3	4.9	7.8		2.8	2.6	4.0
Total Organic Carbon	mg/L	1	-	-	-			9.4	6.9	7.9		3.2	2.5	3.2
Aluminum (Al)-Total	mg/L	0.01	-	0.1	0.075			<0.010	0.045	0.023		<0.010	<0.010	0.046
Antimony (Sb)-Total	mg/L	0.0005	-	0.006	0.02			<0.00050	<0.00050	<0.00050		<0.00050	<0.00050	<0.00050
Arsenic (As)-Total	mg/L	0.001	-	0.025	0.005			0.0012	<0.0010	0.0011		0.0042	0.0039	0.0038
Barium (Ba)-Total	mg/L	0.002	-	1	-			0.011	0.0224	0.0130		0.0301	0.0275	0.0322
Beryllium (Be)-Total	mg/L	0.0005	-	-	1.1			<0.00050	<0.00050	<0.00050		<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Total	mg/L	0.001	-	-	-			<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010
Boron (B)-Total	mg/L	0.01	-	5	0.2			0.031	0.023	0.030		0.052	0.035	0.036
Cadmium (Cd)-Total	mg/L	0.00009	-	0.005	0.0005			<0.000090	0.000176	<0.000090		<0.000090	<0.000090	<0.000090
Calcium (Ca)-Total	mg/L	0.5	-	-	-			25	24.6	25.8		47.9	46.4	48.2
Chromium (Cr)-Total	mg/L	0.0005	-	0.05	0.0089			<0.00050	0.001	0.00105		<0.00050	<0.00050	0.00051
Cobalt (Co)-Total	mg/L	0.0005	-	-	0.0009			<0.00050	<0.00050	<0.00050		<0.00050	<0.00050	<0.00050
Copper (Cu)-Total	mg/L	0.001	-	1	0.005			<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010
Iron (Fe)-Total	mg/L	0.05	-	0.3	0.3			0.157	0.231	0.245		0.975	1.02	1.02
Lead (Pb)-Total	mg/L	0.0005	-	0.01	0.025			<0.00050	0.00052	<0.00050		<0.00050	<0.00050	<0.00050
Lithium (Li)-Total	mg/L	0.1	-	-	-			<0.10	<0.10	<0.10		<0.10	<0.10	<0.10
Magnesium (Mg)-Total	mg/L	0.5	-	-	-			5.59	4.95	5.25		8	6.09	6.68
Manganese (Mn)-Total	mg/L	0.001	-	0.05	-			0.0976	0.0864	0.0905		0.334	0.361	0.348
Mercury (Hg)-Total	mg/L	0.00002	-	0.001	0.0002			-	<0.00010	<0.00010		-	<0.00010	<0.00010
Molybdenum (Mo)-Total	mg/L	0.0005	-	-	0.04			0.0255	0.0207	0.0197		0.00392	0.00265	0.00257
Nickel (Ni)-Total	mg/L	0.001	-	-	0.025			<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010

Table E.3 Bedrock Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQQ	HYD-12-08A					HYD 12-09A				
						Nov-12	Feb-13	May-13	Aug-13	Nov-13	Feb-13	May-13	Aug-13	Nov-13	
Phosphorus (P)-Total	mg/L	0.05	-	-	0.01-0.03			0.059	<0.050	<0.050		<0.050	<0.050	<0.050	
Potassium (K)-Total	mg/L	1	-	-	-			2.3	2.3	2.3		2.6	2.5	2.5	
Selenium (Se)-Total	mg/L	0.0004	-	0.01	0.1			<0.00040	<0.00040	<0.00040		<0.00040	<0.00040	<0.00040	
Silicon (Si)-Total	mg/L	1	-	-	-			5.7	4.9	5.3		6.5	4.7	5.3	
Silver (Ag)-Total	mg/L	0.0001	-	-	0.0001			<0.00010	<0.00010	<0.00010		<0.00010	<0.00010	<0.00010	
Sodium (Na)-Total	mg/L	0.5	-	-	-			16.3	13.3	14.7		7.26	5.02	5.43	
Strontium (Sr)-Total	mg/L	0.001	-	-	-			0.128	0.108	0.130		0.188	0.159	0.157	
Thallium (Tl)-Total	mg/L	0.0003	-	-	0.0003			<0.00030	<0.00030	<0.00030		<0.00030	<0.00030	<0.00030	
Tin (Sn)-Total	mg/L	0.001	-	-	-			<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	
Titanium (Ti)-Total	mg/L	0.002	-	-	-			<0.0020	<0.0020	<0.0020		<0.0020	<0.0020	<0.0020	
Tungsten (W)-Total	mg/L	0.01	-	-	0.03			0.139	0.12	0.116		0.095	0.058	0.066	
Uranium (U)-Total	mg/L	0.001	-	0.02	0.005			<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	
Vanadium (V)-Total	mg/L	0.0005	-	-	0.006			0.00062	0.00057	0.00066		<0.00050	<0.00050	<0.00050	
Zinc (Zn)-Total	mg/L	0.003	-	5	0.02			0.0031	0.0163	0.0070		<0.0030	0.0033	0.0212	
Zirconium (Zr)-Total	mg/L	0.004	-	-	0.004			<0.0040	<0.0040	<0.0040		<0.0040	<0.0040	<0.0040	
Dissolved Metals Filtration Location		n/a	-	-	-			LAB	FIELD	FIELD		LAB	LAB	FIELD	
Aluminum (Al)-Dissolved	mg/L	0.01	-	-	0.075			<0.010	<0.010	0.015		<0.010	<0.010	0.014	
Antimony (Sb)-Dissolved	mg/L	0.0005	-	0.006	0.02			<0.00050	<0.00050	<0.00050		<0.00050	<0.00050	<0.00050	
Arsenic (As)-Dissolved	mg/L	0.001	-	0.025	0.005	0.0021	0.0011	<0.0010	<0.0010	<0.0010	0.0044	0.0029	0.0028	0.0038	
Barium (Ba)-Dissolved	mg/L	0.002	-	1	-			0.0102	0.0204	0.0152		0.0287	0.0272	0.0286	
Beryllium (Be)-Dissolved	mg/L	0.0005	-	-	1.1			<0.00050	<0.00050	<0.00050		<0.00050	<0.00050	<0.00050	
Bismuth (Bi)-Dissolved	mg/L	0.001	-	-	-			<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	
Boron (B)-Dissolved	mg/L	0.01	-	5	0.2			0.025	0.037	0.030		0.044	0.042	0.036	
Cadmium (Cd)-Dissolved	mg/L	0.00009	-	0.005	0.0005			0.000104	<0.000090	<0.000090		<0.000090	<0.000090	<0.000090	
Calcium (Ca)-Dissolved	mg/L	0.5	-	-	-			24.6	25	30.1		50.4	45.5	45.5	
Chromium (Cr)-Dissolved	mg/L	0.0005	-	0.05	0.0089			<0.00050	<0.00050	<0.00050		<0.00050	<0.00050	<0.00050	
Cobalt (Co)-Dissolved	mg/L	0.0005	-	-	0.0009			<0.00050	<0.00050	0.00088		<0.00050	<0.00050	<0.00050	
Copper (Cu)-Dissolved	mg/L	0.001	-	-	0.005	<0.001	<0.001	<0.0010	<0.0010	<0.0010	0.001	<0.0010	<0.0010	<0.0010	
Iron (Fe)-Dissolved	mg/L	0.05	-	0.3	0.2	0.326	0.189	0.122	0.112	0.166	1.04	<0.050	<0.050	0.963	
Lead (Pb)-Dissolved	mg/L	0.0005	-	0.01	0.025			<0.00050	<0.00050	<0.00050		<0.00050	<0.00050	<0.00050	
Lithium (Li)-Dissolved	mg/L	0.1	-	-	-			<0.10	<0.10	<0.10		<0.10	<0.10	<0.10	
Magnesium (Mg)-Dissolved	mg/L	0.5	-	-	-			4.91	5.11	5.60		7.43	7.25	6.64	
Manganese (Mn)-Dissolved	mg/L	0.001	-	0.05	-			0.0952	0.086	0.360		0.355	0.352	0.345	
Molybdenum (Mo)-Dissolved	mg/L	0.0005	-	-	0.04			0.0221	0.0194	0.0183		0.00301	0.00238	0.00241	
Nickel (Ni)-Dissolved	mg/L	0.001	-	-	0.025			<0.0010	<0.0010	0.0013		<0.0010	<0.0010	<0.0010	
Phosphorus (P)-Dissolved	mg/L	0.05	-	-	0.01-0.03			<0.050	<0.050	<0.050		<0.050	<0.050	<0.050	
Potassium (K)-Dissolved	mg/L	1	-	-	-			2.2	2.4	2.5		2.8	2.7	2.5	
Selenium (Se)-Dissolved	mg/L	0.0004	-	0.01	0.1			<0.00040	<0.00040	<0.00040		<0.00040	<0.00040	<0.00040	
Silicon (Si)-Dissolved	mg/L	1	-	-	-			5	5	4.9		5.4	5.3	5.4	
Silver (Ag)-Dissolved	mg/L	0.0001	-	-	0.0001			<0.00010	<0.00010	<0.00010		<0.00010	<0.00010	<0.00010	
Sodium (Na)-Dissolved	mg/L	0.5	-	-	-			13.6	14	13.8		6.48	5.79	5.64	
Strontium (Sr)-Dissolved	mg/L	0.001	-	-	-			0.119	0.109	0.132		0.166	0.16	0.148	
Thallium (Tl)-Dissolved	mg/L	0.0003	-	-	0.0003			<0.00030	<0.00030	<0.00030		<0.00030	<0.00030	<0.00030	
Tin (Sn)-Dissolved	mg/L	0.001	-	-	-			<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	
Titanium (Ti)-Dissolved	mg/L	0.002	-	-	-			<0.0020	<0.0020	<0.0020		<0.0020	<0.0020	<0.0020	
Tungsten (W)-Dissolved	mg/L	0.01	-	-	0.03			0.125	0.124	0.109		0.086	0.058	0.062	
Uranium (U)-Dissolved	mg/L	0.001	-	0.02	0.005			<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	
Vanadium (V)-Dissolved	mg/L	0.0005	-	-	0.006			<0.00050	0.0006	0.00061		<0.00050	<0.00050	<0.00050	
Zinc (Zn)-Dissolved	mg/L	0.003	-	-	0.02			0.0098	0.0063	0.0033		0.0045	0.0046	<0.0030	
Zirconium (Zr)-Dissolved	mg/L	0.004	-	-	0.004			<0.0040	<0.0040	<0.0040		<0.0040	<0.0040	<0.0040	
COD	mg/L	10	-	-	-			42	-	-		23	-	-	

Table E.3 Bedrock Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWQO	HYD-12-10					HYD-12-11A				
						Nov-12	Feb-13	Jun-13	Aug-13	Nov-13	Nov-12	Feb-13	May-13	Aug-13	Nov-13
Conductivity	umhos/cm	3	-	-	-	-	-	-	346	335	-	-	377	427	390
Hardness (as CaCO3)	mg/L	10	-	-	-	-	-	155	-	-	-	-	197	-	-
pH	pH units	0.1	-	6.5-8.5	6.5-8.5	-	-	8.12	8.2	8.01	-	-	7.71	7.94	7.84
Total Dissolved Solids	mg/L	10	-	500	-	-	-	200	195	218	-	-	246	254	237
Alkalinity, Bicarbonate (as CaCO3)	mg/L CaCO3	5 or 10	-	-	-	-	-	169	173	187	-	-	206	217	219
Alkalinity, Carbonate (as CaCO3)	mg/L CaCO3	5 or 10	-	-	-	-	-	<10	<5.0	<10	-	-	<10	<10	<10
Alkalinity, Hydroxide (as CaCO3)	mg/L CaCO3	5 or 10	-	-	-	-	-	<10	<5.0	<10	-	-	<10	<10	<10
Alkalinity, Total (as CaCO3)	mg/L CaCO3	5 or 10	-	30-500	-	-	-	171	173	189	-	-	207	218	220
Ammonia, Total (as N)	mg/L	0.02	-	-	0.02	-	-	0.162	0.151	0.170	-	-	0.093	0.062	0.056
Bromide (Br)	mg/L	0.1	-	-	-	-	-	-	<0.10	<0.10	-	-	-	-	<0.10
Chloride	mg/L	0.1 or 2	-	-	-	-	-	3.4	3.97	4.17	-	-	4.5	4.3	4.40
Computed Conductivity	uS/cm	n/a	-	-	-	-	-	-	-	-	-	-	380	-	-
Conductivity % Difference	%	n/a	-	-	-	-	-	-	-	-	-	-	0.8	-	-
Fluoride (F)	mg/L	0.03	-	1.5	-	-	-	-	<0.15	0.160	-	-	-	-	0.057
Ion Balance	%	n/a	-	-	-	-	-	-	-	-	-	-	118	-	-
Nitrate (as N)	mg/L	0.03 or 0.1	-	10	-	-	-	<0.10	<0.15	<0.030	-	-	<0.10	<0.10	<0.030
Nitrite-N	mg/L	0.02 or 0.1	-	1	-	-	-	<0.10	<0.10	<0.020	-	-	<0.10	<0.10	<0.020
Saturation pH	pH	n/a	-	-	-	-	-	-	-	-	-	-	7.27	-	-
Phosphate-P (ortho)	mg/L	0.003	-	-	-	-	-	-	<0.0030 *	<0.0030	-	-	-	-	<0.0030
Phosphorus (P)-Total Dissolved	mg/L	0.005 or 0.03	-	-	-	-	-	<0.030	<0.0050	<0.0050	-	-	<0.030	<0.030	<0.0050
Total Phosphorus	mg/L	0.003	-	-	-	-	-	-	0.0049	<0.0030	-	-	-	-	0.0087
Phosphorus, Total	mg/L	0.03	-	-	0.01-0.03	-	-	0.045	-	-	-	-	0.065	0.03	-
TDS (Calculated)	mg/L	n/a	-	-	-	-	-	-	-	-	-	-	232	-	-
Sulfate (SO4)	mg/L	0.3	-	-	-	-	-	-	7.8	7.79	-	-	-	-	9.92
Sulphate	mg/L	2	-	500	-	-	-	11	-	-	-	-	14.8	10.2	-
Anion Sum	me/L	n/a	-	-	-	-	-	-	-	-	-	-	3.85	-	-
Cation Sum	me/L	n/a	-	-	-	-	-	-	-	-	-	-	4.54	-	-
Cation - Anion Balance	%	n/a	-	-	-	-	-	-	-	-	-	-	8.2	-	-
Cyanide, Weak Acid Diss	mg/L	0.002	-	-	-	-	-	-	<0.0020	<0.0020	-	-	-	<0.0020	<0.0020
Cyanide, Total	mg/L	0.002	-	0.2	0.005	-	-	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.0020	<0.0020	<0.0020
Dissolved Organic Carbon	mg/L	1	-	5	-	-	-	3.8	3.5	4.9	-	-	2.6	2.5	4.1
Total Organic Carbon	mg/L	1	-	-	-	-	-	4	3.5	4.1	-	-	2.9	2.7	2.8
Aluminum (Al)-Total	mg/L	0.01	-	0.1	0.075	-	-	<0.010	<0.010	0.020	-	-	<0.010	0.031	0.200
Antimony (Sb)-Total	mg/L	0.0005	-	0.006	0.02	-	-	<0.00050	<0.00050	<0.00050	-	-	<0.00050	<0.00050	<0.00050
Arsenic (As)-Total	mg/L	0.001	-	0.025	0.005	-	-	0.0012	0.0011	0.0012	-	-	<0.0010	<0.0010	<0.0010
Barium (Ba)-Total	mg/L	0.002	-	1	-	-	-	0.0087	0.008	0.0096	-	-	0.0216	0.0216	0.0255
Beryllium (Be)-Total	mg/L	0.0005	-	-	1.1	-	-	<0.00050	<0.00050	<0.00050	-	-	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Total	mg/L	0.001	-	-	-	-	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010
Boron (B)-Total	mg/L	0.01	-	5	0.2	-	-	0.033	0.046	0.042	-	-	0.044	0.034	0.041
Cadmium (Cd)-Total	mg/L	0.00009	-	0.005	0.0005	-	-	<0.000090	<0.000090	<0.000090	-	-	<0.000090	<0.000090	<0.000090
Calcium (Ca)-Total	mg/L	0.5	-	-	-	-	-	45.7	50.1	51.4	-	-	65.7	67.4	75.9
Chromium (Cr)-Total	mg/L	0.0005	-	0.05	0.0089	-	-	<0.00050	<0.00050	<0.00050	-	-	<0.00050	<0.00050	0.00130
Cobalt (Co)-Total	mg/L	0.0005	-	-	0.0009	-	-	<0.00050	<0.00050	<0.00050	-	-	<0.00050	<0.00050	<0.00050
Copper (Cu)-Total	mg/L	0.001	-	1	0.005	-	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	0.0024
Iron (Fe)-Total	mg/L	0.05	-	0.3	0.3	-	-	0.158	0.185	0.262	-	-	0.204	0.255	0.484
Lead (Pb)-Total	mg/L	0.0005	-	0.01	0.025	-	-	<0.00050	<0.00050	<0.00050	-	-	<0.00050	<0.00050	<0.00050
Lithium (Li)-Total	mg/L	0.1	-	-	-	-	-	<0.10	<0.10	<0.10	-	-	<0.10	<0.10	<0.10
Magnesium (Mg)-Total	mg/L	0.5	-	-	-	-	-	9.92	11	11.2	-	-	7.97	7.81	8.39
Manganese (Mn)-Total	mg/L	0.001	-	0.05	-	-	-	0.168	0.208	0.193	-	-	0.314	0.285	0.360
Mercury (Hg)-Total	mg/L	0.00002	-	0.001	0.0002	-	-	-	<0.000020	<0.00010	-	-	-	<0.00010	<0.00010
Molybdenum (Mo)-Total	mg/L	0.0005	-	-	0.04	-	-	0.00526	0.00427	0.00363	-	-	0.00096	0.00066	0.00075
Nickel (Ni)-Total	mg/L	0.001	-	-	0.025	-	-	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	0.0011

Table E.3 Bedrock Groundwater Quality

Parameter	Units	LOR	CCME	ODWS	PWGO	HYD-12-10					HYD-12-11A				
						Nov-12	Feb-13	Jun-13	Aug-13	Nov-13	Nov-12	Feb-13	May-13	Aug-13	Nov-13
Phosphorus (P)-Total	mg/L	0.05	-	-	0.01-0.03			<0.050	<0.050	<0.050			<0.050	<0.050	<0.050
Potassium (K)-Total	mg/L	1	-	-	-			3.3	3.7	3.6			1.9	2	2.1
Selenium (Se)-Total	mg/L	0.0004	-	0.01	0.1			<0.00040	<0.00040	<0.00040			<0.00040	<0.00040	<0.00040
Silicon (Si)-Total	mg/L	1	-	-	-			5.2	5.8	5.4			7	6.5	7.5
Silver (Ag)-Total	mg/L	0.0001	-	-	0.0001			<0.00010	<0.00010	<0.00010			<0.00010	<0.00010	<0.00010
Sodium (Na)-Total	mg/L	0.5	-	-	-			13.6	12.8	13.1			12.7	7.86	8.10
Strontium (Sr)-Total	mg/L	0.001	-	-	-			0.365	0.358	0.412			0.375	0.341	0.369
Thallium (Tl)-Total	mg/L	0.0003	-	-	0.0003			<0.00030	<0.00030	<0.00030			<0.00030	<0.00030	<0.00030
Tin (Sn)-Total	mg/L	0.001	-	-	-			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010
Titanium (Ti)-Total	mg/L	0.002	-	-	-			<0.0020	<0.0020	<0.0020			<0.0020	<0.0020	0.0026
Tungsten (W)-Total	mg/L	0.01	-	-	0.03			0.031	0.025	0.023			<0.010	<0.010	<0.010
Uranium (U)-Total	mg/L	0.001	-	0.02	0.005			<0.0010	<0.0010	<0.0010			0.0012	0.0016	0.0016
Vanadium (V)-Total	mg/L	0.0005	-	-	0.006			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.003	-	5	0.02			0.0356	0.0187	0.0095			0.0386	0.0183	0.0108
Zirconium (Zr)-Total	mg/L	0.004	-	-	0.004			<0.0040	<0.0040	<0.0040			<0.0040	<0.0040	<0.0040
Dissolved Metals Filtration Location		n/a	-	-	-			FIELD	LAB	FIELD			LAB	FIELD	FIELD
Aluminum (Al)-Dissolved	mg/L	0.01	-	-	0.075			0.126	<0.010	0.012			<0.010	<0.010	0.014
Antimony (Sb)-Dissolved	mg/L	0.0005	-	0.006	0.02			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Arsenic (As)-Dissolved	mg/L	0.001	-	0.025	0.005	0.0013	0.001	0.0012	0.0013	0.0012	0.0005	0.0004	<0.0010	<0.0010	<0.0010
Barium (Ba)-Dissolved	mg/L	0.002	-	1	-			0.0088	0.0084	0.0087			0.0215	0.0204	0.0216
Beryllium (Be)-Dissolved	mg/L	0.0005	-	-	1.1			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Dissolved	mg/L	0.001	-	-	-			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010
Boron (B)-Dissolved	mg/L	0.01	-	5	0.2			0.035	0.05	0.041			0.038	0.049	0.040
Cadmium (Cd)-Dissolved	mg/L	0.00009	-	0.005	0.0005			<0.000090	<0.000090	<0.000090			<0.000090	<0.000090	<0.000090
Calcium (Ca)-Dissolved	mg/L	0.5	-	-	-			45.8	56.6	47.9			70.3	67.9	76.5
Chromium (Cr)-Dissolved	mg/L	0.0005	-	0.05	0.0089			<0.00050	0.00083	<0.00050			<0.00050	<0.00050	<0.00050
Cobalt (Co)-Dissolved	mg/L	0.0005	-	-	0.0009			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Copper (Cu)-Dissolved	mg/L	0.001	-	-	0.005	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.0010	<0.0010	<0.0010
Iron (Fe)-Dissolved	mg/L	0.05	-	0.3	0.3	0.127	0.181	0.309	<0.050	0.233	0.127	0.572	<0.050	0.16	0.141
Lead (Pb)-Dissolved	mg/L	0.0005	-	0.01	0.025			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Lithium (Li)-Dissolved	mg/L	0.1	-	-	-			<0.10	<0.10	<0.10			<0.10	<0.10	<0.10
Magnesium (Mg)-Dissolved	mg/L	0.5	-	-	-			9.92	12.4	11.0			7.55	8.02	8.54
Manganese (Mn)-Dissolved	mg/L	0.001	-	0.05	-			0.173	0.232	0.193			0.351	0.276	0.318
Molybdenum (Mo)-Dissolved	mg/L	0.0005	-	-	0.04			0.00471	0.00407	0.00333			0.00079	0.00062	0.00061
Nickel (Ni)-Dissolved	mg/L	0.001	-	-	0.025			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010
Phosphorus (P)-Dissolved	mg/L	0.05	-	-	0.01-0.03			<0.050	<0.050	<0.050			<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	1	-	-	-			3.5	4.1	3.6			2.2	2	2.1
Selenium (Se)-Dissolved	mg/L	0.0004	-	0.01	0.1			<0.00040	<0.00040	<0.00040			<0.00040	<0.00040	<0.00040
Silicon (Si)-Dissolved	mg/L	1	-	-	-			5.6	7.5	5.6			7.1	6.9	6.8
Silver (Ag)-Dissolved	mg/L	0.0001	-	-	0.0001			<0.00010	<0.00010	<0.00010			<0.00010	<0.00010	<0.00010
Sodium (Na)-Dissolved	mg/L	0.5	-	-	-			13.3	14.4	13.6			11.6	8.21	8.56
Strontium (Sr)-Dissolved	mg/L	0.001	-	-	-			0.34	0.365	0.373			0.364	0.345	0.368
Thallium (Tl)-Dissolved	mg/L	0.0003	-	-	0.0003			<0.00030	<0.00030	<0.00030			<0.00030	<0.00030	<0.00030
Tin (Sn)-Dissolved	mg/L	0.001	-	-	-			<0.0010	<0.0010	<0.0010			<0.0010	<0.0010	<0.0010
Titanium (Ti)-Dissolved	mg/L	0.002	-	-	-			<0.0020	<0.0020	<0.0020			<0.0020	<0.0020	<0.0020
Tungsten (W)-Dissolved	mg/L	0.01	-	-	0.03			0.026	0.024	0.022			<0.010	<0.010	<0.010
Uranium (U)-Dissolved	mg/L	0.001	-	0.02	0.005			<0.0010	<0.0010	<0.0010			0.0014	0.0015	0.0015
Vanadium (V)-Dissolved	mg/L	0.0005	-	-	0.006			<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved	mg/L	0.003	-	-	0.02			0.106	0.0081	<0.0030			0.048	0.0136	0.0052
Zirconium (Zr)-Dissolved	mg/L	0.004	-	-	0.004			<0.0040	<0.0040	<0.0040			<0.0040	<0.0040	<0.0040
COD	mg/L	10	-	-	-			<10	-	-			19	-	-