2020 Annual Report, Bobcaygeon Transfer Station

Environmental Compliance Approval No. A341307

April 20, 2021

Prepared for:
The Corporation of the Municipality of Trent Lakes

Cambium Reference: 10520-005

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Executive Summary

The Bobcaygeon transfer site operates under the Ministry the Environment, Conservation and Parks Environmental Compliance Approval A341307. The Site is on part Lot 17, Concession 19, geographic township of Harvey, Municipality of Trent Lakes, County of Peterborough. The site is at 42 Peterborough County Road 36, near the community of Bobcaygeon. The total site area is 4.0 ha and has an approved refuse placement area of 1.6 ha. The Site ceased landfilling in 2002 and now operates as a waste transfer station.

Groundwater elevations were within historical ranges. The groundwater flow continued to be south-southeasterly. Consistent with historical findings, a predominant downward vertical gradient was calculated between most groundwater monitoring wells.

Water quality at the site is monitored in the shallow (upper) and deep (middle and lower) aquifers. A weak leachate signature and road salt impacts were present in the upper bedrock monitors immediately adjacent the waste mound. There were minimal impacts to the deep bedrock aquifer, confirming that impacts were restricted vertically at the Site. Impacts were not interpreted to extended beyond the property boundary. The site complied with the Ministry of the Environment, Conservation and Parks Guideline B-7 (Reasonable Use Concept).

Non-site related impacts were in the off-site monitoring wells adjacent Wilderness Park Road, south of the site.

Landfill gas monitoring was completed at the site at all monitoring wells and methane was not detected at concentrations greater than the instrument detection limit.

The site was operated in compliance with the conditions of the site approval.

Recommendations have been provided regarding the future operation of the Site and work to be completed in 2021.

Respectfully submitted,

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1.0 Introduction

The Corporation of the Municipality of Trent Lakes (Municipality) retained Cambium Inc. (Cambium) to complete the 2020 annual monitoring program for the Bobcaygeon Transfer Station and closed landfill (Site). The Site operates under Ontario Ministry the Environment, Conservation and Parks (Ministry) Environmental Compliance Approval (ECA) No. A341307, issued on October 2, 2017 (Appendix A).

To aid in the understanding of the history and development of the Site, the following information is included digitally in the report package:

- *Bobcaygeon Landfill Report, Preliminary Groundwater Investigation* (EMMS, 1995), and Addendum #1 to this document
- *North Landfill Site Closure Plan* (TSH, 2002), in Association with Hydroterra Limited
- *Updated Hydrogeologic Report, 2002 to 2006 Results, Township of Galway-Cavendish and Harvey North Landfill* (Hydroterra, 2006)
- Environmental Compliance Approval Application, with Design and Operations Report, Maps and other supporting documentation to amend ECA, dated May 10, 2016
- Historical water quality (WSP, 2017)
- *Transfer Station, Safety, Emergency, and Spills Procedures* (MTL, 2020a)
- *Transfer Station Standard Operating Procedures* (MTL, 2020b)

1.1 Site Location

The Site is on part of Lot 17, Concession 19, geographic Harvey Township, Municipality of Trent Lakes, County of Peterborough. The municipal address for the Site is 42 Peterborough County Road 36, near the community of Bobcaygeon (Figure 1). The Universal Transverse Mercator (UTM) coordinates for the Site entrance are Zone 17, 695520 m east, 4936383 m north.

1.2 Site Description

The Site operated as a natural attenuation landfill for the disposal of domestic waste from 1978 until 2002. Since 2003, the Site is operated by the Township as a transfer station for the collection of non-hazardous residential, industrial, commercial, and institutional waste from within the Municipality of Trent Lakes, as well as a number of items that are collected for diversion. Site Details are in Embedded Table 1. A Local Topography Plan and Existing Conditions plan are on Figure 2 and Figure 3, respectively.

Embedded Table 1 Site Details

Total Site Area	4.0 ha
Closed Landfill Area of Refuse Placement	1.6 ha

1.3 Scope of Work

The scope of the 2020 work program was based on the results of the 2019 monitoring program (Cambium, 2020), the requirements of the ECA, and included:

- Groundwater elevation monitoring
- Groundwater sampling and analysis
- Evaluation of groundwater quality against the Ontario Drinking Water Quality Standards (ODWQS) and Reasonable Use Concept (RUC) values developed in accordance with Ministry Guideline B-7
- An overview of site development and operations
- Preparation of this annual report

This report presents the results of the 2020 work program, provides an assessment of the current landfill impact of the Site on the surrounding groundwater environment, and a summary of the operational activities at the Site. Cambium has provided recommendations for the 2021 monitoring program and site operations based on the 2020 results and assessment.

2.0 Methodology

The 2020 work program was completed to maintain compliance with the Site ECA and Ministry guidelines and regulations. As such, the monitoring program was completed consistent with *Guidance Manual for Landfill Sites Receiving Municipal Waste* (MOEE, 1993) and *Monitoring and Reporting for Waste Disposal Sites, Groundwater and Surface Water, Technical Guidance Document* (MOE, 2010).

Field tasks were completed following Cambium's Standard Operating Procedures developed from recognized standard procedures such as those listed above and *Guidance on Sampling and Analytical Methods for use at Contaminated Sites in Ontario* (MOEE, 1996). A health and safety program was developed for site-specific conditions and all Cambium personnel working on the project were familiarized and required to follow the identified protocol.

Groundwater samples were stored in coolers with freezer packs and maintained less than 10°C after collection and during transport to Caduceon Environmental Laboratories (Caduceon) in Kingston, Ontario. Caduceon is accredited by the Canadian Associations for Laboratory Accreditation Inc. for specific environmental tests listed in the scope of accreditation. Groundwater samples were submitted at the frequency and for analysis of the parameters outlined in Table 1.

2.1 Groundwater Monitoring Program

The following tasks were completed as part of the 2020 groundwater monitoring program:

- Prior to sampling, water levels were measured at each monitoring well using an electronic water level tape.
- The purge volume was calculated on-site during each monitoring event using the measured water level, well depth, and the borehole diameter. Each groundwater monitoring well to be sampled was purged of approximately three well bore volumes. For wells with low recovery, at least one saturated borehole volume was purged prior to sampling. Purged water was disposed on-site, down-gradient of each respective well.

- Samples were collected using dedicated polyethylene tubing equipped with inertial-lift foot valves.
- Groundwater samples for metals and dissolved organic carbon (DOC) analysis were field filtered.
- Field measurements were recorded for pH, conductivity, temperature, dissolved oxygen (DO), and oxygen reduction potential (ORP).

Groundwater samples were collected on April 20 and November 9 from the on-site monitoring wells listed below:

- 97-1-U
- 97-1-M
- 97-1-L
- 97-2-U
- 97-2-L
- 97-3
- 98-1-U
- 98-1-M
- 98-1-L
- 98-2-U
- 98-2-M
- 98-2-L
- 98-3-U
- 98-3-M
- 98-3-L
- 00-1-U
- 00-1-M
- 00-1-L
- BH16-1S
- BH16-1D

Monitoring wells included in the groundwater monitoring program are shown on Figure 2. The UTM coordinates for the monitoring locations are in Table 2. Groundwater results are discussed in Section 4.2. Field data sheets are in Appendix B. Laboratory Certificates of Analysis are in Appendix C . Photographs of each monitoring location are in Appendix D.

Blind duplicate groundwater samples were collected from 97-3 and 98-3-U in April and November as part of the Quality Assurance/Quality Control (QA/QC) program. As these field duplicates equate to 10% of the total samples collected, this is an adequate QA/QC program for groundwater. In addition to these samples, the laboratory completes internal QA/QC. The results of the QA/QC program are presented in Section 4.1.

2.2 Residential Well Monitoring Program

Residential well sampling was not completed in 2020 due to the COVID-19 pandemic. Residential wells identified in the monitoring program include:

- Empire Fuels
- 515 Riverside
- 314 Riverside
- 396 Riverside
- 320 Riverside
- 68 County Road 36
- 130 County Road 36

Results from the historical residential well sampling are summarized in Table 8 and discussed in Section 4.3. Available water well records are in Appendix E.

Residential well locations are included on Figure 2. Field data sheets are in Appendix B and laboratory Certificates of Analysis provided by Caduceon are in Appendix C.

2.3 Landfill Gas Monitoring Program

Landfill gas (LFG) is not actively managed at the Site. The large, open site area and isolated location from the public supports passive landfill gas management, which allows generated landfill gas to naturally disperse through the waste and naturally-permeable cover to the atmosphere.

LFG monitoring was conducted at the monitoring wells during the spring and autumn sampling events using an RKI Eagle 1 Gas Monitor, equipped with a methane sensor. The purpose of the monitoring is to assess compliance with Section 4.10 of *Landfill Standards, A Guideline on the Regulatory and Approval Requirements for New and Expanding Landfilling Sites* (MOEE, 1998), which states the concentration of methane gas in the subsurface may not exceed 2.5% by volume at the property boundary.

Landfill gas, specifically methane and carbon dioxide, is derived from the decomposition of organic wastes. Production of LFG from landfilled wastes normally reaches a maximum rate approximately two years after placement and may continue at this rate for many years. The biological decomposition process results in the generation of LFG until some period, likely decades, after the landfilling of that waste ceases. Hazardous concentrations for methane are 5 to 15% methane by volume or between 50,000 and 150,000 ppm.

The LFG monitoring results are in Table 9 and discussed in Section 4.4.

2.4 Site Review and Operations Overview

Site operations were observed during site visits completed in April and November 2020. During these visits, the items listed below were inspected on accessed areas of the Site and observations noted in the field file. In January 2021, the Township provided additional 2020 site operations information. Site inspection results are presented in Section 5.0.

- Litter control
- Condition and layout of recycling bins
- Status of monitoring well security
- Condition and layout of access roads, access gates
- Condition of final cover

3.0 Geological and Hydrogeological Context

3.1 Topography and Drainage

The Site is in the Kawartha Lakes tertiary watershed and the Pigeon Lake quaternary watershed. The flow in the area generally collects from the northeast areas of Peterborough County and drains southwest through Trent Lakes and into the Lower Buckhorn Lake (TCC, 2014).

Locally, the Site is well drained. Drainage is controlled by topography and through overland flow which collects in low lying areas, migrating south via natural depressions and road side ditches, ultimately discharging to Pigeon Lake (1 km south). Despite temporal drainage, there are no reported permanent or semi-permanent surface water features in the down-gradient flow path between the Site and Pigeon Lake.

The closest provincially significant wetland is identified as the Nogie's Creek Mouth about 4 km northeast of the Site. Additionally, there are two evaluated wetlands identified as Sturgeon Lake No. 7 to the west and Bobcaygeon West to the southwest. Both evaluated wetlands are about 3.5 km from the Site. Based on the limited surface water features surrounding the Site, a surface water monitoring program does not exist for the Site.

3.1.1 Precipitation Data

A review of the 2020 precipitation data for Peterborough County (Government of Canada, 2021) in comparison to the average precipitation data for 1981 to 2010 for Renfrew (Government of Canada, 2015) indicated that, similar to 2019, the annual precipitation was notably less than normal. January and August received more precipitation than normal, while the remaining months received less. The precipitation in April and November was about 40% lower than normal. The monthly precipitation, as well as the amount of precipitation during and in the three days prior to the sampling events is summarized in Embedded Table 2. Refer to Appendix B for field sheets and climate data.

Embedded Table 2 Historical and 2020 Precipitation Data

Sampling Date	Average Monthly Precipitation (mm) (1981 – 2010)	2020 Precipitation (mm)	Precipitation During and Prior to Sampling (mm)
April 20	68.6	41.1	4.5
November 9	86.4	55	0.0

3.2 Hydrogeology

The hydrogeology of the Site has been characterized by others and documented in the following reports:

- *Bobcaygeon Landfill Report, Preliminary Groundwater Investigation* (EMMS, 1995) and Addendum #1 to this document
- *North Landfill Site Closure Plan* (TSH, 2002), in Association with Hydroterra Limited
- *Updated Hydrogeologic Report, 2002 to 2006 Results, Township of Galway-Cavendish and Harvey North Landfill* (Hydroterra, 2006)
- *Township of Galway-Cavendish and Harvey North Landfill Site, 2007 Annual Monitoring Report* (TSH, 2008)
- *2016 Annual Monitoring Report - Bobcaygeon Closed Landfill Site / Transfer Station* (WSP, 2017)

The following is a summary of currently understood hydrogeological setting of the Site based on the above references. Refer to Appendix E for borehole logs.

There are currently 20 monitoring wells at the Site, installed as well nests in eight locations from 1997 to 2016. Due to a general lack of shallow overburden groundwater, all wells are installed as bedrock wells, with the exception of three wells which are installed as interface wells (97-1-U, 97-2-U, and 97-3). The well nests typically include three installation depths, with the exception of monitoring well 97-3 which is installed as a single well and well nests 97-2 and

BH16-1 which have only two installation depths. Specifically, 97-2-U monitors the upper unit, BH16 1S monitors the middle unit, and monitors 97-2-L and BH16-1D monitor the lower unit.

Embedded Table 3 provides a summary of the minimum and maximum well depths in each region (i.e., upper, middle, and lower), as well as the average groundwater elevations observed.

Embedded Table 3 Well Installation Depths and Water Table Elevations

Well Group	Screen Elevation (masl)		Depth (mbgs)		Average Water Elevation (masl)		
	Min	Max	Min	Max	Min	Max	Average
Upper	251.7	262.5	2.6	10.1	255.3	261.9	257.6
Middle	246.3	254.5	7.3	15.5	253.3	260.3	255.6
Lower	239.0	252.5	13.2	22.9	252.8	256.7	254.5

Note:

1. *masl means metres above sea level.*
2. *mbgs means metres below ground surface.*

The overburden encountered on-site consists primarily of sand and gravel or sand and gravel till (some cobbles and boulders, clay, dense) and ranged in thickness from 3.0 mbgs (00-1) to 7.62 mbgs (97-2). Although no significant overburden water table was encountered, the overburden was described as moist to wet in available boreholes with the exception of well nest 00-1 where it was noted to be dry.

Bedrock in and around the Site is limestone of the Verulam Formation, underlain by limestone and shale of the Gull/River Shadow Lake Formation and/or Precambrian granitic and metasedimentary rocks. All bedrock wells on-site were installed in the limestone bedrock, with the exception of monitor 00-1-L which was installed in limestone and red shale. The limestone bedrock was reported as competent with limited water bearing fractures. The only water bearing fractures reported are summarized in Embedded Table 4. Note that no information on water bearing fractures were provided from the wells installed in 2016 (BH16-1).

Embedded Table 4 Summary of Water Bearing Fractures

Well	Region	Fracture Depth (mbgs)
97-3	Upper	4.6
97-1	Upper	4.3
00-1	Upper	5.2 to 7.0

Despite the limited water bearing fractures noted on the borehole logs, the bedrock formations in the vicinity of the Site were reported to be highly permeable (TSH, 2002).

Bedrock elevations for the monitoring wells at the Site range from 262.2 to 254.8 masl. Although the bedrock slopes to the south, bedrock elevations to the southeast of the waste mound are lower than the bedrock elevations along Wilderness Park Road, southwest of the Site and waste mound. As discussed further in Section 3.2.2, it is interpreted that the groundwater table generally follows the slope of the bedrock and flows south-southeast. There is a small component of southwest flow that exists from the waste mound to wells 97-3 and 97-2 given the slope of the bedrock in this area. Refer to Figure 7 for bedrock elevations.

A description of monitors used to evaluate each groundwater area is described below:

- Well nest 00-1 is northwest of the waste mound and represents background water quality.
- 97-3 is immediately adjacent and down-gradient to the waste mound. Due to the installation depth (shallow aquifer), groundwater monitoring well 97-3 has been deemed to be representative of landfill leachate quality at the Site.
- Well nests 97-1, 97-2, and BH16-1 are down-gradient of the waste mound, adjacent the southern property boundary. Well nests 97-1 and BH16-1 are down-gradient and southeast of the waste mound. Well nest 97-2 is down-gradient and southwest of the waste mound.
- Down-gradient off-site water quality is monitored by well nests 98-1, 98-2, and 98-3 south of the property boundary. Nests 98-1 and 98-2 are adjacent to and north of Wilderness Park Road, 125 m south of the Site. Nest 98-3 is immediately south (within 30 m) of the property boundary, south of well nest 97-1.

3.2.1 Well Records

Of the Ministry water well records available in the vicinity of the Site (Figure 2), 40 records were for domestic water supply wells down-gradient of the Site, between the waste disposal property and Pigeon Lake (Cambium, 2018). The records were for wells installed from 1950 to 2016, with the majority of the wells installed before the mid-1990s. As such, the amount of detail and accuracy of the locations of the well records varied significantly.

A review of these records indicated that all wells were installed in bedrock, primarily in limestone. The domestic water supply wells were installed at depths ranging from 3.7 mbgs to 38.1 mbgs, at an average depth of 10.6 mbgs. Shale was noted in a few well records, typically around 12 to 15 mbgs and sandstone was noted in at least one record at 7.6 mbgs, extending to 21.3 mbgs. Where observed, granitic bedrock was reported below the limestone, shale, and/or sandstone bedrock, at depths typically ranging from 16.8 mbgs to 21.3 mbgs. There was one well record where granite was at only 2.7 mbgs.

Given the number of domestic water supply wells down-gradient of the Site, a residential water quality program is completed for the Site, as discussed in Section 4.3.

3.2.2 Groundwater Flow Direction

Historically, the groundwater direction has been reported to be influenced by the topography of the underlying bedrock. Groundwater elevations collected from the upper, middle, and lower bedrock monitoring wells in 2020 were used to define the horizontal groundwater flow direction at the Site.

Groundwater elevation data is summarized in Table 2. The elevations of each region have been displayed separately on Figure 8 (upper), Figure 9 (middle), and Figure 10 (lower). Significant fluctuations in groundwater elevations are common in the middle and lower water tables (with the exception of 97-2-L), generally following a seasonal pattern. Water elevations in the shallow aquifer are generally more static. Groundwater elevations were within historical ranges in 2020.

Water elevations typically vary significantly within each well nest, with the exception of nests 97-1 and 98-3 where the middle and lower wells have been similar and inferred to be hydraulically connected.

As summarized in Embedded Table 3, there are three distinct water table elevations. When comparing the average water table elevations from 2014 to 2020 at the Site, the middle and lower regions were interpreted to be hydraulically connected to some degree, whereas the upper wells represent a separate aquifer. As such, the upper region (and wells) is identified as

the shallow aquifer and the middle and lower regions are identified as the deep aquifer for assessment purposes.

The general groundwater flow direction was south-southeast in 2020 as displayed on Figure 4 (upper), Figure 5 (middle), and Figure 6 (lower).

As briefly discussed in Section 3.2, the bedrock elevation is high at well 97-3 relative to adjacent well nest 97-2 (Figure 7). Furthermore, the bedrock elevation reported along Wilderness Park Road was higher than the bedrock elevation reported at well nests 97-1 and 98-3. As such, there is a preferential flow pathway to the southeast from the waste mound, with the potential for a small component of flow to the southwest toward well nest 97-2. This is reflected in the water table elevations in the middle and lower regions (deep aquifer), as the water elevations at well nests 98-1 and 98-2 south of the Site are typically higher than the water table elevations at well nest 97-1 and 98-3 southeast of the waste mound. This indicates a potential for a northward component of flow from Wilderness Park Road. This was more predominant in April 2020 as the elevation at 97-2-L was lower than typical in the spring (albeit the elevation was consistent with autumn water levels and was attributed to the low precipitation received in early 2020). Regardless, the primary flow path for impacted water is to the south-southeast from the waste mound, ultimately to Pigeon Lake, with a minor component of flow to the southwest in the area of well nest 97-2.

The hydraulic gradients calculated in 2020 are summarized in Embedded Table 5.

Embedded Table 5 Calculated Hydraulic Gradients, 2020

Event	Upper	Middle	Lower
Spring	0.020 m/m southeast 0.009 m/m southwest	0.033 m/m southeast 0.015 m/m southwest	0.038 m/m southeast 0.024 m/m northwest
Autumn	0.031 m/m southeast 0.013 m/m southwest	0.038 m/m southeast 0.011 m/m southwest	0.017 m/m southeast 0.008 m/m southwest

3.2.3 Vertical Gradients

Using elevations from the upper (interface/bedrock), middle (bedrock), and lower (bedrock) monitors at the Site, vertical gradients were calculated in 2020 (Table 4). Downward vertical

gradients were calculated at all monitoring well nests with the exception of monitors 98-1-U/L (April), 98-1-M/L (April), and 98-2-M/L (April). Vertical gradients were generally consistent with historical results with the exception of an upward gradient noted at 98-1-U/L in April.

3.2.4 Conceptual Site Model

Given the lack of surface water features surrounding the Site, the depth to the water table (i.e., greater than 2 mbgs and an average of 6 mbgs), and the predominant downward vertical gradients calculated, the primary flow path for leachate impacted groundwater is the bedrock aquifer. Impacted groundwater will flow primarily south-southeast from the waste mound toward Pigeon Lake. Due to the bedrock topography, there is a small component of flow that extends southwest from the waste mound, toward well nest 97-2. The primary receptor of potential impacts from the Site are the adjacent domestic water supply wells south of the Site.

4.0 Results and Discussion

Water quality results from the monitoring program are used to assess the existence, extent, and degree of impacts to the groundwater environment related to waste disposal site activities at the Site.

To ensure appropriate actions are in place to respond to degradation in groundwater quality beyond an acceptable level, site-specific trigger levels and contingency measures aid in the assessment of impacts from leachate contamination and help to prevent adverse impacts to the environments surrounding the waste disposal site.

This section presents the results of the 2020 monitoring program.

4.1 Quality Assurance / Quality Control

Results from the analyses completed on the blind duplicate QA/QC samples were evaluated. Parameter concentrations were considered significantly different if the relative percent difference (RPD) between the duplicate and the parent samples was greater than 30% when at least one result was greater than five times the reported detection limit (RDL).

The duplicate groundwater analyses were compared to the originals. Overall, the duplicate samples correlated well with the parent samples and met the data quality objective of 30%. The results were interpreted with confidence.

4.2 Groundwater Quality

Groundwater analysis data for 2011 to 2020 are in Table 5, Table 6, and Table 7. Data from 2002 to 2010 is included digitally with the report package.

To assess water quality impacts related to landfill site operations, the analytical results for groundwater samples collected on-site were compared to background water quality and historical data, and Site compliance was assessed using ODWQS (MOE, 2006) and RUC (MOEE, 1994a).

4.2.1 Background Groundwater Quality

When evaluating the impact of any waste disposal site on a groundwater resource, a reference point or value must be established to assist in determining the magnitude of the impact. The quality of the groundwater that is non-impacted by the waste disposal site operation (i.e., background water quality) should be used for comparison purposes.

Given the location of monitoring nest 00-1 up-gradient of the waste mound, the groundwater results for these monitoring wells are representative background water quality at the Site.

The water quality at wells 00-1-M and 00-1-L have been similar, confirming these two units are hydraulically connected and make up the deep aquifer. Some key differences between the shallow aquifer (i.e., 00-1-U) compared to the deep aquifer include:

- Elevated concentrations of alkalinity, barium, chloride, calcium, nitrate, and sodium in the shallow aquifer.
- Low concentrations of boron, hardness, iron, magnesium, manganese, and sulphate.
- Evidence of impacts at monitor 00-1-U have been exhibited by seasonally elevated concentrations of alkalinity, total dissolved solids (TDS), conductivity, chloride, hardness, sodium, calcium, and barium. Given the up-gradient location of this monitor the impacts were attributed to a non-waste related source (likely road salt).
- TDS concentrations regularly exceed the ODWQS at 00-1-U and historically at 00-1-L. Well 00-1-M has only intermittently exceeded the ODWQS for TDS. All three background monitors and iron and manganese concentrations intermittently exceed the ODWQS at monitors 00-1-M and 00 1-L. DOC concentrations have intermittently exceeded the ODWQS at monitors 00-1-U and 00-1-M.

Water quality data from 2020 was consistent with historical results at these three locations. The data from 2020 indicated stable parameter concentrations and the water quality at these locations remained representative of background groundwater quality.

4.2.2 Leachate Characteristics

A comparison of water quality results from leachate monitoring well 97-3 to background monitoring well nest 00-1 indicated that the landfill leachate is characterized by elevated concentrations of those parameters outlined in Embedded Table 5, identified as the leachate indicator parameters (LIPs) for the Site.

Embedded Table 6 Leachate Indicator Parameters

alkalinity	conductivity	barium	sodium
chloride	ammonia	hardness	boron
calcium	iron	TDS	Chemical oxygen demand (COD)
DOC	manganese		

In 2020, most parameters were within historical concentration ranges; however, the following was noted:

- Concentrations for many LIPs were lower than average at 97-3 in November 2020.

4.2.3 Perimeter Monitoring Wells

4.2.3.1 Shallow Aquifer

A weak leachate signature is present at monitors 97-1-U and 97-2-U; however, concentrations have typically been less than the leachate monitor (97-3). This confirms that natural attenuation is occurring at the Site. Historically, concentration of all LIPs have been greater at monitor 97 2-U compared to monitor 97-1-U with the exception of COD, confirming the southwest flow component discussed in Section 3.2.2. Concentrations of many parameters fluctuate seasonally at this location, consistent with 00-1-U.

In 2020, there were spikes of several LIPS at 97-1-U including: barium, calcium, hardness, iron, manganese, and COD. Elevated concentrations of barium, boron, chloride, iron, sodium, and TDS were also at 97-2. Despite the elevated concentrations noted in 2020 and seasonal fluctuations, parameters concentrations have been stable over time at these wells. An increasing trend for sodium may be developing at 97-2-U.

Consistent with the background water quality at monitor 00-1-U, TDS (persistently) and DOC (intermittently) concentrations have exceeded the ODWQS at monitors 97-1-U and 97-2-U. In addition, concentrations of hardness at both locations and iron and chloride at well 97-2-U have intermittently exceeded the ODWQS. The following ODWQS exceedances occurred during one or more events in 2020:

97-1-U: iron, manganese, hardness, and TDS

97-2-U: chloride, iron, hardness, and TDS

4.2.3.2 Deep Aquifer

Limited, if any, impacts have been evident in the deep aquifer at wells 97-1-M, 97-1-L, 97-2-L, BH16 1S, and BH16-1D. The only parameter concentrations elevated at these down-gradient locations compared to the background water quality at 00-1-M and 00 1-L have been:

97-1-M: barium

97-1-L: barium

97-2-L: boron

BH16-1S: alkalinity, COD, barium, calcium

BH16-1D: boron

The water quality results in the perimeter deep aquifer wells have generally met the ODWQS criteria with the exception of occasional TDS exceedances at monitor 97-1-M and DOC exceedances at all locations.

In 2020, the water quality at these monitors remained consistent with historical results. Only DOC exceeded the ODWQS at BH16-1S in April.

Although the elevated LIP concentrations may indicate marginal impacts from leachate at these deep monitoring wells, it is more likely the elevated concentrations are attributable to natural variation in the deep aquifer water quality.

4.2.4 Off-site Monitoring Wells

4.2.4.1 Shallow Aquifer

Monitoring wells 98-1-U, 98-2-U, and 98-3-U monitor the water quality in the upper bedrock, south of the Site.

Water quality at monitor 98-3-U has historically been similar to background water quality with the exception of slightly elevated barium and boron concentrations. In recent years, COD has also been elevated. Notably, these trends mirror those in up-gradient monitor 97-1-U.

Water quality at monitors 98-1-U and 98-2-U have been comparable to each other and several parameter concentrations have been greater than background water quality including the following: alkalinity, barium (98-1-U only), boron, calcium, conductivity (98-2-U only), hardness, DOC (98-1-U only), TDS. Similar to monitor 98-3-U, many of the concentrations at one or both of these monitors have been elevated in the upgradient monitor 97-2-U. It is further noted that the concentrations of alkalinity, boron, hardness, DOC, and calcium were similar to or elevated compared to 97-2-U.

The following ODWQS exceedances have been reported at these monitors:

98-1-U: Seasonal exceedances of alkalinity, TDS, and hardness; intermittent exceedances of DOC

98-2-U: Persistent exceedances of TDS; intermittent exceedances hardness; occasional exceedances of DOC, iron, and manganese

98-3-U: Occasional exceedances of TDS, DOC, and manganese since 2017

In 2020, the water quality in the off-site down-gradient upper bedrock monitors remained consistent with historical results with the exceptions:

98-3-U: elevated concentrations of many parameters in April. With exception of DOC, concentrations were reported within historical ranges in November. Despite seasonal fluctuations, parameter concentrations of many parameters have been

gradually increasing over time at this well (e.g., barium, calcium, chloride, hardness, sodium).

In 2020, the following ODWQS were exceeded on one or more occasions:

98-1-U: TDS, hardness

98-2-U: TDS, hardness, iron, manganese

98-3-U: hardness, DOC

Marginal impacts have been present at 98-3-U. Elevated parameter concentrations at 98-1-U and 98-2-U have not been attributed to the Site, but rather to a non-waste related source such as the adjacent municipal road. This is supported by the elevated parameter concentrations at these locations compared to up-gradient wells in closer proximity to the landfill. Further, groundwater elevations have typically been higher at well nest 98-1 (and 98-2) compared to well nests 97-1 and 98-3 indicating there is a component of flow to the northeast from well nest 98-1 and Wilderness Park Road (Cambium, 2019).

As noted in the *2016 Annual Monitoring Report* (WSP, 2017), historical landfilling activities reportedly occurred south of the Site. It is speculated that the waste disposal occurred between the property boundary and nested monitors 98-1 and 98-2; however, no confirmation on the location of the landfilling has been received from the Ministry.

4.2.4.2 Deep Aquifer

Monitoring wells 98-1-M, 98-2-M, and 98-3-M monitor the water quality in the middle bedrock and monitoring wells 98-1-L, 98-2-L, and 98-3-L monitor the lower portion of the deep bedrock aquifer south of the Site.

The only deep aquifer monitoring well south of the Site with elevated parameter concentrations has been monitoring well 98-2-L. The following parameter concentrations have typically been elevated at this location: conductivity, TDS, chloride, ammonia, hardness, boron, calcium, iron, manganese, and sodium. Although not a LIP, sulphate has also been elevated at this location. Consistent with the shallow aquifer, these elevated parameter concentrations were also greater than monitor 97-2-L, in closer proximity to the waste mound.

The remaining deep aquifer wells have had only limited elevated parameter concentrations, if any, including the following:

98-1-M: barium

98-1-L: conductivity, TDS, boron, sodium, sulphate

98-3-M: none

98-3-L: sulphate, boron, manganese, sodium

The following ODWQS exceedances have been at these monitors:

98-1-M: Occasional exceedances of DOC

98-1-L: Persistent exceedances of TDS; occasional exceedances of DOC and hardness

98-2-M: Occasional exceedances of DOC and manganese

98-2-L: Persistent exceedances of TDS, sulphate, hardness, iron, and manganese; occasional exceedances of DOC

98-3-M: Occasional exceedances of TDS, iron, and manganese prior to 2017; occasional exceedances of DOC

98-3-L: Occasional exceedances of TDS and DOC

In 2020, the water quality at monitors 98-1-M, 98-1-L, 98-2-M, 98-2-L, 98-3-M, and 98-3-L remained consistent with historical results. Some gradual increasing trends were evident at 98-2-L including boron, calcium, chloride, and hardness. The following ODWQS exceedances were noted:

98-1-L: TDS

98-2-L: TDS, sulphate, hardness, iron, and manganese

98-3-M: field pH at 98-3

Elevated parameter concentrations south of the Site in the deeper aquifer have been attributed to non-site related impacts.

4.2.5 Groundwater VOC Analysis

Volatile organic compound (VOC) analysis was completed during the autumn sampling event on monitoring wells 98-2-U and 98-2-L. All VOC parameter concentrations were less than RDLs consistent with historical results (Table 7).

4.2.6 Summary of Groundwater Quality

Water quality down-gradient of the waste mound is monitored in both the shallow (upper) and deep aquifers (middle and lower). Aside from minor connectivity at well nest 97-1, the shallow and deep aquifer are not interpreted to be hydraulically connected.

Background water quality is monitored at well nest 00-1. Minor impacts from a non-site related source such as road salt have been in the shallow aquifer at this location. Leachate quality has been characterized at 97-3, immediately south and adjacent the waste mound. The leachate quality at the Site has had elevated concentrations of most analyzed parameters. Notably concentrations of sulphate and nitrate are low in the leachate.

There was a weak leachate signature present at shallow aquifer monitors 97-1-U and 97-2-U, southeast and southwest of the waste mound, respectively. Impacts have been greater southwest (and closer) to the waste mound; however, road salt impacts have also been evident at this location. Limited impacts, if any, have been in the deep aquifer on-site, monitored by wells 97-1-M, 97-1-L, 97-2-L, BH16-1S, and BH16-1D.

Marginal impacts (attributed to the Site) have been evident at 98-3-U. Impacts were not present in the deep aquifer at this location (98-3-M and 98-3-L).

There have been elevated parameter concentrations in off-site wells 98-1-U and 98-2-U in the shallow aquifer and in the deep aquifer well 98-2-L. All other off-site monitoring wells have had water quality similar to background. Notably, well 98-2-L has had elevated concentrations of most parameters, including sulphate (non-LIP). Elevated concentrations in these wells have been greater than the monitoring wells immediately south of the waste mound. As such, and with a northeast (and northwest in the deeper aquifer) groundwater flow south of the Site

between well nests 98-1 and nests 97-1 and 98-3, the elevated parameter concentrations have been attributed to a non-site related source (e.g., historical landfill, road salt impacts, etc.).

Impacts from the Site extended to the southwest and southeast in the shallow aquifer; however, due to natural attenuation, the impacts did not extend much beyond the waste mound. Given the lack of impact at monitor 98-3-U (only barium, boron, and COD have been marginally elevated), 30 m down-gradient of the property boundary, impacts beyond an acceptable limit off-site were not expected.

Impacts from the Site were restricted vertically to the shallow aquifer due to the competency of the deeper bedrock. Minor non-site impacts were at various perimeter wells (shallow aquifer), including the background well, likely from road salt application on County Road 36. There was a non-site related impact in the monitoring wells adjacent Wilderness Park Road, south of the Site, primarily in the shallow aquifer (i.e., well nests 98-1 and 98-2). A secondary non-site related source was also in the deep aquifer at well 98-2.

4.2.7 Groundwater Compliance Assessment

The Ministry RUC applies to operating waste disposal sites and sites closed post 1986. As the Site closed in 2002, the RUC applies to the Site. To ensure appropriate actions are in place to respond to any potential degradation in groundwater quality beyond an acceptable level, site-specific trigger levels have been developed for the Site. These are the RUC values developed in accordance with Ministry Guideline B-7 (MOEE, 1994a). The Ministry Guideline B-7 states that, in accordance with the appropriate criteria for particular uses, a change in quality of the groundwater on an adjacent property will be accepted only as follows (Ministry Procedure B-7-1):

> *The quality cannot be degraded by an amount in excess of 50% of the difference between background and the ODWQS for non-health related parameters and in excess of 25% of the difference between background and the ODWQS for health-related parameters. Background is to be the quality of the groundwater prior to any man-made contamination.*

The maximum concentration of a particular contaminant that is considered acceptable in the groundwater beneath an adjacent property is calculated in accordance with the following relationship:

$C_m = C_b + x (C_r - C_b)$

Where:
- C_m = maximum concentration accepted
- C_b = background concentration
- C_r = maximum concentration permitted in accordance with the ODWQS
- x = a constant that reduces the contamination to a level that is considered by the Ministry to have a negligible effect on water use.
  i.e. 0.5 for non-health related parameters
  0.25 for health-related parameters.

The RUC values were calculated using the median value of the background concentration (C_b) from a minimum of the previous five sampling events as required by Ministry Eastern Region Technical Support Section. Where background concentrations were less than the laboratory RDL, the RDL was used as the background concentration. Where the background concentrations exceeded ODWQS, the C_b value was set as the RUC value. The calculated C_m values for the Site were set as the RUC values.

The RUC values were calculated for all parameters listed in Table 1 with an ODWQS criteria. The RUC assessment included the following monitoring wells along the perimeter of the Site: nested wells 97-1, 97-2, and BH16-1. Well nests 00-1 (background) and 98-3 (located 30 m beyond the property boundary) were included for reference. The results indicated that RUC concentrations were met in these monitor wells with the exception of the parameters highlighted in Table 5 and Table 6 and summarized in Embedded Table 7. Parameters listed in bold text are parameters that persistently exceed the RUC criteria.

Embedded Table 7 Groundwater RUC Exceedances

Shallow Aquifer	RUC Exceedance
00-1-U (Background)	**TDS**
97-1-U	barium, chloride, iron, manganese, **hardness, TDS**
97-2-U	barium, **chloride**, iron, manganese**, sodium, alkalinity, hardness, TDS**
98-3-U	hardness, TDS
Deep Aquifer	
00-1-M (Background)	none
97-1-M	none
98-3-M	none
BH16-1S	**DOC**
00-1-L (Background)	iron
97-1-L	none
97-2-L	none
98-3-L	iron, manganese
BH16-1D	none

As discussed in Section 4.2.3, elevated concentrations of several parameters were noted at 97-1-U and 97-2-U in 2020. Parameter concentrations that persistently exceed the RUC criteria are non-health related parameters and were at least partially attributed to naturally elevated concentrations as mirrored by elevated concentrations in the background water quality (i.e., TDS) and/or to road salt impacts (i.e., alkalinity, TDS, hardness, chloride, sodium).

All remaining exceedances noted in Embedded Table 7 were naturally occurring, as exhibited by the concentrations at well nest 00-1 or were not persistently elevated and were attributed to natural variations in the water quality.

Given the lack of persistently elevated concentrations which have exceeded the RUC criteria at down-gradient well nests 98-3 and BH16-1, the Site complied with the intent of the RUC (MOEE, 1994a).

4.3 Residential Water Quality

Residential well samples were not collected as a part of the 2020 monitoring program due to the COVID-19 pandemic. Historical residential well sampling data from 2002 to 2010 are included digitally. Water quality data from 2011 to 2019 are summarized in Table 8.

The residential well sample identified as ‘Empire’ is northwest of Peterborough County Road 36, 75 m up-gradient of the waste mound. Historically, water quality at this well exhibited ODWQS exceedances for TDS and a single elevated concentration of sodium in 2015.

Formerly identified as 95 County Road 36 (WSP, 2017), residential well 68 County Road 36 is 65 m cross-gradient from the waste mound. This well often exhibited elevated TDS concentrations greater than the ODWQS.

There have been no exceedances ODWQS criteria at residential well 515 Riverside Drive, about 1 km southeast and down-gradient of the waste mound.

Three additional residential wells were added to the program in 2017. Residential wells 320 Riverside and 396 Riverside are about 825 and 765 m southeast and down-gradient of the waste mound, respectively. Although only four samples have been collected, no ODWQS exceedances have been reported.

The resident for the well identified as 314 Riverside did not wish to be included in any further monitoring events after October 2017. As such, the well at 130 County Road 36 was permanently added to the monitoring program in 2018 (sampled once before in 2016). Occasional elevated iron concentrations have been reported at this well.

Water quality data at all sampled residential wells were similar to background water quality at the Site (i.e., well nest 00-1). No site related impacts were evident at the residential wells included in the monitoring program in 2019. Furthermore, there were no exceedances of the ODWQS criteria at any of the residential wells sampled in 2019, with the exception of TDS at 68 County Road 36, consistent with historical results.

Although elevated sodium concentrations were not attributed to site impacts and were less than the ODWQS criteria of 200 mg/L, given that the sodium concentrations exceeded 20 mg/L

at a number of the residential wells, the homeowners and local Medical Officer of Health were notified in 2018, as required by the ODWQS (Cambium, 2020). This correspondence was also sent to the Ministry's Peterborough District Office.

4.4 Summary of Landfill Gas Monitoring

Landfill gas monitoring was conducted at the Site in 2020 to assess the potential gas hazard at the Site. The results of the landfill gas monitoring program are documented in the field data sheets (Appendix B) and summarized in Table 9. LFG was not detected at concentrations greater than the instrument detection limit (0.05% methane by volume).

4.5 Adequacy of Monitoring Program

In an effort to have a refined and concise monitoring program at the Site, the existing monitoring program is reviewed annually to determine if it sufficiently monitors impacts at the Site. Following the 2020 assessment, the monitoring program continues to effectively characterize Site conditions, groundwater and any groundwater discharges from the Site, and includes data that relates to background water conditions. At the Site, in whole or in part:

- All monitoring wells were confirmed to be in good condition and secure.
- All fieldwork for groundwater and surface water investigations was done in accordance with the established SOPs (including internal/external QA/QC).
- All groundwater sampling for the monitoring period was successfully completed in accordance with the ECA.
- The Site has an adequate buffer, contaminant attenuation zone (CAZ), and contingency plans in place.
- Design and operational measures, including size and configuration of any CAZ, were adequate to prevent potential human health impacts and impairments of the environment.

Based on the work completed to date, time since closure, and stable conditions, once (spring) annual monitoring and biennial reporting is recommended. As per ECA Condition 17, until

written approval of these recommended changes is received by the District Manager, the monitoring and reporting should continue at the approved frequency.

5.0 Site Operations

This section presents a summary of 2020 operations for the Site. The requirements of ECA Condition 53, related to the Transfer Station operation are addressed as follows:

- Monthly balance of waste received and transferred from the Transfer Station (Section 5.8 and Table 10)
- Summary of any rejected wastes (Section 5.6)
- Summary of any incidents (Section 5.5)
- Summary of complaints received (Section 5.5)
- Statement as to compliance with all ECA Conditions and with the inspection and reporting requirements of the ECA Conditions (Section 5.10)
- Description of any operational changes and/or Transfer Station improvements undertaken and all other operational issues (Section 5.9)

In November 2020, an administrative ECA amendment application was submitted to the Ministry to request operational flexibility related to site layout, storage quantities, documentation requirements, and complaint procedures. The Ministry acknowledged receipt of the application; however, no comments or approval were received as of the date of this report.

5.1 Site Access and Security

The Site is well screened by surrounding forest and thick vegetation. Site access is controlled from Peterborough County Road 36 by a chain linked fence which was in good repair in 2020. The Municipality uses video surveillance equipment to attempt to deter trespassing at the Site. An access pass card is provided to all tax paying residents of the Municipality, where access is only permitted during operational hours and with the presence of a site attendant.

Signage is posted at the gate and the attendant shelter, which lists the hours of operation, emergency contact information, acceptable waste types, site rules, and a warning against illegal dumping.

No changes were made to the operational hours in 2020 and were as followed:

Summer (May 1 to September 30)

Sunday ..... 12:00 PM to 8:00 PM
Tuesday, Friday, Saturday ..... 8:00 AM to 4:30 PM

Winter (October 1 to April 30)

Sunday ..... 12:00 PM to 5:00 PM
Tuesday and Saturday ..... 8:00 AM to 4:30 PM

All sites are closed on Christmas Day, New Years Day, Family Day, Good Friday, Easter Monday and Canada Day.

All sites are open on Victoria Day, Civic Holiday, Labour Day, and Thanksgiving Monday and operate on Sunday Hours.

5.2 Site Operation

In 2020, all transfer operations were conducted under the supervision and direction of the site attendant, employed by the Municipality. The site attendant was responsible for ensuring that the safe and orderly operation and maintenance of the Site complied with the requirements of the ECA and the Environmental Protection Act and its Regulations as administered by the Ministry. The site attendant's responsibilities included, but were not limited to the following:

- controlling admission of authorized vehicles with acceptable wastes
- ensuring proper daily litter control
- controlling collection and haulage of materials by a licensed hauler
- maintain a daily record of all operations which are available for inspection by the Ministry

As part of the daily operation of the Site and outlined in the Standard Operating Procedures (MTL, 2020b), the site attendant used the following forms on each operating day, as applicable:

- TS-1 Daily Inspection Form
- TS-2 Issues and Deficiencies Forms
- TS-3 Daily Incoming Waste Form

- TS-4 Tipping Fee Form
- TS-5 Tire Form
- TS-6 Reuse Centre Form
- TS-7 Unaccepted Refused Waste & Entry Form
- TS-8 Complaint Form
- TS-9 Record of Materials Removed Form

5.3 Training

Training was limited due to the COVID-19 pandemic in 2020. A site attendant meeting was held on October 1, 2020 to complete a WHMIS refresher, discuss policies on wearing face masks in the workplace, how to sanitize tools and equipment, the ECA, and the *Transfer Station, Safety, Emergency, and Spills Procedures* (MTL, 2020a). Employees signed an "Acknowledgement and Understanding" form to acknowledge the training.

In 2019, semi-annual meetings are held with site attendants and municipal staff that operate and/or are responsible for transfer station operations. The following items are covered by these meetings and all operating personnel are trained in the following:

- site operating responsibilities
- receiving and recording procedures
- storage, handling, sorting and shipping procedures
- equipment inspection, operation and maintenance procedures
- housekeeping and nuisance control procedures
- site inspection procedures
- occupational health and safety concerns (related to waste)
- complaint response procedures
- procedures to be followed in the event of a spill, fire medical or other emergency

- a review and discussion of the ECA conditions for the Site

In addition to the semi-annual training/meeting, the following training was provided to site attendants in 2019:

- Paintball Gun Training
- Fire Extinguisher Awareness Training
- Lifting Loads Safely
- Workplace Hazardous Materials Information Systems (WHMIS)

A record is kept of all staff who attend the meetings and/or training.

5.4 Site Inspections

The following section discusses observations during site inspections conducted by Cambium and discusses information provided by the Township in 2020.

Daily site inspections of the on-site equipment and facilities were completed by the site attendant, as per ECA Condition 40.

There were no environmental and/or operational problems that were negatively impacting the environment observed by Cambium or the Municipality during site inspections in 2020.

5.4.1 Litter Control

As noted by Cambium staff, the Site was in good condition. Minimal evidence of blown litter was observed during site visits in 2020.

The intent of good housekeeping practices is to protect on-site worker health and safety, and the surrounding environment from nuisance effects. Nuisance effects are minimized by adopting good housekeeping measures as part of the Site operations. Regular housekeeping is essential to control such nuisances as:

- Blowing and loose litter
- Odour

- Rodents and insects
- Scavenging birds

5.4.2 Roads

The access road has sufficient width at the entrance and within the Site to allow unimpeded winter travel and access for emergency and snow removal equipment. The site access roads were observed to be well maintained and graded and were reported to be regularly cleared of snow with a sand mixture applied as needed by the Municipality during the winter months.

5.4.3 Final Cover Integrity

The waste mound was adequately covered and there was minimal evidence of erosion observed from the areas accessed during visits in 2020. Furthermore, the waste mound was well vegetated, which is an effective erosion control measure. No seeps were noted during any site visits conducted in 2020.

5.5 Complaints and Incidents

According to the Municipality, complaints were received from residents in regards to the following:

- Residents being denied entry to the Site as they did not have their access pass
- Residents complaining about site rules

Minor incidents were reported based on inappropriate behavior from the residents caused by the complaints listed above. One health and safety related incident occurred where a resident tripped over a concrete curb. As a result of the incident the Municipality's Chief Administrative Officer requested that the curbs be cut or separated to allow for a walkway.

5.6 Waste Refusal

The Municipality has a Clear Bag Policy. Any garbage bag that has any visible blue box materials, municipal hazardous and special wastes (MHSW), or more than 20% divertible

items (i.e., clothing, organics, waste electrical electronic equipment (WEEE)) is not accepted at the Site. The site attendant is required to fill out the "TS-7 Unaccepted Refused Waste and Entry" form as detailed in the Municipal document *Transfer Station Standard Operating Procedures* (MTL, 2020b). This Municipality keeps these forms on file.

5.7 Monitoring Well Security

As part of the 2020 groundwater monitoring program, monitoring wells listed in Table 1 were inspected and complied with R.R.O. 1990 Regulation 903 - Wells. Refer to Appendix D for photographs of the monitoring wells.

5.8 Materials Summary

The following waste types are collected at the Site; refer to Figure 3 for the collection locations of each material.

- Residential, Industrial, Commercial, and Institutional (IC&I) non-hazardous waste
- Construction and Demolition (C&D) Materials
- Bulky Items
- WEEE
- Limited MHSW
- Leaf and Yard Waste
- Blue Box Recyclables
- Scrap Metal
- Tires
- CFC Appliances

The Municipality reported that only household waste and blue box recyclables were accepted at the Site from March to June. This was a precaution caused by the COVID-19 pandemic.

Restrictions were slowly lifted and additional waste types were once again accepted at the Site.

In 2020, Waste By-Law B2020-031 was established to maintain and regulate the disposal of waste and divertible materials at all transfer stations owned by the Municipality. Minor housekeeping issues were addressed and fees were removed. Fees are now detailed in the Fees and Charges By-Law.

5.8.1 Site Usage

Site usage, as documented by the Municipality, is summarized in Embedded Table 8. Waste collected is transferred to the Peterborough Waste Management Facility. Refer to appended Table 10 for a monthly summary of materials accepted and transferred at the Site.

Embedded Table 8 Summary of Site Usage

	2020	2019	2018	2017
Vehicles – Private	31,062	30,229	30,998	34,734
Bags of Garbage	38,864	31,597	31,839	36,363
Waste – Tonnes[1]	398.25	366.64	379.08	403.57
C&D Materials – tonnes[2]	59.81	86.52	58.93	-

Notes:

1. 65 bins transferred to the Peterborough Waste Management Facility.

2. C&D materials tonnages unreported in previous years.

5.8.2 Site Diversion

Embedded Table 8 provides a summary of the materials diverted from the Site in 2020, as provided by the Municipality and the County of Peterborough. In addition, about 181 tonnes of brush was received at the Site in 2020, subsequently chipped and used as cover for rehabilitation on Municipal properties.

Embedded Table 9 Summary of Diverted Materials

Material	tonnes
Blue Box	
Plastic Containers	73.03
Fibres	84.72
MHSW (Empty Oil Containers)	0.25
Scrap Metal and White Goods	32.80
Textiles	0.48
WEEE	14.78
Empty Oil/Anti-freeze Containers	0.25
TOTAL	**206.31**
Material	**Unit**
Alcohol Containers	30,250
Tires	722

5.8.3 Municipal Wide Diversion

In addition to the seasonally operated County MHSW Depot, the Site is approved to accept limited MHSW (ECA Conditions 26 and 27), as are various transfer stations in the Municipality including the Buckhorn, Cavendish, and Crystal Lake sites. Embedded Table 10 provides a summary of the limited MHSW accepted at these sites 2020. The quantity of MHSW materials received was less than half compared to 2019 due to COVID-19.

Embedded Table 10 Summary of Limited MHSW Collected - Municipality

MHSW	Municipal Wide tonnes
Batteries	0.81
Florescent Tubes	0.16
Car Batteries	1.20
TOTAL	**2.17**

In 2020, the annual Environmental Day hosted by the County was cancelled due to the COVID-19 pandemic. Typically, this annual event would allow residents to dispose of the following items: polystyrene, media and car seats, hard cover books, and mattresses.

5.9 Site and Documentation Reviews and Updates

The following documents are maintained by the Municipality, reviewed annually, and updated as required.

- Current Design and Operations Plan consisting of the following and associated supporting documents:
- *North Landfill Site Transfer Station, Design, Operation, Maintenance and Closure Report* (TSH, 2002)
- Letter from TSH to the Ministry, dated June 19, 2002, with details pertaining to, the volume of waste to be stored, the contingency plan and construction schedule, and documents pertaining to the name change for the Township and the contingency and emergency plan
- Letter and supporting documentation dated October 19, 2006 to the Ministry from TSH providing additional information for the requested addendum to permit the chipping and storage of wood waste at the Transfer Station. The supporting documentation includes Drawing No. 2 - Bobcaygeon (North) Landfill Site Proposed Final Contours dated October 19, 2006
- Environmental Compliance Approval application, dated May 10, 2016, and includes the Design and Operations Report, maps, and supporting documentation
- email correspondence from Cambium, providing feedback on updated changes to the MHSW program
- *Transfer Station Safety, Emergency and Spills Procedures* (MTL, 2020a)
- *Transfer Station Standard Operating Procedures* (MTL, 2020b)

Specifically,

- No changes were made to the Design and Operations Plan in 2020.

- The *Transfer Station Standard Operating Procedures* were reviewed and updated on October 1, 2020. Minor changes were made to identify the staging area for ashes, changes to the haulers for textiles and blue box recyclables, and the handling of loose waste.
- The *Transfer Station Safety, Emergency and Spills Procedures* was reviewed on November 26, 2020. The following changes were made: clarification stating that all fires must be reported to the Ministry, contact information for the Spills Action Centre, and an "Acknowledgement and Understanding" sign off page was added. Furthermore, Municipal contact information was updated.

As per the requirements detailed in Condition 53, no improvements to the transfer station were completed by the Municipality in 2020.

5.10 Compliance with Ministry Approval

The Bobcaygeon transfer station was operated in compliance with all ECA conditions in 2020. Furthermore, the Municipality operated the Site in compliance with all required inspection and reporting requirements contained in the ECA.

6.0 Conclusions and Recommendations

Based on the 2020 monitoring program, Cambium provides the following conclusions regarding the Bobcaygeon waste disposal site.

- Results of the groundwater elevation monitoring indicated that the shallow and deep aquifer flowed predominantly to the south-southeast. Components to the southwest from the waste mound and to the northwest/northeast from Wilderness Park Road were also present.
- Consistent with historical results, there was a predominant downward vertical gradient calculated between most monitoring well nests.
- The water quality at the Site is monitored in the shallow (upper) and deep (middle and lower) aquifers. Results indicated that site-related impacts were occurring in the upper bedrock monitors with little to no impacts in the deep bedrock aquifer. The site-related impacts were to the southwest and southeast of the waste mound, with marginal impacts at the closest off-site monitor 98-3-U (30 m down-gradient of the property boundary).
- A non-site related impact was impacting the off-site monitoring wells (98-1 and 98-2) adjacent Wilderness Park Road, south of the Site. Two separate sources were suspected; one in the upper aquifer and one in the deep aquifer at well 98-2-L only.
- Given the lack of persistently elevated concentrations which have exceeded the RUC criteria at down-gradient well nest 98-3 (30 m south of property boundary) and at perimeter well nest BH16-1, the Site complied with the intent of the Reasonable Use Concept (MOEE, 1994a).
- Volatile organic compound analysis was completed at monitoring wells 98-2-U and 98-2-L during the autumn sampling event. All concentrations were less than the RDLs.
- Methane was not detected at concentrations greater than the instrument detection limit (0.05% methane by volume).
- According to Municipal and County records, 398.25 tonnes of waste, 59.81 tonnes of construction and demolition waste, 157.75 tonnes of containers and fibres, and

approximately 48.56 tonnes of various other materials were accepted and transferred off-site. Not included in these tonnages were 181 tonnes of brush, 722 tires, and 30,250 alcohol containers.

- The Site was operated in compliance with all ECA Conditions.

Based on the results of the 2020 monitoring program, Cambium recommends the following:

- Groundwater and residential well monitoring should continue in 2021 as described in the monitoring program, included in Table 1.
- Annual reporting should continue in accordance with ECA Conditions 19 and 53.
- Once (spring) annual monitoring and biennial reporting is recommended and should be implemented following written approval from the District Manager, as per ECA Condition 17 (2).

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Glossary of Terms

Active Face/Area
The portion of the landfill facility where waste is currently being deposited, spread and/or, compacted prior to the placement of cover material.

Adverse Environmental Impact
Any direct or indirect undesirable effect on the environment resulting from an emission or discharge that is caused or likely to be caused by human activity.

Annual Report
Report documenting the results of water quality, environmental quality, and operations monitoring for the year, or for a period as prescribed in the Certificate of Approval.

Approved Design and Operations Plan
The design of a landfill site and its facilities which have been submitted along with the application documents for which formal Ministry approval has been issued through the Certificate of Approval.

Approved Site or Facility
A landfill site/facility for which there is an existing and current Certificate of Approval.

Aquifer
A geologic unit (soil or rock) that contains sufficient saturated permeable material to yield measurable quantities of water to wells and springs.

Attenuation
Natural process through which the concentrations of landfill generated contaminants are reduced to safe levels.

Borehole
A hole drilled for soil sampling purposes.

Buffer Area
An area of land situated within the peripheral area surrounding an active filling area, but limited in extent to the property boundary, assigned to provide space for remedial measures, contaminant control measures, and for the reduction or elimination of adverse environmental impact caused by migrating contaminants.

Certificate of Approval
The license or permit issued by the Ministry for the operation of a landfill site. Issued to the owner of the site with conditions of compliance stated therein.

Contaminant
A compound, element, or physical parameter, usually resulting from human activity, or found at elevated concentrations that have or may have a harmful effect on public health or the environment.

Contaminant Migration Path
Route by which a contaminant will move from the site into adjacent properties or the natural environment. Usually a route that offers the least resistance to movement.

Contamination Attenuation Zone
The zone beneath the surface, located beyond the landfill site boundary, where contaminants will be naturally attenuated to predetermined levels. Also, see Reasonable Use Policy.

Contingency Plan
A documented plan detailing a co-ordinated course of action to be followed to control and remediate occurrences such as a fire, explosion, or release of contaminants in an uncontrolled manner that could threaten the environment and public health.

Cover Material
Material approved by the Ministry that is used to cover compacted solid waste. Usually, a soil with suitable characteristics for specific end-use.

Site Development Plan and Operations Report
Development and Operations Plan or Report is a document detailing the planned sequence of activities through the landfill site's active life, the control systems, site facilities and monitoring systems that are necessary. This document is required for obtaining a Certificate of Approval.

Design Capacity
The maximum amount of waste that is planned to be disposed of at a landfill site.

Detection Limit
Concentration under which a parameter cannot be quantitatively measured.

EAA or EA Act
Environmental Assessment Act, Revised Statutes of Ontario, 1990. One of the primary acts of legislation intended to protect, conserve, and wisely manage Ontario's environment through regulating planning and development.

Environmental Compliance Approval
The license or permit issued by the Ministry for the operation of a landfill site. Issued to the owner of the site with conditions of compliance stated therein.

EPA
Environmental Protection Act, Revised Status of Ontario, 1990. EPA is another of the primary pieces of Provincial legislation governing the protection of the natural environment of the Province.

Evapotranspiration
The evaporation of all water from soil, snow, ice, vegetation and other surfaces, including the water absorbed by plants, that is released to the atmosphere as vapour.

Fill Area
The area of a landfill site designed and designated for the disposal of waste.

Final Cover
Soil material or soil in combination with synthetic membranes, overlain by vegetation in a planned landscape, placed over a waste cell that has reached the end of its active life.

Groundwater
Subsurface water that occurs beneath the water table in soils and rocks that are fully saturated.

Hydraulic Conductivity
The rate of flow of water through a cross-section under a specific hydraulic gradient. It is a property of the geologic formation and the fluid, in hydrogeologic applications where the fluid is water (Units of m/day or cm/s).

Hydraulic Gradient
The head drop per unit distance in the direction of flow, the driving force for groundwater flow.

Hydrogeology
The study of subsurface waters and related geologic aspects of surface waters.

Impermeable Fill
Soil material that is placed as filling material that is sufficiently cohesive and fine grained to impede and restrict the flow of water through it.

In situ Testing
Testing done on-site, in the field, of material or naturally occurring substances in their original state.

Landfill Gas
Combustible gas (primarily methane and carbon dioxide) generated by the decomposition of organic waste materials.

Landfill Site
A parcel of land where solid waste is disposed of in or on land for the purposes of waste management.

Leachate
Water or other liquid that has been contaminated by dissolved or suspended particles due to contact with solid waste.

Leachate Breakout
Location where leachate comes to the ground surfaces; a seep or spring.

Limit of Filling
The outermost limit at which waste has been disposed of, or approved or proposed for disposal at a landfill.

Ministry
Ontario Ministry of the Environment, Conservation and Parks.

Monitoring
Regular or spontaneous procedures used to methodically inspect and collect data on the performance of a landfill site relating to environmental quality (i.e., air, leachate, gas, ground or surface water, unsaturated soils, etc.).

Monitoring Well
The constructed unit of casing (riser and screen) installed in a borehole.

Multi-Level Monitoring Well
More than one monitoring well installed at a given test well location.

Native Soil
Soil material occurring naturally in the ground at a location.

Natural Attenuation
Where contaminants are reduced to acceptable concentration levels by natural mechanisms (dilution, absorption onto the soil matrix, etc.), biological action, and chemical interaction.

Occupational Health and Safety Act
The primary act of legislation enacted by Ontario Ministry of Labour to regulate and control the safety in the workplace; also Occupational Health and Safety Act, Revised Statutes of Ontario, 1990.

Odour Control
Minimizing or eliminating the nuisance and undesirable impact of objectionable or unpleasant odours arising from waste disposal operations.

Open Burning
Burning any matter whereby the resultant combustion products are emitted directly to the atmosphere without passing through an adequate stack, duct, or chimney.

Operations Plan
A document detailing the waste disposal operations in a planned, and if necessary, a staged manner, that ensure compliance with regulatory provisions concerning the operations of a landfill site.

Operator (Site Operator)/Attendant
The individual or organization who, through ownership or under contract, manages and operates a landfill site for the purpose of waste disposal.

Owner
A person, persons, organization, or municipal authority who own a landfill facility or part of a landfill facility, and in whose name the Certificate of Approval for the site is issued.

Percolation
The movement of infiltrating water through soil.

Permeability
Often used interchangeable with hydraulic conductivity, but not strictly correct. Permeability is a property of the porous media only. Dependent upon media properties that affect flow, diameter, sphericity, roundness, and packing of the grains.

Piezometer
A well that intersects a confined aquifer.

Provisional Certificate of Approval (Provisional C of A)
Same as Certificate of Approval.

Reasonable Use Policy
A policy developed by the Ministry to stipulate limits to the level of groundwater quality impairment that may be permitted to occur at site property boundaries, to allow the reasonable use of adjacent properties or land without adversely affecting public health and the environment.

Recharge Zone
An area where precipitation or surface run-off infiltrates into the ground and then, through natural percolation enters an aquifer.

Recycling
Sorting, collecting or processing waste materials that can be used as a substitute for the raw materials in a process or activity for the production of (the same or other) goods. For example, the "Blue Box" system, in-plant scrap handling, or raw material recovery systems. Recycling is also the marketing of products made from recycled or recycled materials.

Reduction (of waste or component of 3Rs program)
Those actions, practices, or processes that result in the production or generation of less waste.

Remedial Action
Corrective action taken to clean-up or remedy a spill, an uncontrolled discharge of a contaminant, or a breach in a facility or its operations, in order to minimize the consequent threat to public health and the environment.

Representative Sample
A small portion of soil, water, etc. which can be subjected to testing and analysis, that is expected to yield results that will reliably represent the identical characteristics of the source of the material or of a larger body of material.

Reuse (component of 3Rs program)
The use of an item again in its original form, for a similar purpose as originally intended, or to fulfil a different function.

Run-off
The part of precipitation (rainwater, snowmelt) that flows overland and does not infiltrate the surface material (soil or rock).

Saturated Zone
The zone of a subsurface soil where all voids are filled with water.

Sedimentation
The deposition of fine grained soil in an undesirable location, caused by the scouring, erosion and transportation of earth materials by surface run-off.

Sensitive Land Use
A land use where humans or the natural environment may experience an adverse environmental impact.

Settlement
The subsidence of the top surface and underlying waste of a landfill or waste cell as a result of densification under its own weight.

Site Capacity
The maximum amount of waste that is planned to be disposed (design capacity) or that has been disposed of at a landfill site.

Site Closure
The planned and approved cessation or termination of landfilling activities at a landfill site upon reaching its site capacity.

Site Life
The period from its inception through active period of waste disposal, to the time when a landfill site reaches its' site capacity, when it ceases to receive any further waste, including and up to closure.

Solid Waste
Any waste matter that cannot be characterized by its physical properties as a liquid waste product.

Solid Waste Disposal Site or Facility
A site or facility such as a landfill site where solid waste is disposed of.

Source Separation
The separation of various wastes at their point of generation for the purposes of recycling or further processing.

Standpipe
A monitoring well that intersects the water table aquifer.

Storm water
Run-off that occurs as a direct result of a storm event or thaw.

Storm water Detention
Control of storm water by the construction of impoundments of structures for the purpose of regulating storm water flows during high intensity rainfall events that would otherwise transport excessive amounts of sediment, cause soil erosion or cause flooding.

Stratigraphy
The geologic sub-structuring, usually layered with different distribution, deposition and age.

Surface Run-off (Drainage)
See Run-off.

Surface Water
Water that occurs at the earth's surface (ponds, streams, rivers, lakes, oceans).

Sub-Soil
Soil horizons below the topsoil.

Test hole
A hole drilled for soil sampling purposes.

Topsoil
The uppermost layer of the soil containing appreciable organic materials in mineral soils. Adequate fertility to support plant growth.

Unsaturated Zone
The zone (also vadose zone) in a porous sub-soil, where the voids are not completely water-filled, but contain some air-filled voids. Limited above by the land surface and below by the water table.

Vector
A disease carrier and transmitter; usually an insect or rodent.

VOC
Volatile organic compounds are those compounds that will readily volatilize (convert from liquid to gas phase) at conditions normally found in the environment.

Waste
Ashes, garbage, refuse, domestic waste, industrial waste, or municipal refuse and other used products as are designated or interpreted by the provisions of the Environmental Protection Act.

Waste Disposal Site (Facility)
Any land or land covered by water upon, into, in or through which, or building or structure in which, waste is deposited or processed and any machinery or equipment or operation required for the treatment or disposal of waste.

Waste Management System
All facilities, equipment and operations for the complete management of waste, including the collection, handling, transportation, storage, processing and disposal thereof, and may include one or more waste disposal sites.

Water Table
The water level attained in a monitoring well, which screens the surficial unconfined aquifer.

Water Balance
Amounts of water to various components in a system so that water entering the system equals the amount of water contained within and discharged out of a system.

Water Level
The level of water in a well.

Well Casing
The pipe that is used to construct a well.

Well Screen
A filtering device used to keep sediment from entering a well.

Wetlands
Areas where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrolytic vegetation, and which have soils indicative of wet conditions.

Abbreviations

RFP	Request For Proposal	**ha**	hectare
Ministry	Ontario Ministry of the Environment, Conservation and Parks	**tonne**	metric ton
MNRF	Ontario Ministry of Natural Resources and Forestry	**t**	metric tonne
ECA	Environmental Compliance Approval	**µS**	microSiemens
EPA	Environmental Protection Act	**ODWQS**	Ontario Drinking Water Quality Standards
EAA	Environmental Assessment Act	**PC of A**	Provisional Certificate of Approval
MW	monitoring well	**PWQO**	Provincial Water Quality Objectives
masl	metres above sea level	**TOC**	Total Organic Carbon
pg	picogram	**VOC**	Volatile Organic Compound
ng	nanogram	**BTU**	British Thermal Unit
µg	microgram	**°C**	temperature in degrees Celsius
g	gram	**N/A**	not available
kg	kilogram	**%**	percent
L	Litre	**cfm**	cubic feet per minute
mg/L	milligrams per litre	**ppmdv**	part per million by dry volume
mm	millimetre	**ppmv**	part per million by volume
m	metre	**ppm**	part per million
km	kilometre	**min**	minimum
m^3	cubic metre	**max**	maximum
m^2	square metre		

Standard Limitations

Limited Warranty

In performing work on behalf of a client, Cambium relies on its client to provide instructions on the scope of its retainer and, on that basis, Cambium determines the precise nature of the work to be performed. Cambium undertakes all work in accordance with applicable accepted industry practices and standards. Unless required under local laws, other than as expressly stated herein, no other warranties or conditions, either expressed or implied, are made regarding the services, work or reports provided.

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A site assessment is created using data and information collected during the investigation of a site and based on conditions encountered at the time and particular locations at which fieldwork is conducted. The information, sample results and data collected represent the conditions only at the specific times at which and at those specific locations from which the information, samples and data were obtained and the information, sample results and data may vary at other locations and times. To the extent that Cambium's work or report considers any locations or times other than those from which information, sample results and data was specifically received, the work or report is based on a reasonable extrapolation from such information, sample results and data but the actual conditions encountered may vary from those extrapolations.

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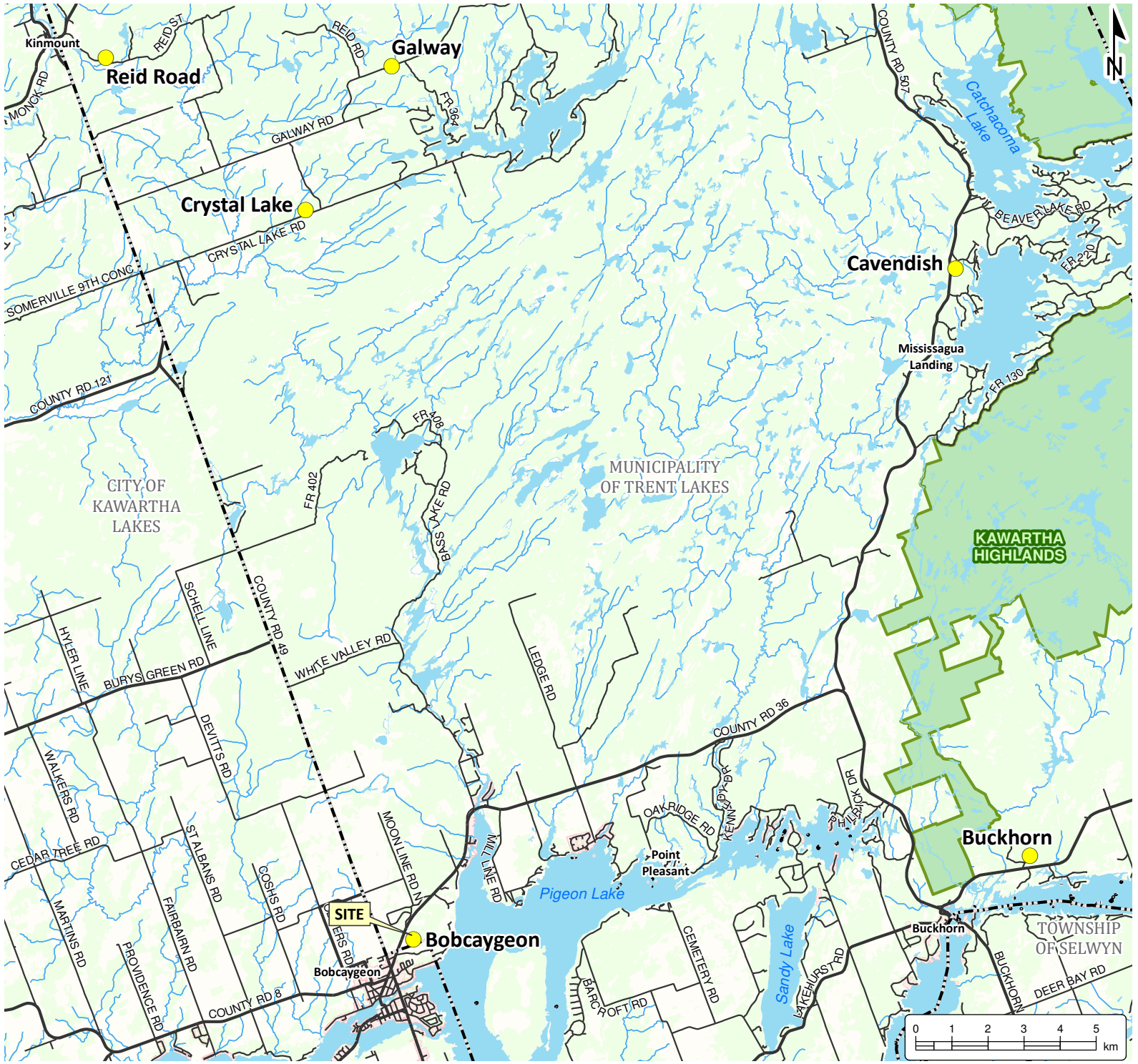
Appended Figures



BOBCAYGEON TRANSFER STATION

42 Peterborough County Road 36,
Trent Lakes, Ontario
Municipality of Trent Lakes

LEGEND

- Trent Lakes Waste Disposal Sites
- Major Road
- Minor Road
- Watercourse
- Water Area
- Provincial Park
- Wooded Area
- Built Up Area
- Lower Tier Municipality

Notes:
- Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources or the Ontario Government).
- Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.
- Cambium Inc. makes every effort to ensure this map is free from errors but cannot be held responsible for any damages due to error or omissions. This map should not be used for navigation or legal purposes. It is intended for general reference use only.

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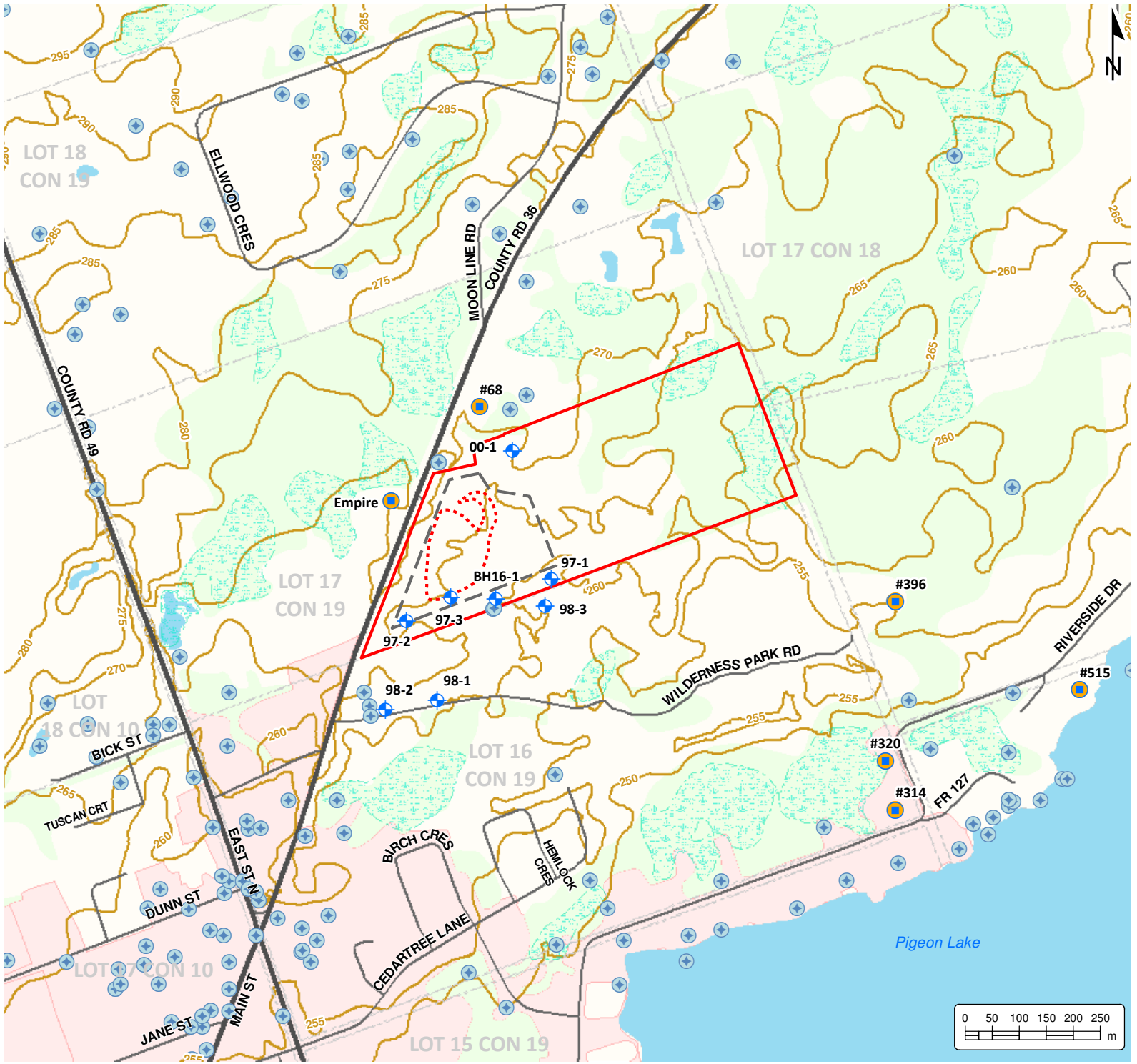
REGIONAL LOCATION PLAN

Project No.: 10520-005		Date: April 2021	Rev.:
Scale: 1:150,000		Projection: NAD 1983 UTM Zone 17N	
Created by: TLC	Checked by: SNR	Figure: 1	

O:\GIS\MXDs\10500-10999\10520-005 MTL - Bobcaygeon Landfill AMP 20220202\1-03-15 AMR FIG 1 - Regional Location Plan.mxd



BOBCAYGEON TRANSFER STATION

42 Peterborough County Road 36,
Trent Lakes, Ontario
Municipality of Trent Lakes

LEGEND

- Select Water Wells
- Monitoring Well Location
- Residential Monitoring Well
- Major Road
- Minor Road
- Contour 5m Interval (Major)
- Contour 5m Interval (Minor)
- Lot / Concession
- Unevaluated Wetlands
- Water Area
- Wooded Area
- Built Up Area
- Site (22 ha.)
- Approved Limit of Waste (4 ha.)
- Limit of Existing Waste (1.6 ha.)

Notes:
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LOCAL TOPOGRAPHY PLAN

Project No.:	11520-005	Date:	April 2021
		Rev.:	
Scale:	1:10,000	Projection:	NAD 1983 UTM Zone 17N
Created by:	TLC	Checked by:	SNR
Figure:	2		

O:\GIS\MXDs\11500-10999\10520-005 MTL - Bobcaygeon Landfill AMP 2020\2021-03-15 AMR FIG 2 - Local Topography Plan.mxd

BOBCAYGEON TRANSFER STATION

42 PETERBOROUGH COUNTY ROAD 36
Trent Lakes, Ontario
Municipality of Trent Lakes

N

00-1
BM
Attendent's Shelter
Privy
MHSW
Bottle Return
Donation Bin
Shed
Leaf and Yard Waste
FIBRE BINS
CONTAINER BINS
WEEE BIN
RE-USE CENTRE
BULKY
Waste Bins
Tires
Wood
Metals Bin
Metals
Ashes
White Goods
CFC Appliances
Furniture
COUNTY ROAD 36
97-1
97-3
98-3
BH16-1
97-2

GRAPHIC SCALE
(IN METRES)
20 0 20 40 60
1 : 1,500

LEGEND

- Monitoring Well Location
- Benchmark
- Topographic Contour Line
- Site (22 ha.)
- Existing Limit of Waste (1.6 ha.)
- Approved Waste Disposal Area (4 ha.)
- Fence
- Gate
- On-site Road
- Approximate Tree Line
- Low Lying Wet Area

Notes:
1. Base mapping features were obtained from the WSP 2016 Landfill Monitoring Report - Figure 3 - Site Plan.
2. Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.

Benchmarks:
1. Nail in pole. Elevation 270.58 m.

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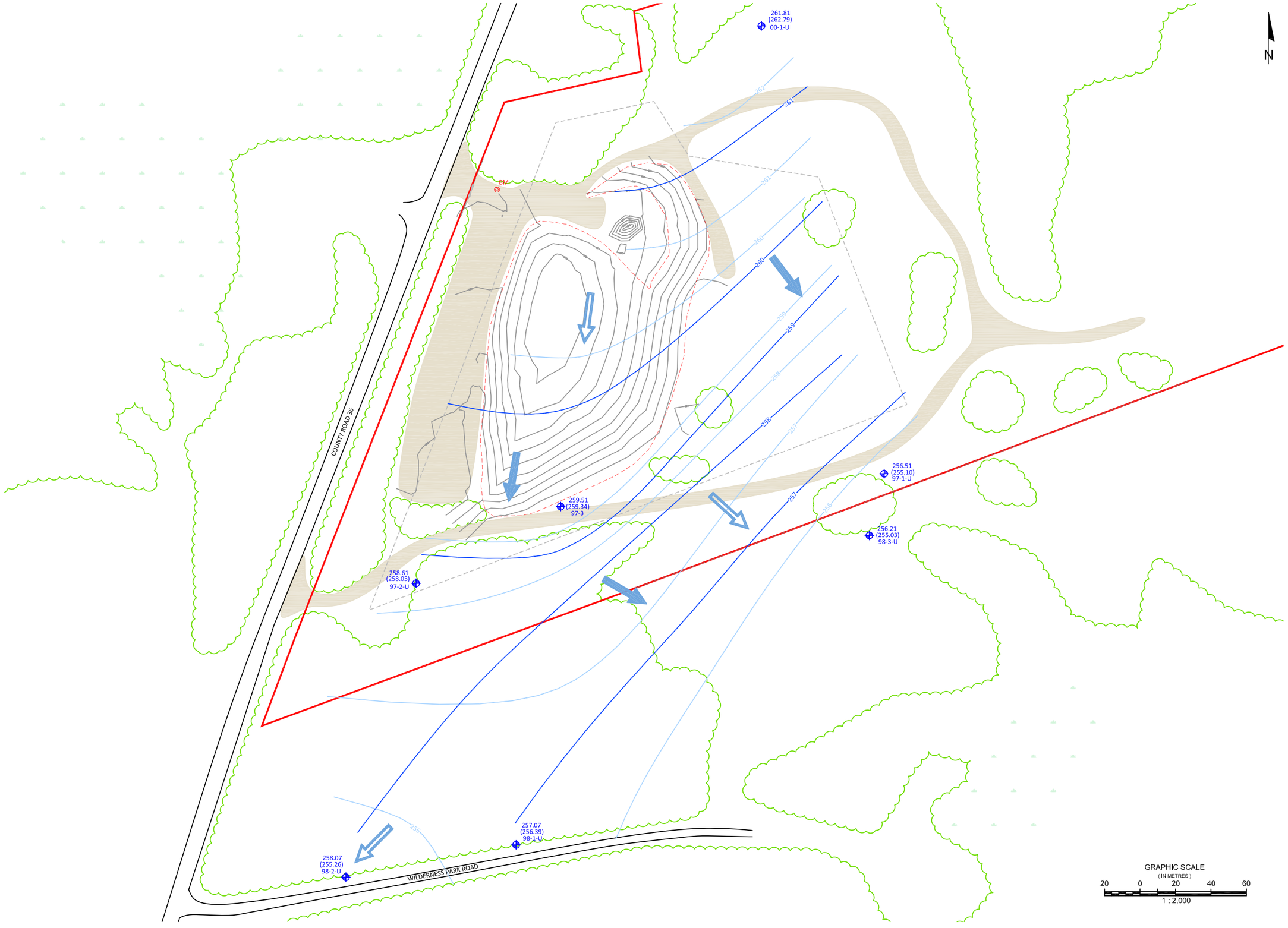
EXISTING CONDITIONS

Project No.: 10520-005		Date: April 2021	
		Rev.:	
Horizontal Scale: 1:1500		Vertical Scale: N/A	
Drawn By: TLC	Checked By: SNR	Figure: 3	

BOBCAYGEON TRANSFER STATION

42 PETERBOROUGH COUNTY ROAD 36
Trent Lakes, Ontario
Municipality of Trent Lakes



LEGEND

- Upper Monitoring Well Location
- Benchmark
- 254.33 (252.51) Groundwater Elevation April 20, 2020 (November 9, 2020)
- Upper Bedrock Groundwater Contour April 20, 2020
- Upper Bedrock Groundwater Contour November 9, 2020
- Topographic Contour Line
- Site (22 ha.)
- Existing Limit of Waste (1.6 ha.)
- Approved Waste Disposal Area (4 ha.)
- Fence
- Gate
- On-site Road
- Approximate Tree Line
- Low Lying Wet Area
- Upper Groundwater Flow Direction April 20, 2020
- Upper Groundwater Flow Direction November 9, 2020

Notes:
1. Base mapping features were obtained from the WSP 2016 Landfill Monitoring Report - Figure 3 - Site Plan.
2. Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.

Benchmarks:
1. Nail in pole. Elevation 270.58 m.

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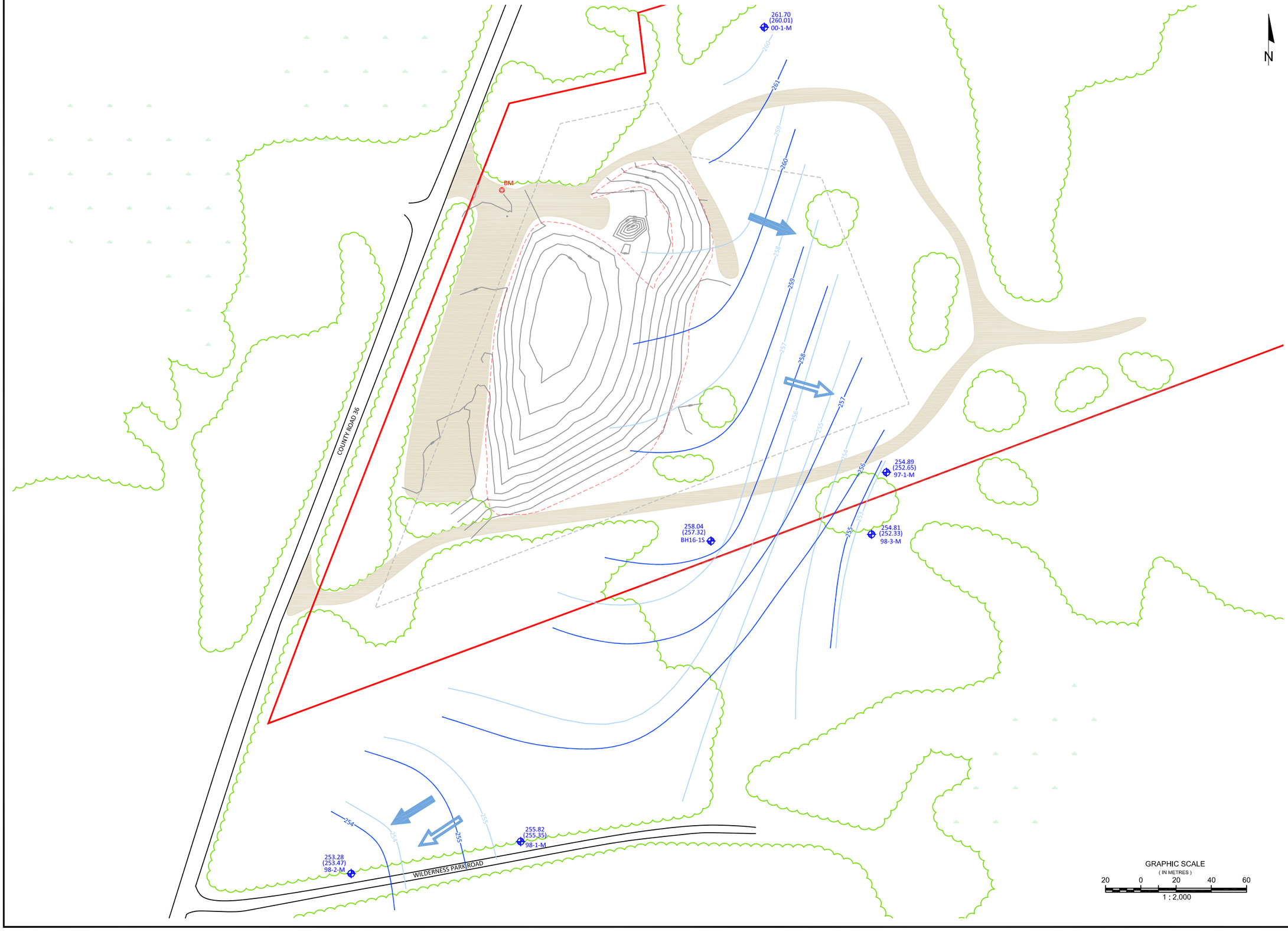
UPPER BEDROCK GROUNDWATER CONFIGURATION

Project No.: 10520-005		Date: April 2021	Rev.:
Horizontal Scale: 1:2,000		Vertical Scale: N/A	
Drawn By: TLC	Checked By: SNR	Figure: 4	

BOBCAYGEON TRANSFER STATION

42 PETERBOROUGH COUNTY ROAD 36
Trent Lakes, Ontario
Municipality of Trent Lakes



LEGEND

- Middle Monitoring Well Location
- Benchmark
- 254.33 (252.51) Groundwater Elevation April 20, 2020 (November 9, 2020)
- Middle Bedrock Groundwater Contour April 20, 2020
- Middle Bedrock Groundwater Contour November 9, 2020
- Topographic Contour Line
- Site (22 ha.)
- Existing Limit of Waste (1.6 ha.)
- Approved Waste Disposal Area (4 ha.)
- Fence
- Gate
- On-site Road
- Approximate Tree Line
- Low Lying Wet Area
- Middle Groundwater Flow Direction April 20, 2020
- Middle Groundwater Flow Direction November 9, 2020

Notes:
1. Base mapping features were obtained from the WSP 2016 Landfill Monitoring Report - Figure 3 - Site Plan.
2. Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.

Benchmarks:
1. Nail in pole. Elevation 270.58 m.

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MIDDLE BEDROCK GROUNDWATER CONFIGURATION

Project No.:	Date:
10520-005	April 2021
	Rev.:
Horizontal Scale:	Vertical Scale:
1:2,000	N/A
Drawn By: TLC	Checked By: SNR
	Figure: 5

BOBCAYGEON TRANSFER STATION

42 PETERBOROUGH COUNTY ROAD 36
Trent Lakes, Ontario
Municipality of Trent Lakes

LEGEND

- Lower Monitoring Well Location
- Benchmark
- 254.33 (252.51) Groundwater Elevation April 20, 2020 (November 9, 2020)
- Lower Bedrock Groundwater Contour April 20, 2020
- Lower Bedrock Groundwater Contour November 9, 2020
- Topographic Contour Line
- Site (22 ha.)
- Existing Limit of Waste (1.6 ha.)
- Approved Waste Disposal Area (4 ha.)
- Fence
- Gate
- On-site Road
- Approximate Tree Line
- Low Lying Wet Area
- Lower Groundwater Flow Direction April 20, 2020
- Lower Groundwater Flow Direction November 9, 2020

GRAPHIC SCALE
(IN METRES)
20 0 20 40 60
1 : 2,000

Notes:
1. Base mapping features were obtained from the WSP 2016 Landfill Monitoring Report - Figure 3 - Site Plan.
2. Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.

Benchmarks:
1. Nail in pole. Elevation 270.58 m.

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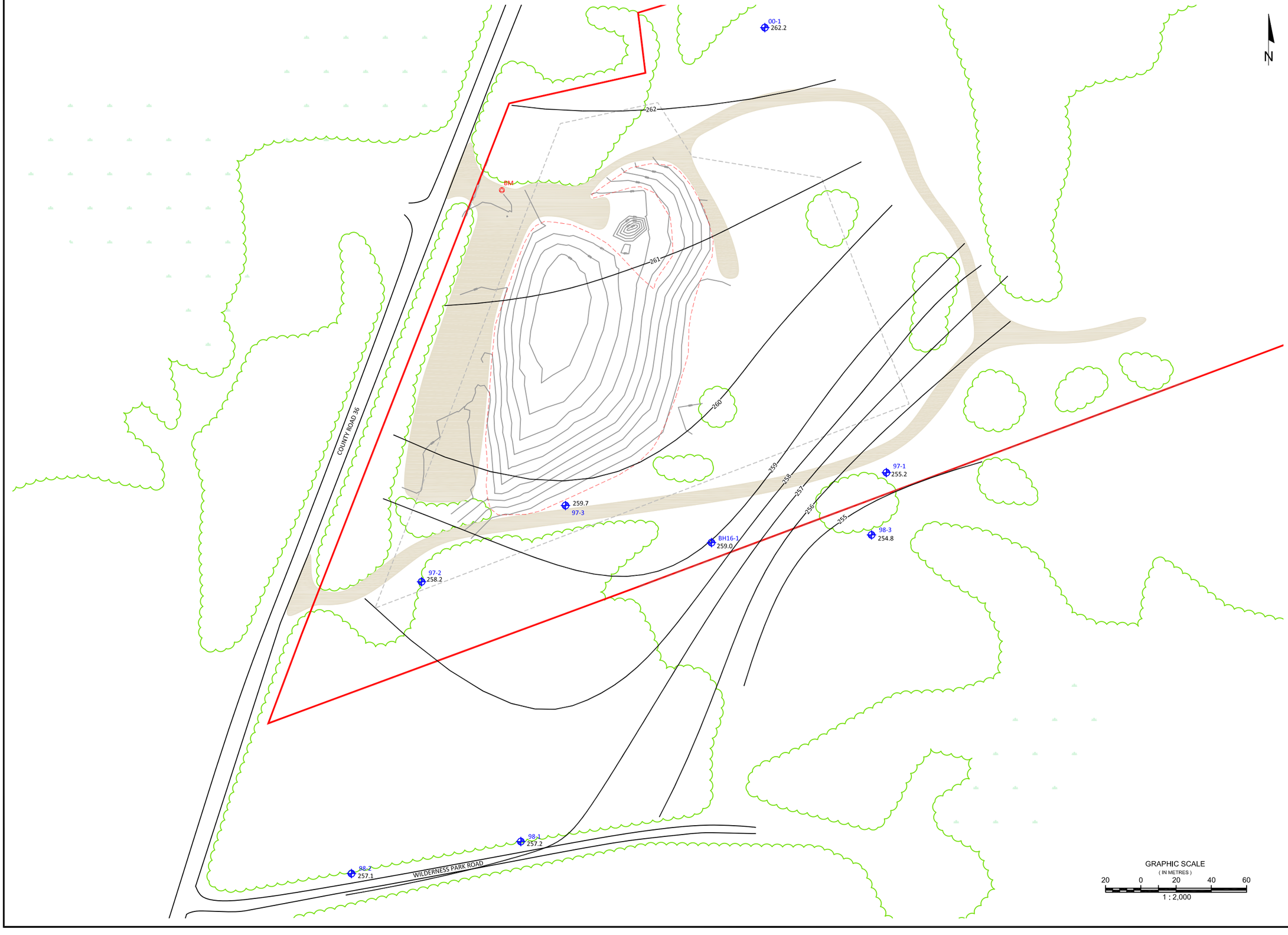
LOWER BEDROCK GROUNDWATER CONFIGURATION

Project No.:	Date:	April 2021
10520-005	Rev.:	
Horizontal Scale: 1:2,000	Vertical Scale:	N/A
Drawn By: TLC	Checked By: SNR	Figure: 6

BOBCAYGEON TRANSFER STATION

42 PETERBOROUGH COUNTY ROAD 36
Trent Lakes, Ontario
Municipality of Trent Lakes



GRAPHIC SCALE
(IN METRES)
20 0 20 40 60
1 : 2,000

LEGEND

- Monitoring Well Location
- Benchmark
- 254.6 Bedrock Surface Elevation
- Bedrock Surface Elevation Contour
- Topographic Contour Line
- Site (22 ha.)
- Existing Limit of Waste (1.6 ha.)
- Approved Waste Disposal Area (4 ha.)
- Fence
- Gate
- On-site Road
- Approximate Tree Line
- Low Lying Wet Area

Notes:
1. Base mapping features were obtained from the WSP 2016 Landfill Monitoring Report - Figure 3 - Site Plan.
2. Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.

Benchmarks:
1. Nail in pole. Elevation 270.58 m.

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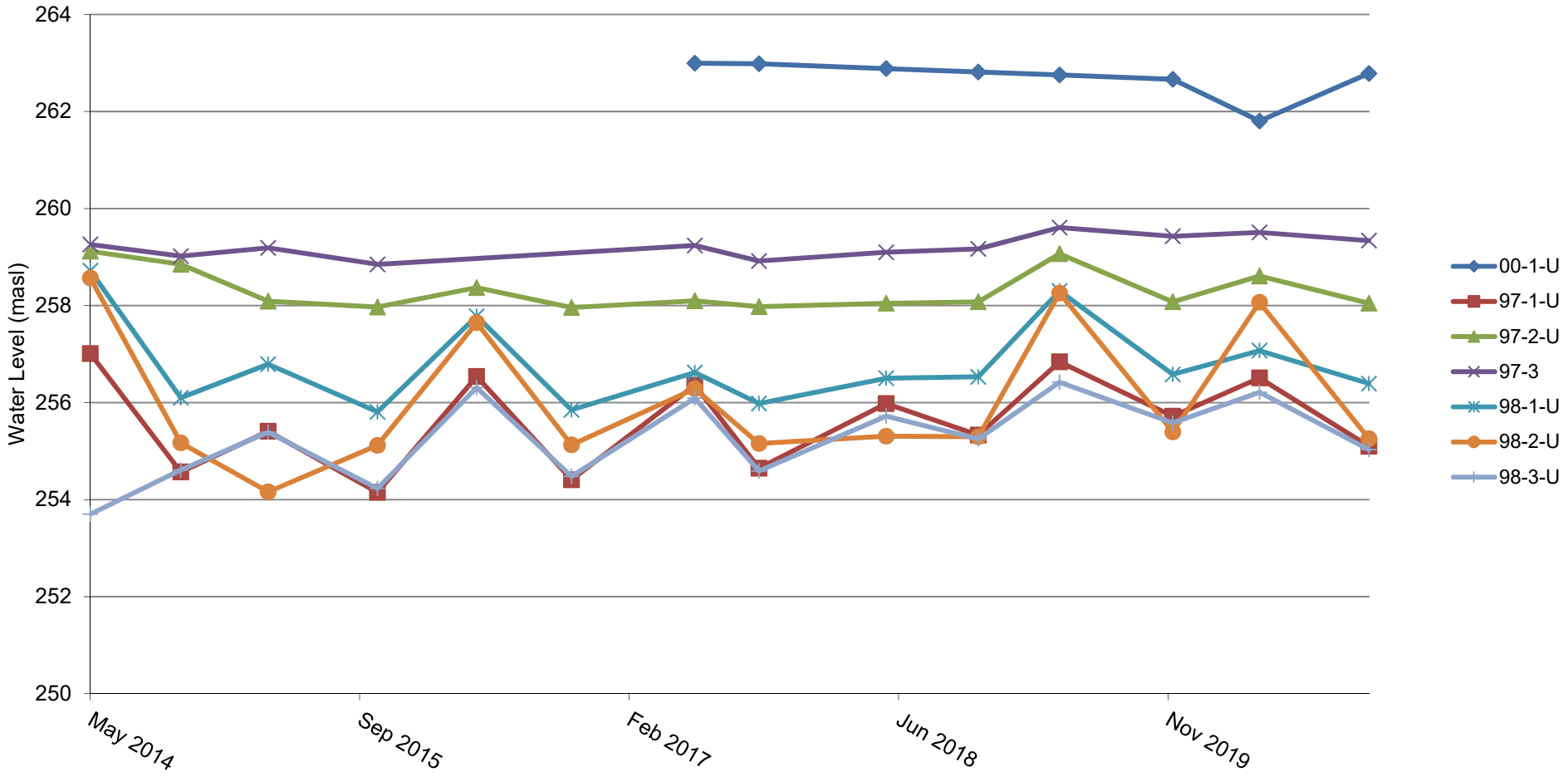
BEDROCK ELEVATION PLAN

Project No.:	Date:
10520-005	April 2021
Horizontal Scale:	Rev.:
1:2,000	
Vertical Scale:	
N/A	
Drawn By:	Checked By:
TLC	SNR
Figure:	
7	

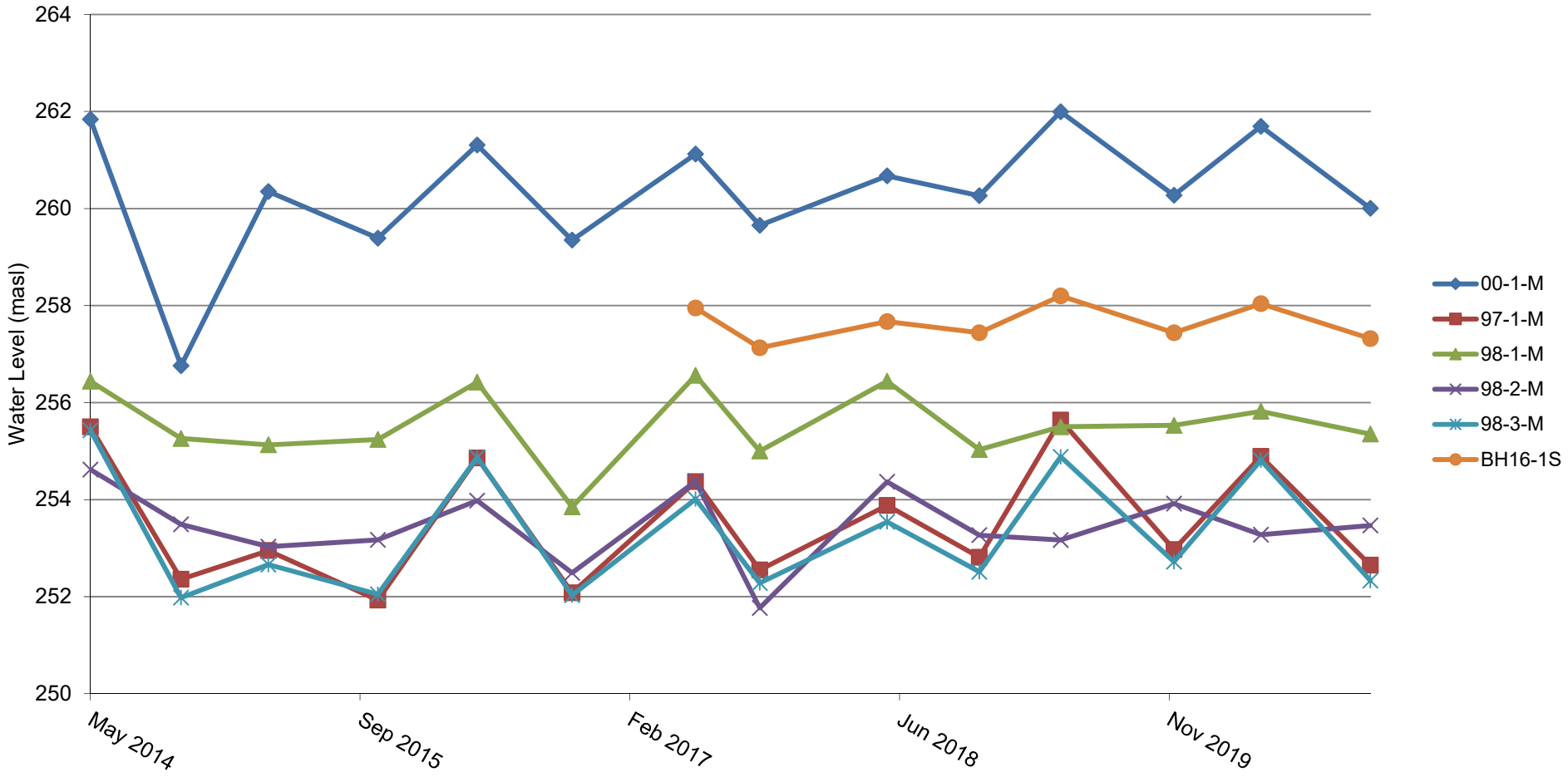


Groundwater Elevations - Interface/Upper Bedrock

2020 Annual Report, Bobcaygeon Transfer Station
42 Peterborough County Road 36, Trent Lakes
The Corporation of the Municipality of Trent Lakes

Figure:	**8**
Date:	Apr-21
Project Manager:	Stephanie Reeder
Project No.:	10520-005

CAMBIUM

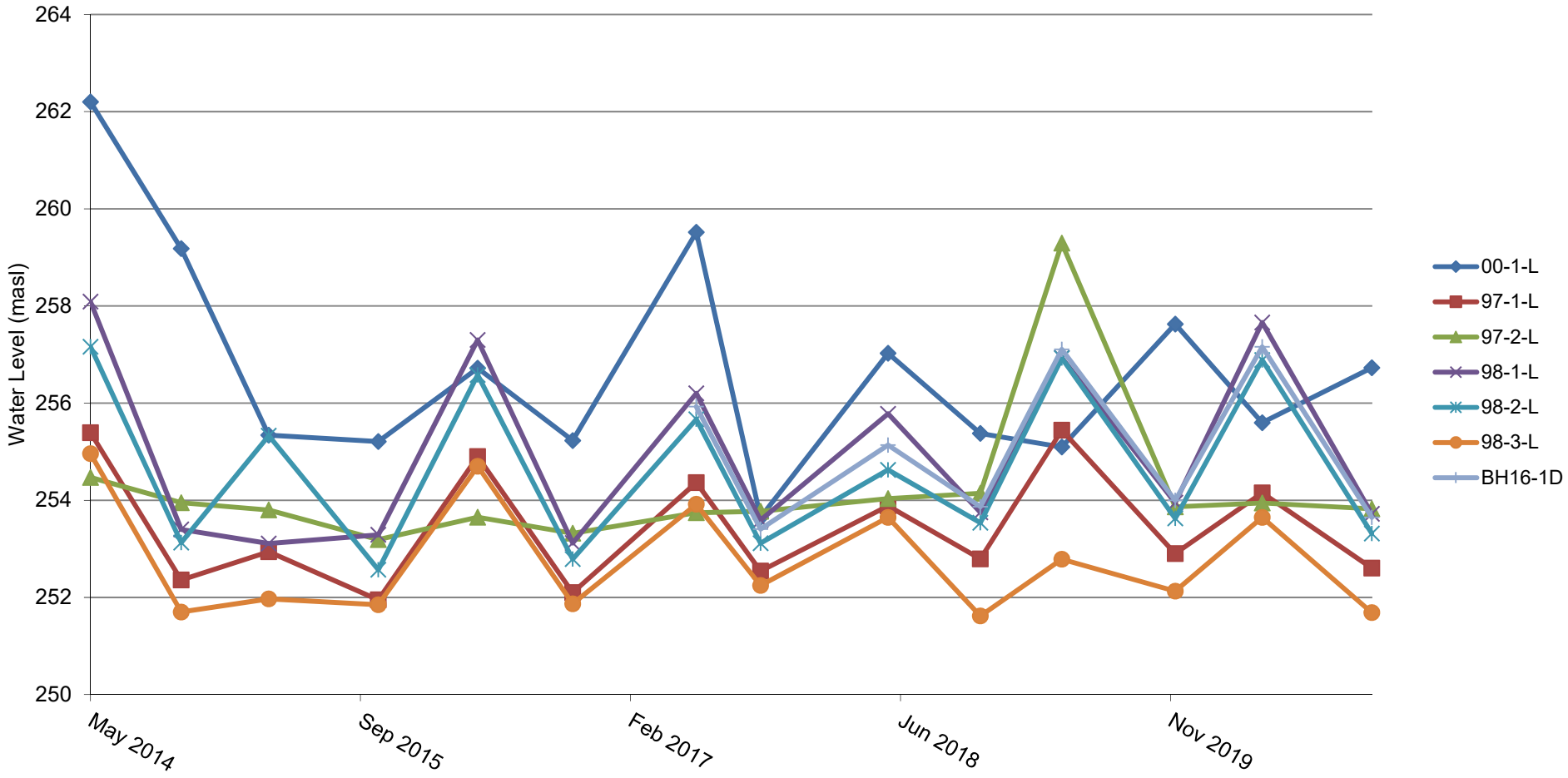


Groundwater Elevations - Middle Bedrock

2020 Annual Report, Bobcaygeon Transfer Station
42 Peterborough County Road 36, Trent Lakes
The Corporation of the Municipality of Trent Lakes

Figure:	**9**
Date:	Apr-21
Project Manager:	Stephanie Reeder
Project No.:	10520-005

CAMBIUM



Groundwater Elevations - Lower Bedrock

2020 Annual Report, Bobcaygeon Transfer Station
42 Peterborough County Road 36, Trent Lakes
The Corporation of the Municipality of Trent Lakes

Figure:	**10**
Date:	Apr-21
Project Manager:	Stephanie Reeder
Project No.:	10520-005

CAMBIUM

Appended Tables

Table Notes

RDL - reported detection limit for the current year

RUC - Reasonable Use Criteria

CWQG - Canadian Water Quality Guidelines for the Protection of Aquatic Life (CCME, 2011)

ODWQS - Ontario Drinking Water Quality Standards, O.Reg. 169/03

PWQO - Water Management, Policies, Guidelines, Provincial Water Quality Objectives (MOEE, 1994b)

PWQO for beryllium, cadmium, copper, and lead depend on hardness

PWQO for aluminum depends on pH and background concentration

NV - No Value

"-" Parameter not analyzed or measured

Unionized ammonia calculated using total ammonia and field data for pH and conductivity

Table 1 - Environmental Monitoring Program

Location	Task	Frequency	Parameters
GROUNDWATER			
97-1-U, 97-1-M, 97-1-L, 97-2-U, 97-2-L, 97-3, 98-1-U, 98-1-M, 98-1-L, 98-2-U, 98-2-M, 98-2-L, 98-3-U, 98-3-M, 98-3-L, 00-1-U, 00-1-M, 00-1-L, BH16-1, BH16-2 Empire, 515 Riverside, 68 County Rd 36, 396 Riverside, 320 Riverside, 130 County Road 36 2 QA/QC Duplicates	• Measure groundwater levels • Groundwater sampling • Field Measurements (pH, temperature, conductivity, dissolved oxygen, ORP)	Twice (Spring and Autumn)	Alkalinity, Ammonia, Barium, Boron, Calcium, Chloride, Conductivity, COD, DOC, Iron, Magnesium, Manganese, Nitrate, pH, Sodium, TDS, Sulphate, Hardness
97-3		Twice (Spring and Autumn)	BOD, TSS
All Existing Monitors	• Measure combustible gas % by volume methane	Twice (Spring and Autumn)	Methane
98-2-U, 98-2-L		Once (Autumn)	EPA 624 VOCs

Table 2 - Groundwater Elevation Data

Monitor	*97-1-U*	97-1-M	97-1-L	*97-2-U*	97-2-L	*97-3*	*98-1-U*	98-1-M	98-1-L	*98-2-U*	98-2-M	98-2-L	*98-3-U*	98-3-M	98-3-L	*00-1-U*	00-1-M	00-1-L	BH16-1S	BH16-1D
Northing Easting [1]	*695759, 4936218*	695759, 4936218	695759, 4936218	*695493, 4936159*	695493, 4936159	*695576, 4936201*	*695549, 4936011*	695549, 4936011	695549, 4936011	*695453, 4935994*	695453, 4935994	695453, 4935994	*695749, 4936183*	695749, 4936183	695749, 4936183	*695692, 4936472*	695692, 4936472	695692, 4936472	695658, 4936181	695659, 4936179
Original Ground Elevation (masl)	*259.9*	259.9	259.9	*265.7*	265.7	*262.9*	*260.1*	260.1	260.1	*261.8*	261.8	261.8	*259.3*	259.3	259.3	*265.1*	265.1	265.1	261.8	261.6
Stick Up (m)	*0.73*	0.75	0.73	*0.95*	0.94	*1.08*	*0.89*	0.89	0.87	*0.92*	0.90	0.90	*0.85*	0.82	0.83	*0.85*	0.81	0.82	0.67	0.84
Depth (m)	*7.24*	11.68	17.77	*9.37*	14.18	*5.79*	*5.80*	9.96	14.24	*11.02*	16.44	23.77	*8.24*	13.29	18.21	*3.46*	13.00	19.13	8.00	16.02
Measuring Point (masl)	*260.61*	260.63	260.60	*266.68*	266.67	*263.96*	*260.96*	260.96	260.94	*262.77*	262.75	262.75	*260.18*	260.15	260.17	*265.93*	265.89	265.90	262.49	262.45
12-May-14	*257.01*	255.50	255.39	*259.12*	254.47	*259.26*	*258.72*	256.44	258.09	*258.57*	254.62	257.16	*253.70*	255.43	254.96	*261.72*	261.84	262.20	-	-
27-Oct-14	*254.57*	252.36	252.36	*258.85*	253.95	*259.02*	*256.10*	255.26	253.40	*255.17*	253.49	253.13	*254.61*	251.98	251.70	*260.62*	256.76	259.18	-	-
07-Apr-15	*255.41*	252.95	252.94	*258.09*	253.80	*259.19*	*256.79*	255.13	253.11	*254.16*	253.03	255.33	*255.39*	252.66	251.97	*260.99*	260.35	255.34	-	-
27-Oct-15	*254.15*	251.93	251.95	*257.97*	253.19	*258.85*	*255.81*	255.24	253.29	*255.12*	253.17	252.57	*254.23*	252.05	251.85	*260.39*	259.39	255.21	-	-
28-Apr-16	*256.54*	254.86	254.90	*258.37*	253.65	-	*257.78*	256.42	257.30	*257.65*	253.98	256.58	*256.31*	254.87	254.70	*261.34*	261.31	256.72	-	-
21-Oct-16	*254.41*	252.08	252.10	*257.96*	253.32	-	*255.85*	253.85	253.12	*255.13*	252.49	252.79	*254.48*	252.03	251.87	*260.39*	259.35	255.23	-	-
07-Jun-17	*256.36*	254.37	254.36	*258.10*	253.74	*259.24*	*256.62*	256.56	256.20	*256.29*	254.38	255.67	*256.09*	254.01	253.92	*263.00*	261.13	259.52	257.95	255.93
04-Oct-17	*254.65*	252.55	252.54	*257.98*	253.77	*258.92*	*255.98*	255.00	253.59	*255.16*	251.77	253.12	*254.59*	252.28	252.25	*262.99*	259.66	253.65	257.13	253.41
28-May-18	*255.98*	253.88	253.88	*258.05*	254.03	*259.10*	*256.50*	256.44	255.78	*255.31*	254.37	254.63	*255.72*	253.54	253.65	*262.89*	260.68	257.03	257.67	255.14
15-Nov-18	*255.33*	252.81	252.79	*258.08*	254.14	*259.17*	*256.53*	255.03	253.75	*255.30*	253.27	253.54	*255.25*	252.51	251.62	*262.82*	260.27	255.38	257.44	253.87
15-Apr-19	*256.84*	255.64	255.44	*259.07*	259.29	*259.61*	*258.30*	255.50	256.93	*258.26*	253.17	256.93	*256.42*	254.88	252.79	*262.76*	262.00	255.10	258.20	257.11
11-Nov-19	*255.72*	252.97	252.90	*258.08*	253.86	*259.43*	*256.58*	255.53	253.95	*255.40*	253.92	253.63	*255.58*	252.72	252.13	*262.67*	260.28	257.63	257.44	254.00
20-Apr-20	*256.51*	254.89	254.15	*258.61*	253.94	*259.51*	*257.07*	255.82	257.66	*258.07*	253.28	256.89	*256.21*	254.81	253.65	*261.81*	261.70	255.60	258.04	257.16
09-Nov-20	*255.10*	252.65	252.60	*258.05*	253.82	*259.34*	*256.39*	255.35	253.72	*255.26*	253.47	253.32	*255.03*	252.33	251.69	*262.79*	260.01	256.73	257.32	253.65

1. Zone 17.

Italicized text represents the upper wells installed in the shallow aquifer.

Unformatted text represents the middle wells installed in the deep aquifer.

Shaded test represents the lower wells installed in the deep aquifer.

Table 3 - Monitor Well Information

Monitor Well	Ground Elevation (m) [1]	Measuring Point Elevation (m) [1]	Depth below Meas. Pt. (m) [1]	Depth (mbgs) [2]	Diameter (mm)	Stick-Up (m)	Screen Length (m)	Bottom of Screen Elevation (m) [1]	Top of Screen Elevation (m) [1]	Unit Screened
97-1-U	*259.9*	*260.61*	*7.24*	*6.51*	*50.8*	*0.73*	*1.5*	*253.369*	*254.869*	*Overburden/Limestone*
97-1-M	259.9	260.63	11.68	10.93	50.8	0.754	1.6	248.951	250.551	Limestone
97-1-L	259.9	260.60	17.77	17.04	50.8	0.726	1.6	242.833	244.433	Limestone
97-2-U	*265.7*	*266.68*	*9.37*	*8.42*	*50.8*	*0.946*	*1.5*	*257.308*	*258.808*	*Overburden/Limestone*
97-2-L	265.7	266.67	14.18	13.24	50.8	0.942	1.5	252.494	253.994	Limestone
97-3	*262.9*	*263.96*	*5.79*	*4.71*	*50.8*	*1.078*	*1.2*	*258.169*	*259.369*	*Overburden/Fractured Limestone*
98-1-U	*260.1*	*260.96*	*5.80*	*4.91*	*50.8*	*0.89*	*1.5*	*255.162*	*256.662*	*Fractured Limestone*
98-1-M	260.1	260.96	9.96	9.07	50.8	0.89	1.5	251.001	252.501	Limestone
98-1-L	260.1	260.94	14.24	13.37	50.8	0.87	1.5	246.701	248.201	Limestone
98-2-U	*261.8*	*262.77*	*11.02*	*10.10*	*50.8*	*0.92*	*0.5*	*251.747*	*252.247*	*Limestone*
98-2-M	261.8	262.75	16.44	15.54	50.8	0.90	1.5	246.308	247.808	Limestone
98-2-L	261.8	262.75	23.77	22.87	50.8	0.90	1.3	238.977	240.277	Limestone
98-3-U	*259.3*	*260.18*	*8.24*	*7.39*	*50.8*	*0.85*	*1.5*	*251.941*	*253.441*	*Limestone*
98-3-M	259.3	260.15	13.29	12.47	50.8	0.82	1.5	246.862	248.362	Limestone
98-3-L	259.3	260.17	18.21	17.38	50.8	0.83	1.9	241.958	243.858	Limestone/Red Shale
00-1-U	*265.1*	*265.93*	*3.46*	*2.61*	*50.8*	*0.85*	*1.5*	*262.465*	*263.965*	*Fractured Limestone*
00-1-M	265.1	265.89	13.00	12.19	50.8	0.81	1.5	252.885	254.385	Limestone
00-1-L	265.1	265.90	19.13	18.31	50.8	0.82	1.5	246.767	248.267	Limestone
BH16-1S	261.8	262.49	8.00	7.33	38.1	0.67	1.5	254.49	255.99	Limestone
BH16-1D	261.6	262.45	16.02	15.18	38.1	0.84	3	246.427	249.427	Limestone

Notes:

1. mbgs means metres below ground surface.
2. Elevations are geodetic.
3. Italicized text represents the upper wells installed in the shallow aquifer.
4. Unformatted text represents the middle wells installed in the deep aquifer.
5. Shaded test represents the lower wells installed in the deep aquifer.

Table 4 - Vertical Hydraulic Gradients

Monitor	Difference in Elevation of Bottom of Screen	Vertical Gradients +downwards, -upwards														**Unit Screened**
		12-May-14	27-Oct-14	7-Apr-15	27-Oct-15	28-Apr-16	21-Oct-16	7-Jun-17	4-Oct-17	28-May-18	15-Nov-18	15-Apr-19	11-Nov-19	20-Apr-20	9-Nov-20	
97-1-U	4.42	0.342	0.500	0.557	0.502	0.380	0.527	0.450	0.475	0.475	0.570	0.271	0.622	0.366	0.554	Overburden/Limestone
97-1-M																Limestone
97-1-U	10.54	0.154	0.210	0.234	0.209	0.156	0.219	0.189	0.200	0.199	0.241	0.132	0.267	0.224	0.237	Overburden/Limestone
97-1-L																Limestone
97-1-M	6.12	0.018	0.000	0.002	-0.003	-0.007	-0.003	0.001	0.001	-0.0003	0.003	0.032	0.011	0.121	0.008	Limestone
97-1-L																Limestone
97-2-U	4.81	0.966	1.018	0.891	0.993	0.980	0.964	0.904	0.873	0.834	0.817	-0.047	0.875	0.969	0.877	Overburden/Bedrock
97-2-L																Limestone
98-1-U	4.16	0.548	0.202	0.399	0.137	0.327	0.481	0.015	0.236	0.015	0.361	0.673	0.253	0.301	0.250	Fractured Limestone
98-1-M																Limestone
98-1-U	8.46	0.074	0.319	0.435	0.298	0.057	0.323	0.050	0.283	0.085	0.329	0.162	0.311	-0.070	0.316	Fractured Limestone
98-1-L																Limestone
98-1-M	4.30	-0.384	0.433	0.470	0.453	-0.205	0.170	0.084	0.328	0.153	0.298	-0.333	0.367	-0.428	0.379	Limestone
98-1-L																Limestone
98-2-U	5.44	0.726	0.309	0.208	0.359	0.675	0.485	0.351	0.623	0.173	0.373	0.936	0.272	0.880	0.329	Limestone
98-2-M																Limestone
98-2-U	12.77	0.110	0.160	-0.092	0.200	0.084	0.183	0.049	0.160	0.053	0.138	0.104	0.139	0.092	0.152	Limestone
98-2-L																Limestone
98-2-M	7.33	-0.346	0.049	-0.314	0.082	-0.355	-0.041	-0.176	-0.184	-0.035	-0.037	-0.513	0.040	-0.492	0.021	Limestone
98-2-L																Limestone
98-3-U	5.08	-0.341	0.518	0.538	0.429	0.284	0.482	0.409	0.455	0.429	0.539	0.303	0.563	0.275	0.531	Limestone
98-3-M																Limestone
98-3-U	9.98	-0.126	0.291	0.343	0.238	0.161	0.261	0.218	0.235	0.208	0.364	0.364	0.346	0.257	0.335	Limestone
98-3-L																Limestone/Red Shale
98-3-M	4.90	0.096	0.057	0.141	0.041	0.035	0.033	0.019	0.007	-0.022	0.182	0.427	0.121	0.237	0.131	Limestone
98-3-L																Limestone/Red Shale
00-1-U	9.58	-0.013	0.403	0.067	0.104	0.003	0.109	0.195	0.348	0.231	0.266	0.079	0.249	0.011	0.290	Fractured Limestone
00-1-M																Limestone
00-1-U	15.70	-0.031	0.092	0.360	0.330	0.294	0.329	0.222	0.595	0.373	0.474	0.488	0.321	0.395	0.386	Fractured Limestone
00-1-L																Limestone
00-1-M	6.12	-0.059	-0.396	0.819	0.683	0.750	0.673	0.263	0.982	0.596	0.799	1.127	0.433	0.997	0.536	Limestone
00-1-L																Limestone
BH16-1S	8.06	-	-	-	-	-	-	0.251	0.462	0.314	0.443	0.136	0.427	0.110	0.456	Limestone
BH16-1D																Limestone

Notes:
Shaded and negative values indicate an upward vertical gradient.
Positive values indicate a downward vertical gradient.

Table 5 - Groundwater Quality - Interface/Upper Bedrock

	Unit	RDL	RUC	ODWQS	00-1-U 2011-05-11	00-1-U 2012-05-02	00-1-U 2012-11-28	00-1-U 2013-06-04	00-1-U 2013-12-05	00-1-U 2014-05-12	00-1-U 2014-10-27	00-1-U 2015-04-06	00-1-U 2015-10-27	00-1-U 2016-04-01
Metals														
Barium (Filtered)	µg/L	1	***317***	**1000**	80	84	107	77	90	70	112	93	130	77
Boron (Filtered)	µg/L	5	***2509***	**5000**	20	15	22	29	25	15	60	19	25	12
Calcium (Filtered)	µg/L	20			130,000	121,000	165,000	128,000	125,000	94,100	140,000	137,000	145,000	113,000
Chloride	µg/L	500	***173500***	**250000**	97,000	70,500	***225,000***	46,300	48,300	38,000	159,000	136,000	166,000	55,200
Iron (Filtered)	µg/L	5	***155***	**300**	<100	<10	<10	<10	<10	<10	<10	<10	<10	<10
Manganese (Filtered)	µg/L	1	***26***	**50**	-	<2	<2	20	<2	<2	<2	<2	<2	<2
Magnesium (Filtered)	µg/L	20			5,600	3,880	8,720	5,800	3,580	33,200	4,980	5,840	5,950	3,500
Sodium (Filtered)	µg/L	200	***128500***	**200000**	65,000	41,000	127,000	54,700	33,200	10,200	83,200	74,800	94,200	31,300
Inorganics														
Alkalinity (as CaCO3)	mg/L	5	***400***	**500**	298	299	333	301	338	262	325	321	308	276
Hardness (as CaCO3) (Filtered)	mg/L	1	***421***	**500**	-	318	***448***	344	327	372	370	366	387	297
Solids - Total Dissolved (TDS)	mg/L	3	***502***	**500**	***548***	482	***764***	486	412	380	***674***	496	***680***	390
Solids - Total Suspended (TSS)	mg/L	3			-	126	616	300	51	197	67	213	238	141
Oxygen Demand - Chemical (COD)	mg/L	5			<4	6	<5	<5	<5	9	<5	<5	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	1.2	3.3	1.7	2	2.6	***4.8***	1.7	2.4	1.1	1.3
Oxygen Demand - Biological (BOD)	mg/L	3			-	<5	<5	<5	<5	<5	<5	<5	<5	<5
Sulphate (Filtered)	mg/L	1	***259***	**500**	18	14.1	33.1	11.3	12.8	116	21.4	21.9	20.9	12.1
Ammonia	mg/L	0.01			<0.05	<0.02	<0.02	<0.02	0.03	0.04	<0.02	<0.02	<0.02	<0.02
Nitrate (as N)	mg/L	0.05	***3.2***	**10**	1.4	0.68	<0.05	0.42	0.51	0.13	2.2	1.65	2.51	0.36
Conductivity (lab)	µS/cm	1			910	758	1,290	909	789	745	1,240	1,030	1,150	691
pH (Lab)	-			**6.5-8.5**	7.85	8.18	8.21	7.79	8.12	7.97	7.65	8.12	7.99	8.02
Field														
DO (Field)	mg/L				-	-	-	-	-	-	-	-	-	7.9
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	-	-
Temp (Field)	°C				-	-	-	-	-	-	-	-	-	8.7
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	-	890
pH (Field)	-			**6.5-8.5**	-	-	-	-	-	-	-	-	-	7.7

Table 5 - Groundwater Quality - Interface/Upper Bedrock

	Unit	RDL	RUC	ODWQS	00-1-U 2016-10-01	00-1-U 2017-06-07	00-1-U 2017-10-04	00-1-U 2018-05-28	00-1-U 2018-11-15	00-1-U 2019-04-15	00-1-U 2019-11-11	00-1-U 2020-04-20	00-1-U 2020-11-09
Metals													
Barium (Filtered)	µg/L	1	***317***	**1000**	109	76	89	91	117	80	93	68	82
Boron (Filtered)	µg/L	5	***2509***	**5000**	21	14	19	18	18	16	15	12	17
Calcium (Filtered)	µg/L	20			134,000	116,000	122,000	120,000	147,000	117,000	129,000	110,000	129,000
Chloride	µg/L	500	***173500***	**250000**	134,000	58,100	73,400	78,200	147,000	124,000	155,000	78,300	144,000
Iron (Filtered)	µg/L	5	***155***	**300**	<10	<5	7	<5	101	19	21	8	23
Manganese (Filtered)	µg/L	1	***26***	**50**	3	<1	1	<1	18	3	1	2	23
Magnesium (Filtered)	µg/L	20			5,080	4,230	4,530	4,540	5,840	3,890	6,220	3,220	4,600
Sodium (Filtered)	µg/L	200	***128500***	**200000**	78,700	48,300	51,700	57,000	96,600	57,200	87,900	30,700	49,300
Inorganics													
Alkalinity (as CaCO3)	mg/L	5	***400***	**500**	351	283	321	278	314	271	297	260	285
Hardness (as CaCO3) (Filtered)	mg/L	1	***421***	**500**	356	307	324	319	392	308	348	288	341
Solids - Total Dissolved (TDS)	mg/L	3	***502***	**500**	***616***	419	***503***	412	***602***	***516***	***578***	407	***580***
Solids - Total Suspended (TSS)	mg/L	3			204	-	-	-	-	-	-	-	-
Oxygen Demand - Chemical (COD)	mg/L	5			<5	<5	<5	<5	<5	<5	6	13	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	2.6	2.1	***5.1***	***10.8***	2.3	1.5	1.3	2.5	0.5
Oxygen Demand - Biological (BOD)	mg/L	3			<5	-	-	-	-	-	-	-	-
Sulphate (Filtered)	mg/L	1	***259***	**500**	23.1	13	14	16	21	18	20	16	25
Ammonia	mg/L	0.01			<0.02	<0.01	<0.01	0.01	0.04	0.06	0.03	0.05	0.04
Nitrate (as N)	mg/L	0.05	***3.2***	**10**	***3.54***	0.98	1.25	0.83	1.49	0.67	1.97	0.5	1
Conductivity (lab)	µS/cm	1			1,080	761	914	785	1,120	969	1,080	776	1,080
pH (Lab)	-			**6.5-8.5**	7.08	7.73	7.77	7.84	7.63	7.71	7.57	7.78	7.7
Field													
DO (Field)	mg/L				8.7	6.08	5.23	7.96	4.22	5.29	4.7	9.81	3.74
Redox Potential (Field)	mV				-	84	165	135	141	177	180	66	106
Temp (Field)	°C				9.4	9	9.4	9	7.7	7	7.7	9.9	9.1
Conductivity (field)	µS/cm				912	1,010	920	870	1,040	820	1,070	510	1,178
pH (Field)	-			**6.5-8.5**	7.3	7.11	7.05	7.36	6.97	6.94	6.95	7.84	7.13

Table 5 - Groundwater Quality - Interface/Upper Bedrock

	Unit	RDL	RUC	ODWQS	97-1-U 2011-05-01	97-1-U 2012-05-02	97-1-U 2012-11-29	97-1-U 2013-06-04	97-1-U 2013-12-05	97-1-U 2014-05-12	97-1-U 2014-10-27	97-1-U 2015-04-06	97-1-U 2015-10-28	97-1-U 2016-04-01
Metals														
Barium (Filtered)	µg/L	1	***317***	**1000**	150	152	183	160	207	302	268	197	250	263
Boron (Filtered)	µg/L	5	***2509***	**5000**	20	18	55	17	59	38	40	50	52	26
Calcium (Filtered)	µg/L	20			120,000	133,000	141,000	136,000	168,000	147,000	162,000	147,000	192,000	154,000
Chloride	µg/L	500	***173500***	**250000**	22,000	15,100	7,980	20,300	21,100	39,100	29,600	32,400	19,200	49,000
Iron (Filtered)	µg/L	5	***155***	**300**	<100	<10	<10	<10	<10	<10	<10	<10	<10	<10
Manganese (Filtered)	µg/L	1	***26***	**50**	-	3	<2	3	<2	3	3	3	<2	2
Magnesium (Filtered)	µg/L	20			5,600	6,660	8,570	6,340	8,360	8,770	8,700	8,590	10,800	7,570
Sodium (Filtered)	µg/L	200	***128500***	**200000**	12,000	8,630	6,160	11,400	10,700	39,000	19,000	17,500	19,100	36,000
Inorganics														
Alkalinity (as CaCO3)	mg/L	5	***400***	**500**	279	323	350	325	***427***	***416***	***414***	356	***445***	383
Hardness (as CaCO3) (Filtered)	mg/L	1	***421***	**500**	-	360	387	366	***454***	403	***440***	402	***524***	416
Solids - Total Dissolved (TDS)	mg/L	3	***502***	**500**	342	416	400	394	***572***	***568***	***534***	412	***564***	**502**
Solids - Total Suspended (TSS)	mg/L	3			-	2,120	1,250	1,600	2,230	359	1,340	1,630	769	828
Oxygen Demand - Chemical (COD)	mg/L	5			15	6	<5	<5	16	13	<5	<5	6	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	2.1	2.5	2.2	***4***	2.5	***5.4***	3.2	2.5	***4.3***	***4.3***
Oxygen Demand - Biological (BOD)	mg/L	3			-	<5	<5	<5	<5	<5	<5	<5	<5	<5
Sulphate (Filtered)	mg/L	1	***259***	**500**	10	19.9	17.2	20.4	17.4	33.5	23	24.3	22.1	24
Ammonia	mg/L	0.01			0.09	0.05	<0.02	<0.02	0.03	0.04	<0.02	<0.02	<0.02	<0.02
Nitrate (as N)	mg/L	0.05	***3.2***	**10**	0.4	1.84	2.64	1.69	1.95	2	2.24	2.54	***3.48***	2.96
Conductivity (lab)	µS/cm	1			624	632	686	749	886	989	936	790	905	897
pH (Lab)	-			**6.5-8.5**	7.83	7.95	7.86	7.76	7.62	8.02	7.8	7.99	7.8	7.99
Field														
DO (Field)	mg/L				-	-	-	-	-	-	-	-	-	9.4
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	-	-
Temp (Field)	°C				-	-	-	-	-	-	-	-	-	11
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	-	929
pH (Field)	-			**6.5-8.5**	-	-	-	-	-	-	-	-	-	7.7

Table 5 - Groundwater Quality - Interface/Upper Bedrock

	Unit	RDL	RUC	ODWQS	97-1-U 2016-10-01	97-1-U 2017-06-07	97-1-U 2017-10-04	97-1-U 2018-05-28	97-1-U 2018-11-15	97-1-U 2019-04-15	97-1-U 2019-11-11	97-1-U 2020-04-20	97-1-U 2020-11-09
Metals													
Barium (Filtered)	µg/L	1	***317***	**1000**	270	***331***	262	241	254	155	260	***401***	***427***
Boron (Filtered)	µg/L	5	***2509***	**5000**	43	24	54	21	43	15	28	23	59
Calcium (Filtered)	µg/L	20			186,000	167,000	167,000	140,000	162,000	111,000	148,000	244,000	840,000
Chloride	µg/L	500	***173500***	**250000**	66,300	***179,000***	133,000	132,000	107,000	50,500	81,900	***176,000***	67,500
Iron (Filtered)	µg/L	5	***155***	**300**	50	<5	5	<5	<5	<5	<5	***744***	22
Manganese (Filtered)	µg/L	1	***26***	**50**	17	5	1	<1	1	<1	4	***162***	***1,430***
Magnesium (Filtered)	µg/L	20			9,790	8,020	9,070	7,340	7,810	6,400	7,590	9,890	13,400
Sodium (Filtered)	µg/L	200	***128500***	**200000**	40,300	***135,000***	76,500	79,600	72,200	28,300	61,300	98,100	45,000
Inorganics													
Alkalinity (as CaCO3)	mg/L	5	***400***	**500**	***484***	383	***404***	320	370	279	380	386	376
Hardness (as CaCO3) (Filtered)	mg/L	1	***421***	**500**	***505***	***450***	***455***	380	***437***	304	401	***651***	***2,160***
Solids - Total Dissolved (TDS)	mg/L	3	***502***	**500**	***650***	***800***	***718***	***534***	***590***	398	***529***	***715***	***532***
Solids - Total Suspended (TSS)	mg/L	3			2,170	-	-	-	-	-	-	-	-
Oxygen Demand - Chemical (COD)	mg/L	5			<5	48	46	34	7	24	50	11	95
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	2.8	***3.8***	***3.9***	***8.3***	3.6	3.5	2.4	3.5	3.1
Oxygen Demand - Biological (BOD)	mg/L	3			<5	-	-	-	-	-	-	-	-
Sulphate (Filtered)	mg/L	1	***259***	**500**	31.3	27	25	16	19	11	16	22	23
Ammonia	mg/L	0.01			<0.02	<0.01	0.03	0.03	0.03	0.07	0.04	0.02	0.05
Nitrate (as N)	mg/L	0.05	***3.2***	**10**	***3.4***	2.09	2.75	0.92	1.92	2.42	2.47	1.72	2.02
Conductivity (lab)	µS/cm	1			1,090	1,450	1,310	1,000	1,100	760	992	1,320	998
pH (Lab)	-			**6.5-8.5**	6.93	7.64	7.68	7.8	7.67	7.76	7.46	7.47	7.62
Field													
DO (Field)	mg/L				8	9.12	9.99	6.75	3.66	9.54	-	7.24	5.37
Redox Potential (Field)	mV				-	77	174	-4	125	153	6	67	255
Temp (Field)	°C				11	12.2	13.7	9.7	9.9	6	8.9	7.4	13.7
Conductivity (field)	µS/cm				848	1,700	1,750	1,120	1,000	630	1,080	1,220	838
pH (Field)	-			**6.5-8.5**	7.1	7.01	7.17	6.97	7.24	7.22	6.9	7.23	6.81

Table 5 - Groundwater Quality - Interface/Upper Bedrock

	Unit	RDL	RUC	ODWQS	97-2-U 2011-05-01	97-2-U 2012-05-02	97-2-U 2012-11-29	97-2-U 2013-06-04	97-2-U 2013-12-05	97-2-U 2014-05-12	97-2-U 2014-10-27	97-2-U 2015-04-07	97-2-U 2015-10-28	97-2-U 2016-04-01
Metals														
Barium (Filtered)	µg/L	1	***317***	**1000**	180	220	290	187	248	158	314	286	***342***	169
Boron (Filtered)	µg/L	5	***2509***	**5000**	50	55	85	45	71	41	107	86	96	38
Calcium (Filtered)	µg/L	20			180,000	175,000	192,000	188,000	159,000	122,000	205,000	215,000	221,000	147,000
Chloride	µg/L	500	***173500***	**250000**	160,000	***220,000***	***269,000***	***202,000***	***177,000***	26,000	***296,000***	***285,000***	***336,000***	***184,000***
Iron (Filtered)	µg/L	5	***155***	**300**	<100	<10	***533***	<10	***239***	<10	<10	<10	<10	<10
Manganese (Filtered)	µg/L	1	***26***	**50**	-	7	16	5	8	<1	8	5	<2	8
Magnesium (Filtered)	µg/L	20			5,300	5,640	6,060	5,850	5,250	9,900	6,690	7,150	7,430	4,750
Sodium (Filtered)	µg/L	200	***128500***	**200000**	100,000	107,000	***148,000***	116,000	109,000	22,200	128,000	***141,000***	***168,000***	93,500
Inorganics														
Alkalinity (as CaCO3)	mg/L	5	***400***	**500**	376	395	***434***	365	***421***	372	***409***	***436***	***463***	328
Hardness (as CaCO3) (Filtered)	mg/L	1	***421***	**500**	-	***460***	***504***	***494***	419	345	***539***	***566***	***582***	387
Solids - Total Dissolved (TDS)	mg/L	3	***502***	**500**	***778***	***814***	***924***	***774***	***730***	498	***1,040***	***926***	***1,120***	***656***
Solids - Total Suspended (TSS)	mg/L	3			-	744	74	421	780	890	169	146	244	136
Oxygen Demand - Chemical (COD)	mg/L	5			8	12	<5	<5	5	10	<5	<5	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	1.5	2	***5.3***	3	***7***	***7.5***	2	2.5	2.6	1.7
Oxygen Demand - Biological (BOD)	mg/L	3			-	<5	<5	6	<5	<5	<5	<5	<5	<5
Sulphate (Filtered)	mg/L	1	***259***	**500**	29	30.5	35.6	29.1	29.9	29.3	33.7	37.3	29.4	23.5
Ammonia	mg/L	0.01			<0.05	0.04	0.06	<0.02	0.04	0.02	<0.02	<0.02	<0.02	<0.02
Nitrate (as N)	mg/L	0.05	***3.2***	**10**	1.5	1.98	<0.05	1.94	2.5	2.38	2.74	***3.23***	***3.6***	2.32
Conductivity (lab)	µS/cm	1			1,280	1,360	1,600	1,420	1,360	865	1,870	1,710	1,930	1,160
pH (Lab)	-			**6.5-8.5**	7.59	8	7.97	7.64	7.72	8.03	7.42	7.89	7.87	7.94
Field														
DO (Field)	mg/L				-	-	-	-	-	-	-	-	-	9.8
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	-	-
Temp (Field)	°C				-	-	-	-	-	-	-	-	-	12.1
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	-	644
pH (Field)	-			**6.5-8.5**	-	-	-	-	-	-	-	-	-	8.1

Table 5 - Groundwater Quality - Interface/Upper Bedrock

	Unit	RDL	RUC	ODWQS	97-2-U 2016-10-01	97-2-U 2017-06-07	97-2-U 2017-10-04	97-2-U 2018-05-28	97-2-U 2018-11-15	97-2-U 2019-04-15	97-2-U 2019-11-11	97-2-U 2020-04-20	97-2-U 2020-11-09
Metals													
Barium (Filtered)	µg/L	1	***317***	**1000**	306	179	258	203	***326***	185	272	155	***374***
Boron (Filtered)	µg/L	5	***2509***	**5000**	102	59	88	52	91	23	83	26	108
Calcium (Filtered)	µg/L	20			208,000	148,000	179,000	162,000	214,000	169,000	178,000	158,000	250,000
Chloride	µg/L	500	***173500***	**250000**	***302,000***	109,000	163,000	***183,000***	***298,000***	***182,000***	***302,000***	130,000	***351,000***
Iron (Filtered)	µg/L	5	***155***	**300**	***798***	<5	145	23	22	<5	18	9	***815***
Manganese (Filtered)	µg/L	1	***26***	**50**	***30***	5	18	8	14	3	12	3	***34***
Magnesium (Filtered)	µg/L	20			7,020	4,900	6,230	5,640	7,120	4,980	6,600	4,500	7,400
Sodium (Filtered)	µg/L	200	***128500***	**200000**	***153,000***	90,600	107,000	106,000	***181,000***	74,000	***186,000***	77,600	***198,000***
Inorganics													
Alkalinity (as CaCO3)	mg/L	5	***400***	**500**	***484***	361	***414***	347	***424***	364	***418***	340	***414***
Hardness (as CaCO3) (Filtered)	mg/L	1	***421***	**500**	***548***	391	***473***	***428***	***564***	***443***	***472***	413	***655***
Solids - Total Dissolved (TDS)	mg/L	3	***502***	**500**	***1,010***	***627***	***790***	***664***	***1,010***	***687***	***970***	***589***	***1,070***
Solids - Total Suspended (TSS)	mg/L	3			149	-	-	-	-	-	-	-	-
Oxygen Demand - Chemical (COD)	mg/L	5			22	6	<5	<5	14	9	9	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	3.1	***15.8***	***4.2***	***15.6***	2.6	1.5	1.2	3.3	0.3
Oxygen Demand - Biological (BOD)	mg/L	3			<5	-	-	-	-	-	-	-	-
Sulphate (Filtered)	mg/L	1	***259***	**500**	33.1	19	19	20	28	16	27	18	28
Ammonia	mg/L	0.01			0.08	<0.01	0.03	0.01	0.1	0.06	0.03	0.01	0.22
Nitrate (as N)	mg/L	0.05	***3.2***	**10**	***3.38***	1.8	2.62	1.79	***3.28***	1.38	3.02	1.6	3.06
Conductivity (lab)	µS/cm	1			1,820	1,140	1,440	1,230	1,840	1,270	1,770	1,100	1,940
pH (Lab)	-			**6.5-8.5**	7.1	7.35	7.63	7.7	7.57	7.65	7.59	7.59	7.58
Field													
DO (Field)	mg/L				7.34	8.39	7.07	9.55	7.72	5.41	9.83	6.47	2.94
Redox Potential (Field)	mV				-	11	126	42	154	169	136	122	103
Temp (Field)	°C				9.7	11.9	12.7	18.7	8	7	6.6	10.3	9.8
Conductivity (field)	µS/cm				1,537	1,280	1,330	1,280	1,500	1,050	1,630	940	1,926
pH (Field)	-			**6.5-8.5**	6.9	6.9	6.93	7.06	7.17	7.14	7	7.2	6.76

Table 5 - Groundwater Quality - Interface/Upper Bedrock

	Unit	RDL	RUC	ODWQS	97-3 2011-05-01	97-3 2012-05-02	97-3 2012-11-29	97-3 2013-06-04	97-3 2013-12-05	97-3 2014-05-12	97-3 2014-10-27	97-3 2015-04-06	97-3 2015-10-27	97-3 2017-06-07
Metals														
Barium (Filtered)	µg/L	1	***317***	**1000**	310	***322***	***345***	***361***	***394***	316	***342***	275	***350***	***388***
Boron (Filtered)	µg/L	5	***2509***	**5000**	430	397	538	602	535	543	655	435	554	721
Calcium (Filtered)	µg/L	20			210,000	207,000	230,000	247,000	197,000	188,000	210,000	198,000	205,000	213,000
Chloride	µg/L	500	***173500***	**250000**	***180,000***	***181,000***	154,000	***208,000***	***181,000***	***174,000***	154,000	103,000	80,200	119,000
Iron (Filtered)	µg/L	5	***155***	**300**	***6,300***	***4,670***	***6,210***	***10,500***	***12,300***	***8,550***	***13,200***	***1,310***	***4,840***	***5,710***
Manganese (Filtered)	µg/L	1	***26***	**50**	-	***596***	***630***	***652***	***625***	***652***	***614***	***342***	***503***	***1,110***
Magnesium (Filtered)	µg/L	20			18,000	17,400	19,200	20,900	19,100	18,800	20,800	16,200	16,900	23,600
Sodium (Filtered)	µg/L	200	***128500***	**200000**	120,000	104,000	103,000	***134,000***	126,000	111,000	105,000	72,600	68,900	103,000
Inorganics														
Alkalinity (as CaCO3)	mg/L	5	***400***	**500**	***573***	***612***	***606***	***622***	***694***	***607***	***657***	***580***	***637***	***751***
Hardness (as CaCO3) (Filtered)	mg/L	1	***421***	**500**	-	***589***	***653***	***703***	***571***	***547***	***610***	***561***	***581***	***629***
Solids - Total Dissolved (TDS)	mg/L	3	***502***	**500**	***1,040***	***944***	***892***	***1,420***	***1,050***	***940***	***674***	***768***	***786***	***1,040***
Solids - Total Suspended (TSS)	mg/L	3			-	7,990	1,910	7,630	2,250	369	274	195	314	290
Oxygen Demand - Chemical (COD)	mg/L	5			35	32	29	26	44	32	35	24	16	42
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	***8.4***	***10.3***	***25.3***	***12***	***21.2***	***17.1***	***13.4***	***10.1***	***10.8***	***12.5***
Oxygen Demand - Biological (BOD)	mg/L	3			-	<5	<5	<5	<5	<5	<5	<5	<5	3
Sulphate (Filtered)	mg/L	1	***259***	**500**	43	44.2	54.4	49	43.7	46.8	57.7	49.7	39	34
Ammonia	mg/L	0.01			16	12.8	12.9	12.9	20.4	15.3	15.7	8	11.6	25.8
Nitrate (as N)	mg/L	0.05	***3.2***	**10**	0.2	1.06	<0.05	<0.5	<0.5	<0.5	<0.25	1.78	<0.25	<0.05
Conductivity (lab)	µS/cm	1			1,710	1,620	1,510	1,900	1,900	1,760	1,870	1,410	1,450	1,890
pH (Lab)	-			**6.5-8.5**	7.23	7.85	7.92	7.51	7.43	7.9	7.22	7.94	7.84	7.01
Field														
DO (Field)	mg/L				-	-	-	-	-	-	-	-	-	2.98
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	-	53
Temp (Field)	°C				-	-	-	-	-	-	-	-	-	12.1
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	-	2,100
pH (Field)	-			**6.5-8.5**	-	-	-	-	-	-	-	-	-	6.64

Table 5 - Groundwater Quality - Interface/Upper Bedrock

	Unit	RDL	RUC	ODWQS	97-3 2017-10-04	97-3 2018-05-28	97-3 2018-11-15	97-3 2019-04-15	97-3 2019-11-11	97-3 2020-04-20	97-3 2020-11-09
Metals											
Barium (Filtered)	µg/L	1	***317***	**1000**	***446***	***391***	***392***	***405***	***401***	***399***	***339***
Boron (Filtered)	µg/L	5	***2509***	**5000**	1,020	604	732	536	864	657	540
Calcium (Filtered)	µg/L	20			213,000	218,000	225,000	214,000	201,000	225,000	226,000
Chloride	µg/L	500	***173500***	**250000**	120,000	172,000	145,000	***337,000***	***175,000***	159,000	30,200
Iron (Filtered)	µg/L	5	***155***	**300**	***14,400***	***2,800***	***6,130***	***1,220***	***8,590***	***4,580***	***5,850***
Manganese (Filtered)	µg/L	1	***26***	**50**	***813***	***902***	***689***	***623***	***826***	***856***	***661***
Magnesium (Filtered)	µg/L	20			27,000	22,100	22,500	22,200	24,200	22,600	17,600
Sodium (Filtered)	µg/L	200	***128500***	**200000**	117,000	120,000	118,000	***152,000***	***131,000***	112,000	43,100
Inorganics											
Alkalinity (as CaCO3)	mg/L	5	***400***	**500**	***795***	***663***	***680***	***582***	***728***	***635***	***570***
Hardness (as CaCO3) (Filtered)	mg/L	1	***421***	**500**	***643***	***636***	***655***	***626***	***602***	***655***	***637***
Solids - Total Dissolved (TDS)	mg/L	3	***502***	**500**	***1,080***	***966***	***988***	***1,250***	***1,070***	***958***	***677***
Solids - Total Suspended (TSS)	mg/L	3			110	200	8,000	90	110	24	18
Oxygen Demand - Chemical (COD)	mg/L	5			57	36	229	43	66	34	7
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	***15.6***	***13.9***	***13.1***	***6.7***	***10.1***	***9.4***	***7.4***
Oxygen Demand - Biological (BOD)	mg/L	3			-	2	7	<3	<3	<3	<3
Sulphate (Filtered)	mg/L	1	***259***	**500**	34	35	35	32	35	39	22
Ammonia	mg/L	0.01			30.1	18.6	23.6	26.3	35.2	22.8	14.4
Nitrate (as N)	mg/L	0.05	***3.2***	**10**	<0.05	<0.05	<0.05	0.32	<0.05	<0.05	0.09
Conductivity (lab)	µS/cm	1			1,960	1,760	1,800	2,260	1,940	1,750	1,250
pH (Lab)	-			**6.5-8.5**	7.2	7.76	7.38	7.4	7.48	7.33	7.12
Field											
DO (Field)	mg/L				5.93	3.41	0.37	2.37	5.27	3.52	2.12
Redox Potential (Field)	mV				187	54	169	196	164	156	98
Temp (Field)	°C				15.9	14	7.7	7	7.6	9.7	13.7
Conductivity (field)	µS/cm				1,750	1,790	1,390	1,590	1,820	1,150	1,343
pH (Field)	-			**6.5-8.5**	6.83	6.71	6.88	6.8	6.57	6.86	6.64

Table 5 - Groundwater Quality - Interface/Upper Bedrock

	Unit	RDL	RUC	ODWQS	98-1-U 2011-05-01	98-1-U 2012-05-04	98-1-U 2012-11-28	98-1-U 2013-06-04	98-1-U 2013-12-05	98-1-U 2014-05-12	98-1-U 2014-10-27	98-1-U 2015-04-07	98-1-U 2015-10-29	98-1-U 2016-04-01
Metals														
Barium (Filtered)	µg/L	1	***317***	**1000**	120	141	160	136	143	171	216	124	-	175
Boron (Filtered)	µg/L	5	***2509***	**5000**	150	88	140	148	130	164	249	107	-	137
Calcium (Filtered)	µg/L	20			150,000	166,000	178,000	165,000	148,000	156,000	226,000	152,000	270,000	191,000
Chloride	µg/L	500	***173500***	**250000**	7,000 - 8,000	55,000	6,660	13,600	6,170	102,000	50,900	15,000	128,000	103,000
Iron (Filtered)	µg/L	5	***155***	**300**	<100	<10	<10	<10	<10	<10	<10	<10	-	<10
Manganese (Filtered)	µg/L	1	***26***	**50**	-	<2	<2	<2	<2	<2	<2	<2	-	8
Magnesium (Filtered)	µg/L	20			9,600 - 9,800	8,200	11,600	10,400	10,100	8,770	13,900	9,190	11,900	9,520
Sodium (Filtered)	µg/L	200	***128500***	**200000**	8,500 - 8,900	34,900	7,050	11,700	6,270	60,100	27,400	11,900	31,900	58,200
Inorganics														
Alkalinity (as CaCO3)	mg/L	5	***400***	**500**	361 - 363	***460***	***462***	397	***419***	***407***	***534***	393	***502***	***445***
Hardness (as CaCO3) (Filtered)	mg/L	1	***421***	**500**	-	***448***	***492***	***455***	411	***426***	***622***	417	***723***	***516***
Solids - Total Dissolved (TDS)	mg/L	3	***502***	**500**	476 - 478	***592***	***534***	480	438	***670***	***808***	442	***938***	***652***
Solids - Total Suspended (TSS)	mg/L	3			-	143	81	26	21	20	28	54	28	26
Oxygen Demand - Chemical (COD)	mg/L	5			6 - 7	<5	<5	<5	9	11	<5	<5	8	8
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	2.1 - 2.2	3	***4.7***	3	***7.8***	***4.7***	***4.2***	2.7	***4.4***	3.6
Oxygen Demand - Biological (BOD)	mg/L	3			-	<5	<5	<5	<5	<5	<5	<5	<5	<5
Sulphate (Filtered)	mg/L	1	***259***	**500**	38 - 42	34.5	38.5	51.8	40.3	57.1	89	34.5	65.2	57.7
Ammonia	mg/L	0.01			<0.05	<0.02	<0.02	<0.02	<0.02	0.67	<0.02	<0.02	0.03	0.52
Nitrate (as N)	mg/L	0.05	***3.2***	**10**	0.7 - 0.74	1.06	<0.05	0.81	0.57	***3.53***	***3.84***	1.13	2.42	***3.24***
Conductivity (lab)	µS/cm	1			776 - 790	996	878	884	821	1,210	1,380	809	1,400	1,220
pH (Lab)	-			**6.5-8.5**	7.67 - 7.86	7.79	8.05	7.61	7.86	7.96	7.1	8.07	8.01	7.92
Field														
DO (Field)	mg/L				-	-	-	-	-	-	-	-	-	6.8
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	-	-
Temp (Field)	°C				-	-	-	-	-	-	-	-	-	8
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	-	1,235
pH (Field)	-			**6.5-8.5**	-	-	-	-	-	-	-	-	-	7.4

Table 5 - Groundwater Quality - Interface/Upper Bedrock

	Unit	RDL	RUC	ODWQS	98-1-U 2016-10-01	98-1-U 2017-06-07	98-1-U 2017-10-04	98-1-U 2018-05-28	98-1-U 2018-11-15	98-1-U 2019-04-15	98-1-U 2019-11-11	98-1-U 2020-04-20	98-1-U 2020-11-09
Metals													
Barium (Filtered)	µg/L	1	***317***	**1000**	213	128	233	146	207	155	173	203	237
Boron (Filtered)	µg/L	5	***2509***	**5000**	199	139	291	154	173	119	181	206	211
Calcium (Filtered)	µg/L	20			230,000	149,000	231,000	148,000	209,000	175,000	170,000	194,000	239,000
Chloride	µg/L	500	***173500***	**250000**	63,800	12,900	28,500	34,000	29,200	121,000	22,600	80,600	26,700
Iron (Filtered)	µg/L	5	***155***	**300**	54	<5	11	12	<5	<5	<5	96	<5
Manganese (Filtered)	µg/L	1	***26***	**50**	5	1	2	1	<1	<1	<1	23	1
Magnesium (Filtered)	µg/L	20			11,800	8,640	14,800	9,870	12,400	8,300	11,700	10,500	13,200
Sodium (Filtered)	µg/L	200	***128500***	**200000**	37,200	14,800	21,800	24,100	19,400	49,400	20,400	61,600	19,600
Inorganics													
Alkalinity (as CaCO3)	mg/L	5	***400***	**500**	***586***	368	***540***	372	***483***	372	***432***	***418***	***482***
Hardness (as CaCO3) (Filtered)	mg/L	1	***421***	**500**	***623***	408	***638***	411	***573***	***472***	***473***	***528***	***652***
Solids - Total Dissolved (TDS)	mg/L	3	***502***	**500**	***778***	455	***701***	462	***596***	***641***	***528***	***620***	***600***
Solids - Total Suspended (TSS)	mg/L	3			48	-	-	-	-	-	-	-	-
Oxygen Demand - Chemical (COD)	mg/L	5			<5	11	6	<5	12	19	13	12	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	***4.4***	***8.8***	***15.1***	***12.9***	***6.4***	***4.4***	***4.7***	***4.9***	3.5
Oxygen Demand - Biological (BOD)	mg/L	3			<5	-	-	-	-	-	-	-	-
Sulphate (Filtered)	mg/L	1	***259***	**500**	77.7	36	84	40	43	34	49	44	48
Ammonia	mg/L	0.01			0.02	0.08	0.09	0.1	0.02	0.07	0.03	1.52	0.01
Nitrate (as N)	mg/L	0.05	***3.2***	**10**	2.61	1.88	***3.64***	2.05	2.49	2.75	2.68	***3.35***	3.12
Conductivity (lab)	µS/cm	1			1,310	828	1,270	874	1,110	1,190	990	1,150	117
pH (Lab)	-			**6.5-8.5**	6.88	7.35	7.12	7.72	7.48	7.6	7.41	7.41	7.09
Field													
DO (Field)	mg/L				4.7	6.48	2.71	9	3.73	2.48	4.7	1.91	4.42
Redox Potential (Field)	mV				-	37	131	9	128	156	104	68	261
Temp (Field)	°C				10	16.6	12.9	13.7	9	5	8.4	8.1	10.4
Conductivity (field)	µS/cm				1,104	980	1,210	930	990	980	990	730	890
pH (Field)	-			**6.5-8.5**	7.2	6.62	6.57	7.02	6.95	7.05	7.06	6.84	6.69

Table 5 - Groundwater Quality - Interface/Upper Bedrock

	Unit	RDL	RUC	ODWQS	98-2-U 2011-05-01	98-2-U 2012-05-01	98-2-U 2012-11-01	98-2-U 2013-06-04	98-2-U 2013-12-05	98-2-U 2014-05-12	98-2-U 2014-10-27	98-2-U 2015-04-07	98-2-U 2015-10-27	98-2-U 2016-04-01
Metals														
Barium (Filtered)	µg/L	1	***317***	**1000**	90	77	102	89	88	98	111	105	105	94
Boron (Filtered)	µg/L	5	***2509***	**5000**	230	194	266	226	176	64	214	198	198	99
Calcium (Filtered)	µg/L	20			160,000	155,000	176,000	184,000	152,000	119,000	180,000	198,000	189,000	156,000
Chloride	µg/L	500	***173500***	**250000**	81,000	91,800	96,800	90,900	81,700	90,600	102,000	117,000	111,000	115,000
Iron (Filtered)	µg/L	5	***155***	**300**	***1,000***	43	<10	***210***	<10	<10	***793***	<10	<10	<10
Manganese (Filtered)	µg/L	1	***26***	**50**	-	18	***41***	18	17	2	***63***	3	4	3
Magnesium (Filtered)	µg/L	20			16,000	15,800	16,800	18,900	14,600	7,360	15,600	15,600	15,600	9,500
Sodium (Filtered)	µg/L	200	***128500***	**200000**	64,000	63,200	61,200	64,200	54,800	61,600	66,600	68,400	72,900	68,700
Inorganics														
Alkalinity (as CaCO3)	mg/L	5	***400***	**500**	400	***452***	***467***	***444***	***420***	325	***445***	***472***	***461***	395
Hardness (as CaCO3) (Filtered)	mg/L	1	***421***	**500**	-	***452***	***509***	***537***	***440***	327	***514***	***559***	***536***	***429***
Solids - Total Dissolved (TDS)	mg/L	3	***502***	**500**	***688***	***652***	***724***	***646***	***596***	***672***	***696***	***726***	***772***	***762***
Solids - Total Suspended (TSS)	mg/L	3			-	666	95	1,210	704	1,460	994	502	204	836
Oxygen Demand - Chemical (COD)	mg/L	5			13	6	<5	9	5	<5	23	<5	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	1.9	2.7	***5.6***	2	2.7	***6.8***	2.4	2.2	1.3	2.1
Oxygen Demand - Biological (BOD)	mg/L	3			-	<5	<5	9	<5	<5	<5	<5	<5	<5
Sulphate (Filtered)	mg/L	1	***259***	**500**	60	72.5	80.3	78.5	67.9	25.4	85.9	69.7	65.8	39.8
Ammonia	mg/L	0.01			0.07	<0.02	0.07	0.02	0.11	0.03	0.2	<0.02	<0.02	<0.02
Nitrate (as N)	mg/L	0.05	***3.2***	**10**	0.7	0.85	<0.05	0.52	0.48	1.58	0.73	2.42	2.31	2.09
Conductivity (lab)	µS/cm	1			1,110	1,140	1,200	1,270	1,110	965	1,360	1,300	1,280	1,110
pH (Lab)	-			**6.5-8.5**	7.46	7.93	7.99	7.62	7.63	7.81	7.4	7.86	7.92	7.95
Field														
DO (Field)	mg/L				-	-	-	-	-	-	-	-	-	6.8
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	-	-
Temp (Field)	°C				-	-	-	-	-	-	-	-	-	9.9
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	-	1,206
pH (Field)	-			**6.5-8.5**	-	-	-	-	-	-	-	-	-	7.2

Table 5 - Groundwater Quality - Interface/Upper Bedrock

	Unit	RDL	RUC	ODWQS	98-2-U 2016-10-01	98-2-U 2017-06-07	98-2-U 2017-10-04	98-2-U 2018-05-28	98-2-U 2018-11-15	98-2-U 2019-04-15	98-2-U 2019-11-11	98-2-U 2020-04-20	98-2-U 2020-11-09
Metals													
Barium (Filtered)	µg/L	1	***317***	**1000**	91	137	101	104	102	124	104	144	112
Boron (Filtered)	µg/L	5	***2509***	**5000**	188	155	208	227	196	115	179	76	189
Calcium (Filtered)	µg/L	20			174,000	183,000	171,000	184,000	181,000	175,000	178,000	176,000	191,000
Chloride	µg/L	500	***173500***	**250000**	103,000	91,500	80,000	107,000	97,800	169,000	130,000	93,900	101,000
Iron (Filtered)	µg/L	5	***155***	**300**	<10	<5	<5	<5	<5	<5	<5	***867***	10
Manganese (Filtered)	µg/L	1	***26***	**50**	7	5	4	9	2	2	23	***79***	1
Magnesium (Filtered)	µg/L	20			14,500	10,900	16,200	18,600	16,400	11,200	16,600	7,920	15,600
Sodium (Filtered)	µg/L	200	***128500***	**200000**	65,400	78,200	62,800	72,800	69,800	84,300	78,600	65,800	70,100
Inorganics													
Alkalinity (as CaCO3)	mg/L	5	***400***	**500**	***484***	***455***	***442***	***444***	***427***	363	***423***	325	399
Hardness (as CaCO3) (Filtered)	mg/L	1	***421***	**500**	***494***	***502***	***494***	***536***	***520***	***484***	***513***	***473***	***542***
Solids - Total Dissolved (TDS)	mg/L	3	***502***	**500**	***672***	***705***	***683***	***658***	***670***	***715***	***705***	***505***	***643***
Solids - Total Suspended (TSS)	mg/L	3			420	-	-	-	-	-	-	-	-
Oxygen Demand - Chemical (COD)	mg/L	5			<5	46	36	<5	30	11	260	8	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	***4.2***	***3.7***	***5.7***	***12.3***	***4***	2.8	2	2	0.8
Oxygen Demand - Biological (BOD)	mg/L	3			<5	-	-	-	-	-	-	-	-
Sulphate (Filtered)	mg/L	1	***259***	**500**	65.7	43	52	64	64	32	66	27	62
Ammonia	mg/L	0.01			<0.02	0.05	0.02	0.03	0.04	0.05	0.05	0.03	<0.01
Nitrate (as N)	mg/L	0.05	***3.2***	**10**	2.12	2.75	1.67	1.49	2.06	1.83	1.34	1.36	1.11
Conductivity (lab)	µS/cm	1			1,220	1,280	1,240	1,220	1,240	1,320	1,300	950	1,190
pH (Lab)	-			**6.5-8.5**	6.9	7.24	7.64	7.66	7.56	7.66	7.48	7.57	7.38
Field													
DO (Field)	mg/L				5	3.32	6.54	6.82	6.14	5.01	3.95	6.72	4.75
Redox Potential (Field)	mV				-	34	124	37	136	155	118	75	247
Temp (Field)	°C				9.6	17.4	13.4	14.4	7.8	8	7.3	8.1	9.3
Conductivity (field)	µS/cm				1,030	1,440	1,160	1,200	1,120	1,020	1,220	740	888
pH (Field)	-			**6.5-8.5**	6.8	6.5	6.98	7.03	7.21	7	6.92	7.04	6.93

Table 5 - Groundwater Quality - Interface/Upper Bedrock

	Unit	RDL	RUC	ODWQS	98-3-U 2011-05-11	98-3-U 2012-05-02	98-3-U 2012-11-12	98-3-U 2013-06-04	98-3-U 2013-12-05	98-3-U 2014-05-12	98-3-U 2014-10-27	98-3-U 2015-04-07	98-3-U 2015-10-28	98-3-U 2016-04-01
Metals														
Barium (Filtered)	µg/L	1	***317***	**1000**	98	134	141	123	169	139	167	123	171	40
Boron (Filtered)	µg/L	5	***2509***	**5000**	30	66	92	46	52	34	129	67	92	239
Calcium (Filtered)	µg/L	20			110,000	116,000	127,000	116,000	145,000	130,000	140,000	113,000	141,000	63,800
Chloride	µg/L	500	***173500***	**250000**	18,000	10,600	11,700	15,300	23,900	112,000	19,600	13,400	18,700	11,500
Iron (Filtered)	µg/L	5	***155***	**300**	<100	<10	15	<10	<10	<10	<10	<10	<10	20
Manganese (Filtered)	µg/L	1	***26***	**50**	-	<2	***38***	***46***	<2	11	12	<2	<2	19
Magnesium (Filtered)	µg/L	20			6,800	7,900	8,390	8,710	8,890	4,170	9,290	7,610	9,110	26,900
Sodium (Filtered)	µg/L	200	***128500***	**200000**	9,300	5,920	5,460	8,480	9,090	71,900	13,800	7,530	11,500	12,400
Inorganics														
Alkalinity (as CaCO3)	mg/L	5	***400***	**500**	274	293	323	296	***403***	311	356	283	346	207
Hardness (as CaCO3) (Filtered)	mg/L	1	***421***	**500**	-	322	352	326	399	342	388	313	390	270
Solids - Total Dissolved (TDS)	mg/L	3	***502***	**500**	382	384	360	370	456	490	472	324	434	326
Solids - Total Suspended (TSS)	mg/L	3			-	360	359	5,200	348	64	146	608	458	87
Oxygen Demand - Chemical (COD)	mg/L	5			<4	7	<5	<5	6	7	<5	<5	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	1.6	2.5	***3.8***	2	2.8	2.1	1.9	1.8	1.7	0.8
Oxygen Demand - Biological (BOD)	mg/L	3			-	<5	<5	<5	<5	<5	<5	<5	<5	<5
Sulphate (Filtered)	mg/L	1	***259***	**500**	13	24.1	16.9	19.6	17.4	21.1	23.3	21.6	19.8	86.2
Ammonia	mg/L	0.01			<0.05	<0.02	0.18	<0.02	0.02	<0.02	0.15	<0.02	<0.02	0.06
Nitrate (as N)	mg/L	0.05	***3.2***	**10**	0.6	***3.42***	1.76	2.54	2.96	1.32	2.47	1.99	1.76	<0.25
Conductivity (lab)	µS/cm	1			597	607	654	679	837	988	842	611	745	570
pH (Lab)	-			**6.5-8.5**	7.79	8.04	8.01	7.7	7.84	7.92	7.83	8.19	8.03	8.14
Field														
DO (Field)	mg/L				-	-	-	-	-	-	-	-	-	5.6
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	-	-
Temp (Field)	°C				-	-	-	-	-	-	-	-	-	8.1
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	-	990
pH (Field)	-			**6.5-8.5**	-	-	-	-	-	-	-	-	-	7.4

Table 5 - Groundwater Quality - Interface/Upper Bedrock

	Unit	RDL	RUC	ODWQS	98-3-U 2016-10-01	98-3-U 2017-06-07	98-3-U 2017-10-04	98-3-U 2018-05-28	98-3-U 2018-11-15	98-3-U 2019-04-15	98-3-U 2019-11-11	98-3-U 2020-04-20	98-3-U 2020-11-09
Metals													
Barium (Filtered)	µg/L	1	***317***	**1000**	169	179	167	219	140	76	131	235	170
Boron (Filtered)	µg/L	5	***2509***	**5000**	117	25	109	34	65	20	51	28	80
Calcium (Filtered)	µg/L	20			142,000	158,000	143,000	182,000	126,000	81,300	122,000	202,000	151,000
Chloride	µg/L	500	***173500***	**250000**	22,500	76,200	34,900	147,000	24,600	40,000	33,400	163,000	30,200
Iron (Filtered)	µg/L	5	***155***	**300**	<10	<5	5	<5	<5	<5	6	<5	<5
Manganese (Filtered)	µg/L	1	***26***	**50**	6	***144***	1	***142***	<1	<1	4	3	1
Magnesium (Filtered)	µg/L	20			8,620	8,490	9,050	10,700	7,270	4,730	7,730	10,900	8,090
Sodium (Filtered)	µg/L	200	***128500***	**200000**	11,200	69,600	25,800	85,300	17,300	20,600	17,000	86,500	13,700
Inorganics													
Alkalinity (as CaCO3)	mg/L	5	***400***	**500**	396	390	360	***412***	311	203	299	377	317
Hardness (as CaCO3) (Filtered)	mg/L	1	***421***	**500**	390	***430***	395	***499***	345	223	337	***550***	411
Solids - Total Dissolved (TDS)	mg/L	3	***502***	**500**	446	***606***	479	***647***	374	299	379	***677***	398
Solids - Total Suspended (TSS)	mg/L	3			273	-	-	-	-	-	-	-	-
Oxygen Demand - Chemical (COD)	mg/L	5			<5	7	5	<5	<5	20	40	24	40
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	1.8	***5.1***	***8.1***	***8***	2.3	2.9	2.3	3.3	1.1
Oxygen Demand - Biological (BOD)	mg/L	3			<5	-	-	-	-	-	-	-	-
Sulphate (Filtered)	mg/L	1	***259***	**500**	23.9	26	22	27	14	11	11	22	16
Ammonia	mg/L	0.01			<0.02	0.02	<0.01	0.03	0.03	0.06	0.05	0.02	0.03
Nitrate (as N)	mg/L	0.05	***3.2***	**10**	1.63	2.78	2.17	1.56	1.6	1.31	1.85	1.01	1.07
Conductivity (lab)	µS/cm	1			784	1,100	871	1,200	718	576	727	1,250	760
pH (Lab)	-			**6.5-8.5**	7.02	7.31	7.61	7.47	7.72	7.9	7.63	7.43	7.58
Field													
DO (Field)	mg/L				7.2	2.59	4.98	2.61	5.75	8.52	5.98	2.8	6.7
Redox Potential (Field)	mV				-	-5	128	98	120	148	111	75	263
Temp (Field)	°C				11.2	11.2	13.1	11.2	9.9	7	9.1	7.8	10.9
Conductivity (field)	µS/cm				699	1,220	990	1,360	720	520	730	830	602
pH (Field)	-			**6.5-8.5**	8	6.68	6.94	6.73	7.5	7.55	7.16	7.05	6.92

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	00-1-L 2011-05-11	00-1-L 2012-05-02	00-1-L 2012-11-28	00-1-L 2013-06-04	00-1-L 2013-12-05	00-1-L 2014-05-12	00-1-L 2014-10-27	00-1-L 2015-04-06	00-1-L 2015-10-27	00-1-L 2016-04-01
Metals														
Barium (Filtered)	µg/L	1	***267***	**1000**	22	20	20	20	18	70	19	17	19	23
Boron (Filtered)	µg/L	5	***2623***	**5000**	310	333	292	241	335	15	315	442	404	218
Calcium (Filtered)	µg/L	20			110,000	105,000	102,000	123,000	104,000	94,100	107,000	114,000	115,000	104,000
Chloride	µg/L	500	***142000***	**250000**	31,000	29,400	34,900	16,000	16,500	18,100	21,200	5,780	6,500	19,900
Iron (Filtered)	µg/L	5	***166***	**300**	***500***	***876***	***232***	<10	***276***	<10	54	***594***	15	29
Manganese (Filtered)	µg/L	1	***30***	**50**	-	***93***	9	14	9	20	***71***	25	8	6
Magnesium (Filtered)	µg/L	20			38,000	38,000	36,000	46,700	38,700	33,200	39,000	42,500	41,500	38,300
Sodium (Filtered)	µg/L	200	***114200***	**200000**	29,000	27,400	23,500	30,100	34,800	10,200	23,100	23,000	31,100	38,700
Inorganics														
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	243	242	241	234	228	222	240	208	215	238
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	-	419	403	***499***	419	387	428	***460***	***458***	417
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	***538***	***582***	***514***	***644***	***634***	380	***604***	***638***	***654***	***614***
Solids - Total Suspended (TSS)	mg/L				-	48	19	36	<10	197	24	46	22	26
Oxygen Demand - Chemical (COD)	mg/L	5			<4	9	<5	7	7	7	<5	<5	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	0.9	2.4	1.7	1	1.4	1.5	2.4	1.5	***3.7***	1.1
Oxygen Demand - Biological (BOD)	mg/L				-	<5	<5	<5	<5	<5	<5	<5	<5	<5
Sulphate (Filtered)	mg/L	1	***326***	**500**	170	224	196	278	279	241	232	309	300	266
Ammonia	mg/L	0.01			<0.05	<0.02	<0.02	0.02	0.03	0.07	0.5	0.04	<0.02	<0.02
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	0.2	0.12	0.07	<0.25	<0.25	0.13	0.53	<0.25	<0.25	0.35
Conductivity (lab)	µS/cm	1			883	865	804	981	936	914	940	926	967	944
pH (Lab)	-			**6.5-8.5**	8.04	8.2	8.27	7.87	8.27	8.18	8.12	8.2	8.07	8.05
Field														
DO (Field)	mg/L				-	-	-	-	-	-	-	-	-	7.9
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	-	-
Temp (Field)	°C				-	-	-	-	-	-	-	-	-	6.9
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	-	957
pH (Field)	-			**6.5-8.5**	-	-	-	-	-	-	-	-	-	8.2

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	00-1-L 2016-10-01	00-1-L 2017-06-07	00-1-L 2017-10-04	00-1-L 2018-05-28	00-1-L 2018-11-15	00-1-L 2019-04-15	00-1-L 2019-11-11	00-1-L 2020-04-20	00-1-L 2020-11-09
Metals													
Barium (Filtered)	µg/L	1	***267***	**1000**	19	36	22	19	16	14	33	33	37
Boron (Filtered)	µg/L	5	***2623***	**5000**	385	259	379	483	434	410	247	340	317
Calcium (Filtered)	µg/L	20			107,000	107,000	108,000	111,000	113,000	104,000	96,200	110,000	116,000
Chloride	µg/L	500	***142000***	**250000**	10,600	30,500	16,400	6,300	6,300	6,200	45,700	20,900	11,100
Iron (Filtered)	µg/L	5	***166***	**300**	166	143	30	***258***	***201***	***398***	42	***191***	13
Manganese (Filtered)	µg/L	1	***30***	**50**	9	22	2	12	11	14	4	6	4
Magnesium (Filtered)	µg/L	20			38,100	28,600	41,200	48,900	45,700	43,400	29,500	35,900	31,900
Sodium (Filtered)	µg/L	200	***114200***	**200000**	31,700	44,600	35,600	31,300	30,400	27,200	45,100	45,800	43,800
Inorganics													
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	231	223	215	205	192	192	225	216	183
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	424	384	439	***478***	***470***	438	362	423	421
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	***640***	***515***	***527***	471	***524***	487	451	473	468
Solids - Total Suspended (TSS)	mg/L				35	-	-	-	-	-	-	-	-
Oxygen Demand - Chemical (COD)	mg/L	5			<5	35	<5	<5	5	20	8	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	2.2	2.2	***4.7***	***3.7***	2.6	***4.2***	2.7	2	1.1
Oxygen Demand - Biological (BOD)	mg/L				<5	-	-	-	-	-	-	-	-
Sulphate (Filtered)	mg/L	1	***326***	**500**	308	177	225	284	293	285	165	252	275
Ammonia	mg/L	0.01			<0.02	<0.01	<0.01	0.03	0.05	0.06	0.01	<0.01	0.03
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	0.27	0.57	0.27	0.08	0.06	0.06	0.36	0.28	0.11
Conductivity (lab)	µS/cm	1			950	936	959	890	938	918	854	893	884
pH (Lab)	-			**6.5-8.5**	7.47	7.86	8.09	7.95	7.91	7.98	7.89	7.83	7.84
Field													
DO (Field)	mg/L				8.7	6.3	6.98	6.75	4.2	3.56	8.31	6.47	6.85
Redox Potential (Field)	mV				-	56	164	103	112	154	170	154	260
Temp (Field)	°C				8.6	13.5	10.7	12.8	7.2	7	6.3	9.1	10.4
Conductivity (field)	µS/cm				832	1,040	910	960	870	790	880	920	690
pH (Field)	-			**6.5-8.5**	7.2	7.42	7.6	7.57	7.38	7.39	7.02	7.93	7.48

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	00-1-M 2011-05-11	00-1-M 2012-05-02	00-1-M 2012-11-28	00-1-M 2013-06-04	00-1-M 2013-12-05	00-1-M 2014-05-13	00-1-M 2014-10-27	00-1-M 2015-04-06	00-1-M 2015-11-05	00-1-M 2016-04-01	00-1-M 2016-10-01
Metals															
Barium (Filtered)	µg/L	1	***267***	**1000**	23	25	26	22	26	24	22	23	20	25	32
Boron (Filtered)	µg/L	5	***2623***	**5000**	240	231	232	220	209	236	246	242	194	230	223
Calcium (Filtered)	µg/L	20			100,000	99,700	103,000	111,000	93,900	101,000	94,200	97,500	99,500	95,300	99,300
Chloride	µg/L	500	***142000***	**250000**	36,000	42,500	42,100	38,100	39,000	65,100	37,500	39,200	34,900	38,600	39,700
Iron (Filtered)	µg/L	5	***166***	**300**	***200***	15	<10	<10	<10	<10	14	<10	<10	34	86
Manganese (Filtered)	µg/L	1	***30***	**50**	-	6	4	4	2	<2	16	***35***	19	19	***60***
Magnesium (Filtered)	µg/L	20			35,000	34,300	34,400	39,000	32,600	4,060	32,500	32,600	32,800	33,700	30,300
Sodium (Filtered)	µg/L	200	***114200***	**200000**	28,000	16,300	12,400	12,500	10,700	38,500	39,400	30,200	34,300	28,800	25,700
Inorganics															
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	256	268	254	255	265	254	267	277	291	285	305
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	-	390	399	438	369	269	369	378	384	377	373
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	***522***	***550***	470	500	464	486	***530***	496	482	***504***	***504***
Solids - Total Suspended (TSS)	mg/L				-	89	56	396	66	78	34	<10	304	1,700	1,090
Oxygen Demand - Chemical (COD)	mg/L	5			6	8	<5	<5	<5	<5	<5	<5	22	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	1	1.7	3	2	2.4	2.1	1.1	1.5	1.7	1.2	1.9
Oxygen Demand - Biological (BOD)	mg/L				-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Sulphate (Filtered)	mg/L	1	***326***	**500**	130	129	107	128	113	15.7	137	132	113	132	139
Ammonia	mg/L	0.01			0.28	0.04	<0.02	0.12	0.03	0.05	0.1	0.07	0.15	0.06	0.16
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	0.1	0.2	0.1	<0.25	0.33	0.43	<0.1	<0.25	0.41	<0.25	<0.25
Conductivity (lab)	µS/cm	1			845	788	748	854	784	822	918	838	861	857	861
pH (Lab)	-			**6.5-8.5**	8.08	8.16	8.17	7.9	8.17	8.16	7.94	8.29	8.24	8.11	7.45
Field															
DO (Field)	mg/L				-	-	-	-	-	-	-	-	-	7.9	8.7
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	-	-	-
Temp (Field)	°C				-	-	-	-	-	-	-	-	-	9.1	9
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	-	870	730
pH (Field)	-			**6.5-8.5**	-	-	-	-	-	-	-	-	-	8.1	7.4

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	00-1-M 2017-06-07	00-1-M 2017-10-04	00-1-M 2018-05-28	00-1-M 2018-11-15	00-1-M 2019-04-15	00-1-M 2019-11-11	00-1-M 2020-04-20	00-1-M 2020-11-09
Metals												
Barium (Filtered)	µg/L	1	***267***	**1000**	24	27	27	26	23	23	27	30
Boron (Filtered)	µg/L	5	***2623***	**5000**	240	232	267	241	239	250	264	233
Calcium (Filtered)	µg/L	20			100,000	95,800	103,000	104,000	97,200	91,800	106,000	106,000
Chloride	µg/L	500	***142000***	**250000**	30,900	33,100	37,500	36,900	35,400	37,400	36,700	35,900
Iron (Filtered)	µg/L	5	***166***	**300**	***501***	14	***376***	107	<5	<5	5	13
Manganese (Filtered)	µg/L	1	***30***	**50**	***60***	3	***38***	17	4	2	1	9
Magnesium (Filtered)	µg/L	20			35,500	32,900	39,100	36,300	33,500	35,700	37,100	33,600
Sodium (Filtered)	µg/L	200	***114200***	**200000**	26,400	18,600	21,700	16,400	14,700	20,900	26,500	30,800
Inorganics												
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	87	270	276	262	256	253	260	254
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	397	375	418	409	381	376	417	403
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	500	447	148	428	432	416	425	422
Solids - Total Suspended (TSS)	mg/L				-	-	-	-	-	-	-	-
Oxygen Demand - Chemical (COD)	mg/L	5			9	<5	<5	<5	<5	11	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	3.4	***6.6***	***12.6***	3.4	2.8	***5.5***	2.1	0.9
Oxygen Demand - Biological (BOD)	mg/L				-	-	-	-	-	-	-	-
Sulphate (Filtered)	mg/L	1	***326***	**500**	104	87	113	104	114	117	114	107
Ammonia	mg/L	0.01			0.14	<0.01	0.04	0.07	0.07	0.02	0.01	0.04
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	0.12	0.11	0.09	0.2	0.11	0.05	0.16	<0.05
Conductivity (lab)	µS/cm	1			909	812	796	813	820	793	808	804
pH (Lab)	-			**6.5-8.5**	6.62	8.08	8.09	7.9	8	7.92	7.87	7.89
Field												
DO (Field)	mg/L				3.13	8.27	7.86	2.96	7.83	7.59	6.22	7.94
Redox Potential (Field)	mV				68	153	116	129	157	167	144	63
Temp (Field)	°C				9.5	10.4	14.2	7.9	619	6.8	7.9	8.2
Conductivity (field)	µS/cm				950	780	850	760	710	810	860	892
pH (Field)	-			**6.5-8.5**	7.18	7.49	7.57	7.2	7.41	7.16	7.83	7.45

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	97-1-L 2011-05-11	97-1-L 2012-05-02	97-1-L 2012-11-29	97-1-L 2013-06-04	97-1-L 2013-12-05	97-1-L 2014-05-12	97-1-L 2014-10-27	97-1-L 2015-10-28	97-1-L 2016-10-01	97-1-L 2017-06-07
Metals														
Barium (Filtered)	µg/L	1	***267***	**1000**	29	31	28	23	39	40	49	47	72	51
Boron (Filtered)	µg/L	5	***2623***	**5000**	250	247	277	215	199	197	186	251	221	239
Calcium (Filtered)	µg/L	20			69,000	68,200	69,300	98,400	73,100	81,800	88,500	80,700	89,900	86,500
Chloride	µg/L	500	***142000***	**250000**	11,000	10,000	10,000	13,300	9,950	19,000	20,400	9,900	14,900	19,300
Iron (Filtered)	µg/L	5	***166***	**300**	<100	<10	<10	<10	<10	<10	<10	<10	<10	<5
Manganese (Filtered)	µg/L	1	***30***	**50**	-	<2	<2	<2	<2	***52***	2	2	<2	<1
Magnesium (Filtered)	µg/L	20			26,000	27,000	27,200	24,100	23,600	22,000	24,600	26,100	23,500	29,600
Sodium (Filtered)	µg/L	200	***114200***	**200000**	16,000	16,300	15,300	12,600	15,000	13,600	18,800	17,400	18,000	23,200
Inorganics														
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	204	213	201	275	233	228	266	246	277	242
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	-	281	285	345	280	295	322	309	321	338
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	356	386	342	336	342	372	436	402	410	387
Solids - Total Suspended (TSS)	mg/L				-	32	26	60	13	53	13	24	13	-
Oxygen Demand - Chemical (COD)	mg/L	5			5	6	<5	<5	<5	<5	<5	<5	<5	7
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	0.8	1.1	1.3	2	1.7	1.9	1.2	1.3	1.7	2.1
Oxygen Demand - Biological (BOD)	mg/L				-	<5	<5	<5	<5	<5	<5	<5	<5	-
Sulphate (Filtered)	mg/L	1	***326***	**500**	78	104	95.4	51.9	84.9	57.7	74.1	90.6	93.2	76
Ammonia	mg/L	0.01			<0.05	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.01
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	1.1	1.19	0.95	2.19	1.23	1.03	0.81	1.18	1.86	1.8
Conductivity (lab)	µS/cm	1			579	577	553	684	619	621	743	658	688	704
pH (Lab)	-			**6.5-8.5**	8.08	8.21	8.19	7.94	8.15	8.15	7.75	7.79	7.21	7.94
Field														
DO (Field)	mg/L				-	-	-	-	-	-	-	-	7.7	9.06
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	-	37
Temp (Field)	°C				-	-	-	-	-	-	-	-	9.9	13.4
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	623	730
pH (Field)	-			**6.5-8.5**	-	-	-	-	-	-	-	-	7.1	7.72

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	97-1-L 2017-10-04	97-1-L 2018-05-28	97-1-L 2018-11-15	97-1-L 2019-04-15	97-1-L 2019-11-11	97-1-L 2020-04-20	97-1-L 2020-05-16	97-1-L 2020-11-09
Metals												
Barium (Filtered)	µg/L	1	***267***	**1000**	57	45	45	40	63	59	48	53
Boron (Filtered)	µg/L	5	***2623***	**5000**	213	258	226	199	145	207	215	238
Calcium (Filtered)	µg/L	20			85,100	81,700	76,400	70,500	76,000	83,900	84,000	88,300
Chloride	µg/L	500	***142000***	**250000**	38,000	15,700	19,600	16,600	23,800	18,800	15,400	28,800
Iron (Filtered)	µg/L	5	***166***	**300**	5	<5	<5	<5	<5	<5	66	26
Manganese (Filtered)	µg/L	1	***30***	**50**	1	2	<1	1	<1	1	30	4
Magnesium (Filtered)	µg/L	20			27,400	30,300	26,700	23,700	21,000	26,300	27,100	27,800
Sodium (Filtered)	µg/L	200	***114200***	**200000**	23,500	24,800	19,900	16,300	22,900	19,700	19,000	19,500
Inorganics												
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	262	225	215	220	225	230	268	229
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	325	329	301	274	276	318	321	335
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	423	323	335	322	325	328	392	356
Solids - Total Suspended (TSS)	mg/L				-	-	-	-	-	-	20	-
Oxygen Demand - Chemical (COD)	mg/L	5			7	<5	6	26	<5	<5	<5	14
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	***3.9***	***8.4***	2.3	3.5	***6.1***	2.3	1.2	1
Oxygen Demand - Biological (BOD)	mg/L				-	-	-	-	-	-	<5	-
Sulphate (Filtered)	mg/L	1	***326***	**500**	59	93	83	66	60	69	82.3	87
Ammonia	mg/L	0.01			<0.01	0.01	0.02	0.04	<0.01	<0.01	<0.02	0.01
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	1.77	1.16	0.99	1.33	1.72	1.47	2.02	0.11
Conductivity (lab)	µS/cm	1			769	622	645	621	627	631	684	685
pH (Lab)	-			**6.5-8.5**	7.94	8.09	7.98	8.08	7.78	7.9	8.12	7.84
Field												
DO (Field)	mg/L				10.64	8.47	8.75	11.39	8.05	8.92	10.2	7.84
Redox Potential (Field)	mV				159	102	104	144	136	49	-	275
Temp (Field)	°C				13.1	13.1	9.3	7	8.3	10.4	10.6	11.1
Conductivity (field)	µS/cm				690	650	630	570	680	520	750	513
pH (Field)	-			**6.5-8.5**	7.71	7.65	7.75	7.8	7.26	8.15	8	7.23

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	97-1-M 2011-05-01	97-1-M 2012-05-02	97-1-M 2012-11-29	97-1-M 2013-06-04	97-1-M 2013-12-05	97-1-M 2014-05-12	97-1-M 2014-10-27	97-1-M 2015-04-06	97-1-M 2015-10-29	97-1-M 2016-04-01
Metals														
Barium (Filtered)	µg/L	1	***267***	**1000**	39	38	36	69	65	77	113	60	51	194
Boron (Filtered)	µg/L	5	***2623***	**5000**	190	193	280	173	195	103	135	227	247	55
Calcium (Filtered)	µg/L	20			69,000	69,800	67,500	89,500	70,500	110,000	96,000	80,500	72,700	151,000
Chloride	µg/L	500	***142000***	**250000**	11,000	10,300	9,880	11,700	10,200	28,400	21,300	12,000	9,900	37,900
Iron (Filtered)	µg/L	5	***166***	**300**	<100	<10	<10	<10	<10	<10	<20	<10	<10	<10
Manganese (Filtered)	µg/L	1	***30***	**50**	-	<2	4	<2	<2	<2	<2	6	<2	<2
Magnesium (Filtered)	µg/L	20			22,000	25,900	27,100	22,600	22,600	15,400	23,200	25,100	26,100	21,000
Sodium (Filtered)	µg/L	200	***114200***	**200000**	12,000	15,300	13,000	10,400	12,400	24,800	19,100	15,300	12,100	28,900
Inorganics														
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	209	219	214	251	237	320	289	239	240	***402***
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	-	281	280	317	269	338	335	304	289	***464***
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	396	364	350	378	354	446	412	356	332	***524***
Solids - Total Suspended (TSS)	mg/L				-	146	154	163	47	116	192	214	59	164
Oxygen Demand - Chemical (COD)	mg/L	5			<5	<5	<5	5	<5	<5	<5	<5	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	0.9	1.1	1.5	2	***4.5***	2	2.5	2	0.8	2.8
Oxygen Demand - Biological (BOD)	mg/L				-	<5	<5	<5	<5	<5	<5	<5	<5	<5
Sulphate (Filtered)	mg/L	1	***326***	**500**	57	84.5	103	55.7	76	45.6	52.2	81.8	74	35.5
Ammonia	mg/L	0.01			<0.05	<0.02	<0.02	0.61	<0.02	0.03	0.05	0.03	<0.02	<0.02
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	1	1.26	1.12	1.66	1.36	1.4	1.52	1.33	1.45	***5.54***
Conductivity (lab)	µS/cm	1			538	568	567	648	622	798	755	622	599	917
pH (Lab)	-			**6.5-8.5**	8	8.1	8.08	7.88	8.03	8.13	7.92	8.27	7.93	7.98
Field														
DO (Field)	mg/L				-	-	-	-	-	-	-	-	-	11
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	-	-
Temp (Field)	°C				-	-	-	-	-	-	-	-	-	12.3
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	-	942
pH (Field)	-			**6.5-8.5**	-	-	-	-	-	-	-	-	-	8.2

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	97-1-M 2016-10-01	97-1-M 2017-06-07	97-1-M 2017-10-04	97-1-M 2018-05-28	97-1-M 2018-11-15	97-1-M 2019-04-15	97-1-M 2019-11-11	97-1-M 2020-04-20	97-1-M 2020-11-09
Metals													
Barium (Filtered)	µg/L	1	***267***	**1000**	81	104	81	62	61	117	68	109	64
Boron (Filtered)	µg/L	5	***2623***	**5000**	210	108	209	200	236	38	168	122	248
Calcium (Filtered)	µg/L	20			88,400	117,000	88,900	78,000	84,400	91,400	76,400	93,500	89,200
Chloride	µg/L	500	***142000***	**250000**	15,400	77,200	28,900	21,700	17,200	28,200	25,700	20,400	22,800
Iron (Filtered)	µg/L	5	***166***	**300**	<10	<5	5	<5	<5	<5	<5	<5	10
Manganese (Filtered)	µg/L	1	***30***	**50**	2	<1	<1	<1	<1	4	<1	<1	1
Magnesium (Filtered)	µg/L	20			23,700	24,800	25,500	24,500	28,100	8,950	24,400	19,000	29,700
Sodium (Filtered)	µg/L	200	***114200***	**200000**	16,300	48,100	23,300	21,800	18,600	21,600	20,700	18,500	15,600
Inorganics													
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	298	293	240	221	230	266	230	239	212
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	318	394	327	296	326	265	291	312	345
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	410	***518***	392	307	343	325	335	318	334
Solids - Total Suspended (TSS)	mg/L				221	-	-	-	-	-	-	-	-
Oxygen Demand - Chemical (COD)	mg/L	5			<5	8	6	8	13	11	8	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	1.8	2.5	***6.1***	***51.1***	2	3.3	***8.5***	2.7	1.3
Oxygen Demand - Biological (BOD)	mg/L				<5	-	-	-	-	-	-	-	-
Sulphate (Filtered)	mg/L	1	***326***	**500**	85.8	38	64	66	80	16	70	44	80
Ammonia	mg/L	0.01			<0.02	<0.01	<0.01	0.01	0.03	0.05	<0.01	0.02	<0.01
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	1.68	***3.14***	1.4	0.93	1.08	2.11	1.56	1.32	0.18
Conductivity (lab)	µS/cm	1			690	941	712	591	660	625	646	612	644
pH (Lab)	-			**6.5-8.5**	7.37	7.92	7.96	8.09	7.87	8.05	7.77	7.88	7.92
Field													
DO (Field)	mg/L				7.46	10.33	9.09	11.62	9.03	10.26	9.29	8.55	6.6
Redox Potential (Field)	mV				-	14	155	-17	105	151	140	65	275
Temp (Field)	°C				10.3	12	13.1	12.4	6.5	6	5.7	9.3	10.4
Conductivity (field)	µS/cm				631	960	700	640	660	570	690	660	506
pH (Field)	-			**6.5-8.5**	7.2	7.54	7.66	7.54	7.9	7.45	7.45	7.78	7.43

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	97-2-L 2011-05-01	97-2-L 2012-05-02	97-2-L 2012-11-29	97-2-L 2013-06-04	97-2-L 2013-12-05	97-2-L 2014-05-12	97-2-L 2014-10-27	97-2-L 2015-10-28	97-2-L 2016-04-01	97-2-L 2016-10-01
Metals														
Barium (Filtered)	µg/L	1	***267***	**1000**	23	21	24	20	25	22	23	25	27	25
Boron (Filtered)	µg/L	5	***2623***	**5000**	860	680	912	713	709	756	793	765	682	709
Calcium (Filtered)	µg/L	20			61,000	59,200	60,600	61,800	49,800	50,600	52,800	56,600	58,100	61,200
Chloride	µg/L	500	***142000***	**250000**	4,000	4,500	4,470	4,400	4,100	4,560	4,050	3,160	4,120	3,540
Iron (Filtered)	µg/L	5	***166***	**300**	<100	<10	<10	<10	<10	<10	<10	<10	45	24
Manganese (Filtered)	µg/L	1	***30***	**50**	-	<2	<2	<2	3	<2	12	8	10	20
Magnesium (Filtered)	µg/L	20			29,000	27,500	27,700	29,500	25,200	26,700	26,000	26,500	27,800	27,200
Sodium (Filtered)	µg/L	200	***114200***	**200000**	27,000	25,300	25,400	27,700	24,400	26,100	24,500	24,200	24,100	23,500
Inorganics														
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	185	191	185	182	186	163	168	183	184	179
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	-	261	265	276	228	236	239	250	260	265
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	384	406	406	390	360	380	370	394	-	426
Solids - Total Suspended (TSS)	mg/L				-	76	173	54	53	79	250	195	-	217
Oxygen Demand - Chemical (COD)	mg/L	5			7	<5	<5	<5	<5	5	<5	<5	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	0.6	***4.1***	1.8	<1	1.1	2.2	0.9	***4.2***	0.9	2.1
Oxygen Demand - Biological (BOD)	mg/L				-	<5	<5	<5	<5	<5	<5	<5	<5	<5
Sulphate (Filtered)	mg/L	1	***326***	**500**	140	160	150	141	140	142	143	143	152	169
Ammonia	mg/L	0.01			0.05	<0.02	<0.02	<0.02	0.03	0.02	0.05	<0.02	<0.02	0.19
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	0.4	0.87	0.47	0.48	<0.1	0.41	<0.1	<0.25	<0.25	<0.25
Conductivity (lab)	µS/cm	1			651	619	614	662	603	620	644	631	639	601
pH (Lab)	-			**6.5-8.5**	8.02	8.25	8.12	7.85	8.09	8.19	8.11	7.72	8.12	8.07
Field														
DO (Field)	mg/L				-	-	-	-	-	-	-	-	8.8	9.35
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	-	-
Temp (Field)	°C				-	-	-	-	-	-	-	-	10	9.3
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	1,238	593
pH (Field)	-			**6.5-8.5**	-	-	-	-	-	-	-	-	7.4	7.4

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	97-2-L 2017-06-07	97-2-L 2017-10-04	97-2-L 2018-05-28	97-2-L 2018-11-15	97-2-L 2019-04-15	97-2-L 2019-11-11	97-2-L 2020-04-20	97-2-L 2020-11-09
Metals												
Barium (Filtered)	µg/L	1	***267***	**1000**	22	24	22	21	19	20	24	23
Boron (Filtered)	µg/L	5	***2623***	**5000**	807	809	869	779	730	795	819	807
Calcium (Filtered)	µg/L	20			61,800	55,300	55,700	57,700	51,100	50,100	57,100	65,100
Chloride	µg/L	500	***142000***	**250000**	3,400	3,600	5,100	5,000	5,400	3,500	5,100	4,600
Iron (Filtered)	µg/L	5	***166***	**300**	<5	6	<5	<5	<5	<5	17	77
Manganese (Filtered)	µg/L	1	***30***	**50**	3	1	<1	<1	<1	<1	5	5
Magnesium (Filtered)	µg/L	20			30,200	30,000	31,600	29,400	27,000	28,700	29,300	29,100
Sodium (Filtered)	µg/L	200	***114200***	**200000**	26,900	23,600	29,000	29,700	24,300	26,100	26,800	24,700
Inorganics												
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	176	170	167	159	157	158	158	154
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	278	262	269	265	239	243	263	282
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	353	348	317	329	322	313	311	312
Solids - Total Suspended (TSS)	mg/L				-	-	-	-	-	-	-	-
Oxygen Demand - Chemical (COD)	mg/L	5			<5	<5	<5	<5	12	7	18	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	2.5	2.8	***13.1***	1.8	2.7	<0.2	***4.7***	0.8
Oxygen Demand - Biological (BOD)	mg/L				-	-	-	-	-	-	-	-
Sulphate (Filtered)	mg/L	1	***326***	**500**	128	127	149	155	152	150	146	147
Ammonia	mg/L	0.01			<0.01	<0.01	<0.01	0.04	0.06	0.04	0.05	<0.01
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	0.54	0.33	1.11	1.04	0.23	0.12	0.67	0.22
Conductivity (lab)	µS/cm	1			642	632	611	634	621	603	600	602
pH (Lab)	-			**6.5-8.5**	8.13	8.13	8.1	8.09	8.06	7.97	7.74	8.06
Field												
DO (Field)	mg/L				8.85	9.4	12.18	6.19	12.58	8.34	10.37	11.01
Redox Potential (Field)	mV				1	106	34	125	149	110	37	68
Temp (Field)	°C				14.7	14	19	6.6	6	7.1	10.5	9.3
Conductivity (field)	µS/cm				820	580	680	630	560	640	670	633
pH (Field)	-			**6.5-8.5**	7.87	7.97	7.77	8.14	7.99	8.12	8.46	7.77

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	98-1-L 2011-05-01	98-1-L 2012-05-01	98-1-L 2012-11-01	98-1-L 2013-06-04	98-1-L 2013-12-05	98-1-L 2014-05-12	98-1-L 2014-10-27	98-1-L 2015-04-07	98-1-L 2015-10-28	98-1-L 2016-04-01	98-1-L 2016-10-01
Metals															
Barium (Filtered)	µg/L	1	***267***	**1000**	17	15	15	17	18	16	17	16	17	18	16
Boron (Filtered)	µg/L	5	***2623***	**5000**	680	521	575	662	629	706	697	762	752	647	638
Calcium (Filtered)	µg/L	20			76,000	82,800	66,900	103,000	92,100	81,800	81,700	96,600	111,000	98,900	95,700
Chloride	µg/L	500	***142000***	**250000**	7,000	6,040	5,330	8,330	7,130	7,260	6,530	7,590	6,360	7,030	6,260
Iron (Filtered)	µg/L	5	***166***	**300**	100	<10	<10	<10	***220***	<10	<10	***255***	***235***	<10	<10
Manganese (Filtered)	µg/L	1	***30***	**50**	-	3	<2	<2	17	17	3	18	28	12	<2
Magnesium (Filtered)	µg/L	20			37,000	39,400	30,000	54,500	46,600	44,500	39,500	48,000	55,900	50,800	44,000
Sodium (Filtered)	µg/L	200	***114200***	**200000**	68,000	60,700	67,200	52,800	57,800	55,100	61,600	59,700	53,800	64,100	61,700
Inorganics															
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	214	256	226	199	213	198	225	204	190	199	232
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	-	369	291	***482***	422	388	367	439	***507***	***456***	420
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	***538***	***558***	***650***	***740***	***686***	***730***	***776***	***690***	***742***	***770***	***680***
Solids - Total Suspended (TSS)	mg/L				-	45	27	41	14	29	15	49	46	234	26
Oxygen Demand - Chemical (COD)	mg/L	5			7	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	0.7	1.3	1.1	1	1.8	2.8	0.9	1.3	1	0.7	2.3
Oxygen Demand - Biological (BOD)	mg/L				-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Sulphate (Filtered)	mg/L	1	***326***	**500**	250	283	224	***392***	***353***	***362***	316	***378***	***430***	***409***	***381***
Ammonia	mg/L	0.01			<0.05	<0.02	<0.02	0.11	0.04	<0.02	<0.02	0.03	0.11	<0.02	<0.02
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	0.2	0.06	0.23	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Conductivity (lab)	µS/cm	1			895	932	827	1,130	1,020	1,060	1,030	1,050	1,140	1,080	1,070
pH (Lab)	-			**6.5-8.5**	8.1	8.08	8.22	7.84	8.07	8.2	7.56	8.25	7.81	8.08	7.15
Field															
DO (Field)	mg/L				-	-	-	-	-	-	-	-	-	9.9	7.8
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	-	-	-
Temp (Field)	°C				-	-	-	-	-	-	-	-	-	8.5	9.1
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	-	1,003	877
pH (Field)	-			**6.5-8.5**	-	-	-	-	-	-	-	-	-	8.4	7.1

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	98-1-L 2017-06-07	98-1-L 2017-10-04	98-1-L 2018-05-28	98-1-L 2018-11-15	98-1-L 2019-04-15	98-1-L 2019-11-11	98-1-L 2020-04-20	98-1-L 2020-11-09
Metals												
Barium (Filtered)	µg/L	1	***267***	**1000**	16	16	18	16	14	15	17	17
Boron (Filtered)	µg/L	5	***2623***	**5000**	695	738	770	671	738	763	807	789
Calcium (Filtered)	µg/L	20			91,300	90,600	85,200	79,900	96,700	85,800	98,600	104,000
Chloride	µg/L	500	***142000***	**250000**	5,400	5,400	6,800	6,100	6,300	5,400	7,100	6,200
Iron (Filtered)	µg/L	5	***166***	**300**	<5	5	9	16	***175***	21	130	99
Manganese (Filtered)	µg/L	1	***30***	**50**	7	1	1	1	19	1	7	13
Magnesium (Filtered)	µg/L	20			45,300	49,600	48,100	42,000	54,000	50,800	54,000	51,500
Sodium (Filtered)	µg/L	200	***114200***	**200000**	68,900	61,600	76,500	76,900	54,300	68,500	66,900	63,200
Inorganics												
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	201	193	183	176	167	167	162	157
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	414	430	411	372	***464***	423	***468***	***472***
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	***602***	***590***	***568***	***562***	***596***	***576***	***581***	***548***
Solids - Total Suspended (TSS)	mg/L				-	-	-	-	-	-	-	-
Oxygen Demand - Chemical (COD)	mg/L	5			<5	<5	<5	<5	11	<5	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	***4.2***	***6.8***	***39.1***	2.2	2.8	1.7	1.3	1.7
Oxygen Demand - Biological (BOD)	mg/L				-	-	-	-	-	-	-	-
Sulphate (Filtered)	mg/L	1	***326***	**500**	311	275	***396***	***365***	***376***	***419***	***426***	***390***
Ammonia	mg/L	0.01			0.04	<0.01	0.05	0.06	0.1	0.05	0.06	0.02
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	0.09	0.07	<0.05	0.09	<0.05	<0.05	0.08	0.13
Conductivity (lab)	µS/cm	1			1,090	1,070	1,060	1,050	1,110	1,070	1,080	1,030
pH (Lab)	-			**6.5-8.5**	8.07	8.07	8.05	8.09	8.03	7.95	7.86	7.88
Field												
DO (Field)	mg/L				7.1	7.54	9.05	10.12	9.95	6.6	8.46	6.41
Redox Potential (Field)	mV				12	129	11	130	148	112	64	252
Temp (Field)	°C				22.9	12.9	13	7.3	7	6.8	8.7	9.2
Conductivity (field)	µS/cm				1,160	1,060	1,060	1,020	870	1,070	700	748
pH (Field)	-			**6.5-8.5**	7.72	7.52	7.8	8.11	7.93	7.61	8.4	7.72

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	98-1-M 2011-05-01	98-1-M 2012-05-01	98-1-M 2012-11-01	98-1-M 2013-06-04	98-1-M 2013-12-05	98-1-M 2014-05-12	98-1-M 2014-10-27	98-1-M 2015-10-28	98-1-M 2016-04-01	98-1-M 2016-10-01	98-1-M 2017-06-07
Metals															
Barium (Filtered)	µg/L	1	***267***	**1000**	61	54	69	55	73	65	63	64	66	66	68
Boron (Filtered)	µg/L	5	***2623***	**5000**	280	223	273	228	218	239	280	254	247	275	277
Calcium (Filtered)	µg/L	20			97,000	98,800	104,000	102,000	93,400	80,800	94,200	94,400	96,700	105,000	103,000
Chloride	µg/L	500	***142000***	**250000**	23,000	21,900	23,000	21,800	19,800	19,700	19,900	16,500	18,200	18,400	14,900
Iron (Filtered)	µg/L	5	***166***	**300**	<100	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5
Manganese (Filtered)	µg/L	1	***30***	**50**	-	<2	4	<2	2	<2	12	<2	<2	7	<1
Magnesium (Filtered)	µg/L	20			27,000	26,200	27,300	28,200	25,400	23,400	25,100	24,800	26,300	25,700	28,600
Sodium (Filtered)	µg/L	200	***114200***	**200000**	23,000	20,000	20,500	22,400	23,800	20,500	20,100	20,800	21,700	21,300	23,700
Inorganics															
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	264	306	301	279	293	265	273	281	279	343	299
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	-	355	372	371	338	298	339	338	350	368	376
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	466	476	436	462	408	440	454	438	426	492	428
Solids - Total Suspended (TSS)	mg/L				-	111	39	131	40	78	66	65	241	88	-
Oxygen Demand - Chemical (COD)	mg/L	5			9	<5	<5	<5	<5	7	<5	<5	<5	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	1.2	1.7	1.5	1	2	***5.8***	1.1	1.4	1	2.8	3.4
Oxygen Demand - Biological (BOD)	mg/L				-	<5	<5	<5	<5	<5	<5	<5	<5	<5	-
Sulphate (Filtered)	mg/L	1	***326***	**500**	94	102	101	98.6	99.2	95.2	94.6	93.8	104	109	80
Ammonia	mg/L	0.01			<0.05	<0.02	<0.02	<0.02	0.04	<0.02	0.05	<0.02	<0.02	<0.02	<0.01
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	<0.1	<0.05	<0.05	<0.25	<0.25	<0.1	<0.1	<0.25	<0.25	<0.25	0.12
Conductivity (lab)	µS/cm	1			758	756	749	789	765	750	791	730	740	812	779
pH (Lab)	-			**6.5-8.5**	7.93	8.01	8.18	7.84	7.95	8.18	7.86	7.77	7.88	7.17	7.98
Field															
DO (Field)	mg/L				-	-	-	-	-	-	-	-	8	6.8	8.19
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	-	-	20
Temp (Field)	°C				-	-	-	-	-	-	-	-	9.1	9.6	14.7
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	754	710	850
pH (Field)	-			**6.5-8.5**	-	-	-	-	-	-	-	-	-	7.1	7.26

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	98-1-M 2017-10-04	98-1-M 2018-05-28	98-1-M 2018-11-15	98-1-M 2019-04-15	98-1-M 2019-11-11	98-1-M 2020-04-20	98-1-M 2020-11-09
Metals											
Barium (Filtered)	µg/L	1	***267***	**1000**	65	66	66	59	55	71	69
Boron (Filtered)	µg/L	5	***2623***	**5000**	278	295	264	251	267	289	283
Calcium (Filtered)	µg/L	20			92,900	92,900	94,700	84,700	82,900	94,000	101,000
Chloride	µg/L	500	***142000***	**250000**	15,200	17,700	17,500	16,600	17,000	18,100	17,600
Iron (Filtered)	µg/L	5	***166***	**300**	7	<5	<5	<5	<5	<5	13
Manganese (Filtered)	µg/L	1	***30***	**50**	3	<1	<1	<1	<1	<1	<1
Magnesium (Filtered)	µg/L	20			27,700	29,300	27,200	25,100	27,500	28,100	27,600
Sodium (Filtered)	µg/L	200	***114200***	**200000**	19,800	23,700	21,800	19,400	21,600	21,400	20,200
Inorganics											
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	282	270	260	254	258	247	243
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	346	353	349	315	320	350	366
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	414	366	381	374	371	363	368
Solids - Total Suspended (TSS)	mg/L				-	-	-	-	-	-	-
Oxygen Demand - Chemical (COD)	mg/L	5			<5	<5	8	9	10	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	***4.6***	***5.1***	***4***	2.8	2.5	2.9	1.5
Oxygen Demand - Biological (BOD)	mg/L				-	-	-	-	-	-	-
Sulphate (Filtered)	mg/L	1	***326***	**500**	77	95	94	93	98	90	97
Ammonia	mg/L	0.01			0.02	0.02	0.03	0.04	0.03	0.02	0.01
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	<0.05	0.07	0.07	0.08	<0.05	0.11	0.12
Conductivity (lab)	µS/cm	1			752	705	731	718	715	698	709
pH (Lab)	-			**6.5-8.5**	7.96	8.13	8.04	8.08	7.99	7.84	7.92
Field											
DO (Field)	mg/L				4.45	8.45	7.24	7.35	8.11	8.6	8.46
Redox Potential (Field)	mV				115	3	117	135	99	49	253
Temp (Field)	°C				11.1	13	8.3	7	6.8	9.2	9.7
Conductivity (field)	µS/cm				770	760	700	640	720	600	546
pH (Field)	-			**6.5-8.5**	7.44	7.52	7.94	7.72	7.8	8.3	7.45

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	98-2-L 2011-05-01	98-2-L 2012-05-01	98-2-L 2012-11-01	98-2-L 2013-06-04	98-2-L 2013-12-05	98-2-L 2014-05-12	98-2-L 2014-10-27	98-2-L 2015-04-07	98-2-L 2015-10-27	98-2-L 2016-04-01	98-2-L 2016-10-01
Metals															
Barium (Filtered)	µg/L	1	***267***	**1000**	16	15	14	16	16	17	15	15	15	16	17
Boron (Filtered)	µg/L	5	***2623***	**5000**	1,700	1,600	1,850	1,560	1,470	1,760	1,690	1,650	1,830	1,670	1,670
Calcium (Filtered)	µg/L	20			290,000	257,000	278,000	322,000	270,000	251,000	246,000	311,000	273,000	295,000	273,000
Chloride	µg/L	500	***142000***	**250000**	39,000	44,900	62,800	51,100	50,900	52,700	54,300	61,000	49,900	62,400	58,400
Iron (Filtered)	µg/L	5	***166***	**300**	***1,600***	***1,840***	***1,140***	165	***1,480***	<10	119	***1,610***	***747***	***501***	***433***
Manganese (Filtered)	µg/L	1	***30***	**50**	-	***70***	***73***	***35***	***77***	20	***70***	***77***	***61***	***34***	***44***
Magnesium (Filtered)	µg/L	20			120,000	106,000	114,000	123,000	108,000	104,000	94,100	117,000	105,000	114,000	103,000
Sodium (Filtered)	µg/L	200	***114200***	**200000**	81,000	72,600	76,200	75,600	73,500	74,700	63,700	75,200	77,200	77,400	76,200
Inorganics															
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	19	203	185	200	210	199	198	218	212	223	264
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	-	***1,080***	***1,160***	***1,310***	***1,120***	***1,060***	***1,000***	***1,260***	***1,110***	***1,210***	***1,110***
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	***1,330***	***1,660***	***1,700***	***1,800***	***1,740***	***1,710***	***1,720***	***1,830***	***1,700***	***1,730***	***1,740***
Solids - Total Suspended (TSS)	mg/L				-	22	17	33	20	31	30	14	16	16	15
Oxygen Demand - Chemical (COD)	mg/L	5			<4	<5	6	<5	6	<5	<5	<5	<5	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	0.9	3.6	3.6	2	2.3	1.9	1.2	2.1	1.2	0.9	1.9
Oxygen Demand - Biological (BOD)	mg/L				-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Sulphate (Filtered)	mg/L	1	***326***	**500**	***1,000***	***1,090***	***1,240***	***1,150***	***1,100***	***998***	***976***	***1,100***	***971***	***1,130***	***1,020***
Ammonia	mg/L	0.01			0.48	0.36	0.4	0.12	0.4	0.07	0.19	0.29	0.12	0.2	0.1
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	<0.1	<0.05	<0.1	<0.5	<0.5	<0.5	<0.5	<0.25	<0.5	<0.5	<0.5
Conductivity (lab)	µS/cm	1			2,210	2,000	1,910	2,250	2,130	2,080	2,220	2,220	2,140	2,200	2,160
pH (Lab)	-			**6.5-8.5**	7.76	7.9	8.13	7.85	7.91	7.96	7.76	8.23	7.87	8.04	6.91
Field															
DO (Field)	mg/L				-	-	-	-	-	-	-	-	-	8.7	5.7
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	-	-	-
Temp (Field)	°C				-	-	-	-	-	-	-	-	-	12.1	9.3
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	-	2,205	1,857
pH (Field)	-			**6.5-8.5**	-	-	-	-	-	-	-	-	-	7.6	7

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	98-2-L 2017-06-07	98-2-L 2017-10-04	98-2-L 2018-05-28	98-2-L 2018-11-15	98-2-L 2019-04-15	98-2-L 2019-11-11	98-2-L 2020-04-20	98-2-L 2020-11-09
Metals												
Barium (Filtered)	µg/L	1	***267***	**1000**	13	13	13	13	12	15	14	14
Boron (Filtered)	µg/L	5	***2623***	**5000**	1,710	1,900	2,030	1,860	1,770	1,940	2,040	2,000
Calcium (Filtered)	µg/L	20			267,000	280,000	283,000	301,000	277,000	286,000	306,000	314,000
Chloride	µg/L	500	***142000***	**250000**	53,300	57,300	70,000	71,600	72,500	61,500	79,800	81,400
Iron (Filtered)	µg/L	5	***166***	**300**	<5	***351***	***249***	***516***	***479***	***2,170***	***1,030***	***171***
Manganese (Filtered)	µg/L	1	***30***	**50**	4	***40***	20	***68***	***52***	***76***	***60***	***40***
Magnesium (Filtered)	µg/L	20			111,000	118,000	125,000	117,000	112,000	120,000	122,000	117,000
Sodium (Filtered)	µg/L	200	***114200***	**200000**	77,300	72,000	84,200	83,500	69,400	77,600	78,700	78,200
Inorganics												
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	221	218	242	210	212	213	222	216
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	***1,120***	***1,180***	***1,220***	***1,230***	***1,150***	***1,210***	***1,270***	***1,270***
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	***1,180***	***1,240***	***1,130***	***1,200***	***1,200***	***1,190***	***1,150***	***1,150***
Solids - Total Suspended (TSS)	mg/L				-	-	-	-	-	-	-	-
Oxygen Demand - Chemical (COD)	mg/L	5			8	<5	<5	<5	6	8	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	***5.3***	***12.2***	1.5	2.6	2.2	1.5	1.6	0.3
Oxygen Demand - Biological (BOD)	mg/L				-	-	-	-	-	-	-	-
Sulphate (Filtered)	mg/L	1	***326***	**500**	***811***	***808***	151	***955***	***642***	***1,050***	***966***	***980***
Ammonia	mg/L	0.01			0.07	0.3	0.1	0.17	0.09	0.34	0.29	0.06
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	0.49	<0.05	0.25	0.23	0.28	<0.5	<0.05	0.34
Conductivity (lab)	µS/cm	1			2,140	2,250	2,040	2,170	2,170	2,160	2,090	2,090
pH (Lab)	-			**6.5-8.5**	7.64	7.74	7.72	7.77	7.87	7.69	7.62	7.57
Field												
DO (Field)	mg/L				7.25	6.2	5.94	5.8	4	2.79	8.56	3.25
Redox Potential (Field)	mV				33	125	43	135	155	112	84	248
Temp (Field)	°C				16.3	12.4	12.5	8.1	8	8.2	7.8	9.2
Conductivity (field)	µS/cm				2,400	1,930	2,300	1,650	1,070	2,100	1,400	1,621
pH (Field)	-			**6.5-8.5**	7.16	7.04	7.09	7.56	7.03	7.05	7.63	7.1

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	98-2-M 2011-05-01	98-2-M 2012-05-01	98-2-M 2012-11-01	98-2-M 2013-06-04	98-2-M 2013-12-05	98-2-M 2014-05-12	98-2-M 2014-10-27	98-2-M 2015-04-08	98-2-M 2015-10-28	98-2-M 2016-04-01	98-2-M 2016-10-01
Metals															
Barium (Filtered)	µg/L	1	***267***	**1000**	30	25	29	28	29	28	29	28	27	30	24
Boron (Filtered)	µg/L	5	***2623***	**5000**	400	248	413	378	296	331	374	404	441	337	563
Calcium (Filtered)	µg/L	20			74,000	63,600	71,500	73,600	63,300	55,200	60,600	70,100	66,800	69,000	70,200
Chloride	µg/L	500	***142000***	**250000**	14,000	11,100	12,700	13,900	13,400	11,700	13,700	15,600	13,900	15,800	15,900
Iron (Filtered)	µg/L	5	***166***	**300**	***300***	<10	<10	62	<10	<10	52	28	<10	<10	29
Manganese (Filtered)	µg/L	1	***30***	**50**	-	***54***	***47***	6	6	27	13	15	12	7	17
Magnesium (Filtered)	µg/L	20			27,000	21,000	25,400	28,100	24,000	19,800	22,200	26,200	25,700	25,600	28,200
Sodium (Filtered)	µg/L	200	***114200***	**200000**	22,000	15,700	26,600	19,600	18,100	15,000	15,300	28,600	26,800	19,800	45,600
Inorganics															
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	235	250	240	224	226	193	197	242	225	227	271
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	-	245	283	299	257	219	243	283	273	278	291
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	398	300	370	328	322	326	358	362	***1,770***	340	384
Solids - Total Suspended (TSS)	mg/L				-	238	286	112	72	32	20	115	14	76	124
Oxygen Demand - Chemical (COD)	mg/L	5			7	<5	<5	<5	13	7	<5	<5	<5	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	0.8	***7.2***	***4***	<1	2.1	***6.2***	1.7	1.1	3.2	1.2	1.8
Oxygen Demand - Biological (BOD)	mg/L				-	25	<5	<5	<5	<5	<5	<5	<5	<5	<5
Sulphate (Filtered)	mg/L	1	***326***	**500**	70	57.9	83.7	80.2	79.8	60.3	69	96.4	95.1	87.6	159
Ammonia	mg/L	0.01			0.12	2.06	0.42	0.04	0.09	0.02	<0.02	0.14	0.06	<0.02	0.32
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	<0.1	<0.05	<0.05	0.12	<0.1	0.36	0.28	<0.25	0.58	0.36	<0.25
Conductivity (lab)	µS/cm	1			637	581	592	648	594	522	597	661	646	626	789
pH (Lab)	-			**6.5-8.5**	7.91	7.8	8.1	7.91	7.96	8.02	7.99	8.22	8.07	8.06	7.52
Field															
DO (Field)	mg/L				-	-	-	-	-	-	-	-	-	8.5	6.6
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	-	-	-
Temp (Field)	°C				-	-	-	-	-	-	-	-	-	10.1	9.5
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	-	630	565
pH (Field)	-			**6.5-8.5**	-	-	-	-	-	-	-	-	-	7.9	7.1

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	98-2-M 2017-06-07	98-2-M 2017-10-04	98-2-M 2018-05-28	98-2-M 2018-11-15	98-2-M 2019-04-15	98-2-M 2019-11-11	98-2-M 2020-04-20	98-2-M 2020-11-09
Metals												
Barium (Filtered)	µg/L	1	***267***	**1000**	27	29	32	31	22	27	31	31
Boron (Filtered)	µg/L	5	***2623***	**5000**	294	342	378	338	432	345	351	360
Calcium (Filtered)	µg/L	20			59,300	63,400	69,300	68,900	69,300	61,600	68,700	72,300
Chloride	µg/L	500	***142000***	**250000**	11,700	13,400	16,000	15,600	14,900	16,000	17,900	17,400
Iron (Filtered)	µg/L	5	***166***	**300**	<5	5	<5	13	58	5	5	<5
Manganese (Filtered)	µg/L	1	***30***	**50**	<1	1	1	<1	14	1	<1	<1
Magnesium (Filtered)	µg/L	20			23,200	26,400	29,100	26,400	28,600	26,800	27,200	26,700
Sodium (Filtered)	µg/L	200	***114200***	**200000**	14,700	15,100	17,900	18,200	30,900	18,000	17,000	16,900
Inorganics												
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	193	211	209	200	212	205	192	191
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	244	267	293	281	291	264	284	290
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	298	331	288	306	378	328	293	304
Solids - Total Suspended (TSS)	mg/L				-	-	-	-	-	-	-	-
Oxygen Demand - Chemical (COD)	mg/L	5			11	<5	<5	<5	11	6	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	***17.3***	***5.4***	0.6	2.7	1.4	1.9	1.5	0.8
Oxygen Demand - Biological (BOD)	mg/L				-	-	-	-	-	-	-	-
Sulphate (Filtered)	mg/L	1	***326***	**500**	55	65	80	76	137	103	74	80
Ammonia	mg/L	0.01			0.03	<0.01	0.01	0.02	0.14	0.05	<0.01	0.01
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	0.16	<0.05	0.11	0.1	0.06	<0.05	0.11	0.06
Conductivity (lab)	µS/cm	1			541	602	556	590	725	632	566	587
pH (Lab)	-			**6.5-8.5**	7.98	8.08	8.04	8	8.02	7.99	7.76	7.84
Field												
DO (Field)	mg/L				12.12	10.02	7.1	6.43	4.13	6.16	7.63	5.55
Redox Potential (Field)	mV				5	101	21	113	137	99	72	239
Temp (Field)	°C				12.8	12	13.5	8.7	8	7.9	8.1	9.2
Conductivity (field)	µS/cm				640	530	660	590	640	590	6,108	464
pH (Field)	-			**6.5-8.5**	7.47	7.69	7.55	8.28	7.61	7.79	8.06	7.15

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	98-3-L 2011-05-01	98-3-L 2012-05-02	98-3-L 2012-11-28	98-3-L 2013-06-04	98-3-L 2013-12-05	98-3-L 2014-05-12	98-3-L 2014-10-27	98-3-L 2015-04-08	98-3-L 2015-10-28	98-3-L 2016-04-01
Metals														
Barium (Filtered)	µg/L	1	***267***	**1000**	30	16	15	13	17	16	14	16	16	16
Boron (Filtered)	µg/L	5	***2623***	**5000**	640	534	596	572	620	602	625	617	577	519
Calcium (Filtered)	µg/L	20			74,000	70,100	71,100	79,400	71,700	66,600	70,100	72,800	70,400	75,200
Chloride	µg/L	500	***142000***	**250000**	6,000	5,360	4,210	5,030	4,440	4,400	5,070	5,640	4,240	6,040
Iron (Filtered)	µg/L	5	***166***	**300**	***200***	<10	<10	13	<10	<10	<10	<10	<10	<10
Manganese (Filtered)	µg/L	1	***30***	**50**	-	<2	<2	<2	<2	14	<2	25	***48***	11
Magnesium (Filtered)	µg/L	20			26,000	25,000	24,600	26,100	24,400	24,600	24,200	24,400	24,000	25,900
Sodium (Filtered)	µg/L	200	***114200***	**200000**	65,000	54,500	49,900	64,200	53,600	56,400	50,900	55,600	57,400	60,900
Inorganics														
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	164	172	146	182	165	152	150	164	167	187
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	-	278	279	306	280	268	275	282	275	294
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	488	***540***	476	500	482	498	474	430	***504***	482
Solids - Total Suspended (TSS)	mg/L				-	38	32	398	245	4,810	1,520	1,790	412	1,280
Oxygen Demand - Chemical (COD)	mg/L	5			<4	<5	<5	<5	<5	<5	<5	<5	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	0.5	1	1.2	***43.5***	1.5	***4.5***	0.7	2.1	2.6	0.7
Oxygen Demand - Biological (BOD)	mg/L				-	<5	<5	<5	<5	<5	<5	<5	<5	<5
Sulphate (Filtered)	mg/L	1	***326***	**500**	240	248	233	240	235	244	232	237	210.4	253
Ammonia	mg/L	0.01			<0.05	<0.02	<0.02	0.29	0.05	<0.02	<0.02	0.02	0.02	<0.02
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	0.2	0.2	<0.05	<0.25	0.32	0.12	<0.1	<0.25	0.11	<0.25
Conductivity (lab)	µS/cm	1			794	750	706	779	776	783	791	766	775	795
pH (Lab)	-			**6.5-8.5**	8.13	7.87	8.19	8.02	7.93	8.18	8.13	8.37	7.96	8.02
Field														
DO (Field)	mg/L				-	-	-	-	-	-	-	-	-	10
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	-	-
Temp (Field)	°C				-	-	-	-	-	-	-	-	-	8.8
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	-	770
pH (Field)	-			**6.5-8.5**	-	-	-	-	-	-	-	-	-	8.5

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	98-3-L 2016-10-01	98-3-L 2017-06-07	98-3-L 2017-10-04	98-3-L 2018-05-28	98-3-L 2018-11-15	98-3-L 2019-04-15	98-3-L 2019-11-11	98-3-L 2020-04-20	98-3-L 2020-11-09
Metals													
Barium (Filtered)	µg/L	1	***267***	**1000**	37	14	14	16	14	13	14	16	30
Boron (Filtered)	µg/L	5	***2623***	**5000**	599	572	582	627	555	547	599	589	586
Calcium (Filtered)	µg/L	20			65,400	66,500	65,200	70,900	70,400	67,000	65,700	71,200	77,400
Chloride	µg/L	500	***142000***	**250000**	6,070	4,900	5,000	6,400	6,100	5,900	5,400	6,700	6,700
Iron (Filtered)	µg/L	5	***166***	**300**	***167***	<5	5	6	7	18	33	<5	***176***
Manganese (Filtered)	µg/L	1	***30***	**50**	3	1	1	2	30	***48***	***35***	1	***31***
Magnesium (Filtered)	µg/L	20			22,400	25,100	25,900	28,800	25,900	23,900	26,000	27,100	25,300
Sodium (Filtered)	µg/L	200	***114200***	**200000**	58,300	60,600	55,300	64,500	61,900	57,700	62,700	65,900	65,200
Inorganics													
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	177	170	163	173	169	171	169	165	165
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	256	269	269	296	282	266	271	289	297
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	***550***	433	423	392	407	413	395	394	398
Solids - Total Suspended (TSS)	mg/L				1,330	-	-	-	-	-	-	-	-
Oxygen Demand - Chemical (COD)	mg/L	5			<5	5	<5	<5	24	8	6	10	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	1.6	2.3	***5.7***	***13.3***	2.4	2.7	3	1.5	1.8
Oxygen Demand - Biological (BOD)	mg/L				<5	-	-	-	-	-	-	-	-
Sulphate (Filtered)	mg/L	1	***326***	**500**	246	187	184	218	219	219	219	215	219
Ammonia	mg/L	0.01			0.05	<0.01	<0.01	0.01	0.08	0.07	0.05	0.03	0.05
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	<0.25	0.22	0.13	0.17	0.06	0.05	<0.05	0.09	0.06
Conductivity (lab)	µS/cm	1			757	788	769	750	776	788	756	754	761
pH (Lab)	-			**6.5-8.5**	7.64	8.08	8.14	8.09	8.13	8.09	7.98	7.9	8.03
Field													
DO (Field)	mg/L				8.1	7.89	8.82	7.12	5.56	5.59	4.39	8.03	10.34
Redox Potential (Field)	mV				-	-61	97	-62	128	152	113	70	258
Temp (Field)	°C				9.6	14.9	13.6	15.5	9.3	8	8.3	8.9	11.5
Conductivity (field)	µS/cm				675	850	730	800	710	700	750	600	613
pH (Field)	-			**6.5-8.5**	7.9	7.56	7.81	7.74	8.16	7.96	7.42	8.34	7.8

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	98-3-M 2011-05-03	98-3-M 2012-05-02	98-3-M 2012-11-28	98-3-M 2013-06-04	98-3-M 2013-12-05	98-3-M 2014-05-12	98-3-M 2014-10-27	98-3-M 2015-04-07	98-3-M 2015-10-28	98-3-M 2016-04-01
Metals														
Barium (Filtered)	µg/L	1	***267***	**1000**	41	28	30	52	35	25	27	34	78	171
Boron (Filtered)	µg/L	5	***2623***	**5000**	260	237	282	256	262	244	280	261	244	39
Calcium (Filtered)	µg/L	20			71,000	75,000	68,500	70,700	66,400	60,300	62,300	62,200	60,800	145,000
Chloride	µg/L	500	***142000***	**250000**	12,000	12,300	11,500	10,800	11,100	10,700	10,400	12,000	10,500	51,300
Iron (Filtered)	µg/L	5	***166***	**300**	***500***	***384***	<10	164	***309***	<10	44	***214***	42	<10
Manganese (Filtered)	µg/L	1	***30***	**50**	-	***54***	***82***	***42***	***37***	14	***189***	***58***	***84***	<2
Magnesium (Filtered)	µg/L	20			29,000	28,000	27,500	29,300	26,700	26,500	27,500	26,400	25,600	9,300
Sodium (Filtered)	µg/L	200	***114200***	**200000**	13,000	24,600	12,500	19,400	18,000	15,200	11,500	15,000	11,100	42,300
Inorganics														
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	239	272	213	213	213	196	207	223	209	***382***
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	-	303	284	297	276	260	269	264	257	400
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	372	372	344	346	326	328	328	324	326	***570***
Solids - Total Suspended (TSS)	mg/L				-	352	47	104	37	64	24	34	16	532
Oxygen Demand - Chemical (COD)	mg/L	5			31	<5	<5	8	<5	5	88	<5	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	2.5	1.8	2.3	***30.5***	1.4	3.4	***6.7***	1.7	3.2	***4.1***
Oxygen Demand - Biological (BOD)	mg/L				-	<5	<5	<5	<5	<5	24	6	<5	<5
Sulphate (Filtered)	mg/L	1	***326***	**500**	61	74.4	94.1	83.8	92.7	88.6	88.2	74.9	81.6	29.8
Ammonia	mg/L	0.01			0.07	<0.02	0.03	0.05	0.04	0.02	4.62	0.84	0.05	<0.02
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	<0.1	<0.05	1.88	<0.1	<0.25	<0.1	<0.1	0.49	<0.1	***3.46***
Conductivity (lab)	µS/cm	1			596	633	579	571	601	587	639	589	563	902
pH (Lab)	-			**6.5-8.5**	7.99	8.09	8.07	7.94	7.81	8.12	7.81	8.19	7.94	7.95
Field														
DO (Field)	mg/L				-	-	-	-	-	-	-	-	-	6.9
Redox Potential (Field)	mV				-	-	-	-	-	-	-	-	-	-
Temp (Field)	°C				-	-	-	-	-	-	-	-	-	8.6
Conductivity (field)	µS/cm				-	-	-	-	-	-	-	-	-	591
pH (Field)	-			**6.5-8.5**	-	-	-	-	-	-	-	-	-	8.1

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	98-3-M 2016-10-01	98-3-M 2017-06-07	98-3-M 2017-10-04	98-3-M 2018-05-28	98-3-M 2018-11-15	98-3-M 2019-04-15	98-3-M 2019-11-11	98-3-M 2020-04-20	98-3-M 2020-11-09
Metals													
Barium (Filtered)	µg/L	1	***267***	**1000**	26	25	26	26	25	21	23	24	27
Boron (Filtered)	µg/L	5	***2623***	**5000**	275	251	264	284	257	237	264	272	272
Calcium (Filtered)	µg/L	20			61,800	61,100	60,100	63,400	63,700	58,600	57,700	63,400	69,200
Chloride	µg/L	500	***142000***	**250000**	10,300	9,000	9,200	10,800	11,000	10,000	9,600	11,000	10,500
Iron (Filtered)	µg/L	5	***166***	**300**	<10	<5	7	<5	<5	<5	<5	<5	<5
Manganese (Filtered)	µg/L	1	***30***	**50**	<2	<1	1	1	<1	<1	<1	1	1
Magnesium (Filtered)	µg/L	20			25,500	28,400	29,100	31,400	29,100	26,700	29,400	29,700	28,800
Sodium (Filtered)	µg/L	200	***114200***	**200000**	10,800	11,800	10,700	12,900	12,300	10,200	13,500	11,900	12,800
Inorganics													
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	226	200	197	199	198	187	188	209	178
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	259	269	270	288	279	256	265	281	291
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	334	314	313	278	303	297	289	283	290
Solids - Total Suspended (TSS)	mg/L				22	-	-	-	-	-	-	-	-
Oxygen Demand - Chemical (COD)	mg/L	5			<5	<5	<5	<5	7	10	<5	<5	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	1	***7.6***	***3.9***	***10.4***	1.9	2.3	2	1.5	0.9
Oxygen Demand - Biological (BOD)	mg/L				<5	-	-	-	-	-	-	-	-
Sulphate (Filtered)	mg/L	1	***326***	**500**	91.2	71	71	85	88	85	89	84	88
Ammonia	mg/L	0.01			<0.02	<0.01	<0.01	0.01	0.2	0.06	0.03	<0.01	0.03
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	<0.25	0.11	<0.05	0.08	0.1	0.06	<0.05	0.13	0.36
Conductivity (lab)	µS/cm	1			566	571	569	537	585	573	558	546	560
pH (Lab)	-			**6.5-8.5**	7.71	8.09	8.21	8.12	8.04	8.12	8	7.84	8.04
Field													
DO (Field)	mg/L				6.1	10.21	7.09	8.78	8.33	10.41	7.38	8.65	5.15
Redox Potential (Field)	mV				-	-65	78	-53	111	132	102	44	250
Temp (Field)	°C				9.9	14.3	14.7	16.1	9.7	8	8.3	9.1	9.9
Conductivity (field)	µS/cm				514	590	530	590	550	540	630	490	440
pH (Field)	-			**6.5-8.5**	7.7	7.83	7.76	7.78	8.39	7.99	7.65	**8.51**	7.77

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	BH16-1D 2016-10-01	BH16-1D 2017-06-07	BH16-1D 2017-10-04	BH16-1D 2018-05-28	BH16-1D 2018-11-15	BH16-1D 2019-04-15	BH16-1D 2019-11-11	BH16-1D 2020-04-20	BH16-1D 2020-11-09
Metals													
Barium (Filtered)	µg/L	1	***267***	**1000**	32	16	16	18	15	12	13	20	16
Boron (Filtered)	µg/L	5	***2623***	**5000**	542	565	555	634	550	544	549	601	569
Calcium (Filtered)	µg/L	20			63,300	63,100	61,600	67,100	64,000	60,700	58,700	70,000	73,500
Chloride	µg/L	500	***142000***	**250000**	19,900	11,600	14,300	15,300	16,800	16,000	18,500	18,900	19,200
Iron (Filtered)	µg/L	5	***166***	**300**	<10	<5	18	16	24	10	19	20	54
Manganese (Filtered)	µg/L	1	***30***	**50**	11	12	16	12	12	9	14	11	24
Magnesium (Filtered)	µg/L	20			36,000	38,700	38,700	43,200	39,100	37,700	39,100	41,900	38,700
Sodium (Filtered)	µg/L	200	***114200***	**200000**	26,600	23,100	19,700	24,200	22,500	19,600	21,400	22,400	20,400
Inorganics													
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	234	226	228	223	223	213	219	210	209
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	306	317	313	345	321	307	307	347	343
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	436	392	382	349	356	359	351	357	341
Solids - Total Suspended (TSS)	mg/L				2,230	-	-	-	-	-	-	-	-
Oxygen Demand - Chemical (COD)	mg/L	5			<5	5	<5	<5	<5	8	10	7	<5
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	2.9	***15.1***	1.5	1.4	1.9	2.2	1.7	1.6	1.4
Oxygen Demand - Biological (BOD)	mg/L				<5	-	-	-	-	-	-	-	-
Sulphate (Filtered)	mg/L	1	***326***	**500**	139	110	98	128	110	121	112	126	115
Ammonia	mg/L	0.01			0.03	0.02	0.04	0.05	0.05	0.08	0.05	0.06	0.05
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	<0.25	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Conductivity (lab)	µS/cm	1			724	712	694	672	685	691	675	687	656
pH (Lab)	-			**6.5-8.5**	8.26	7.97	8.11	8.06	8	8.02	7.89	7.97	7.78
Field													
DO (Field)	mg/L				3.9	2.82	5.54	5.03	1.72	3.2	4.13	1.86	11.23
Redox Potential (Field)	mV				-	-10	148	43	104	146	131	160	78
Temp (Field)	°C				9.6	12.3	11.7	13.2	8.3	8	7.9	10.5	12.4
Conductivity (field)	µS/cm				573	780	660	740	680	640	660	750	823
pH (Field)	-			**6.5-8.5**	7	7.45	7.62	7.57	7.8	7.76	7.39	7.87	7.41

Table 6 - Groundwater Quality - Middle and Lower Bedrock

	Unit	RDL	RUC	ODWQS	BH16-1S 2017-06-07	BH16-1S 2017-10-04	BH16-1S 2018-05-28	BH16-1S 2018-11-15	BH16-1S 2019-04-15	BH16-1S 2019-11-11	BH16-1S 2020-04-20	BH16-1S 2020-11-09
Metals												
Barium (Filtered)	µg/L	1	***267***	**1000**	95	99	106	105	92	90	107	112
Boron (Filtered)	µg/L	5	***2623***	**5000**	197	210	234	193	178	164	203	182
Calcium (Filtered)	µg/L	20			112,000	110,000	120,000	126,000	114,000	110,000	129,000	134,000
Chloride	µg/L	500	***142000***	**250000**	18,100	15,300	19,700	20,400	31,700	32,600	22,300	20,000
Iron (Filtered)	µg/L	5	***166***	**300**	<5	14	<5	7	<5	27	<5	32
Manganese (Filtered)	µg/L	1	***30***	**50**	12	28	1	17	<1	16	4	7
Magnesium (Filtered)	µg/L	20			23,800	24,000	26,700	24,400	20,300	20,600	20,800	19,600
Sodium (Filtered)	µg/L	200	***114200***	**200000**	30,500	26,300	35,600	32,700	37,500	39,800	44,500	32,800
Inorganics												
Alkalinity (as CaCO3)	mg/L	5	***371***	**500**	317	297	344	348	318	310	336	298
Hardness (as CaCO3) (Filtered)	mg/L	1	***453***	**500**	378	374	410	415	368	360	408	416
Solids - Total Dissolved (TDS)	mg/L	3	***500***	**500**	428	402	409	445	445	417	428	396
Solids - Total Suspended (TSS)	mg/L				-	-	-	-	-	-	-	-
Oxygen Demand - Chemical (COD)	mg/L	5			125	108	53	92	34	97	22	7
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L	0.2	***3.6***	**5**	***5.4***	***6.3***	3.5	***5.2***	***6***	3.1	***5.6***	2.5
Oxygen Demand - Biological (BOD)	mg/L				-	-	-	-	-	-	-	-
Sulphate (Filtered)	mg/L	1	***326***	**500**	56	53	69	67	67	59	59	65
Ammonia	mg/L	0.01			<0.01	0.02	0.03	0.04	0.07	0.04	0.03	0.01
Nitrate (as N)	mg/L	0.05	***2.7***	**10**	<0.05	0.09	0.2	0.36	0.8	0.55	1.26	0.59
Conductivity (lab)	µS/cm	1			779	730	781	843	843	795	814	758
pH (Lab)	-			**6.5-8.5**	7.86	7.99	7.99	7.9	7.95	7.87	7.85	7.87
Field												
DO (Field)	mg/L				9.67	9.49	11.11	7.41	6.42	5.03	10.31	4.07
Redox Potential (Field)	mV				15	141	47	116	157	135	154	69
Temp (Field)	°C				12.3	17.8	15.9	9.3	7	8.9	9.3	11
Conductivity (field)	µS/cm				1,220	760	830	790	770	840	880	728
pH (Field)	-			**6.5-8.5**	7.22	7.42	7.43	7.5	7.5	7.07	7.65	7.67

Table 7 - Groundwater Quality - VOCs

	Unit	RDL	ODWQS	00-1-L	00-1-M	00-1-U	97-1-L	97-1-M	97-1-U	97-2-L	97-2-U	97-3	98-1-L	98-1-M	98-1-U
				2013-06-04	2013-06-04	2013-06-04	2013-06-04	2013-06-04	2013-06-04	2013-06-04	2013-06-04	2013-06-04	2013-06-04	2013-06-04	2013-06-04
BTEX															
Benzene	µg/L	0.5	**1**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	µg/L	0.5	**60**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.44	<0.2	<0.2	<0.2
Ethylbenzene	µg/L	0.5	**140**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene Total	µg/L	1.1	**90**	-	-	-	-	-	-	-	-	-	-	-	-
VOCs															
Acetone	µg/L	30		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromoform	µg/L	5		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Bromomethane	µg/L	0.5		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carbon tetrachloride	µg/L	0.2	**2**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	µg/L		**80**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chloroform	µg/L	1		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chloroethane	µg/L			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chloromethane	µg/L			<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Dibromochloromethane	µg/L	2		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibromochloropropane (DBCP)	µg/L			-	-	-	-	-	-	-	-	-	-	-	-
Dibromoethylene, 1,2-trans-	µg/L			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dibromomethane	µg/L			-	-	-	-	-	-	-	-	-	-	-	-
Dichlorobenzene, 1,2-	µg/L	0.5	**200**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorobenzene, 1,3-	µg/L	0.5		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorobenzene, 1,4-	µg/L	0.5	**5**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorodifluoromethane	µg/L	2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dichloropropane, 1,3-	µg/L			-	-	-	-	-	-	-	-	-	-	-	-
Dichloroethane, 1,1-	µg/L	0.5		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Dichloroethane, 1,2-	µg/L	0.5	**5**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dichloroethylene, 1,1-	µg/L		**14**	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Dichloroethylene,1,2-trans-	µg/L	0.5		-	-	-	-	-	-	-	-	-	-	-	-
Dichloroethylene, 1,2-cis-	µg/L	0.5		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dichloropropane, 1,2-	µg/L	0.5		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dichloropropane, 2,2-	µg/L			-	-	-	-	-	-	-	-	-	-	-	-
Dichloropropene, 1,1-	µg/L			-	-	-	-	-	-	-	-	-	-	-	-
Dichloropropene, 1,3-cis-	µg/L	0.5		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dichloropropene, 1,3-trans-	µg/L	0.5		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Dichloropropene, 1,3-(cis+trans)	µg/L	0.5		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Ethylene dibromide	µg/L	0.2		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorobutadiene	µg/L			-	-	-	-	-	-	-	-	-	-	-	-
Hexane	µg/L	5		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methyl butyl ketone (2-hexanone)	µg/L			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Methyl Ethyl Ketone	µg/L	20		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl Isobutyl Ketone	µg/L	20		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methylene chloride	µg/L	5	**50**	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Methyl tert-Butyl Ether	µg/L	2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Styrene	µg/L	0.5		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tetrachloroethane, 1,1,2,2-	µg/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tetrachloroethane, 1,1,1,2-	µg/L	0.5		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tetrachloroethylene	µg/L	0.5	**10**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Trichlorobenzene, 1,2,4-	µg/L			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Trichloroethane, 1,1,1-	µg/L	0.5		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Trichloroethane, 1,1,2-	µg/L	0.5		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Trichloroethylene	µg/L	0.5	**5**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Trichloropropane, 1,2,3-	µg/L			-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	µg/L	5		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Vinyl chloride	µg/L	0.2	**1**	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Halogenated Benzenes															
Bromobenzene	µg/L			-	-	-	-	-	-	-	-	-	-	-	-
Chlorotoluene, 2-	µg/L			-	-	-	-	-	-	-	-	-	-	-	-
Chlorotoluene, 4-	µg/L			-	-	-	-	-	-	-	-	-	-	-	-
Trichlorobenzene, 1,2,3	µg/L			-	-	-	-	-	-	-	-	-	-	-	-
MAH															
Trimethylbenzene, 1,2,4-	µg/L			-	-	-	-	-	-	-	-	-	-	-	-
Trimethylbenzene, 1,3,5-	µg/L			-	-	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene	µg/L			-	-	-	-	-	-	-	-	-	-	-	-
n-butylbenzene	µg/L			-	-	-	-	-	-	-	-	-	-	-	-
n-propylbenzene	µg/L			-	-	-	-	-	-	-	-	-	-	-	-
p-isopropyltoluene	µg/L			-	-	-	-	-	-	-	-	-	-	-	-
sec-butylbenzene	µg/L			-	-	-	-	-	-	-	-	-	-	-	-
tert-butylbenzene	µg/L			-	-	-	-	-	-	-	-	-	-	-	-

Table 7 - Groundwater Quality - VOCs

	Unit	RDL	ODWQS	98-2-L 2010-10-20	98-2-L 2012-11-01	98-2-L 2013-12-05	98-2-L 2014-10-27	98-2-L 2015-10-27	98-2-L 2016-10-01	98-2-L 2017-10-04	98-2-L 2018-11-15	98-2-L 2019-11-11	98-2-L 2020-11-09	98-2-M 2013-06-04	98-2-M 2013-12-05	98-2-M 2014-10-27
BTEX																
Benzene	µg/L	0.5	**1**	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2
Toluene	µg/L	0.5	**60**	<0.2	<0.2	<0.2	<0.2	<0.2	0.29	<0.5	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2
Ethylbenzene	µg/L	0.5	**140**	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1
Xylene Total	µg/L	1.1	**90**	-	-	-	-	-	-	-	<1.1	<1.1	<1.1	-	-	-
VOCs																
Acetone	µg/L	30		<10	-	<1	<1	<1	<1	<2	<30	<30	<30	<1	<1	<1
Bromodichloromethane	µg/L	2		<0.1	-	<0.2	<0.2	<0.2	<0.2	<0.1	<2	<2	<2	<0.2	<0.2	<0.2
Bromoform	µg/L	5		<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<5	<5	<5	<0.1	<0.1	<0.1
Bromomethane	µg/L	0.5		<0.5	-	<0.2	<0.2	<0.2	<0.2	<0.3	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2
Carbon tetrachloride	µg/L	0.2	**2**	<0.1	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	µg/L		**80**	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.5	<0.5	-	<0.1	<0.1	<0.1
Chloroform	µg/L	1		<0.1	-	<0.2	<0.2	<0.2	<0.2	<0.3	<1	<1	<1	<0.2	<0.2	<0.2
Chloroethane	µg/L			-	-	<0.2	<0.2	<0.2	<0.2	<0.1	<0.08	<3	-	<0.2	<0.2	<0.2
Chloromethane	µg/L			-	-	<0.4	<0.4	<0.4	<0.4	<0.3	<0.06	<2	-	<0.4	<0.4	<0.4
Dibromochloromethane	µg/L	2		<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<2	<2	<2	<0.1	<0.1	<0.1
Dibromochloropropane (DBCP)	µg/L			-	-	-	-	-	-	<1	-	-	-	-	-	-
Dibromoethylene, 1,2-trans-	µg/L			-	-	<0.2	<0.2	<0.2	<0.2	<0.1	<0.5	<0.5	-	<0.2	<0.2	<0.2
Dibromomethane	µg/L			-	-	-	-	-	-	<1	-	-	-	-	-	-
Dichlorobenzene, 1,2-	µg/L	0.5	**200**	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1
Dichlorobenzene, 1,3-	µg/L	0.5		<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1
Dichlorobenzene, 1,4-	µg/L	0.5	**5**	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1
Dichlorodifluoromethane	µg/L	2		-	-	<0.2	<0.2	<0.2	<0.2	<1	<2	<2	<2	<0.2	<0.2	<0.2
Dichloropropane, 1,3-	µg/L			-	-	-	-	-	-	<0.2	-	-	-	-	-	-
Dichloroethane, 1,1-	µg/L	0.5		<0.1	-	<0.3	<0.3	<0.3	<0.3	<0.1	<0.5	<0.5	<0.5	<0.3	<0.3	<0.3
Dichloroethane, 1,2-	µg/L	0.5	**5**	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.1	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2
Dichloroethylene, 1,1-	µg/L		**14**	<0.1	-	<0.3	<0.3	<0.3	<0.3	<0.1	-	-	<0.5	<0.3	<0.3	<0.3
Dichloroethylene,1,2-trans-	µg/L	0.5		-	-	-	-	-	-	-	-	-	<0.5	-	-	-
Dichloroethylene, 1,2-cis-	µg/L	0.5		<0.1	-	<0.2	<0.2	<0.2	<0.2	<0.1	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2
Dichloropropane, 1,2-	µg/L	0.5		<0.1	-	<0.2	<0.2	<0.2	<0.2	<0.1	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2
Dichloropropane, 2,2-	µg/L			-	-	-	-	-	-	<0.2	-	-	-	-	-	-
Dichloropropene, 1,1-	µg/L			-	-	-	-	-	-	-	<0.1	<0.2	-	-	-	-
Dichloropropene, 1,3-cis-	µg/L	0.5		<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.1	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2
Dichloropropene, 1,3-trans-	µg/L	0.5		-	-	<0.3	<0.3	<0.3	<0.3	<0.1	<0.5	<0.5	<0.5	<0.3	<0.3	<0.3
Dichloropropene, 1,3-(cis+trans)	µg/L	0.5		-	-	<0.3	<0.3	<0.3	<0.3	<0.2	<0.5	<0.5	<0.5	<0.3	<0.3	<0.3
Ethylene dibromide	µg/L	0.2		<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1
Hexachlorobutadiene	µg/L			-	-	-	-	-	-	<1	-	-	-	-	-	-
Hexane	µg/L	5		-	-	<0.2	<0.2	<0.2	<0.2	<1	<5	<5	<5	<0.2	<0.2	<0.2
Methyl butyl ketone (2-hexanone)	µg/L			-	-	<0.2	<0.3	<0.3	<1	<10	-	-	-	<0.3	<0.3	<0.3
Methyl Ethyl Ketone	µg/L	20		<5	-	<1	<1	<1	<1	<1	<20	<20	<20	<1	<1	<1
Methyl Isobutyl Ketone	µg/L	20		<5	-	<1	<1	<1	<1	<1	<20	<20	<20	<1	<1	<1
Methylene chloride	µg/L	5	**50**	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<5	<5	<0.3	<0.3	<0.3
Methyl tert-Butyl Ether	µg/L	2		<0.2	-	<0.2	<0.2	<0.2	<0.2	<1	<2	<2	<2	<0.2	<0.2	<0.2
Styrene	µg/L	0.5		<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1
Tetrachloroethane, 1,1,2,2-	µg/L			<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.4	<0.5	<0.5	-	<0.1	<0.1	<0.1
Tetrachloroethane, 1,1,1,2-	µg/L	0.5		<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1
Tetrachloroethylene	µg/L	0.5	**10**	<0.1	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2
Trichlorobenzene, 1,2,4-	µg/L			-	-	<0.3	<0.3	<0.3	<0.3	<0.2	-	-	-	<0.3	<0.3	<0.3
Trichloroethane, 1,1,1-	µg/L	0.5		<0.1	-	<0.3	<0.3	<0.3	<0.3	<0.1	<0.5	<0.5	<0.5	<0.3	<0.3	<0.3
Trichloroethane, 1,1,2-	µg/L	0.5		<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.1	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2
Trichloroethylene	µg/L	0.5	**5**	<0.1	-	<0.2	<0.2	<0.2	<0.2	<0.1	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2
Trichloropropane, 1,2,3-	µg/L			-	-	-	-	-	-	<0.2	-	-	-	-	-	-
Trichlorofluoromethane	µg/L	5		-	-	<0.4	<0.4	<0.4	<0.4	<0.1	<5	<5	<5	<0.4	<0.4	<0.4
Vinyl chloride	µg/L	0.2	**1**	<0.2	<0.17	<0.17	<0.17	<0.17	<0.17	<0.2	<0.5	<0.2	<0.2	<0.17	<0.17	<0.17
Halogenated Benzenes																
Bromobenzene	µg/L			-	-	-	-	-	-	<0.1	-	-	-	-	-	-
Chlorotoluene, 2-	µg/L			-	-	-	-	-	-	<0.2	-	-	-	-	-	-
Chlorotoluene, 4-	µg/L			-	-	-	-	-	-	<0.2	-	-	-	-	-	-
Trichlorobenzene, 1,2,3	µg/L			-	-	-	-	-	-	<0.2	-	-	-	-	-	-
MAH																
Trimethylbenzene, 1,2,4-	µg/L			-	-	-	-	-	-	<2	-	-	-	-	-	-
Trimethylbenzene, 1,3,5-	µg/L			-	-	-	-	-	-	<0.6	<0.06	<0.1	-	-	-	-
Isopropylbenzene	µg/L			-	-	-	-	-	-	<0.2	-	-	-	-	-	-
n-butylbenzene	µg/L			-	-	-	-	-	-	<0.7	-	-	-	-	-	-
n-propylbenzene	µg/L			-	-	-	-	-	-	<0.4	-	-	-	-	-	-
p-isopropyltoluene	µg/L			-	-	-	-	-	-	<0.4	-	-	-	-	-	-
sec-butylbenzene	µg/L			-	-	-	-	-	-	<0.5	-	-	-	-	-	-
tert-butylbenzene	µg/L			-	-	-	-	-	-	<0.1	-	-	-	-	-	-

Table 7 - Groundwater Quality - VOCs

	Unit	RDL	ODWQS	98-2-U 2010-10-20	98-2-U 2012-11-01	98-2-U 2013-12-05	98-2-U 2015-10-27	98-2-U 2016-10-01	98-2-U 2017-10-04	98-2-U 2018-11-15	98-2-U 2019-11-11	98-2-U 2020-11-09	98-3-L 2013-06-04	98-3-M 2013-06-04	98-3-U 2013-06-04
BTEX															
Benzene	µg/L	0.5	**1**	<0.1	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2
Toluene	µg/L	0.5	**60**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.2	<0.2	0.52
Ethylbenzene	µg/L	0.5	**140**	<0.1	-	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1
Xylene Total	µg/L	1.1	**90**	-	-	-	-	-	-	<1.1	<1.1	<1.1	-	-	-
VOCs															
Acetone	µg/L	30		<10	-	<1	<1	<1	<2	<30	<30	<30	<1	<1	<1
Bromodichloromethane	µg/L	2		<0.1	-	<0.2	<0.2	<0.2	<0.1	<2	<2	<2	<0.2	<0.2	<0.2
Bromoform	µg/L	5		<0.2	-	<0.1	<0.1	<0.1	<0.1	<5	<5	<5	<0.1	<0.1	<0.1
Bromomethane	µg/L	0.5		<0.5	-	<0.2	<0.2	<0.2	<0.3	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2
Carbon tetrachloride	µg/L	0.2	**2**	<0.1	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	µg/L		**80**	<0.1	-	<0.1	<0.1	<0.1	<0.2	<0.5	<0.5	-	<0.1	<0.1	<0.1
Chloroform	µg/L	1		<0.1	-	<0.2	<0.2	<0.2	<0.3	<1	<1	<1	<0.2	<0.2	<0.2
Chloroethane	µg/L			-	-	<0.2	<0.2	<0.2	<0.1	<0.08	<3	-	<0.2	<0.2	<0.2
Chloromethane	µg/L			-	-	<0.4	<0.4	<0.4	<0.3	<0.06	<2	-	<0.4	<0.4	<0.4
Dibromochloromethane	µg/L	2		<0.2	-	<0.1	<0.1	<0.1	<0.1	<2	<2	<2	<0.1	<0.1	<0.1
Dibromochloropropane (DBCP)	µg/L			-	-	-	-	-	<1	-	-	-	-	-	-
Dibromoethylene, 1,2-trans-	µg/L			-	-	<0.2	<0.2	<0.2	<0.1	<0.5	<0.5	-	<0.2	<0.2	<0.2
Dibromomethane	µg/L			-	-	-	-	-	<1	-	-	-	-	-	-
Dichlorobenzene, 1,2-	µg/L	0.5	**200**	<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1
Dichlorobenzene, 1,3-	µg/L	0.5		<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1
Dichlorobenzene, 1,4-	µg/L	0.5	**5**	<0.2	<0.1	<0.1	<0.1	<0.1	<0.2	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1
Dichlorodifluoromethane	µg/L	2		-	-	0.41	<0.2	<0.2	<1	<2	<2	<2	<0.2	<0.2	<0.2
Dichloropropane, 1,3-	µg/L			-	-	-	-	-	<0.2	-	-	-	-	-	-
Dichloroethane, 1,1-	µg/L	0.5		<0.1	-	<0.3	<0.3	<0.3	<0.1	<0.5	<0.5	<0.5	<0.3	<0.3	<0.3
Dichloroethane, 1,2-	µg/L	0.5	**5**	<0.2	-	<0.2	<0.2	<0.2	<0.1	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2
Dichloroethylene, 1,1-	µg/L		**14**	<0.1	-	<0.3	<0.3	<0.3	<0.1	-	-	<0.5	<0.3	<0.3	<0.3
Dichloroethylene,1,2-trans-	µg/L	0.5		-	-	-	-	-	-	-	-	<0.5	-	-	-
Dichloroethylene, 1,2-cis-	µg/L	0.5		<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2
Dichloropropane, 1,2-	µg/L	0.5		<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2
Dichloropropane, 2,2-	µg/L			-	-	-	-	-	<0.2	-	-	-	-	-	-
Dichloropropene, 1,1-	µg/L			-	-	-	-	-	-	<0.1	<0.2	-	-	-	-
Dichloropropene, 1,3-cis-	µg/L	0.5		<0.2	-	<0.2	<0.2	<0.2	<0.1	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2
Dichloropropene, 1,3-trans-	µg/L	0.5		-	-	<0.3	<0.3	<0.3	<0.1	<0.5	<0.5	<0.5	<0.3	<0.3	<0.3
Dichloropropene, 1,3-(cis+trans)	µg/L	0.5		-	-	<0.3	<0.3	<0.3	<0.2	<0.5	<0.5	<0.5	<0.3	<0.3	<0.3
Ethylene dibromide	µg/L	0.2		<0.2	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1
Hexachlorobutadiene	µg/L			-	-	-	-	-	<1	-	-	-	-	-	-
Hexane	µg/L	5		-	-	<0.2	<0.2	<0.2	<1	<5	<5	<5	<0.2	<0.2	<0.2
Methyl butyl ketone (2-hexanone)	µg/L			-	-	<0.3	<0.3	<1	<10	-	-	-	<0.3	<0.3	<0.3
Methyl Ethyl Ketone	µg/L	20		<5	-	<1	<1	<1	<1	<20	<20	<20	<1	<1	<1
Methyl Isobutyl Ketone	µg/L	20		<5	-	<1	<1	<1	<1	<20	<20	<20	<1	<1	<1
Methylene chloride	µg/L	5	**50**	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<5	<5	<0.3	<0.3	<0.3
Methyl tert-Butyl Ether	µg/L	2		<0.2	-	<0.2	<0.2	<0.2	<1	<2	<2	<2	<0.2	<0.2	<0.2
Styrene	µg/L	0.5		<0.2	-	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1
Tetrachloroethane, 1,1,2,2-	µg/L			<0.2	-	<0.1	<0.1	<0.1	<0.4	<0.5	<0.5	-	<0.1	<0.1	<0.1
Tetrachloroethane, 1,1,1,2-	µg/L	0.5		<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1
Tetrachloroethylene	µg/L	0.5	**10**	<0.1	-	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2
Trichlorobenzene, 1,2,4-	µg/L			-	-	<0.3	<0.3	<0.3	<0.2	-	-	-	<0.3	<0.3	<0.3
Trichloroethane, 1,1,1-	µg/L	0.5		<0.1	-	<0.3	<0.3	<0.3	<0.1	<0.5	<0.5	<0.5	<0.3	<0.3	<0.3
Trichloroethane, 1,1,2-	µg/L	0.5		<0.2	-	<0.2	<0.2	<0.2	<0.1	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2
Trichloroethylene	µg/L	0.5	**5**	<0.1	-	<0.2	<0.2	<0.2	<0.1	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2
Trichloropropane, 1,2,3-	µg/L			-	-	-	-	-	<0.2	-	-	-	-	-	-
Trichlorofluoromethane	µg/L	5		-	-	<0.4	<0.4	<0.4	<0.1	<5	<5	<5	<0.4	<0.4	<0.4
Vinyl chloride	µg/L	0.2	**1**	<0.2	<0.17	<0.17	<0.17	<0.17	<0.2	<0.5	<0.2	<0.2	<0.17	<0.17	<0.17
Halogenated Benzenes															
Bromobenzene	µg/L			-	-	-	-	-	<0.1	-	-	-	-	-	-
Chlorotoluene, 2-	µg/L			-	-	-	-	-	<0.2	-	-	-	-	-	-
Chlorotoluene, 4-	µg/L			-	-	-	-	-	<0.2	-	-	-	-	-	-
Trichlorobenzene, 1,2,3	µg/L			-	-	-	-	-	<0.2	-	-	-	-	-	-
MAH															
Trimethylbenzene, 1,2,4-	µg/L			-	-	-	-	-	<2	-	-	-	-	-	-
Trimethylbenzene, 1,3,5-	µg/L			-	-	-	-	-	<0.6	<0.06	<0.1	-	-	-	-
Isopropylbenzene	µg/L			-	-	-	-	-	<0.2	-	-	-	-	-	-
n-butylbenzene	µg/L			-	-	-	-	-	<0.7	-	-	-	-	-	-
n-propylbenzene	µg/L			-	-	-	-	-	<0.4	-	-	-	-	-	-
p-isopropyltoluene	µg/L			-	-	-	-	-	<0.4	-	-	-	-	-	-
sec-butylbenzene	µg/L			-	-	-	-	-	<0.5	-	-	-	-	-	-
tert-butylbenzene	µg/L			-	-	-	-	-	<0.1	-	-	-	-	-	-

Table 8 - Residential Well Water Quality

	Unit	RDL	ODWQS	103 Moon Line Road 2015-05-14	103 Moon Line Road 2015-10-27	103 Moon Line Road 2021-05-16	130 Country Road 36 2018-05-28	130 Country Road 36 2018-11-20	130 Country Road 36 2019-04-15	130 Country Road 36 2021-04-16	151 Country Road 36 2015-05-14
Metals											
Barium (Filtered)	µg/L		**1000**	33	61	31	<1	94	94	86	3
Boron (Filtered)	µg/L		**5000**	95	85	166	229	194	92	104	170
Calcium (Filtered)	µg/L			105,000	134,000	92,700	650	135,000	120,000	122,000	890
Chloride	µg/L		**250000**	28,000	28,500	27,400	19,100	38,800	28,400	23,000	29,500
Iron (Filtered)	µg/L		**300**	10	<10	248	17	**326**	35	**461**	<10
Manganese (Filtered)	µg/L		**50**	<2	<2	4	<1	3	5	9	<2
Magnesium (Filtered)	µg/L			8,530	8,670	13,400	20	6,620	5,370	6,220	<50
Sodium (Filtered)	µg/L		**200000**	17,500	18,900	13,000	184,000	30,000	14,000	27,200	180,000
Inorganics											
Alkalinity (as CaCO3)	mg/L		**500**	372	335	289	316	320	304	325	315
Hardness (as CaCO3) (Filtered)	mg/L		**500**	297	370	287	2	365	322	330	2.2
Solids - Total Dissolved (TDS)	mg/L		**500**	354	410	368	335	412	362	378	382
Oxygen Demand - Chemical (COD)	mg/L			<5	<5	<5	5	<5	<5	<5	<5
Solids - Total Suspended (TSS)	mg/L			<10	<10	<10	-	-	-	<10	<10
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L		**5**	0.9	0.8	0.9	0.9	2.9	1.9	1	0.9
Oxygen Demand - Biological (BOD)	mg/L			-	<5	<5	-	-	-	<5	-
Sulphate (Filtered)	mg/L		**500**	21.3	26	38.5	28	32	28	30.4	32
Nitrogen (NH3 & NH4)	mg/L			<0.02	0.02	0.04	0.02	0.11	0.06	<0.02	<0.02
Nitrate (as N)	mg/L		**10**	1.02	1.59	0.25	<0.05	0.2	0.06	<0.25	<0.1
Conductivity (lab)	µS/cm			661	762	675	646	786	697	713	746
pH (Lab)	-		**6.5-8.5**	8.18	8.03	8.25	7.84	7.59	7.86	8.01	8.16
Field											
DO (Field)	mg/L			-	-	8.3	2.72	-	2.75	-	-
Redox Potential (Field)	mV			-	-	-	62	-	-	-	-
Temp (Field)	°C			-	-	12.3	14.6	-	4	-	-
Conductivity (field)	µS/cm			-	-	671	720	-	-	-	-
pH (Field)	-		**6.5-8.5**	-	-	7.1	7.17	-	-	-	-

Table 8 - Residential Well Water Quality

	Unit	RDL	ODWQS	314 Riverside Drive	320 Riverside Drive	320 Riverside Drive	320 Riverside Drive	320 Riverside Drive	396 Riverside Drive	396 Riverside Drive	396 Riverside Drive
				2017-10-04	2017-10-04	2018-11-15	2019-04-15	2019-11-11	2017-10-04	2018-11-15	2019-04-15
Metals											
Barium (Filtered)	µg/L		**1000**	129	1	<1	1	1	111	122	78
Boron (Filtered)	µg/L		**5000**	44	31	27	25	26	14	12	11
Calcium (Filtered)	µg/L			135,000	1,550	1,050	1,570	2,080	102,000	101,000	94,300
Chloride	µg/L		**250000**	26,000	21,600	27,900	10,500	38,700	20,300	24,500	27,400
Iron (Filtered)	µg/L		**300**	146	<5	<5	<5	<5	6	<5	<5
Manganese (Filtered)	µg/L		**50**	5	<1	<1	<1	<1	<1	<1	<1
Magnesium (Filtered)	µg/L			8,000	90	90	100	220	3,590	3,900	2,900
Sodium (Filtered)	µg/L		**200000**	9,800	160,000	185,000	131,000	192,000	18,100	17,200	14,200
Inorganics											
Alkalinity (as CaCO3)	mg/L		**500**	320	304	297	259	314	261	232	221
Hardness (as CaCO3) (Filtered)	mg/L		**500**	370	4	3	4	6	270	269	248
Solids - Total Dissolved (TDS)	mg/L		**500**	405	385	375	306	404	326	292	291
Oxygen Demand - Chemical (COD)	mg/L			<5	<5	<5	9	11	<5	<5	5
Solids - Total Suspended (TSS)	mg/L			-	-	-	-	-	-	-	-
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L		**5**	2.5	2.2	2.8	2.8	3	1.8	2	1.9
Oxygen Demand - Biological (BOD)	mg/L			-	-	-	-	-	-	-	-
Sulphate (Filtered)	mg/L		**500**	21	16	24	18	17	8	9	8
Nitrogen (NH3 & NH4)	mg/L			<0.01	<0.01	0.03	0.03	0.02	<0.01	0.04	0.03
Nitrate (as N)	mg/L		**10**	0.06	0.18	0.73	0.43	0.87	0.63	0.92	0.21
Conductivity (lab)	µS/cm			737	700	720	590	772	593	563	562
pH (Lab)	-		**6.5-8.5**	7.76	7.87	7.78	7.92	7.85	7.81	7.93	8.01
Field											
DO (Field)	mg/L			3.06	4.87	3.38	6.09	2.86	7.98	7.74	8.66
Redox Potential (Field)	mV			123	151	153	-	119	111	103	-
Temp (Field)	°C			19	17.9	13	14	10	13.7	21.1	11
Conductivity (field)	µS/cm			690	660	730	-	830	580	570	-
pH (Field)	-		**6.5-8.5**	7.1	7.39	8.14	-	7.61	7.48	7.72	-

Table 8 - Residential Well Water Quality

	Unit	RDL	ODWQS	396 Riverside Drive	515 Riverside Drive	515 Riverside Drive	515 Riverside Drive	515 Riverside Drive	515 Riverside Drive	68 Country Road 36	68 Country Road 36
				2019-11-11	2015-05-14	2017-10-04	2018-05-28	2019-04-15	2021-05-16	2017-06-14	2017-10-04
Metals											
Barium (Filtered)	µg/L		**1000**	109	144	175	163	170	147	88	104
Boron (Filtered)	µg/L		**5000**	6	11	18	13	10	16	6	23
Calcium (Filtered)	µg/L			90,600	106,000	109,000	104,000	114,000	96,100	116,000	133,000
Chloride	µg/L		**250000**	27,400	60,800	24,700	36,100	93,200	50,000	41,500	40,400
Iron (Filtered)	µg/L		**300**	<5	<10	32	21	23	<10	26	23
Manganese (Filtered)	µg/L		**50**	<1	<2	1	1	<1	<2	<1	1
Magnesium (Filtered)	µg/L			3,820	4,070	4,280	4,220	4,470	3,870	3,770	4,110
Sodium (Filtered)	µg/L		**200000**	18,800	37,600	20,500	27,700	37,900	26,900	41,700	34,100
Inorganics											
Alkalinity (as CaCO3)	mg/L		**500**	229	264	280	257	233	265	282	341
Hardness (as CaCO3) (Filtered)	mg/L		**500**	242	281	290	277	303	256	304	349
Solids - Total Dissolved (TDS)	mg/L		**500**	287	394	350	313	432	334	397	446
Oxygen Demand - Chemical (COD)	mg/L			<5	<5	<5	<5	<5	<5	<5	<5
Solids - Total Suspended (TSS)	mg/L			-	<10	-	-	-	<10	-	-
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L		**5**	1.5	1.4	2.3	1.5	2.2	1.6	1.4	2.4
Oxygen Demand - Biological (BOD)	mg/L			-	-	-	-	-	<5	-	-
Sulphate (Filtered)	mg/L		**500**	6	11.2	6	8	9	11	10	10
Nitrogen (NH3 & NH4)	mg/L			0.02	<0.02	0.01	<0.01	0.03	<0.02	<0.01	0.02
Nitrate (as N)	mg/L		**10**	0.86	2.59	0.97	1.07	4.66	1.6	0.81	0.83
Conductivity (lab)	µS/cm			554	729	637	604	820	654	721	810
pH (Lab)	-		**6.5-8.5**	7.86	8.21	7.67	7.82	7.89	8	7.53	7.59
Field											
DO (Field)	mg/L			9.31	-	4.38	6.05	6.12	7.9	6.93	6.76
Redox Potential (Field)	mV			96	-	120	78	-	-	57	101
Temp (Field)	°C			8.6	-	15.1	11.1	9	8.6	13.1	14.6
Conductivity (field)	µS/cm			600	-	650	670	-	652	810	800
pH (Field)	-		**6.5-8.5**	7.59	-	7.14	7.17	-	7.8	6.86	7.04

Table 8 - Residential Well Water Quality

	Unit	RDL	ODWQS	68 Country Road 36 2018-05-28	68 Country Road 36 2018-11-15	68 Country Road 36 2019-04-15	68 Country Road 36 2019-11-11	95 Country Road 36 2015-05-14	95 Country Road 36 2021-05-16	95 Country Road 36 2021-10-16	Empire 2011-05-01	Empire 2012-05-01
Metals												
Barium (Filtered)	µg/L		**1000**	83	150	103	139	89	81	129	23	21
Boron (Filtered)	µg/L		**5000**	10	14	12	7	13	15	22	450	349
Calcium (Filtered)	µg/L			111,000	152,000	113,000	135,000	115,000	94,900	141,000	100,000	90,500
Chloride	µg/L		**250000**	48,300	146,000	138,000	170,000	105,000	65,800	109,000	30,000	29,300
Iron (Filtered)	µg/L		**300**	7	8	5	6	<10	<10	<10	<100	<10
Manganese (Filtered)	µg/L		**50**	1	<1	<1	1	<2	<2	<2	-	19
Magnesium (Filtered)	µg/L			3,190	4,160	3,330	4,020	3,580	3,390	3,900	34,000	31,300
Sodium (Filtered)	µg/L		**200000**	35,200	100,000	67,500	125,000	53,000	30,100	84,200	30,000	25,600
Inorganics												
Alkalinity (as CaCO3)	mg/L		**500**	264	330	239	347	270	234	408	246	267
Hardness (as CaCO3) (Filtered)	mg/L		**500**	291	397	296	354	302	251	368	-	355
Solids - Total Dissolved (TDS)	mg/L		**500**	333	**613**	**509**	**659**	470	386	**588**	**516**	498
Oxygen Demand - Chemical (COD)	mg/L			<5	<5	<5	<5	<5	<5	<5	<5	<5
Solids - Total Suspended (TSS)	mg/L			-	-	-	-	<10	<10	<10	-	<10
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L		**5**	1.2	2.3	1.6	1.3	1.2	1.2	1.4	0.7	0.8
Oxygen Demand - Biological (BOD)	mg/L			-	-	-	-	-	<5	<5	-	<5
Sulphate (Filtered)	mg/L		**500**	9	18	14	16	13.2	12.3	18.4	140	146
Nitrogen (NH3 & NH4)	mg/L			0.01	0.02	0.04	0.02	0.05	<0.02	<0.02	0.13	0.07
Nitrate (as N)	mg/L		**10**	0.41	1.7	1.52	2.3	0.62	0.63	2.3	<0.1	<0.05
Conductivity (lab)	µS/cm			642	1,140	956	1,220	861	628	1,080	843	785
pH (Lab)	-		**6.5-8.5**	7.9	7.94	7.96	7.74	8.14	8.1	7.06	7.98	8.1
Field												
DO (Field)	mg/L			9.17	7.87	10.31	4.86	-	8.3	8.7	-	-
Redox Potential (Field)	mV			55	140	-	114	-	-	-	-	-
Temp (Field)	°C			12.5	8.4	7	14.3	-	9	11.3	-	-
Conductivity (field)	µS/cm			690	1,030	-	1,100	-	726	935	-	-
pH (Field)	-		**6.5-8.5**	7.26	7.47	-	7.02	-	7.9	7	-	-

Table 8 - Residential Well Water Quality

	Unit	RDL	ODWQS	Empire 2012-11-01	Empire 2013-06-04	Empire 2013-12-05	Empire 2014-05-12	Empire 2014-10-27	Empire 2015-04-07	Empire 2015-10-27	Empire 2017-06-07	Empire 2017-10-04	Empire 2018-05-28	Empire 2018-11-15	Empire 2019-04-15	Empire 2019-11-11
Metals																
Barium (Filtered)	µg/L		**1000**	20	20	20	44	24	<2	22	21	22	32	20	23	24
Boron (Filtered)	µg/L		**5000**	380	387	343	152	389	409	390	369	396	397	432	135	442
Calcium (Filtered)	µg/L			91,000	104,000	87,800	96,000	97,900	4,210	98,000	97,100	98,500	97,700	98,400	94,400	94,700
Chloride	µg/L		**250000**	29,900	28,200	26,900	21,500	28,000	31,400	25,900	24,900	26,500	24,800	26,900	24,200	26,100
Iron (Filtered)	µg/L		**300**	30	<10	<10	<10	<10	<10	<10	<5	6	<5	15	39	10
Manganese (Filtered)	µg/L		**50**	23	21	26	17	23	<2	26	21	26	28	20	4	20
Magnesium (Filtered)	µg/L			31,200	36,400	31,100	14,500	30,100	1,340	31,600	34,100	36,500	31,500	35,600	13,500	34,700
Sodium (Filtered)	µg/L		**200000**	25,000	75,600	28,400	15,500	27,900	**202,000**	27,700	27,600	25,100	29,600	32,200	15,700	30,400
Inorganics																
Alkalinity (as CaCO3)	mg/L		**500**	255	250	251	225	243	257	263	258	258	239	239	233	233
Hardness (as CaCO3) (Filtered)	mg/L		**500**	356	410	347	299	368	16	375	383	396	374	392	291	379
Solids - Total Dissolved (TDS)	mg/L		**500**	488	**556**	**510**	376	**508**	**516**	494	467	457	395	443	338	433
Oxygen Demand - Chemical (COD)	mg/L			<5	<5	<5	<5	5	<5	<5	9	<5	<5	<5	<5	<5
Solids - Total Suspended (TSS)	mg/L			<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L		**5**	0.7	<1	0.9	1.8	0.9	0.7	0.6	0.9	1.4	0.9	1.8	2	1.2
Oxygen Demand - Biological (BOD)	mg/L			<5	<5	<5	<5	<5	<5	<5	-	-	-	-	-	-
Sulphate (Filtered)	mg/L		**500**	147	160	161	75.2	148	151	142	122	119	142	163	56	164
Nitrogen (NH3 & NH4)	mg/L			0.1	0.11	0.13	0.03	0.07	<0.02	0.06	0.04	0.08	0.06	0.1	0.03	0.08
Nitrate (as N)	mg/L		**10**	<0.05	<0.25	<0.25	<0.1	<0.1	<0.25	<0.25	<0.05	<0.05	<0.05	<0.05	0.28	<0.05
Conductivity (lab)	µS/cm			803	875	811	650	859	903	824	849	830	755	840	651	822
pH (Lab)	-		**6.5-8.5**	8.19	7.95	7.97	8.11	8.04	8.3	7.94	7.84	7.81	7.95	7.95	7.99	7.87
Field																
DO (Field)	mg/L			-	-	-	-	-	-	-	1.39	2.31	4.08	3.04	6.81	2.94
Redox Potential (Field)	mV			-	-	-	-	-	-	-	-1	100	34	122	-	98
Temp (Field)	°C			-	-	-	-	-	-	-	13.4	15.3	11.6	13.7	10	13.8
Conductivity (field)	µS/cm			-	-	-	-	-	-	-	1,020	850	810	790	-	830
pH (Field)	-		**6.5-8.5**	-	-	-	-	-	-	-	7.1	7.32	7.35	7.76	-	7.45

Table 8 - Residential Well Water Quality

	Unit	RDL	ODWQS	Empire 2021-04-16	Empire 2021-10-16
Metals					
Barium (Filtered)	µg/L		**1000**	36	20
Boron (Filtered)	µg/L		**5000**	245	380
Calcium (Filtered)	µg/L			100,000	98,400
Chloride	µg/L		**250000**	25,200	29,200
Iron (Filtered)	µg/L		**300**	<10	<10
Manganese (Filtered)	µg/L		**50**	21	22
Magnesium (Filtered)	µg/L			24,400	30,800
Sodium (Filtered)	µg/L		**200000**	21,900	28,300
Inorganics					
Alkalinity (as CaCO3)	mg/L		**500**	260	274
Hardness (as CaCO3) (Filtered)	mg/L		**500**	350	373
Solids - Total Dissolved (TDS)	mg/L		**500**	412	**534**
Oxygen Demand - Chemical (COD)	mg/L			<5	<5
Solids - Total Suspended (TSS)	mg/L			<10	<10
Organic Carbon - Dissolved (DOC) (Filtered)	mg/L		**5**	1.1	0.8
Oxygen Demand - Biological (BOD)	mg/L			<5	<5
Sulphate (Filtered)	mg/L		**500**	109	171
Nitrogen (NH3 & NH4)	mg/L			<0.02	0.06
Nitrate (as N)	mg/L		**10**	<0.25	<0.25
Conductivity (lab)	µS/cm			738	840
pH (Lab)	-		**6.5-8.5**	8.13	7.39
Field					
DO (Field)	mg/L			4.8	4.6
Redox Potential (Field)	mV			-	-
Temp (Field)	°C			9.1	11.5
Conductivity (field)	µS/cm			758	747
pH (Field)	-		**6.5-8.5**	7.7	7.2

CAMBIUM

Table 9 - Landfill Gas Monitoring Data

Well ID	Top of Screen Elevation (m)[1]	Water Elevation (mASL)[2]	Screen Saturated	Percent Methane by Volume							
				7-Jun-17	4-Oct-17	28-May-18	15-Nov-18	15-Apr-19	11-Nov-19	20-Apr-20	9-Nov-20
97-1-U	254.9	255.6	yes	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
97-1-M	250.6	253.5	yes	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
97-1-L	244.4	253.5	yes	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
97-2-U	258.8	258.3	no	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
97-2-L	254.0	254.2	yes	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
97-3	259.4	259.2	no	>2.5	0.27	1.18	<0.05	<0.05	<0.05	<0.05	<0.05
98-1-U	256.7	256.8	yes	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
98-1-M	252.5	255.5	yes	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
98-1-L	248.2	255.0	yes	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
98-2-U	252.2	256.1	yes	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
98-2-M	247.8	253.5	yes	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
98-2-L	240.3	254.7	yes	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
98-3-U	253.4	255.3	yes	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
98-3-M	248.4	253.3	yes	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
98-3-L	243.9	252.8	yes	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00-1-U	264.0	261.9	no	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00-1-M	254.4	260.3	yes	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
00-1-L	248.3	256.7	yes	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH16-1S	256.0	257.6	yes	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH16-1D	249.4	255.0	yes	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Notes:

1. Screen length is 1.5 m for all monitors except BH16-1D.

2. Average water elevation since May 2014.

Table 10 - Monthly Summary of Materials Accepted and Transfered

Quantity accepted at the Site, as recorded on daily incoming waste forms								
Month	**Vehicles**	**Total Garbage Bags**	**Major Appliances without Freon (quantity)**	**Major Appliances with Freon (quantity)**	**Reuse Centre Bins (40 yd - quantity)**	**Brush (tonnes)**	**Tires[1] (quantity)**	**Alcohol Containers[2] (quantity)**
January	1,385	1,822	-	-	-	-	-	-
February	1,630	2,087	-	-	-	-	-	-
March	1,665	2,132	-	-	-	-	-	-
April	1,918	2,491	-	-	-	-	-	-
May	2,837	3,623	-	-	-	-	-	-
June	3,552	4,127	-	-	-	-	-	-
July	3,809	4,905	-	-	-	-	-	-
August	3,840	5,150	-	-	-	-	-	-
September	3,388	3,658	-	-	-	-	-	-
October	2,670	3,290	-	-	-	-	-	-
November	2,362	2,848	-	-	-	-	-	-
December	2,006	2,731	-	-	-	-	-	-
Annual Total	**31,062**	**38,864**	-	-	-	**180.9**	**722**	**30,250**

Quantity reported to be removed from the Site, transported/processed as noted													
Month	**Waste[3] (tonnes)**	**Loads[3]**	**C&D Materials[4] (tonnes)**	**Containers[5] (tonnes)**	**Fibres[5] (tonnes)**	**Furniture[6] (tonnes)**	**Scrap Metals & White Goods[7] (tonnes)**	**WEEE[8] (tonnes)**	**MHSW[9] (tonnes)**	**MHSW Event Day[10] (tonnes)**	**Empty Oil Container[11] (tonnes)**	**Textiles[12] (tonnes)**	**Durable Plastics (tonnes)[13]**
January	22.99	5	-	4.29	4.72	-	-	-	-	-	-	-	-
February	13.95	4	-	4.07	3.47	-	-	-	-	-	-	-	-
March	24.52	4	-	3.34	6.86	-	-	4.00	-	-	0.06	-	-
April	32.27	5	-	6.25	5.48	-	-	-	-	-	-	-	-
May	24.71	5	14.15	6.75	6.90	-	12.93	-	-	-	-	-	-
June	37.03	6	-	8.73	8.28	-	-	-	-	-	-	-	-
July	49.79	7	-	6.11	9.41	-	-	-	-	-	0.06	-	-
August	52.95	6	-	8.52	7.99	-	-	3.90	-	-	-	-	-
September	44.87	7	-	8.50	7.94	-	-	-	-	-	0.11	-	-
October	34.17	5	45.66	4.91	10.02	-	19.87	-	-	-	-	-	-
November	30.08	5	-	5.51	5.44	-	-	4.29	-	-	0.03	-	-
December	30.92	6	-	6.05	8.21	-	-	2.59	-	-	-	-	-
Annual Total	**398.25**	**65.00**	**59.81**	**73.03**	**84.72**	**-**	**25.39**	**14.78**	**2.17**	**-**	**0.25**	**0.48**	**-**

Notes:

1. Transferred off-site to retire your tire

2. Transferred off-site by Community Living to the Beer Store

3. Scaled weights from the Bensfort Road Waste Disposal Site

4. Transported by Kawartha Disposal to Waste Connections for processing

5. Transported by Emterra to Peterborough Materials Recovery Facility for processing by HGC

6. Collected at all MTL transfer stations, transferred to the Peterborough Waste Management Facility

7. Transported by Kawartha Disposal to Kings Auto Wreckers

8. Transported and processed by Quantum Life Cycle LPP on contract with the County of Peterborough

9. Limited MHSW collected at all transfer sites, including batteries (Call 2 Cycle), flourscent tubes (Photech), empty oil/anitfreeze containers (Pnweko), and car batteries (Photech)

10. Event Cancelled in 2020 due to the COVID -19 pandemic

11. Transported and Processed by Pnewko on contract with the County of Peterborough

12. Transferred to the Diabetes Association and Jakes House

13. County Program cancelled in 2020 due to COVID-19 pandemic

Appendix A

Environmental Compliance Approval A341307

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A341307
Issue Date: October 2, 2017

The Corporation of the Municipality of Trent Lakes
760 Peterborough County Road 36
Trent Lakes, Ontario
K0M 1A0

Site Location: Bobcaygeon Transfer Station
42 County Rd 36
Municipality of Trent Lakes

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act , R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

the use and operation of a Waste Transfer Station at the closed Bobcaygeon Landfill site.

For the purpose of this environmental compliance approval, the following definitions apply:

a. ***"Act" and "EPA"*** means *Environmental Protection Act* , R.S.O. 1990, c. E. 19, as amended;

b. ***"Approval"*** means this Environmental Compliance Approval and any Schedules to it, including the application and supporting documentation listed in Schedule "A";

c. ***"County"*** means the County of Peterborough.

d. **" *Director* "** means any *Ministry* employee appointed in writing by the *Minister* pursuant to section 5 of the *EPA* as a Director for the purposes of Part V of the *EPA* ;

e. **" *District Manager* "** means the *District Manager* of the local district office of the *Ministry* in which the *Site* is geographically located;

f. **" *Ministry* "** and ***"MOECC "*** means the Ministry of the Environment and Climate Change;

g. " ***MHSW "*** means Municipal Hazardous and/or Special Waste restricted to waste classes 121 and 146, generated within the geographic boundaries of the Municipality of Trent Lakes;

h. " ***Ontario Regulation 393/04 "*** means Ontario Regulation 393/04 Waste Electrical and Electronic Equipment made under the Waste Diversion Act 2002;

i. " ***Ontario Regulation 463/10 "*** means Ontario Regulation 463/10, Ozone Depleting Substances and Other Halocarbons, made under the *EPA;*

j. **" *Operator* "** means any person, other than the Owner's employees, authorized by the *Owner* as having the charge, management or control of any aspect of the site;

k. **" *Owner* "** means any person that is responsible for the establishment or operation of the site being approved by this *Approval* , and includes the Municipality of Trent Lakes **,** and its successors and assigns;

l. **" *OWRA* "** means the *Ontario Water Resources Act* , R.S.O. 1990, c. O-40, as amended from time to time;

m. **" *PA* "** means the *Pesticides Act* , R.S.O. 1990, c. P-11, as amend from time to time;

n. **" *Provincial Officer* "** means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the *OWRA* or section 5 of the *EPA* or section 17 of *PA* .

o. **" *Regional Director* "** means the Regional Director of the local Regional Office of the *Ministry* in which the *Site* is located;

p. **" *Reg. 347* "** means Regulation 347, R.R.O. 1990, made under the *EPA* , as amended from time to time;

q. ***"Transfer Station"*** means the area of land for the handling and storage of the disposable waste, leaf & yard waste, recyclable materials, MHSW, WEEE, organic waste and all other waste materials.

r. **" *Site* "** means the Landfill Site and Transfer Station operations being approved under this Approval, at the Bobcaygeon Site and Transfer Station, 42 County Rd 36, Municipality of Trent Lakes, County of Peterborough.

s. ***"Source Separated Organics"*** means organic materials separated at the point of generation;

t. ***"Township"*** means the Corporation of the Municipality of Trent Lakes.

u. ***"Trained personnel"*** means knowledgeable in the following through instruction and/or practice:

i.. relevant waste management legislation, regulations and guidelines;
ii. major environmental concerns pertaining to the waste to be handled;
iii. occupational health and safety concerns pertaining to the processes and wastes to be handled;
iv. management procedures including the use and operation of equipment for the processes and wastes to be handled;
v. emergency response procedures;

vi. specific written procedures for the control of nuisance conditions;

vii. specific written procedures for refusal of unacceptable waste loads;
viii. the requirements of this *Approval* .

v. ***"Waste electrical and electronic equipment (WEEE)"*** means devices listed in Schedules 1 through 7 of *Ontario Regulation 393/04.*

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

PART 1- GENERAL

Compliance

2. The *Owner* and *Operator* shall ensure compliance with all the conditions of this *Approval* and shall ensure that any person authorized to carry out work on or operate any aspect of the *Site* is notified of this *Approval* and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

3. Any person authorized to carry out work on or operate any aspect of the *Site* shall comply with the conditions of this *Approval* .

Build, etc. in Accordance

4. Except as otherwise provided by this *Approval* , the *Site* shall be designed, developed, built, operated and maintained in accordance with the applications for this *Approval* and all supporting documentation listed in Schedule "A".

Interpretation

5. Where there is a conflict between a provision of any document, including the application, referred to in this *Approval* , and the conditions of this *Approval,* the conditions in this *Approval* shall take precedence.

6. Where there is a conflict between the application and a provision in any documents listed in Schedule "A", the application shall take precedence, unless it is clear that the purpose of the document was to amend the application and that the *Ministry* approved the amendment.

7. Where there is a conflict between any two documents listed in Schedule "A", other than the application, the document bearing the most recent date shall take precedence.

8. The requirements of this *Approval* are severable. If any requirement of this *Approval* , or the application of any requirement of this *Approval* to any circumstance, is held invalid or unenforceable, the application of such requirement to other circumstances and the remainder of this *Approval* shall not be affected thereby.

Other Legal Obligations

9. The issuance of, and compliance with the conditions of, this *Approval* does not:
a. relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement; or
b. limit in any way the authority of the *Ministry* to require certain steps be taken or to require the *Owner* and *Operator* to furnish any further information related to compliance with this *Approval* ;

Adverse Effects

10. The *Owner* and *Operator* shall take steps to minimize and ameliorate immediately any adverse effect on the natural environment or impairment of water quality resulting from the *Site* , including such accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.

11. Despite an *Owner* , *Operator* or any other person fulfilling any obligations imposed by this *Approval,* the person remains responsible for any contravention of any other condition of this *Approval*

or any applicable statute, regulation, or other legal requirement resulting from any act or omission that caused the adverse effect to the natural environment or impairment of water quality.

Change of Owner

12. The *Owner* shall notify the *Director* in writing, and forward a copy of the notification to the *District Manager,* within 30 days of the occurrence of any changes:
a. the ownership of the *Site*
b. the *Operator* of the *Site;*
c. the address of the *Owner* or *Operator* ;
d. the partners, where the *Owner* is or at any time becomes a partnership and a copy of the most recent declaration filed under the *Business Names Act,* R.S.O. 1990, c. B-17 shall be included in the notification;
e. the name of the corporation where the *Owner* is or at any time becomes a corporation, other than a municipal corporation, and a copy of the most current information filed under the *Corporations Information Act* , R.S.O. 1990, C-39 shall be included in the notification; or

13. No portion of this *Site* shall be transferred or encumbered prior to or after closing of the *Site* unless the *Director* is notified in advance and sufficient financial assurance is deposited with the *Ministry* to ensure that these conditions will be carried out. In the event of any change in *Ownership* of the *Site* , other than change to a successor municipality, the *Owner* shall notify the successor of and provide the successor with a copy of this *Approval* , and the Owner shall provide a copy of the notification to the *District Manager* and the *Director.*

PART 2 - LANDFILL CLOSURE

Closure

14. The landfill site shall be closed, inspected and maintained in accordance with Items 5 through 10 in Schedule "A". The *Owner*shall take all necessary action to ensure that no additional waste is deposited in or on the *Landfill Site.*

15. Upon commencement of the operation of the Transfer Station facility, or December 31, 2002, which ever occurs first, the Owner shall take all necessary action to ensure that waste is no longer disposed of in the landfill.

16. The *Owner* shall ensure that MOE Guideline B-7 Reasonable Use Guideline is applied and met at all points on the property line which are impacted by leachate at the *Site* .

17. (1) The *Owner* shall conduct groundwater and surface water monitoring as per Section 3 and 5.3 in Item 5 in Schedule "A".

(2) The *Owner* can make changes to the monitoring program in accordance with the recommendations of the annual report provided that the *District Manager* agrees, in writing, to such changes to the program.

18. (1) The Owner is hereby permitted to process (chip) and store the process wood waste on-site in accordance with Items 9 to 10 in Schedule "A".

(2) The maximum storage period for the chipped wood waste at the site is one (1) year. Any waste

stored more than one year shall be removed from the Site within 30 days of the one year anniversary of material being processed.

(3) The maximum storage capacity for the chipped wood is five thousand (5,000) cubic meters.

Ground and Surface Water Reporting

19. By April 30, 2007, and by every April 30 thereafter, the proponent shall submit to the MOE Peterborough District Manager, an annual report that summarizes groundwater and surface water monitoring and any remedial work that occurred at the site. The report shall be prepared by a qualified professional hydrogeologist and surface water specialist. The report shall contain, but is not limited to, the following information:

a) a discussion and/or illustration on any changes that may have occurred in the current reporting period with regards to the landfill's hydrogeologic setting, potentially sensitive groundwater and/or surface water features or changes to the landfill. If no changes occur, then author shall reference appropriate Section(s) in previous reports to direct the reviewer to the existing information.
b) Sampling protocols, and a description of any problems encountered during the sampling events which may have impacted the reliability of analytical results;
c) The data shall be interpreted by the author(s) and presented in a manner that is acceptable to the Director. All analytical results for all parameters shall be presented in tabular form. All analytical results for the critical contaminants must be compared to the trigger levels in accordance with the environmental contingency plan;
d) The report shall identify the "Reasonable Use" (Guideline B-7) of the ground water that is to be impacted. The report should also identify expected and worst-case impacts;
e) The report shall include a comparison of the results of surface water sampling to the PWQOs or Interim PWQOs described in Water Management, MOEE, July 1994, as amended from time to time;
f) A discussion on the contaminant attenuation zone and buffer zone requirements;
g) QA/QC protocol must be described; and
h) The report shall have the conclusions and recommendations of the author(s), especially as they concern future sampling parameters, frequency and protocol.

PART 3 - WASTE TRANSFER STATION

In Accordance

20. Except as otherwise provided by these conditions, the Transfer Station shall be located, constructed, used, maintained, operated, inspected, reported and closed, and all facilities, equipment and fixtures shall be built and installed, in accordance with the Application for Approval for a Waste Disposal Site dated February 8, 2002 **,** and supporting documentation, and plans and specifications listed in Schedule "A".

21. Disposal of waste from the Transfer Station shall be to a licensed waste disposal site.

Hours of Operation

22. a. The *Owner* shall set operational hours which provides an adequate level of service. The hours of operation shall be any day of the week, during daylight hours.
b. Hours of operation may be changed by the *Owner* at any time, provided that the hours are correctly posted at the *Site* gate, and that suitable public notice is given of any change.
c. The *Owner*shall notify the *District Manager,*in writing, of any changes to the hours of operation.

23. With the prior written approval of the *District Manager*, the time periods may be extended to accommodate seasonal or unusual quantities of waste.

Approved Waste Type and Quantities

24. The Transfer Station shall only accept municipal waste limited to solid non-hazardous residential, industrial, commercial, institutional (IC&I) and *construction and demolition waste* , *WEEE, source separated organics* and *limited MHSW* from the Municipality of Trent Lakes located in the County of Peterborough.

25. The Transfer Station may receive up to 500 cubic metres of waste and/or recyclable materials per day.

26. The total volumes of waste/materials stored at the Transfer Station at any one time shall not exceed:

a) Municipal solid waste (non-segregated) 130 cubic metres
b) Recyclable materials 160 cubic metres
c) Tires 200 cubic metres
d) White goods 400 cubic metres
e) Metal 400 cubic metres
f) Leaf & Yard Waste (wood & brush) 400 cubic metres
g) Construction and demolition waste 400 cubic metres
h) WEEE 30 cubic metres
i) Hard plastics 60 cubic metres
j) Source separated organic materials 10 cubic metres
k) MHSW 50 cubic metres
h) Total waste/materials 2240 cubic metres

27. Further to Condition 26k., the 50 m 3 approved quantity of *MHSW* shall be further restricted as follows:
i. Up to 50 vehicle batteries;
ii. Up to one 250 litre drum of lithium, dry cell and rechargeable batteries;
iii. Up to 250 litres of empty motor oil containers; and
iv. Up to 50 units of fluorescent light bulbs.

28. The *Owner* shall ensure that *limited MHSW* is stored as follows:
i. vehicles batteries shall be stored on pallets in a manner which protects them from the elements;
ii. lithium, dry cell and rechargeable batteries shall be bulked into a 250 L plastic or metal drum, either bagged or with the terminal ends of each battery taped over or otherwise stored in a manner which prevents the terminal ends from touching;
iii. empty motor oil containers shall be bulked into a 250 L plastic or metal drum;
iv. fluorescent bulbs shall be stored in a rigid container in a manner which prevents the breakage of bulbs during storage and transport.

29. Municipality shall ensure that all bins used for emptying the underground containers, as described in Item 18 of Schedule "A", properly contain all organic material placed inside.

30. The Municipality shall retain a record of the following information at the Municipality at a location approved by the District Manager:

i) Date the containers are emptied;
ii) Approximate volume transferred to the collection truck per load; and
iii) A record of any spills that occur during emptying and a description outlining any remediation measures that were implemented.

31. The organics collection program shall be operated and maintained in such a manner that does not pose a danger or health risk to the environment or public.

32. An area for the acceptance, storage and preparation for transport for recycling, of waste electrical and electronic equipment (WEEE), and subsequent transfer of such wastes by an approved carrier for disposal elsewhere shall be operated in accordance with the following:

(a) the materials shall be stored: in a roll-off bin (covered), a trailer or other suitable shelter; in an orderly fashion, to avoid breakage (broken materials shall be placed in containers), such that WEEE is sheltered from rain and snow, and as provided under the contractual agreement with the MOE approved program plan administrators.
(b) maximum storage volume is 40 cubic yards;
(c) the Site Plan submitted annually shall show the location of the storage area;
(d) a log shall be kept of the firm used for the transportation and the destination where the waste will be consolidated for recycling, re-use, refurbishment or disposal as per the WEEE Program Plan and in accordance with the Conditions of this Approval.

33. White goods received at the *Transfer Station* which contain refrigerants shall:

a. be stored in an upright position and in such a manner to allow for the safe handling and removal from the *Site* for removal of refrigerants as required by *Ontario Regulation 463/10;* and

b. have refrigerants removed by a licensed technician in accordance with *Ontario Regulation 463/10,* or as amended prior to be transferred form the *Site;* or

c. shall be transferred only to facilities where the refrigerants can removed by a licensed technician in accordance with *Ontario Regulation 463/10.*

34. The *Owner*shall ensure the following:

i. the Transfer Station shall only accept solid non-hazardous organic waste, stored temporary in two (2) deep-well containers for a period not exceeding 72 hours or disposed more frequently off-site as needed, to prevent odour effects, and/or in storage quantity not exceeding 10 cubic meters at any time. If for any reason waste cannot be transferred from the Transfer Station, the Owner shall cease accepting waste;
ii. the Owner shall ensure that at the end of each day's operation, the organic waste storage containers at the Transfer Station are managed appropriately to prevent blowing litter, and to prevent interference of the waste by rodents, birds, vector/ vermin etc;
iii. organic waste storage containers shall be leaf-proof, lockable and bear resistant; and
iv. organic waste being accepted at the Site shall be visually inspected by a Trained Personnel to ensure that the incoming Organic Waste meets the requirements of this Approval .

Waste Storage

35. All recycling bins, roll-off containers and segregated waste storage areas shall be clearly marked

showing the type of waste they are to contain.

36. The operator will monitor segregated waste and reuse areas daily to remove unauthorized materials.

37. The Owner shall ensure that all wastes at the Transfer Station are managed and disposed in accordance with Ontario Regulation 347, R.R.O. 1990, as amended, and the Environmental Protection Act.

38. The Owner shall ensure that the Transfer Station is operated in a safe and secure manner which minimizes the impacts of dust, odour, noise and litter on the general public, site personnel, and the natural environment.

Waste Inspection

39. All waste shall be inspected by *trained personnel* prior to being accepted at the *Transfer Station* to ensure that the waste is of a type approved for acceptance under this *Approval* .

40. The Owner shall conduct daily inspections of the equipment and facilities at the *Transfer Station* to ensure that they are maintained in good working condition at all times. Any deficiencies, which might negatively impact the environment, detected during these inspections shall be recorded in a log, and shall include the following information:
a. the name and signature of person that conducted the inspection;
b. the date and time of the inspection;
c. a list of any deficiencies discovered;
d. any recommendations for remedial action; and
e. the date, time and description of actions taken.

Complaints

41. If at any time, the *Municipality* receives complaints regarding the operation of the *Transfer Station* , the *Municipality* shall respond to these complaints according to the following procedure:
a. record and number each complaint, either electronically or in a separate log book, and shall include the following information;
b. the nature of the complaint,
c. if complaint is odour or nuisance related, the weather conditions and wind direction at the time of the complaint;
d. the name, address and the telephone number of the complainant (if provided);
e. the time and date of the complaint;
f. the *Municipality* , upon notification of the complaint, shall initiate appropriate steps to determine all possible causes of the complaint, proceed to take the necessary actions to eliminate the cause of the complaint and forward a formal reply to the complainant; and
g. the *Municipality* shall complete and retain on-site a report with a copy given to the *District Manager* within one (1) week of the complaint date, listing the actions taken to resolve the complaint and any recommendations for remedial measures, and managerial or operational changes to reasonably avoid the recurrence of similar incidents.

42. Seven (7) days following the complaint/s, the *Owner* shall contact the District Manager notifying him of the nature of the complaint and provide him with a written description of the complaint and the actions taken to address the concern(s).

Emergency Management Program

43. Copies of the "Trent Lakes Emergency Management Program B2016-138 dated December 20, 2016", shall be kept on the Site at all times in a central location, available to all staff, in a good state of repair and fully operational.

44. Copies of the Program shall also be submitted to the local Municipality and the Fire Department. Changes to the Emergency Management Program shall be submitted to the *District Manager.* It is the discretion of the *District Manager* if such changes require *Director'* s approval.

45. The Owner shall ensure that all operating personnel are fully trained in the use, and in the procedures to be employed in the event of an emergency;

46. The Owner shall immediately take all measures necessary to contain and clean up any spill or leak which may result from the operation of the *Transfer Station* and report all spills and upsets immediately the ministry's Spills Action Center at 416-325-3000 or 1-800-268-6060, and the Municipality, and shall be recorded in a log book as to the nature of the spill or upset, and the action taken for clean-up, correction and prevention of future occurrences.

47. All waste material resulting from a spill or process upset, shall be managed and disposed of in accordance with Ontario Regulation 347, R.R.O. 1990, as amended.

48. A detailed storm water management plan for the *Transfer Station* facility shall be included in the Closure and Long Term Care and Monitoring Plan for the Landfill Site.

Closure

49. The Owner must submit a written Closure Plan for the Transfer Station as part of the Closure and Long Term Care and Monitoring Plan for the Landfill Site.

50. The Owner must submit, in writing to the Director, a notice stating the Owner's intent to close the Transfer Station one (1) month prior to the closure of the Transfer Station. This notice must include an updated description of the work that will be done to facilitate closure and cleanup of the Transfer Station and a schedule for completion of the work.

51. Within ten (10) days after closure of the Transfer Station, the Owner must notify the Director, in writing, that the facility has been closed in accordance with the approved Closure Plan.

PART 4 - DOCUMENTATION

Daily Log Book (or electronic log)

52. A daily log shall be maintained and shall include the following information:
a. date;
b. types (class and primary characteristic), quantities and source of waste received;
c. quantities and destination of each type of waste shipped from the *Transfer Station* ;
d. a record of daily inspections required by this *Approval;*
e. a record of any spills or process upsets at the site, the nature of the spill or process upset and the action taken for the clean up or correction of the spill, the time and date of the spill or process upset, and for spills, the time that the *Ministry* and other persons were notified of the spill in fulfilment of the reporting requirements in the *EPA; and*

f. a record of any waste refusals which shall include: amounts, reasons for refusal and actions taken.

Annual Reporting

53. Beginning July 1, 2003 and by July 1 of each year thereafter, the Owner shall submit to the District Manager, an annual monitoring report to include but not be limited to monthly balance of waste received and transferred from the Transfer Station, a summary of any rejected wastes, a summary of any incidents, a summary of complaints received, a statement as to compliance with all Conditions of this Approval and with the inspection and reporting requirements of the Conditions contained herein, a description of any operational changes and/or Transfer Station improvements undertaken and all other operational issues;

54. The Owner shall maintain on-site a written record of daily inspections of the Transfer Station. This record shall be in the form of a *Transfer Station* Inspection daily log(s) and shall include as a minimum:

(i) date and time of inspection;
(ii) name, title and signature of trained personnel supervising the inspection;
(iii) a listing of all equipment, fencing, gates, etc. inspected and any deficiencies observed;
(iv) any maintenance conducted as a result of these inspections;
(v) recommendations for remedial action and date remedial action, if necessary, was completed;
(vi) date and time of any complaints received at the Site and their nature; and
(vii) date and time of any environmentally significant incidents.

55. The Owner shall maintain a daily written record of the waste received at the Transfer Station, and the waste transferred from the Transfer Station. This record shall be in the form of a Transfer Station daily log(s) and shall include as a minimum the date, quantity and source of waste received and date, quantity and the destination of material removed/transferred from the Site.

56. The Owner shall maintain a written record of the incidental hazardous waste received at the *Transfer Station* , and transferred from the *Transfer Station.* This record shall be in the form of Incidental Hazardous Waste Transfer daily log(s) and shall include as a minimum date, quantity, and source of incidental hazardous waste, date, quantity, type and the destination of incidental hazardous waste transferred from the Site.

This Schedule "A" forms part of Environmental Compliance Approval:

1. Application for Approval of a Waste Disposal Site dated February 2, 2002.

2. Township of Galway-Cavendish and Harvey, North Landfill Site Transfer Station, Design, Operation, Maintenance and Closure Report, prepared by Totten Sims Hubicki Associates, dated February 8, 2002.

3. Letter from Michael Cant of Totten Sims Hubicki Associates to Heather Brodie-Brown of the Ministry of the Environment and Energy, dated June 19, 2002, with details pertaining to, the volume of waste to be stored, the contingency plan and construction schedule, and documents pertaining to the name change for the Township and the contingency and emergency plan.

4. Township of Galway-Cavendish and Harvey, North Landfill Site Transfer Station Safety and Emergency response Procedures.

5. Report entitled "Closure Plan - North Landfill Site" prepared for the Township of Galway-Cavendish and Harvey by TSH dated September 2002.

6. Letter dated June 6, 2003 to Mr. J. Millage, Township of Galway-Cavendish and Harvey from Mr. Jim Hirashi, Ministry of the Environment requesting additional information on contour, monitoring and inspections at the Site.

7. Letter dated August 10, 2006 to Mr. Dale Gable, Ministry of the Environment from Mr. Chris Visser, TSH providing updated drawings for the Existing Site Conditions and Proposed Final Contours.

8. Letter dated August 15, 2006 to Mr. J. Millage, Township of Galway-Cavendish and Harvey from Mr. Dale Gable, Ministry of the Environment providing comments on the amended proposed final contours and the reasonable use criteria at the site.

9. Letter and supporting documentation dated October 5, 2006 addressed to Mr. Dale Gable, Ministry of the Environment from Mr. Chris Visser, TSH providing amended drawings and a response to the additional information request from August 15, 2006. The supporting documentation included the following:

i. Drawing No. 1 - Bobcaygeon (North) Landfill Site Existing Site Plan (Scale 1:500) prepared by TSH (Project No. 52-27858) dated October 4, 2006; and
ii. Drawing No. 2 - Bobcaygeon (North) Landfill Site Proposed Final Contours (Scale 1:500) prepared by TSH (Project No. 52-27858) dated October 4, 2006.

10. Letter and supporting documentation dated October 19, 2006 addressed to Mr. Dale Gable, Ministry of the Environment from Mr. Chris Visser, TSH providing additional information for the requested addendum to permit the chipping and storage of wood waste at the Transfer Station. The supporting documentation includes the following:

i. Drawing No. 2 - Bobcaygeon (North) Landfill Site Proposed Final Contours (Scale 1:500) prepared by TSH (Project No. 52-27858) dated October 19, 2006.

11. Application for an Approval for a Waste Disposal Site, signed by Ms. Pat Kemp, CAO/Clerk and dated April 6, 2006.

12. Letter to Mr. James O'Mara (MOE) from Mr. Michael Cant (TSH) regarding the submission of an application for the establishment and operation of a Household Hazardous Waste Collection Facility at Bobcaygeon Transfer Station.

13. Letter to Mr. Matthew Chisholm (MOE) from Ms. Colleen Carter, P.Eng. (TSH) dated May 8, 2006 regarding notification letter to adjacent landowners/tenants with distribution list and HHW facility layout.

14. Letter dated June 28, 3006 to Mr. Richard Saunders, P.Eng. (MOE) from Mr. Chris Visser (TSH) regarding waste classes being approved, emergency response plans, waste storage containers and containment areas, and response to the adjacent landowners comments.

15. Email dated July 21, 2006 to Mr. Richard Saunders, P.Eng. from Mr. Chris Visser (TSH) regarding the flammable drum storage area.

16. Fax dated July 24, 2006 to Mr. Richard Saunders, P.Eng. (MOE) from Mr. Chris Visser (TSH) regarding the maximum waste storage volumes.

17. Letter dated July 28, 2006 to Mr. Richard Saunders, P.Eng. (MOE) from Mr. Chris Visser (TSH) regarding site plan and updated waste class list and HHW Operation Manual and includes the

following:
a. Drawing No. 1 entitled "Bobcaygeon Transfer Station, Household Hazardous Waste Facility" prepared by TSH dated July 2006.
b. Report entitled "County of Peterborough, HHW Operation Manual, 2006 Season" complied and supplied by the County of Peterborough.

18. Letter dated June 9, 2008 requesting an amendment to an existing Approval, signed by Catrina Switzer, Environmental Services, County of Peterborough, including all supporting information.

19. Application for a Approval for a Waste Disposal Site dated June14, 2010, signed by Pat Kemp, Chief Administrative Officer, The Corporation of the Municipality of Trent Lakes **,** including all documents attached to this application.

20. E-mail dated June 18, 2010, including all attachments to the e-mail, from Laurie Westaway, County of Peterborough (Project Technical Information Contact) to Nihar Bhatt, Ontario Ministry of the Environment, providing electronic copies of the appendices to the Operations Manual for the Site.

21. Environmental Compliance Approval Application, with Design and Operations Report, Maps and other supporting documentation to amend ECA, dated May 10, 2016 and signed by Lois O'Neill-Jackson, CAO/Economic Development Officer., Municipality of Trent Lakes.

22. Email, dated September 18, 2017, from David Bucholtz, General Manager, Cambium Inc., providing feedback on updated changes to the MHSW program.

The reasons for the imposition of these terms and conditions are as follows:

1. The reason for Condition 1 is to simplify the wording of the subsequent conditions and define the specific meaning of terms as used in this Approval.

2. The reasons for Conditions 2, 3, 4 5, 6, 7, 8, 9, 10 and 11 are to clarify the legal rights and responsibilities of the Owner and Operator.

3. The reasons for Condition 12 and 13 is to ensure the Director is notified of the change in Ownership of the Site.

4. The reasons for Condition 14, 15 and 16 are to ensure the Owner closes the Site as per the submitted information in Schedule "A". This is to ensure the long-term health and safety of the public and the environment.

5. The reason for Condition 17 is to ensure the Owner installs the environmental monitoring wells and conducts environmental monitoring at the site as per the Ministry's recommendations. This is to ensure the long-term health and safety of the public and the environment.

6. The reasons for Condition 18 is to permit the Owner to chip and store wood waste material on-site for up to one year. The condition also establishes a maximum amount of waste that can be stored on-site. This is to ensure the long-term health and safety of the public and the environment.

7. The reason for Condition 19 is to ensure the Owner submits an annual report to the Ministry of the Environment that describes the monitoring and remedial work that occurs at the site. This is to ensure the long-term health and safety of the public and environment

8. The reason for Condition 20 is to ensure that the Transfer Station is operated in accordance with the application and supporting documentation submitted by the Company, and not in a manner which the

Director has not been asked to consider.

9. The reason for Condition 22 and 23 is to establish the hours of operation for the Transfer Station.

10. The reason for Conditions 21, and 24 through to 34 is to ensure that the types and amounts of waste received at the Site are in accordance with that considered by the Director and approved under this Approval. Condition 21 is also to ensure that an approved end disposal site is available for the waste stored at the Transfer Station.

11. The reason for Conditions 35 through to 38 is to establish the storage location and disposal of wastes
on Site.

12. The reason for Conditions 39 and 40 is to ensure that detailed records of Site inspections are recorded and maintained at the Transfer Station for inspection and information purposes.

13. The reason for Condition 41 and 42 is to ensure that any complaints regarding operations at the Transfer Station are responded to in a timely manner.

14. The reasons for Conditions 43 through to 48 are to ensure that an Emergency Management Program is developed and maintained at the Transfer Station and that staff are properly trained in the operation of the equipment used at the Site. Also, the local fire department should be aware of the Emergency Management Program.

15. The reasons for Conditions 49, 50 and 51 are to ensure that the Transfer Station is closed in accordance with Ministry standards and to protect the health and safety of the public and the environment.

16. The reasons for Condition 52, 53, 54, 55 and 56 is to ensure that regular review of site development, operations and monitoring data is documented and any possible improvements to site design, operations or monitoring programs are identified. An annual report is an important tool used in reviewing site activities and for determining the effectiveness of site design.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). A341307 issued on March 11, 2011.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*****
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment and Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or** www.ert.gov.on.ca

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 2nd day of October, 2017

Dale Gable, P.Eng.
Director
appointed for the purposes of Part II.1 of
the *Environmental Protection Act*

CJ/
c: District Manager, MOECC Peterborough
Dave Bucholtz, Cambium Inc.

Appendix B
Field and Precipitation Data

LOCATION: Bobcaygeon WDS DATE: April 20, 2020 WEATHER (SAMPLE DAY): -7°C Sun 8°C

PROJECT NUMBER: 10520-005 SAMPLED BY: N. Morin and M. Pion WEATHER (PREVIOUS DAY): 6°C ~5mm Rain

FIELD SHEET – GROUNDWATER DEVELOPMENT & SAMPLING

Sample Location	Water Level	B.H. Depth (m)	B.H. Dia. (mm)	Stick – Up (m)	Purge Volumes (L)		Temp (°C)	pH (units)	Cond. (µS/cm)	DO (mg/L)	ORP (mV)	LFG (ppm)	Observations				
					Needed	Actual							Clarity	Colour	Odour	Sheen	Other
00-1-U	4.12	8.63	50.8	0.71	28	28	9.9	7.84	510	9.81	66	<5	Clear	None	None	None	
00-1-M	4.19	13.00	50.8	0.70	54	Dry x 1 15	7.9	7.83	860	6.22	144	15	Clear	None	None	None	
00-1-L	10.30	19.13	50.8	0.70	54	Dry x 1 19	9.1	7.93	920	6.47	154	35	Clear	Yellow	None	None	
97-1-U	4.10	7.24	50.8	0.64	20	Dry x 1 9	7.4	7.23	1220	7.24	67	<5	Opaque	Grey	None	None	
97-1-M	5.74	11.65	50.8	0.62	36	Dry x 1 17	9.3	7.78	660	8.55	65	<5	Clear	None	None	None	
97-1-L	6.45	17.77	50.8	0.64	69	Dry x 1 25	10.4	8.15	520	8.92	49	<5	Clear	None	None	None	
97-2-U	8.07	9.37	50.8	0.85	8	8	10.3	7.20	940	6.47	122	85	Clear	None	None	None	
97-2-L	12.73	14.18	50.8	0.85	9	9	10.5	8.46	670	10.37	37	55	Cloudy	None	None	None	
97-3	4.45	5.57	50.8	0.74	7	7	9.7	6.86	1150	3.52	156	<5	Clear	None	None	None	QA/QC #1
98-1-U	3.89	5.80	50.8	0.83	12	12	8.1	6.84	730	1.91	68	<5	Clear	None	None	None	
98-1-M	5.14	9.96	50.8	0.82	30	Dry x 1 10	9.2	8.30	600	8.60	49	<5	Clear	None	None	None	
98-1-L	3.28	14.24	50.8	0.82	67	Dry x 1 24	8.7	8.40	700	8.46	64	<5	Clear	None	None	None	
98-2-U	4.70	10.94	50.8	0.79	38	38	8.1	7.04	740	6.72	75	<5	Cloudy	Brown	None	None	
98-2-M	9.47	16.37	50.8	0.80	43	Dry x 1 15	8.1	8.06	6108	7.63	72	<5	Cloudy	None	None	None	
98-2-L	5.86	23.71	50.8	0.81	109	Dry x 1 43	7.8	7.63	1400	8.56	84	<5	Cloudy	Grey	None	None	
98-3-U	3.97	8.24	50.8	0.78	26	26	7.8	7.05	830	2.80	75	<5	Cloudy	Brown	None	None	QA/QC #2

LOCATION: Bobcaygeon WDS DATE: April 20, 2020 WEATHER (SAMPLE DAY): -7°C Sun 8°C

PROJECT NUMBER: 10520-005 SAMPLED BY: N. Morin and M. Pion WEATHER (PREVIOUS DAY): 6°C ~5mm Rain

FIELD SHEET – GROUNDWATER DEVELOPMENT & SAMPLING

Sample Location	Water Level	B.H. Depth (m)	B.H. Dia. (mm)	Stick – Up (m)	Purge Volumes (L)		Temp (°C)	pH (units)	Cond. (µ/cmS)	DO (mg/L)	ORP (mV)	LFG (ppm)	Observations				
					Needed	Actual							Clarity	Colour	Odour	Sheen	Other
98-3-M	5.34	13.29	50.8	0.77	49	Dry x 1 18	9.1	8.51	490	8.65	44	<5	Clear	None	None	None	
98-3-L	6.52	18.21	50.8	0.77	72	Dry x 1 24	8.9	8.34	600	8.03	70	<5	Cloudy	Grey	None	None	
BH16-1S	4.45	8.00	38.1	0.80	13	Dry x 1 7	9.3	7.65	880	10.31	154	55	Opaque	Grey	None	None	
BH16-1D	5.29	16.02	38.1	0.47	37	37	10.5	7.87	750	1.86	160	75	Cloudy	Grey	Sulphur	None	

LOCATION: Bobcaygeon WDS DATE: November 09, 2020 WEATHER (SAMPLE DAY): 4°C Sun and Cloud 19°C

PROJECT NUMBER: 10520-005 SAMPLED BY: R. Doyle + N. Morin WEATHER (PREVIOUS DAY): 15°C Sun

FIELD SHEET – GROUNDWATER DEVELOPMENT & SAMPLING

Sample Location	Water Level	B.H. Depth (m)	B.H. Dia. (mm)	Stick – Up (m)	Purge Volumes (L)		Temp (°C)	pH (units)	Cond. (µS/cm)	DO (mg/L)	ORP (mV)	LFG (ppm)	Observations				
					Needed	Actual							Clarity	Colour	Odour	Sheen	Other
00-1-U	3.14	3.46	50.8	0.71	2	-	9.1	7.13	1178	3.74	106	15	Cloudy	Grey	None	None	
00-1-M	5.88	13.00	50.8	0.70	44	Dry x 1 15	8.2	7.45	892	7.94	63	20	Cloudy	Grey	None	None	
00-1-L	9.17	19.13	50.8	0.70	61	Dry x 1 23	10.4	7.48	690	6.85	260	20	Clear	None	None	None	
97-1-U	5.51	7.24	50.8	0.64	11	Dry x 1 6	13.7	6.81	838	5.37	255	<5	Opaque	Grey	None	None	
97-1-M	7.98	11.65	50.8	0.62	23	Dry x 1 11	10.4	7.43	506	6.60	275	<5	Cloudy	Grey	None	None	
97-1-L	8.00	17.77	50.8	0.64	60	Dry x 1 20	11.1	7.23	513	7.84	275	<5	Cloudy	Grey	None	None	
97-2-U	8.63	9.37	50.8	0.85	4.5	5	9.8	6.76	1926	2.94	103	<5	Cloudy	None	None	None	
97-2-L	12.85	14.18	50.8	0.85	9	Dry x 1 5.5	9.3	7.77	633	11.01	68	<5	Cloudy	Grey	None	None	
97-3	4.62	5.57	50.8	0.74	6	Dry x 1 3	13.7	6.64	1343	2.12	98	<5	Clear	None	Swampy	None	QA/QC #1
98-1-U	4.57	5.80	50.8	0.83	8	Dry x 1 3	10.4	6.69	890	4.42	261	<5	Cloudy	None	None	None	
98-1-M	5.61	9.96	50.8	0.82	27	Dry x 1 10	9.7	7.45	546	8.46	253	<5	Cloudy	Grey	None	None	
98-1-L	7.22	14.24	50.8	0.82	43	Dry x 1 15	9.2	7.72	748	6.41	252	<5	Cloudy	None	None	None	
98-2-U	7.51	10.94	50.8	0.79	21	Dry x 1 10	9.3	6.93	888	4.75	247	<5	Opaque	Grey	None	None	
98-2-M	9.28	16.37	50.8	0.80	44	Dry x 1 17	9.2	7.15	464	5.55	239	10	Clear	None	None	None	
98-2-L	9.43	23.71	50.8	0.81	87	87	9.2	7.10	1621	3.25	248	15	Clear	None	Sulphur	None	
98-3-U	5.15	8.24	50.8	0.78	19	19	10.9	6.92	602	6.70	263	<5	Opaque	Red-brown	None	None	QA/QC #2

LOCATION: Bobcaygeon WDS DATE: November 09, 2020 WEATHER (SAMPLE DAY): 4°C Sun and Cloud 19°C

PROJECT NUMBER: 10520-005 SAMPLED BY: R. Doyle + N. Morin WEATHER (PREVIOUS DAY): 15°C Sun

FIELD SHEET – GROUNDWATER DEVELOPMENT & SAMPLING

Sample Location	Water Level	B.H. Depth (m)	B.H. Dia. (mm)	Stick – Up (m)	Purge Volumes (L)		Temp (°C)	pH (units)	Cond. (µS/cm)	DO (mg/L)	ORP (mV)	LFG (ppm)	Observations				
					Needed	Actual							Clarity	Colour	Odour	Sheen	Other
98-3-M	7.82	13.29	50.8	0.77	34	Dry x 1 12	9.9	7.77	440	5.15	250	<5	Clear	None	None	None	
98-3-L	8.48	18.21	50.8	0.77	60	Dry x 1 23	11.5	7.80	613	10.34	258	<5	Opaque	Grey	None	None	
BH16-1S	5.17	8.00	38.1	0.80	10	Dry x 1 3	12.4	7.41	823	11.23	78	<5	Cloudy	Grey	None	None	
BH16-1D	8.80	16.02	38.1	0.47	25	25	11.0	7.67	728	4.07	69	<5	Cloudy	Grey	Sulphur	None	

Government of Canada / Gouvernement du Canada

Daily Data Report for April 2020

PETERBOROUGH A
ONTARIO
Current Station Operator: NAVCAN

Latitude:	44°13'48.000" N	**Longitude:**	78°21'48.000" W	**Elevation:**	191.40 m
Climate ID:	6166415	**WMO ID:**	71436	**TC ID:**	YPQ

DAY	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
01	10.8	-1.7	4.6	13.4	0.0			0.0		34	33
02	13.8	-3.3	5.3	12.7	0.0			0.0		31	45
03	10.4	1.7	6.1	11.9	0.0			2.2		2	35
04	12.0	4.3	8.2	9.8	0.0			0.0		M	M
05	10.8	0.1	5.5	12.5	0.0			0.0		30	41
06	13.8	-4.0	4.9	13.1	0.0			0.0		29	42
07	15.4	-2.1	6.7	11.3	0.0			3.2		M	M
08	10.8	0.8	5.8	12.2	0.0			0.0		27	42
09	7.9	0.7	4.3	13.7	0.0			12.2		27	65
10	8.0	-0.1	4.0	14.0	0.0			0.0		32	68
11	8.2	-2.4	2.9	15.1	0.0			0.0		27	54
12	13.1	-2.7	5.2	12.8	0.0			0.0		M	M
13	14.6	1.9	8.3	9.7	0.0			13.7		26	72
14	6.4	-2.9	1.8	16.2	0.0			0.8		29	48
15	2.9	-6.9	-2.0	20.0	0.0			0.2		29	48
16	4.8	-4.9	-0.1	18.1	0.0			0.0		29	58
17	6.6	-6.5	0.1	17.9	0.0			0.0		18	37
18	9.9	-6.2	1.9	16.1	0.0			0.0		19	41
19	10.4	-1.9	4.3	13.7	0.0			4.5		23	54
20	7.1	-5.0	1.1	16.9	0.0			0.0		15	33
21	6.3	-3.9	1.2	16.8	0.0			0.5		27	80
22	3.2	-5.5	-1.2	19.2	0.0			0.0		28	63
23	8.7	-8.0	0.4	17.6	0.0			0.0		M	M
24	8.4	-1.7	3.4	14.6	0.0			0.0		5	35
25	16.4	-5.1	5.7	12.3	0.0			0.0		M	M
26	11.0	6.1	8.6	9.4	0.0			0.0		5	63
27	15.9	2.3	9.1	8.9	0.0			0.0		16	32
28	12.9	1.2	7.1	10.9	0.0			0.0		M	M
29	15.4	1.3	8.4	9.6	0.0			3.8		13	48
30	M	M	M	M	M			M		13	45
Sum				400.4^	0.0^			41.1^			
Avg	10.2^	-1.9^	4.2^								

DAY	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
Xtrm	16.4^	-8.0^								27^	80^

Summary, average and extreme values are based on the data above.

Legend

- A = Accumulated
- C = Precipitation occurred, amount uncertain
- E = Estimated
- F = Accumulated and estimated
- L = Precipitation may or may not have occurred
- M = Missing
- N = Temperature missing but known to be > 0
- S = More than one occurrence
- T = Trace
- Y = Temperature missing but known to be < 0
- [empty] = Indicates an unobserved value
- ^ = The value displayed is based on incomplete data
- † = Data that is not subject to review by the National Climate Archives

Date modified:

2020-09-17

Government of Canada / Gouvernement du Canada

Daily Data Report for November 2020

PETERBOROUGH A
ONTARIO
Current Station Operator: NAVCAN

Latitude:	44°13'48.000" N	**Longitude:**	78°21'48.000" W	**Elevation:**	191.40 m
Climate ID:	6166415	**WMO ID:**	71436	**TC ID:**	YPQ

DAY	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
01	8.8	-0.3	4.3	13.7	0.0			5.6		31	65
02	5.8	-4.2	0.8	17.2	0.0			0.4		31	78
03	5.8	-2.3	1.8	16.2	0.0			0.2		32	58
04	16.7	-4.4	6.2	11.8	0.0			0.0		21	59
05	18.9	9.3	14.1	3.9	0.0			0.0		21	41
06	20.6	1.7	11.2	6.8	0.0			0.0		27	35
07	21.6	1.7	11.7	6.3	0.0			0.0		22	35
08	21.6	-0.4	10.6	7.4	0.0			0.0		M	M
09	21.5	1.7	11.6	6.4	0.0			0.0		M	M
10	22.5	2.6	12.6	5.4	0.0			0.0		20	35
11	20.1	3.7	11.9	6.1	0.0			0.0		27	48
12	9.7	-4.1	2.8	15.2	0.0			0.0		M	M
13	7.4	-4.0	1.7	16.3	0.0			0.0		31	46
14	7.5	-6.0	0.8	17.2	0.0			0.0		28	39
15	10.5	-3.5	3.5	14.5	0.0			7.6		26	81
16	5.3	1.4	3.4	14.6	0.0			0.0		25	55
17	2.2	-7.0	-2.4	20.4	0.0			0.2		28	61
18	-1.4	-9.0	-5.2	23.2	0.0			0.0		34	37
19	12.7	-3.4	4.7	13.3	0.0			0.0		22	55
20	17.0	4.2	10.6	7.4	0.0			0.0		22	45
21	5.0	0.4	2.7	15.3	0.0			0.0		30	41
22	1.6	-2.7	-0.6	18.6	0.0			16.1		7	32
23	2.9	-1.6	0.7	17.3	0.0			0.0		31	37
24	M	M	M	M	M			M		M	M
25	5.3	-3.4	1.0	17.0	0.0			4.9		M	M
26	8.3	3.3	5.8	12.2	0.0			0.0		27	32
27	6.7	3.0	4.9	13.1	0.0			0.0		M	M
28	6.7	1.3	4.0	14.0	0.0			0.5		28	41
29	9.8	-4.1	2.9	15.1	0.0			0.0		20	37
30	3.7	-1.1	1.3	16.7	0.0			19.5		1	37
Sum				382.6^	0.0^			55.0^			
Avg	10.5^	-0.9^	4.8^								

DAY	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
Xtrm	22.5^	-9.0^								26^	81^

Summary, average and extreme values are based on the data above.

Legend

- A = Accumulated
- C = Precipitation occurred, amount uncertain
- E = Estimated
- F = Accumulated and estimated
- L = Precipitation may or may not have occurred
- M = Missing
- N = Temperature missing but known to be > 0
- S = More than one occurrence
- T = Trace
- Y = Temperature missing but known to be < 0
- [empty] = Indicates an unobserved value
- ^ = The value displayed is based on incomplete data
- † = Data that is not subject to review by the National Climate Archives

Date modified:

2020-09-17

Appendix C
Laboratory Certificates of Analysis

CADUCEON™ ENVIRONMENTAL LABORATORIES
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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G93109 **REPORT No. B20-10308**

Report To:

Cambium Environmental
PO Box 325, 52 Hunter Street East
Peterborough ON K9H 1G5 Canada
Attention: Stephanie Reeder

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 21-Apr-20
DATE REPORTED: 28-Apr-20
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Bobcaygeon WDS
P.O. NUMBER: 10520-005
WATERWORKS NO.

			Client I.D.		98-2-U	98-2-M	98-2L	98-3-U
			Sample I.D.		B20-10308-1	B20-10308-2	B20-10308-3	B20-10308-4
			Date Collected		20-Apr-20	20-Apr-20	20-Apr-20	20-Apr-20
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	22-Apr-20/O	325	192	222	377
Conductivity @25°C	µmho/cm	1	SM 2510B	22-Apr-20/O	950	566	2090	1250
pH @25°C	pH Units		SM 4500H	22-Apr-20/O	7.57	7.76	7.62	7.43
Total Dissolved Solids	mg/L	3	SM 2540D	23-Apr-20/O	505	293	1150	677
Total Suspended Solids	mg/L	3	SM2540D	22-Apr-20/K				
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	22-Apr-20/O	2.0	1.5	1.6	3.3
BOD(5 day)	mg/L	3	SM 5210B	22-Apr-20/K				
COD	mg/L	5	SM 5220D	23-Apr-20/O	8	< 5	< 5	24
Chloride	mg/L	0.5	SM4110C	23-Apr-20/O	93.9	17.9	79.8	163
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	22-Apr-20/K	0.03	< 0.01	0.29	0.02
Sulphate	mg/L	1	SM4110C	23-Apr-20/O	27	74	966	22
Nitrate (N)	mg/L	0.05	SM4110C	23-Apr-20/O	1.36	0.11	< 0.05	1.01
Hardness (as CaCO3)	mg/L	1	SM 3120	22-Apr-20/O	473	284	1270	550
Barium	mg/L	0.001	SM 3120	22-Apr-20/O	0.144	0.031	0.014	0.235
Boron	mg/L	0.005	SM 3120	22-Apr-20/O	0.076	0.351	2.04	0.028
Calcium	mg/L	0.02	SM 3120	22-Apr-20/O	176	68.7	306	202
Iron	mg/L	0.005	SM 3120	22-Apr-20/O	0.867	0.005	1.03	< 0.005
Magnesium	mg/L	0.02	SM 3120	22-Apr-20/O	7.92	27.2	122	10.9
Manganese	mg/L	0.001	SM 3120	22-Apr-20/O	0.079	< 0.001	0.060	0.003
Sodium	mg/L	0.2	SM 3120	22-Apr-20/O	65.8	17.0	78.7	86.5

Michelle Dubien
Lab Manager

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

CADUCEON™ ENVIRONMENTAL LABORATORIES
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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G93109 **REPORT No. B20-10308**

Report To:

Cambium Environmental
PO Box 325, 52 Hunter Street East
Peterborough ON K9H 1G5 Canada
Attention: Stephanie Reeder

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 21-Apr-20
DATE REPORTED: 28-Apr-20
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Bobcaygeon WDS
P.O. NUMBER: 10520-005
WATERWORKS NO.

			Client I.D.		98-3-M	98-3-L	QA/QC #2	98-1-U
			Sample I.D.		B20-10308-5	B20-10308-6	B20-10308-7	B20-10308-8
			Date Collected		20-Apr-20	20-Apr-20	20-Apr-20	20-Apr-20
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	22-Apr-20/O	209	165	379	418
Conductivity @25°C	µmho/cm	1	SM 2510B	22-Apr-20/O	546	754	1260	1150
pH @25°C	pH Units		SM 4500H	22-Apr-20/O	7.84	7.90	7.44	7.41
Total Dissolved Solids	mg/L	3	SM 2540D	23-Apr-20/O	283	394	683	620
Total Suspended Solids	mg/L	3	SM2540D	22-Apr-20/K				
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	22-Apr-20/O	1.5	1.5	3.4	4.9
BOD(5 day)	mg/L	3	SM 5210B	22-Apr-20/K				
COD	mg/L	5	SM 5220D	23-Apr-20/O	< 5	10	26	12
Chloride	mg/L	0.5	SM4110C	23-Apr-20/O	11.0	6.7	166	80.6
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	22-Apr-20/K	< 0.01	0.03	0.03	1.52
Sulphate	mg/L	1	SM4110C	23-Apr-20/O	84	215	22	44
Nitrate (N)	mg/L	0.05	SM4110C	23-Apr-20/O	0.13	0.09	1.01	3.35
Hardness (as CaCO3)	mg/L	1	SM 3120	22-Apr-20/O	281	289	544	528
Barium	mg/L	0.001	SM 3120	22-Apr-20/O	0.024	0.016	0.241	0.203
Boron	mg/L	0.005	SM 3120	22-Apr-20/O	0.272	0.589	0.028	0.206
Calcium	mg/L	0.02	SM 3120	22-Apr-20/O	63.4	71.2	200	194
Iron	mg/L	0.005	SM 3120	22-Apr-20/O	< 0.005	< 0.005	< 0.005	0.096
Magnesium	mg/L	0.02	SM 3120	22-Apr-20/O	29.7	27.1	10.7	10.5
Manganese	mg/L	0.001	SM 3120	22-Apr-20/O	0.001	0.001	0.003	0.023
Sodium	mg/L	0.2	SM 3120	22-Apr-20/O	11.9	65.9	87.8	61.6

Michelle Dubien
Lab Manager

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Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G93109 **REPORT No. B20-10308**

Report To:

Cambium Environmental
PO Box 325, 52 Hunter Street East
Peterborough ON K9H 1G5 Canada
Attention: Stephanie Reeder

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 21-Apr-20
DATE REPORTED: 28-Apr-20
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Bobcaygeon WDS
P.O. NUMBER: 10520-005
WATERWORKS NO.

			Client I.D.		98-1-M	98-1-L	BH16-2	BH16-1
			Sample I.D.		B20-10308-9	B20-10308-10	B20-10308-11	B20-10308-12
			Date Collected		20-Apr-20	20-Apr-20	20-Apr-20	20-Apr-20
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	22-Apr-20/O	247	162	210	336
Conductivity @25°C	µmho/cm	1	SM 2510B	22-Apr-20/O	698	1080	687	814
pH @25°C	pH Units		SM 4500H	22-Apr-20/O	7.84	7.86	7.97	7.85
Total Dissolved Solids	mg/L	3	SM 2540D	23-Apr-20/O	363	581	357	428
Total Suspended Solids	mg/L	3	SM2540D	22-Apr-20/K				
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	22-Apr-20/O	2.9	1.3	1.6	5.6
BOD(5 day)	mg/L	3	SM 5210B	22-Apr-20/K				
COD	mg/L	5	SM 5220D	23-Apr-20/O	< 5	< 5	7	22
Chloride	mg/L	0.5	SM4110C	23-Apr-20/O	18.1	7.1	18.9	22.3
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	22-Apr-20/K	0.02	0.06	0.06	0.03
Sulphate	mg/L	1	SM4110C	23-Apr-20/O	90	426	126	59
Nitrate (N)	mg/L	0.05	SM4110C	23-Apr-20/O	0.11	0.08	< 0.05	1.26
Hardness (as CaCO3)	mg/L	1	SM 3120	22-Apr-20/O	350	468	347	408
Barium	mg/L	0.001	SM 3120	22-Apr-20/O	0.071	0.017	0.020	0.107
Boron	mg/L	0.005	SM 3120	22-Apr-20/O	0.289	0.807	0.601	0.203
Calcium	mg/L	0.02	SM 3120	22-Apr-20/O	94.0	98.6	70.0	129
Iron	mg/L	0.005	SM 3120	22-Apr-20/O	< 0.005	0.130	0.020	< 0.005
Magnesium	mg/L	0.02	SM 3120	22-Apr-20/O	28.1	54.0	41.9	20.8
Manganese	mg/L	0.001	SM 3120	22-Apr-20/O	< 0.001	0.007	0.011	0.004
Sodium	mg/L	0.2	SM 3120	22-Apr-20/O	21.4	66.9	22.4	44.5

Michelle Dubien
Lab Manager

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Final Report

C.O.C.: G93109 **REPORT No. B20-10308**

Report To:

Cambium Environmental
PO Box 325, 52 Hunter Street East
Peterborough ON K9H 1G5 Canada
Attention: Stephanie Reeder

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 21-Apr-20
DATE REPORTED: 28-Apr-20
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Bobcaygeon WDS
P.O. NUMBER: 10520-005
WATERWORKS NO.

			Client I.D.		97-3	QA/QC	97-2L	00-1-U
			Sample I.D.		B20-10308-13	B20-10308-14	B20-10308-15	B20-10308-16
			Date Collected		20-Apr-20	20-Apr-20	20-Apr-20	20-Apr-20
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	22-Apr-20/O	635	632	158	260
Conductivity @25°C	µmho/cm	1	SM 2510B	22-Apr-20/O	1750	1760	600	776
pH @25°C	pH Units		SM 4500H	22-Apr-20/O	7.33	7.35	7.74	7.78
Total Dissolved Solids	mg/L	3	SM 2540D	23-Apr-20/O	958	964	311	407
Total Suspended Solids	mg/L	3	SM2540D	22-Apr-20/K	24			
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	22-Apr-20/O	9.4	9.2	4.7	2.5
BOD(5 day)	mg/L	3	SM 5210B	22-Apr-20/K	< 3			
COD	mg/L	5	SM 5220D	23-Apr-20/O	34	36	18	13
Chloride	mg/L	0.5	SM4110C	23-Apr-20/O	159	159	5.1	78.3
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	22-Apr-20/K	22.8	22.7	0.05	0.05
Sulphate	mg/L	1	SM4110C	23-Apr-20/O	39	39	146	16
Nitrate (N)	mg/L	0.05	SM4110C	23-Apr-20/O	< 0.05	< 0.05	0.67	0.50
Hardness (as CaCO3)	mg/L	1	SM 3120	22-Apr-20/O	655	624	263	288
Barium	mg/L	0.001	SM 3120	22-Apr-20/O	0.399	0.379	0.024	0.068
Boron	mg/L	0.005	SM 3120	22-Apr-20/O	0.657	0.640	0.819	0.012
Calcium	mg/L	0.02	SM 3120	22-Apr-20/O	225	214	57.1	110
Iron	mg/L	0.005	SM 3120	22-Apr-20/O	4.58	3.76	0.017	0.008
Magnesium	mg/L	0.02	SM 3120	22-Apr-20/O	22.6	21.7	29.3	3.22
Manganese	mg/L	0.001	SM 3120	22-Apr-20/O	0.856	0.813	0.005	0.002
Sodium	mg/L	0.2	SM 3120	22-Apr-20/O	112	108	26.8	30.7

Michelle Dubien
Lab Manager

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Peterborough ON K9H 1G5 Canada
Attention: Stephanie Reeder

Caduceon Environmental Laboratories
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Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 21-Apr-20
DATE REPORTED: 28-Apr-20
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Bobcaygeon WDS
P.O. NUMBER: 10520-005
WATERWORKS NO.

			Client I.D.		00-1-M	00-1-L	97-2-U	97-1-U
			Sample I.D.		B20-10308-17	B20-10308-18	B20-10308-19	B20-10308-20
			Date Collected		20-Apr-20	20-Apr-20	20-Apr-20	20-Apr-20
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	22-Apr-20/O	260	216	340	386
Conductivity @25°C	µmho/cm	1	SM 2510B	22-Apr-20/O	808	893	1100	1320
pH @25°C	pH Units		SM 4500H	22-Apr-20/O	7.87	7.83	7.59	7.47
Total Dissolved Solids	mg/L	3	SM 2540D	23-Apr-20/O	425	473	589	715
Total Suspended Solids	mg/L	3	SM2540D	22-Apr-20/K				
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	22-Apr-20/O	2.1	2.0	3.3	3.5
BOD(5 day)	mg/L	3	SM 5210B	22-Apr-20/K				
COD	mg/L	5	SM 5220D	23-Apr-20/O	< 5	< 5	< 5	11
Chloride	mg/L	0.5	SM4110C	23-Apr-20/O	36.7	20.9	130	176
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	22-Apr-20/K	0.01	< 0.01	0.01	0.02
Sulphate	mg/L	1	SM4110C	23-Apr-20/O	114	252	18	22
Nitrate (N)	mg/L	0.05	SM4110C	23-Apr-20/O	0.16	0.28	1.60	1.72
Hardness (as CaCO3)	mg/L	1	SM 3120	22-Apr-20/O	417	423	413	651
Barium	mg/L	0.001	SM 3120	22-Apr-20/O	0.027	0.033	0.155	0.401
Boron	mg/L	0.005	SM 3120	22-Apr-20/O	0.264	0.340	0.026	0.023
Calcium	mg/L	0.02	SM 3120	22-Apr-20/O	106	110	158	244
Iron	mg/L	0.005	SM 3120	22-Apr-20/O	0.005	0.191	0.009	0.744
Magnesium	mg/L	0.02	SM 3120	22-Apr-20/O	37.1	35.9	4.50	9.89
Manganese	mg/L	0.001	SM 3120	22-Apr-20/O	0.001	0.006	0.003	0.162
Sodium	mg/L	0.2	SM 3120	22-Apr-20/O	26.5	45.8	77.6	98.1

M. Dubien

Michelle Dubien
Lab Manager

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Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 21-Apr-20
DATE REPORTED: 28-Apr-20
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Bobcaygeon WDS
P.O. NUMBER: 10520-005
WATERWORKS NO.

			Client I.D.		97-1-M	97-1-L		
			Sample I.D.		B20-10308-21	B20-10308-22		
			Date Collected		20-Apr-20	20-Apr-20		
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	22-Apr-20/O	239	230		
Conductivity @25°C	µmho/cm	1	SM 2510B	22-Apr-20/O	612	631		
pH @25°C	pH Units		SM 4500H	22-Apr-20/O	7.88	7.90		
Total Dissolved Solids	mg/L	3	SM 2540D	23-Apr-20/O	318	328		
Total Suspended Solids	mg/L	3	SM2540D	22-Apr-20/K				
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	22-Apr-20/O	2.7	2.3		
BOD(5 day)	mg/L	3	SM 5210B	22-Apr-20/K				
COD	mg/L	5	SM 5220D	23-Apr-20/O	< 5	< 5		
Chloride	mg/L	0.5	SM4110C	23-Apr-20/O	20.4	18.8		
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	22-Apr-20/K	0.02	< 0.01		
Sulphate	mg/L	1	SM4110C	23-Apr-20/O	44	69		
Nitrate (N)	mg/L	0.05	SM4110C	23-Apr-20/O	1.32	1.47		
Hardness (as CaCO3)	mg/L	1	SM 3120	22-Apr-20/O	312	318		
Barium	mg/L	0.001	SM 3120	22-Apr-20/O	0.109	0.059		
Boron	mg/L	0.005	SM 3120	22-Apr-20/O	0.122	0.207		
Calcium	mg/L	0.02	SM 3120	22-Apr-20/O	93.5	83.9		
Iron	mg/L	0.005	SM 3120	22-Apr-20/O	< 0.005	< 0.005		
Magnesium	mg/L	0.02	SM 3120	22-Apr-20/O	19.0	26.3		
Manganese	mg/L	0.001	SM 3120	22-Apr-20/O	< 0.001	0.001		
Sodium	mg/L	0.2	SM 3120	22-Apr-20/O	18.5	19.7		

Michelle Dubien
Lab Manager

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G099370

REPORT No. B20-35710 (i)

Rev. 2

Report To:

Cambium Environmental
PO Box 325, 52 Hunter Street East
Peterborough ON K9H 1G5 Canada
Attention: Stephanie Reeder

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 11-Nov-20
DATE REPORTED: 01-Apr-21
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Bobcaygeon WDS
P.O. NUMBER: 10520-005
WATERWORKS NO.

			Client I.D.		98-2-M_B	98-2-U_A	98-2-L_C	98-1-L_C
			Sample I.D.		B20-35710-1	B20-35710-2	B20-35710-3	B20-35710-4
			Date Collected		09-Nov-20	09-Nov-20	09-Nov-20	09-Nov-20
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	16-Nov-20/O	191	399	216	157
Conductivity @25°C	µmho/cm	1	SM 2510B	16-Nov-20/O	587	1190	2090	1030
pH @25°C	pH Units		SM 4500H	16-Nov-20/O	7.84	7.38	7.57	7.88
Total Dissolved Solids	mg/L	3	SM 2540D	17-Nov-20/O	304	643	1150	548
Total Suspended Solids	mg/L	3	SM2540D	12-Nov-20/K				
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	16-Nov-20/O	0.8	0.8	0.3	1.7
BOD(5 day)	mg/L	3	SM 5210B	12-Nov-20/K				
COD	mg/L	5	SM5220C	12-Nov-20/K	< 5	< 5	< 5	< 5
Chloride	mg/L	0.5	SM4110C	13-Nov-20/O	17.4	101	81.4	6.2
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	17-Nov-20/K	0.01	< 0.01	0.06	0.02
Sulphate	mg/L	1	SM4110C	13-Nov-20/O	80	62	980	390
Nitrate (N)	mg/L	0.05	SM4110C	13-Nov-20/O	0.06	1.11	0.34	0.13
Hardness (as CaCO3)	mg/L	1	SM 3120	13-Nov-20/O	290	542	1270	472
Barium	mg/L	0.001	SM 3120	13-Nov-20/O	0.031	0.112	0.014	0.017
Boron	mg/L	0.005	SM 3120	13-Nov-20/O	0.360	0.189	2.00	0.789
Calcium	mg/L	0.02	SM 3120	13-Nov-20/O	72.3	191	314	104
Iron	mg/L	0.005	SM 3120	13-Nov-20/O	< 0.005	0.010	0.171	0.099
Magnesium	mg/L	0.02	SM 3120	13-Nov-20/O	26.7	15.6	117	51.5
Manganese	mg/L	0.001	SM 3120	13-Nov-20/O	< 0.001	0.001	0.040	0.013
Sodium	mg/L	0.2	SM 3120	13-Nov-20/O	16.9	70.1	78.2	63.2

1 Sediment present

Michelle Dubien
Lab Manager

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REPORT No. B20-35710 (i)

Rev. 2

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DATE RECEIVED: 11-Nov-20
DATE REPORTED: 01-Apr-21
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Bobcaygeon WDS
P.O. NUMBER: 10520-005
WATERWORKS NO.

			Client I.D.		98-1-M_B	98-1-U_A	98-3-L_C	98-3-M_B
			Sample I.D.		B20-35710-5	B20-35710-6	B20-35710-7	B20-35710-8
			Date Collected		09-Nov-20	09-Nov-20	09-Nov-20	09-Nov-20
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	16-Nov-20/O	243	482	165	178
Conductivity @25°C	µmho/cm	1	SM 2510B	16-Nov-20/O	709	117	761	560
pH @25°C	pH Units		SM 4500H	16-Nov-20/O	7.92	7.09	8.03	8.04
Total Dissolved Solids	mg/L	3	SM 2540D	17-Nov-20/O	368	600	398	290
Total Suspended Solids	mg/L	3	SM2540D	12-Nov-20/K				
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	16-Nov-20/O	1.5	3.5	1.8	0.9
BOD(5 day)	mg/L	3	SM 5210B	12-Nov-20/K				
COD	mg/L	5	SM5220C	12-Nov-20/K	< 5	< 5	< 5	< 5
Chloride	mg/L	0.5	SM4110C	13-Nov-20/O	17.6	26.7	6.7	10.5
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	17-Nov-20/K	0.01	0.01	0.05	0.03
Sulphate	mg/L	1	SM4110C	13-Nov-20/O	97	48	219	88
Nitrate (N)	mg/L	0.05	SM4110C	13-Nov-20/O	0.12	3.12	0.06	0.36
Hardness (as CaCO3)	mg/L	1	SM 3120	13-Nov-20/O	366	652	297	291
Barium	mg/L	0.001	SM 3120	13-Nov-20/O	0.069	0.237	0.030	0.027
Boron	mg/L	0.005	SM 3120	13-Nov-20/O	0.283	0.211	0.586	0.272
Calcium	mg/L	0.02	SM 3120	13-Nov-20/O	101	239	77.4	69.2
Iron	mg/L	0.005	SM 3120	13-Nov-20/O	0.013	< 0.005	0.176	< 0.005
Magnesium	mg/L	0.02	SM 3120	13-Nov-20/O	27.6	13.2	25.3	28.8
Manganese	mg/L	0.001	SM 3120	13-Nov-20/O	< 0.001	0.001	0.031	0.001
Sodium	mg/L	0.2	SM 3120	13-Nov-20/O	20.2	19.6	65.2	12.8

1 Sediment present

Michelle Dubien
Lab Manager

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Final Report

C.O.C.: G099370

REPORT No. B20-35710 (i)

Rev. 2

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Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 11-Nov-20
DATE REPORTED: 01-Apr-21
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Bobcaygeon WDS
P.O. NUMBER: 10520-005
WATERWORKS NO.

			Client I.D.		98-3-U_A	GW QA/QC #2	97-2-L_C	97-2-U_A
			Sample I.D.		B20-35710-9	B20-35710-10	B20-35710-11	B20-35710-12
			Date Collected		09-Nov-20	09-Nov-20	09-Nov-20	09-Nov-20
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	16-Nov-20/O	317	308	154	414
Conductivity @25°C	µmho/cm	1	SM 2510B	16-Nov-20/O	760	754	602	1940
pH @25°C	pH Units		SM 4500H	16-Nov-20/O	7.58	7.54	8.06	7.58
Total Dissolved Solids	mg/L	3	SM 2540D	17-Nov-20/O	398	394	312	1070
Total Suspended Solids	mg/L	3	SM2540D	12-Nov-20/K				
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	16-Nov-20/O	1.1	1.1	0.8	0.3
BOD(5 day)	mg/L	3	SM 5210B	12-Nov-20/K				
COD	mg/L	5	SM5220C	12-Nov-20/K	40	48	< 5	< 5
Chloride	mg/L	0.5	SM4110C	13-Nov-20/O	30.2	29.6	4.6	351
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	17-Nov-20/K	0.03	0.03	< 0.01	0.22
Sulphate	mg/L	1	SM4110C	13-Nov-20/O	16	16	147	28
Nitrate (N)	mg/L	0.05	SM4110C	13-Nov-20/O	1.07	1.05	0.22	3.06
Hardness (as CaCO3)	mg/L	1	SM 3120	13-Nov-20/O	411	408	282	655
Barium	mg/L	0.001	SM 3120	13-Nov-20/O	0.170	0.169	0.023	0.374
Boron	mg/L	0.005	SM 3120	13-Nov-20/O	0.080	0.080	0.807	0.108
Calcium	mg/L	0.02	SM 3120	13-Nov-20/O	151	150	65.1	250
Iron	mg/L	0.005	SM 3120	13-Nov-20/O	< 0.005	< 0.005	0.077	0.815
Magnesium	mg/L	0.02	SM 3120	13-Nov-20/O	8.09	8.06	29.1	7.40
Manganese	mg/L	0.001	SM 3120	13-Nov-20/O	0.001	0.001	0.005	0.034
Sodium	mg/L	0.2	SM 3120	13-Nov-20/O	13.7	13.7	24.7	198

1. Sediment present

Michelle Dubien
Lab Manager

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G099370

REPORT No. B20-35710 (i)

Rev. 2

Report To:

Cambium Environmental
PO Box 325, 52 Hunter Street East
Peterborough ON K9H 1G5 Canada
Attention: Stephanie Reeder

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 11-Nov-20
DATE REPORTED: 01-Apr-21
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Bobcaygeon WDS
P.O. NUMBER: 10520-005
WATERWORKS NO.

			Client I.D.		97-3_a	QA/QC 1	00-1-U_a	00-1-M_b
			Sample I.D.		B20-35710-13	B20-35710-14	B20-35710-15	B20-35710-16
			Date Collected		09-Nov-20	09-Nov-20	09-Nov-20	09-Nov-20
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	16-Nov-20/O	570	575	285	254
Conductivity @25°C	µmho/cm	1	SM 2510B	16-Nov-20/O	1250	1260	1080	804
pH @25°C	pH Units		SM 4500H	16-Nov-20/O	7.12	7.31	7.70	7.89
Total Dissolved Solids	mg/L	3	SM 2540D	17-Nov-20/O	677	678	580	422
Total Suspended Solids	mg/L	3	SM2540D	12-Nov-20/K	18			
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	16-Nov-20/O	7.4	7.1	0.5	0.9
BOD(5 day)	mg/L	3	SM 5210B	12-Nov-20/K	< 3			
COD	mg/L	5	SM5220C	12-Nov-20/K	7	10	< 5	< 5
Chloride	mg/L	0.5	SM4110C	13-Nov-20/O	30.2	30.4	144	35.9
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	17-Nov-20/K	14.4	14.4	0.04	0.04
Sulphate	mg/L	1	SM4110C	13-Nov-20/O	22	22	25	107
Nitrate (N)	mg/L	0.05	SM4110C	13-Nov-20/O	0.09	< 0.05	1.00	< 0.05
Hardness (as CaCO3)	mg/L	1	SM 3120	13-Nov-20/O	637	639	341	403
Barium	mg/L	0.001	SM 3120	13-Nov-20/O	0.339	0.338	0.082	0.030
Boron	mg/L	0.005	SM 3120	13-Nov-20/O	0.540	0.528	0.017	0.233
Calcium	mg/L	0.02	SM 3120	13-Nov-20/O	226	227	129	106
Iron	mg/L	0.005	SM 3120	13-Nov-20/O	5.85	5.82	0.023	0.013
Magnesium	mg/L	0.02	SM 3120	13-Nov-20/O	17.6	17.4	4.60	33.6
Manganese	mg/L	0.001	SM 3120	13-Nov-20/O	0.661	0.662	0.023	0.009
Sodium	mg/L	0.2	SM 3120	13-Nov-20/O	43.1	42.4	49.3	30.8

1 . Sediment present

Michelle Dubien
Lab Manager

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Peterborough ON K9H 1G5 Canada
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Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 11-Nov-20
DATE REPORTED: 01-Apr-21
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Bobcaygeon WDS
P.O. NUMBER: 10520-005
WATERWORKS NO.

			Client I.D.		BH16-1D_c	BH16-1S_b	97-1-M_b	97-1-L_c
			Sample I.D.		B20-35710-17	B20-35710-18	B20-35710-19	B20-35710-20
			Date Collected		09-Nov-20	09-Nov-20	09-Nov-20	09-Nov-20
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	16-Nov-20/O	209	298	212	229
Conductivity @25°C	µmho/cm	1	SM 2510B	16-Nov-20/O	656	758	644	685
pH @25°C	pH Units		SM 4500H	16-Nov-20/O	7.78	7.87	7.92	7.84
Total Dissolved Solids	mg/L	3	SM 2540D	17-Nov-20/O	341	396	334	356
Total Suspended Solids	mg/L	3	SM2540D	12-Nov-20/K				
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	16-Nov-20/O	1.4	2.5	1.3	1.0
BOD(5 day)	mg/L	3	SM 5210B	12-Nov-20/K				
COD	mg/L	5	SM5220C	12-Nov-20/K	< 5	7	< 5	14
Chloride	mg/L	0.5	SM4110C	13-Nov-20/O	19.2	20.0	22.8	28.8
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	17-Nov-20/K	0.05	0.01	< 0.01	0.01
Sulphate	mg/L	1	SM4110C	13-Nov-20/O	115	65	80	87
Nitrate (N)	mg/L	0.05	SM4110C	13-Nov-20/O	< 0.05	0.59	0.18	0.11
Hardness (as CaCO3)	mg/L	1	SM 3120	13-Nov-20/O	343	416	345	335
Barium	mg/L	0.001	SM 3120	13-Nov-20/O	0.016	0.112	0.064	0.053
Boron	mg/L	0.005	SM 3120	13-Nov-20/O	0.569	0.182	0.248	0.238
Calcium	mg/L	0.02	SM 3120	13-Nov-20/O	73.5	134	89.2	88.3
Iron	mg/L	0.005	SM 3120	13-Nov-20/O	0.054	0.032	0.010	0.026
Magnesium	mg/L	0.02	SM 3120	13-Nov-20/O	38.7	19.6	29.7	27.8
Manganese	mg/L	0.001	SM 3120	13-Nov-20/O	0.024	0.007	0.001	0.004
Sodium	mg/L	0.2	SM 3120	13-Nov-20/O	20.4	32.8	15.6	19.5

1 . Sediment present

Michelle Dubien
Lab Manager

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Peterborough ON K9H 1G5 Canada
Attention: Stephanie Reeder

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 11-Nov-20
DATE REPORTED: 01-Apr-21
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Bobcaygeon WDS
P.O. NUMBER: 10520-005
WATERWORKS NO.

			Client I.D.		97-1-U_a	00-1-L_c		
			Sample I.D.		B20-35710-21	B20-35710-22		
			Date Collected		09-Nov-20	09-Nov-20		
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	16-Nov-20/O	376	183		
Conductivity @25°C	µmho/cm	1	SM 2510B	16-Nov-20/O	998	884		
pH @25°C	pH Units		SM 4500H	16-Nov-20/O	7.62	7.84		
Total Dissolved Solids	mg/L	3	SM 2540D	17-Nov-20/O	532	468		
Total Suspended Solids	mg/L	3	SM2540D	12-Nov-20/K				
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	16-Nov-20/O	3.1	1.1		
BOD(5 day)	mg/L	3	SM 5210B	12-Nov-20/K				
COD	mg/L	5	SM5220C	12-Nov-20/K	95	< 5		
Chloride	mg/L	0.5	SM4110C	13-Nov-20/O	67.5	11.1		
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	17-Nov-20/K	0.05	0.03		
Sulphate	mg/L	1	SM4110C	13-Nov-20/O	23	275		
Nitrate (N)	mg/L	0.05	SM4110C	13-Nov-20/O	2.02	0.11		
Hardness (as CaCO3)	mg/L	1	SM 3120	13-Nov-20/O	2160	421		
Barium	mg/L	0.001	SM 3120	13-Nov-20/O	0.427	0.037		
Boron	mg/L	0.005	SM 3120	13-Nov-20/O	0.059	0.317		
Calcium	mg/L	0.02	SM 3120	13-Nov-20/O	840 [1]	116		
Iron	mg/L	0.005	SM 3120	13-Nov-20/O	0.022	0.013		
Magnesium	mg/L	0.02	SM 3120	13-Nov-20/O	13.4	31.9		
Manganese	mg/L	0.001	SM 3120	13-Nov-20/O	1.43	0.004		
Sodium	mg/L	0.2	SM 3120	13-Nov-20/O	45.0	43.8		

1. Sediment present

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Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Michelle Dubien
Lab Manager

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PO Box 325, 52 Hunter Street East
Peterborough ON K9H 1G5 Canada
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Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 11-Nov-20
DATE REPORTED: 01-Apr-21
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Bobcaygeon WDS
P.O. NUMBER: 10520-005
WATERWORKS NO.

			Client I.D.		98-2-U_A	98-2-L_C		
			Sample I.D.		B20-35710-2	B20-35710-3		
			Date Collected		09-Nov-20	09-Nov-20		
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Acetone	µg/L	30	EPA 8260	20-Nov-20/R	< 30	< 30		
Benzene	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Bromodichloromethane	µg/L	2	EPA 8260	20-Nov-20/R	< 2	< 2		
Bromoform	µg/L	5	EPA 8260	20-Nov-20/R	< 5	< 5		
Bromomethane	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Carbon Tetrachloride	µg/L	0.2	EPA 8260	20-Nov-20/R	< 0.2	< 0.2		
Chloroethane	µg/L	3	EPA 8260	20-Nov-20/R	< 3	< 3		
Chloroform	µg/L	1	EPA 8260	20-Nov-20/R	< 1	< 1		
Chloromethane	µg/L	2	EPA 8260	20-Nov-20/R	< 2	< 2		
Dibromochloromethane	µg/L	2	EPA 8260	20-Nov-20/R	< 2	< 2		
Dibromoethane,1,2- (Ethylene Dibromide)	µg/L	0.2	EPA 8260	20-Nov-20/R	< 0.2	< 0.2		
Dichlorobenzene,1,2-	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Dichlorobenzene,1,3-	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Dichlorobenzene,1,4-	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Dichlorodifluoromethane	µg/L	2	EPA 8260	20-Nov-20/R	< 2	< 2		
Dichloroethane,1,1-	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Dichloroethane,1,2-	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Dichloroethene, cis-1,2-	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Dichloroethene, trans-1,2-	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Dichloroethylene,1,1-	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Dichloromethane (Methylene Chloride)	µg/L	5	EPA 8260	20-Nov-20/R	< 5	< 5		
Dichloropropane,1,2-	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Dichloropropene 1,3- cis+trans	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Dichloropropene, cis-1,3-	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Dichloropropene, trans-1,3-	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		

Michelle Dubien
Lab Manager

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SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Bobcaygeon WDS
P.O. NUMBER: 10520-005
WATERWORKS NO.

			Client I.D.		98-2-U_A	98-2-L_C		
			Sample I.D.		B20-35710-2	B20-35710-3		
			Date Collected		09-Nov-20	09-Nov-20		
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Dichloropropene,1,1-	µg/L	0.2	EPA 8260	20-Nov-20/R	< 0.2	< 0.2		
Ethylbenzene	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Hexane	µg/L	5	EPA 8260	20-Nov-20/R	< 5	< 5		
Methyl Ethyl Ketone	µg/L	20	EPA 8260	20-Nov-20/R	< 20	< 20		
Methyl Isobutyl Ketone	µg/L	20	EPA 8260	20-Nov-20/R	< 20	< 20		
Methyl-t-butyl Ether	µg/L	2	EPA 8260	20-Nov-20/R	< 2	< 2		
Monochlorobenzene (Chlorobenzene)	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Styrene	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Tetrachloroethane,1,1,1,2-	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Tetrachloroethane,1,1,2,2-	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Tetrachloroethylene	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Toluene	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Trichloroethane,1,1,1-	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Trichloroethane,1,1,2-	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Trichloroethylene	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		
Trichlorofluoromethane	µg/L	5	EPA 8260	20-Nov-20/R	< 5	< 5		
Trimethylbenzene,1,3,5-	µg/L	0.1	EPA 8260	20-Nov-20/R	< 0.1	< 0.1		
Vinyl Chloride	µg/L	0.2	EPA 8260	20-Nov-20/R	< 0.2	< 0.2		
Xylene, m,p-	µg/L	1.0	EPA 8260	20-Nov-20/R	< 1.0	< 1.0		
Xylene, m,p,o-	µg/L	1.1	EPA 8260	20-Nov-20/R	< 1.1	< 1.1		
Xylene, o-	µg/L	0.5	EPA 8260	20-Nov-20/R	< 0.5	< 0.5		

1. Revised to include additional VOC parameter

Michelle Dubien
Lab Manager

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Appendix D
Photographs

Photograph 1: Monitors 97-1-U, 97-1-M, and 97-1-L, April 2020

Photograph 2: Monitors 97-1-U, 97-1-M, and 97-1-L, April 2019

Photograph 3: Monitors 97-2-U and 97-2-L, April 2020

Photograph 4: Monitors 97-2-U and 97-2-L, April 2019

Photograph 5: Monitor 97-3, April 2019

Photograph 6: Monitors 98-1-U, 98-1-M, and 98-1-L, April 2020

Photograph 7: Monitors 98-1-U, 98-1-M, and 98-1-L, November 2019

Photograph 8: Monitors 98-2-U, 98-2-M, and 98-2-L, April 2019

Photograph 9: Monitors 98-3-U, 98-3-M, and 98-3-L, April 2020

Photograph 10: Monitors 98-3-U, 98-3-M, and 98-3-L, April 2020

Photograph 11: Monitors 00-1-U, 00-1-M, and 00-1-L, April 2019

Photograph 12: Monitors 00-1-U, 00-1-M, and 00-1-L, April 2019

Photograph 13: Monitors BH16-1D and BH16-1S, November 2019

Photograph 14: Monitors BH16-1D and BH16-1S, April 2019

Appendix E

Borehole Logs

HYDROTERRA LIMITED
16 Glamis Place, Thornhill, Ontario L3T 3G7

BOREHOLE NO. 97-1

PROJECT NAME: North Harvey Landfill
PROJECT NO.: 1400
CLIENT: Township of Harvey
DATE: Dec 18/97
BOREHOLE TYPE: Air-Rotary (150 mm Dia)
FIELD SUPERVISOR: LB
GROUND ELEVATION: 88.75 m (Relative)
ENGINEER: LB

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS (D M S)	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION SPT 'N' VALUE / SHEAR STRENGTH	WATER CONTENT % (Wp, WL)	REMARKS
0	Brown, dry to moist SAND, with some GRAVEL sizes, occasional cobbles			SS							
4.76											
5	Grey to light grey LIMESTONE; no significant water-bearing fractures										
10											
15											
17.06											
20	50 mm PVC screens set from 4.9 to 6.4 m; 9.1 to 10.7 m; and 15.2 to 16.8 m										

HYDROTERRA LIMITED
15 Glamis Place, Thornhill, Ontario L3T 3G7

BOREHOLE NO. 97-2

PROJECT NAME: North Landfill
PROJECT NO.: 1400
CLIENT: Township of Harvey
DATE: Dec 19/97
BOREHOLE TYPE: Air-Rotary (150 mm Dia)
FIELD SUPERVISOR: LB
GROUND ELEVATION: 94.95 m (Relative)
ENGINEER: LB

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS (D S)	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION SPT 'N' VALUE / SHEAR STRENGTH	WATER CONTENT % (W P, W L)	REMARKS
0	Brown, dry to moist SAND, with some GRAVEL, occasional cobbles			SS							
5											
7.62											
	Grey to light grey LIMESTONE; no significant water-bearing fractures										
10											
13.10											
15	50 mm PVC screens set from 7.0 to 8.5 and 11.6 to 13.1 m										
20											

HYDROTERRA LIMITED
15 Glamis Place, Thornhill, Ontario L3T 3G7

BOREHOLE NO. 97-3

PROJECT NAME North Harvey Landfill
PROJECT NO. 1400
CLIENT Township of Harvey
DATE Dec 19/97
BOREHOLE TYPE Air-Rotary (150 mm Dia)
FIELD SUPERVISOR LB
GROUND ELEVATION 91.82 m (Relative)
ENGINEER LB

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION SPT 'N' VALUE / SHEAR STRENGTH	WATER CONTENT % (W P, W, W L)	REMARKS
0	Brown, moist to wet SAND and GRAVEL			SS							
3.05											
	Grey LIMESTONE, significant fracture at 4.6 m										
5											
7.01											
10											
15											
20	500 PVC screen set from 3.4 to 4.6 m										

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BOREHOLE NO. 98-1

PROJECT NAME: North Landfill Investigation
PROJECT NO.: 1400A
CLIENT: Township of Galway-Cavendish-Harvey
DATE: Dec 16/98
BOREHOLE TYPE: Air Rotary (150 mm diameter)
FIELD SUPERVISOR: LB
GROUND ELEVATION: 89.09 m (relative)
ENGINEER: LB

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION SPT 'N' VALUE / SHEAR STRENGTH	WATER CONTENT % W_P W_L	REMARKS
0	Brown SAND and GRAVEL, moist		DMS								50 mm PVC screens set from 3.5 to 5.0 m; 7.5 to 9.0 m; 11.9 to 13.4 m.
3.05											
	Grey to light grey LIMESTONE; discernable water-bearing fracture at 4.30 metres										
5											
10											
13.41											
15											
20											

HYDROTERRA LIMITED
15 Glamis Place, Thornhill, Ontario L3T 3G7

BOREHOLE NO. 98-2

PROJECT NAME: North Landfill Investigation
PROJECT NO.: 1400A
CLIENT: Township of Galway-Cavendish-Harvey
DATE: Dec 17/98
BOREHOLE TYPE: Air Rotary (150 mm diameter)
FIELD SUPERVISOR: LB
GROUND ELEVATION: 90.83 m (relative)
ENGINEER: LB

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS DMS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE ROD (%)	CONE PENETRATION SPT 'N' VALUE / SHEAR STRENGTH	WATER CONTENT % W_P W_L	REMARKS
0	Brown SAND and GRAVEL, moist										
4.80											
5	Grey to light grey LIMESTONE; no significant water-bearing fractures										50 mm PVC screens set from 8.7 to 9.2 m; 14.1 to 15.6 m; 21.2 to 22.5 m.
10											
15											
20											
22.71											

HYDROTERRA LIMITED
15 Glamis Place, Thornhill, Ontario L3T 3G7

BOREHOLE NO. 98-3

PROJECT NAME: North Landfill Investigation
PROJECT NO. 1400A
CLIENT: Township of Galway-Cavendish-Harvey
DATE: Dec 17/98
BOREHOLE TYPE: Air Rotary (150 mm diameter)
FIELD SUPERVISOR: LB
GROUND ELEVATION: 88.45 m (relative)
ENGINEER: LB

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS DMS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE ROD (%)	CONE PENETRATION SPT 'N' VALUE / SHEAR STRENGTH	WATER CONTENT % W_P W_L	REMARKS
0	Brown sand and GRAVEL, bouldery, moist										
4.72											
5	Grey to light grey LIMESTONE; no significant water-bearing fractures										50 mm PVC screens set from 5.9 to 7.4 m; 11.0 to 12.5 m; 15.5 to 17.4 m.
10											
15											
17.47	RED SHALE										
20											

HYDROTERRA LIMITED
15 Glamis Place, Thornhill, Ontario L3T 3G7

BOREHOLE NO. 00-1

PROJECT NAME North Landfill Investigation — **PROJECT NO.** 1400A

CLIENT Township of Galway-Cavendish-Harvey — **DATE** Jan 10/00

BOREHOLE TYPE Air Rotary (150 mm diameter) — **FIELD SUPERVISOR** LB

GROUND ELEVATION _____ — **ENGINEER** LB

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS I II III	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE ROD (%)	CONE PENETRATION SPT 'N' VALUE / SHEAR STRENGTH	WATER CONTENT % Wp Wl	REMARKS
0	Sand, gravel boulders, very dense, dry			SS							Borehole cased to 3.1 metres, and sand backfill opposite screened intervals.
3.0											
5	Grey to light grey LIMESTONE; noticeable water-bearing fracture at 5.2 to 7.0 metres										50 mm PVC screens set from 6.1 to 7.6 m; 10.7 to 12.2 m; and 16.8 to 18.3 m.
10											Bentonite seals set from 3.0 to 4.6 m; 7.9 to 9.5 m; and 12.8 to 14.9 m.
15											
18.3											
20											

BOREHOLE NO. BH16-1d

PROJECT NAME: BOBCAYGEON LANDFILL
PROJECT NO.: 121-15605-01
CLIENT: MUNICIPALITY OF TRENT LAKES
DATE COMPLETED: Oct 11, 2016
BOREHOLE TYPE: 168 mm AIR HAMMER DRILL
SUPERVISOR: TB
GROUND ELEVATION: NOT DETERMINED
REVIEWER: LJG

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
0.0	**SAND AND GRAVEL:** Brown SAND AND GRAVEL, trace to some cobbles and boulders, moist										Monitoring well installed with 50 mm inner diameter, schedule 40 PVC risers, with a 3.04 m length No. 10 screen size well screen.
5.8	**LIMESTONE BEDROCK:** Grey LIMESTONE (chip samples), presumed Verulam Formation.										Groundwater at 11.9 m below ground surface
15.2	Borehole terminated at 15.2 m below ground surface in LIMESTONE BEDROCK.										Borehole open upon completion of drilling.

BOREHOLE NO. BH16-1s

PROJECT NAME: BOBCAYGEON LANDFILL
PROJECT NO.: 121-15605-01
CLIENT: MUNICIPALITY OF TRENT LAKES
DATE COMPLETED: Oct 11, 2016
BOREHOLE TYPE: 168 mm AIR HAMMER DRILL
SUPERVISOR: TB
GROUND ELEVATION: NOT DETERMINED
REVIEWER: LJG

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
0.0	**SAND AND GRAVEL:** Brown SAND AND GRAVEL, trace to some cobbles and boulders, moist										Monitoring well installed with 50 mm inner diameter, schedule 40 PVC risers, with a 1.53 m length No. 10 screen size well screen.
3.7	**LIMESTONE BEDROCK:** Grey LIMESTONE (chip samples), presumed Verulam Formation.										Groundwater at 6.4 m below ground surface
7.3	Borehole terminated at 7.3 m below ground surface in LIMESTONE BEDROCK.										Borehole open upon completion of drilling.

British Empire Fuels

Ontario Ministry of the Environment

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☑ CORRECT BOX WHERE APPLICABLE

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON.	LOT
Victoria	Harvey	19	Pt 17

OWNER (SURNAME FIRST)	ADDRESS	DATE COMPLETED
British Empire Fuels	Box 359, Bobcaygeon, Ont.	DAY 12 MO Sept YR 88

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH FEET FROM	DEPTH FEET TO
Brown	Gravel & Clay			0	20
Gray	Limestone			20	97
Red	Granite			97	100

WATER RECORD

WATER FOUND AT FEET	KIND OF WATER		
97	☒ FRESH ☐ SALTY	☐ SULPHUR ☐ MINERALS ☐ GAS	WATER SUPPLY
	☐ FRESH ☐ SALTY	☐ SULPHUR ☐ MINERALS ☐ GAS	
	☐ FRESH ☐ SALTY	☐ SULPHUR ☐ MINERALS ☐ GAS	
	☐ FRESH ☐ SALTY	☐ SULPHUR ☐ MINERALS ☐ GAS	
	☐ FRESH ☐ SALTY	☐ SULPHUR ☐ MINERALS ☐ GAS	

CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH FEET FROM	DEPTH FEET TO
6¼	☒ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC	.188	0	20
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC			
	☐ STEEL ☐ GALVANIZED ☐ CONCRETE ☐ OPEN HOLE ☐ PLASTIC			

SCREEN

RECORD OF SCREEN (SEE INSTR. NO.)	MAKE	SLOT NO.
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	DIAMETER INCHES

PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, CLAY, PACKER, ETC.)
15	10	Holeplug
10	0	Cuttings & Mud

PUMPING TEST

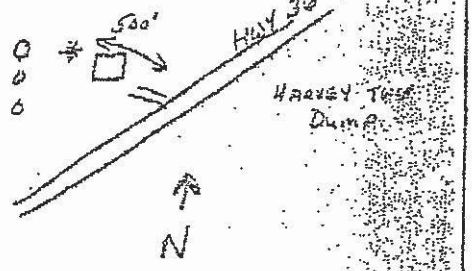
PUMPING TEST METHOD: ☐ PUMP ☒ BAILER
PUMPING RATE: 4 GPM
DURATION OF PUMPING: 2 HOURS
STATIC LEVEL: 60 FEET
WATER LEVEL END OF PUMPING: 90 FEET
WATER LEVELS DURING: ☒ PUMPING ☐ RECOVERY

10 MINUTES	20 MINUTES	30 MINUTES	40 MINUTES
90 FEET	90 FEET	90 FEET	90 FEET

IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: 98 FEET
WATER AT END OF TEST: ☒ CLEAR ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING: 98 FEET
RECOMMENDED PUMPING RATE: 4 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLER'S REMARKS: 30070

FINAL STATUS OF WELL	☒ WATER SUPPLY ☐ OBSERVATION WELL ☐ TEST HOLE ☐ RECHARGE WELL ☐ ABANDONED, INSUFFICIENT SUPPLY ☐ ABANDONED, POOR QUALITY ☐ UNFINISHED ☐ DEWATERING
WATER USE	☒ DOMESTIC ☐ STOCK ☐ IRRIGATION ☐ INDUSTRIAL ☐ COMMERCIAL ☐ MUNICIPAL ☐ PUBLIC SUPPLY ☐ COOLING OR AIR CONDITIONING ☐ OTHER ☐ NOT USED
METHOD OF CONSTRUCTION	☒ CABLE TOOL ☐ ROTARY (CONVENTIONAL) ☐ ROTARY (REVERSE) ☐ ROTARY (AIR) ☐ AIR PERCUSSION ☐ BORING ☐ DIAMOND ☐ JETTING ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Watson Water Wells Ltd.
WELL CONTRACTOR'S LICENCE NUMBER: 5457
ADDRESS: R.R.#2, Cameron, Ont.
NAME OF WELL TECHNICIAN: Jim Lean
WELL TECHNICIAN'S LICENCE NUMBER: 1-3546
SIGNATURE OF TECHNICIAN/CONTRACTOR:
SUBMISSION DATE: DAY MO YR

CONTRACTOR'S COPY

OFFICE USE ONLY

PRIVATE WELL 1

FORM NO. 0506 (11/84) FORM 8