MANORS OF BELFOUNTAIN CORP

HYDROGEOLOGICAL INVESTIGATION REPORT

Manors of Belfountain, Caledon, ON

COLE Reference No. 2017-0646



FEBRUARY 2018

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February 13, 2018 Reference No. 2017-0646

Manors of Belfountain Corp 55 Blue Willow Drive Woodbridge, ON L4L 9EB

Attention: John Spina

Re: Manors of Belfountain, Caledon, ON Hydrogeological Investigation Report

Dear Mr. Spina,

Cole Engineering Group Ltd. (COLE) is pleased to submit the enclosed hydrogeological investigation report for the development Lot 9, Concession 5 in Caledon, ON. The investigation includes a review of existing hydrogeological information for the study area, characterization of the geological and hydrogeological setting, an assessment of potential impacts due to development, and potential mitigation measures. The findings of our study are summarized in the following report.

Should you have any questions or comments, please do not hesitate to contact the undersigned.

Best Regards, COLE ENGINEERING GROUP LTD.

SD_

Steve Davies, M.Sc., P.Geo. Senior Hydrogeologist

/th/cc

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Issues and Revisions Registry

Identification	Date	Description of issued and/or revision
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Revision of Draft Report	January 23, 2018	
Final Report	February 13, 2018	



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Executive Summary

Cole Engineering Group Ltd. (COLE) was retained by Manors of Belfountain Corporation (Manors of Belfountain) to undertake a hydrogeological study at part of Lot 9, Concession 5 in Caledon, ON (the "Site"). The Site is approximately 70.28 hectares (ha) in area and is currently used for agricultural purposes. It is generally bounded by Bush Street to the north, Shaws Creek Road to the west, Mississauga Road to the east, and vacant lands to the south. The Belfountain Public School and several existing residential properties are located northwest of the Site. The Site is located within the jurisdiction of the Credit Valley Conservation Authority and partially within a regulated area. Based on the Draft Plan of Subdivision 21T-91015C dated December 5, 2017, prepared by Glen Schnarr & Associates Inc., the development will include 67 rural estate lots with an average lot size of 0.63 ha. Water supply will be provided by private wells and waste water servicing will be provided by individual septic systems with tertiary (Level IV) treatment. The stormwater management plan for the Site will rely on retention and infiltration to closely match existing conditions.

Previous Site investigations date back to 1988 and include work done by Terraprobe, W.B. Beatty & Associates Limited, and R.J. Burnside. These investigations include drilling of monitoring wells, pumping tests, a water supply and wastewater servicing review, groundwater level monitoring and sampling, infiltration tests, and a well survey of nearby properties. Since October 2017, COLE conducted a hydrogeological investigation consisting of groundwater level measurements, groundwater sampling, water balance analysis, nitrate loading assessment, and the assessment of water taking rates and analysis of pumping tests.

The Site is located within the West Credit River Subwatershed and is considered to be within the Horseshoe Moraine physiographic region due to the sand content and hummocky nature of the topography. Geology at the Site consists of approximately 10 meters (m) to 20 m of sandy overburden overlying the Guelph / Amabel dolostone aquifer, which overlies the Cabot Head shale aquitard. Hydraulic conductivity estimates of the dolostone bedrock aquifer range from 4.7×10^{-6} m/s to 2.9×10^{-4} m/s with an average of 3.6×10^{-5} m/s. Based on testing completed at the Site by R.J. Burnside, infiltration rates for the overburden range from 29 mm/hr to 420 mm/hr with an average of approximately 152 mm/hr.

Water levels measured in October 2017 indicate that groundwater across the Site is typically 10 to 20 m below ground surface (mbgs) with the exception of the on-Site wetland features (SWT3-2 and MAS3-1) where groundwater is typically between 0 to 1 mbgs. Seasonal groundwater fluctuations across the Site are typically not greater than 3 m, with decreasing water levels in the summer and fall months. In general, groundwater elevations are higher in the south and groundwater movement is approximately south to north across the Site.

Groundwater discharge is expected to occur at the West Credit River and the off-Site wetland features (SWM1-1 and MAM3-1). However, no on-Site water courses or wetland features (SWT3-2 and MAS3-1) were interpreted to receive groundwater discharge.

A pre-development Site water balance analysis was completed and results indicate that infiltration comprises approximately 32% of the total precipitation across the Site, runoff comprises approximately 9% of total precipitation, and evapotranspiration comprises more than half (59%) of total precipitation. The water balance analysis shows a significant amount of infiltration, which is to be expected due to the closed depressions within the hummocky topography and sandy overburden materials. It is understood that infiltration measures will be utilized to maintain pre-development infiltration on-Site in post-development conditions, with essentially no runoff leaving the Site up to the 100 year storm capacity.



Groundwater quality analysis was conducted at twelve (12) on-Site wells and results indicate no exceedances of health-related Ontario Drinking Water Standards (ODWS), while there were some exceedances in total hardness, total dissolved solids, sulphate, turbidity, and iron. These parameters, with the exception of hardness, are considered aesthetic parameters that affect the taste, odour or colour of water but do not directly affect the safety of the water supply. Water hardness at the Site and aesthetic parameters can be controlled with water treatment systems for each property.

Nitrate concentrations in groundwater at the Site meet the ODWS of 10 mg/L. Nitrate concentrations generally increase from south to north across the Site, with the existing nitrate concentrations likely due to agricultural activities both on and off-Site. Development of the Site will result in a reduction of the agricultural areas suspected of contributing to the on-Site nitrate concentrations by approximately 67%. Thus, development of the Site is expected to lead to a long-term decrease in nitrate concentrations.

A nitrate loading analysis was completed in compliance with MOECC Procedure D-5-4 in order to evaluate the potential impact of the individual on-Site septic systems. Results indicate that a nitrate loading concentration of approximately 2.17 mg/L is expected at the Site boundary. This concentration is lower than the CCME guideline for NO₃-as-N of 3 mg/L for protection of sensitive surface water habitat, which has also been adopted by CVC. As on-Site wetland features (SWT3-2 and MAS3-1) are essentially at the Site boundary, and any groundwater seepage locations appear to be beyond the Site boundary, the CCME / CVC guideline is therefore met at all downgradient natural features that may receive even minimal groundwater discharge.

Although existing on-Site nitrate concentrations in groundwater are consistently below the ODWS, as a precautionary approach it is recommended that supply wells should not be installed in the northernmost portion of the Site where the highest on-Site nitrate concentration were identified. It is therefore recommended that supply wells not be placed north of an identified line of higher nitrate concentrations (i.e., > 7 mg/L) and that any wells be located a minimum of 7 m south (upgradient) of this line, based on a zone of contribution analysis. Review of the Draft Plan for the Site confirms that there is sufficient room to locate supply wells on every lot in compliance with this recommendation.

Pumping tests to assess the supply of groundwater available at the Site were completed at the Site by R.J. Burnside and are considered to demonstrate water supply compliance with MOECC Procedure D-5-5. Water supply analysis based on the pumping test results indicate that all tested wells can sustainably support continuous pumping at the expected average pumping rate of 1.56 L/min/house for a duration of 50 years. In addition, a more conservative analysis indicates that most tested wells can sustainably support continuous pumping at the peak pumping rate of 18.75 L/min/house for a duration of 50 years. The total water takings expected at the Site, based on an average pumping rate of 1.56 L/min/house and 67 houses, is 150,750 L/day, which is a small portion of the estimated recharge across the Site (549,474 L/day).

Based on the estimated long term average pumping rate of 1.56 L/min/house and the effect of recharge on groundwater quantity, the expected radius of influence for each well is estimated to be approximately 30 m (or 0.27 ha in area). As the average lot size is approximately 0.63 ha in area, minimal supply interference is expected between lots.

On-Site wells be placed a minimum of 30 m apart. Since the radius of influence of each well is expected to be 30 m, if wells are placed 30 m apart minor superposition of drawdown may occur where the radii intersect. The maximum superposition of drawdown is expected to occur at the midpoint between wells (15 m). However, interference between supply wells spaced 30 m apart will be negligible.

Potential long-term impacts to the closest groundwater users are expected to be minimal as nitrate loading at the Site boundary is low, the radius of influence of individual supply wells is not expected to



extend beyond the Site, and total water takings are small compared to total input of horizontal groundwater flux and recharge at the Site.

Potential long-term impacts to natural features are also expected to be minimal as on-Site features do not rely on groundwater contributions. For off-Site features that do rely on groundwater contributions, impacts are also expected to be minimal as total nitrate loadings at the property boundary are expected to be lower than the CCME and CVC guideline for NO₃-as-N of 3 mg/L, infiltration is expected to be maintained post-development, and total groundwater taking on-Site are small. Therefore, feature based water balance analysis for on-Site and off-Site wetland features is not recommended.

Based on the results of the various groundwater investigations completed at the Site and the review of groundwater receptors and potential impacts from development of the Site from changes to groundwater quality and quantity, there does not appear to be a significant potential for impacts to groundwater users or natural features from the proposed development of the Site. This assessment assumes that mitigation measures, such as maintain infiltration and implementation of tertiary (Level IV) septic systems will be implemented across the proposed development.



1 Introduction

Cole Engineering Group Ltd. (COLE) was retained by Manors of Belfountain Corporation (Manors of Belfountain) to undertake a hydrogeological study at part of Lot 9, Concession 5 in Caledon, ON (the "Site"). The Site is located near the intersection of Bush Street and Mississauga Road in Caledon, Ontario. The location of the Site is shown on **Figure 1**.

1.1 Project Description

The Site is approximately 70.28 hectares (ha) in area and is currently used for agricultural purposes. It is approximately bounded by Bush Street to the north, Shaws Creek Road to the west, Mississauga Road to the east, and vacant lands to the south. Belfountain Public School and several existing residential properties are located northwest of the Site. The Site is located within the jurisdiction of the Credit Valley Conservation (CVC) and partially within a regulated area. Based on the Draft Plan of Subdivision 21T-91015C dated December 5, 2017, prepared by Glen Schnarr & Associates Inc., the proposed development will include 67 rural estate lots with an average lot size of 0.63 ha. Water supply will be provided by private wells and waste water servicing will be provided by individual septic systems with tertiary (Level IV) treatment. The stormwater management plan for the Site will rely on retention and infiltration to closely match existing conditions. Site servicing is described in detail in the functional servicing report prepared by COLE and submitted under separate cover.

The Draft Plan of Subdivision is included as **Appendix A**.

1.2 Objectives

The objectives of this hydrogeological investigation are:

- Characterize the existing geological and hydrogeological setting;
- Identify environmentally sensitive features and groundwater receptors on or near the Site;
- Estimate the water balance parameters for the Site, particularly groundwater recharge;
- Estimate the potential water supply demand for the development and assess the results of pumping tests completed at on-Site test wells;
- Review groundwater quality results for the Site and compare to Ontario Drinking Water Quality Standards;
- Estimate the potential nitrate loading to the groundwater system from the private septic systems;
- Assess the potential impacts to the natural environment and other groundwater users as a result of the development, including the planned private wells and septic systems; and
- Provide recommendations on management and mitigation measures.

1.3 Applicable Regulations and Agencies

Environmental regulations and policies that may be relevant for this hydrogeological investigation are briefly discussed below.

Provincial Policy Statement (2014)

The Provincial Policy Statement provides direction to regional and local municipalities regarding planning policies for the protection and management of natural heritage features and water resources. According to the Provincial Policy Statement, development and Site alteration shall not be permitted in:

- Significant habitat of endangered species or threatened species;
- Significant wetlands within specific Ecoregions (as per schedule in the Provincial Policy Statement);
- Significant coastal wetlands (as per schedule in the Provincial Policy Statement);
- Significant woodlands and valleylands within specific Ecoregions (as per schedule in the Provincial Policy Statement);
- Significant areas of natural and scientific interest;
- Within or near sensitive surface water and sensitive groundwater features; and
- Fish habitat except in accordance with provincial and federal requirements.

Similarly, for lands adjacent to the natural heritage features as defined above, it needs to be demonstrated that the development will not result in negative impacts on natural features or ecological functions. Typically, significant natural features are identified through an Environmental Impact Study (EIS) and significant wetlands are identified by the Ministry of Natural Resources and Forestry (MNRF). Endangered or threatened species habitat is identified through ecological studies, such as an EIS, and regulated by the MNRF. Fish habitat is under the jurisdiction of Fisheries and Oceans Canada (DFO) with support from Conservation Authorities. Identification and regulation of woodlands, valleylands, Areas of Natural and Scientific Interest (ANSI), and wildlife habitats are typically the responsibility of the municipality or other planning authority.

Restrictions to development and alterations should be implemented to protect all municipal drinking water supplies and designated vulnerable areas. Development and alterations are to be restricted in or near sensitive surface water features and sensitive groundwater features such that their hydrologic function will be protected, restored, or improved.

Niagara Escarpment Plan (2017)

The Niagara Escarpment Plan (NEP), last amended in 2017, seeks to protect the geologic feature of the Niagara Escarpment and lands within the vicinity by allowing only developments compatible with the natural environment. The objectives of the NEP are:

- To protect unique ecologic and historic areas;
- To maintain and enhance the quality and character of natural streams and water supplies;
- To provide adequate opportunities for outdoor recreation;
- To maintain and enhance the open landscape character of the Niagara Escarpment in so far as possible, by such means as compatible farming or forestry and by preserving the natural scenery;
- To ensure that all new development is compatible with the purpose of the Plan;
- To provide for adequate public access to the Niagara Escarpment; and
- To support municipalities within the Niagara Escarpment Plan Area in their exercise of the planning functions conferred upon them by the Planning Act.

Based on the NEP, the Site is located within the Minor Urban centre of Belfountain and is designated "Escarpment Rural Area", "Escarpment Protection Area" and "Escarpment Natural Area".



Region of Peel Official Plan (2016)

The Region of Peel Official Plan is a public document that outlines the long-term policy framework for decision making related to protection of the environment, management of resources, directing growth and sets the basis for providing Regional services. The Region of Peel recognizes the importance of preserving and protecting natural environment and ecosystems. The Site is within the Region's "Rural System" and the northeastern portion is within the Core Areas of the Greenlands System.

Town of Caledon Official Plan (2016)

The Town of Caledon Official Plan is a document that outlines the principles, goals, objectives, and policies intended to guide future land use, physical development, effects on the social, economic, and natural environment within the Town of Caledon. It was initially adopted in 1979 but has been consolidated in 2016. According to the Town of Caledon Official Plan, the Site is situated within the settlement area (Hamlet) of Belfountain.

Permit to Take Water – Section 34 of the Ontario Water Resources Act (1990)

Based on recent regulatory changes, a Permit to Take Water (PTTW) is required under Section 34 of the Ontario Water Resources Act (OWRA) for water takings greater than 50,000 L/day, and for construction water takings greater than 400,000 L/day. Construction water takings between 50,000 L/day and 400,000 L/day require registration on the Environmental Activity and Sector Registry (EASR). Water taking permit applications are not anticipated for either construction dewatering or for water supply purposes.

Credit Valley Conservation Authority (O.Reg. 160/06)

Under Section 28 of the Conservation Authorities Act, the local Conservation Authorities are mandated to protect the health and integrity of the regional greenspace system and to maintain or improve the hydrological and ecological functions performed by valley and stream corridors. CVC, through its regulatory mandate, is responsible for issuing permits under O.Reg. 160/06, Development, Interference with Wetlands and Alterations to Shorelines and Watercourses for development applications or Site alteration works within regulated areas.

The Endangered Species Act – Ministry of Natural Resources and Forestry

The MNRF has jurisdiction to administer the Endangered Species Act (2007) to protect species at risk (SAR) and their habitat. Where works may occur in or near a protected habitat, SAR are on or near the Site, and/or the works may harm / harass the species or damage / destroy the protected habitat, a confirmation of notice of activity, a permit or a Letter of Authorization or Advice will be required.

The Clean Water Act, 2006 – Ontario Ministry of the Environment and Climate Change

The Ministry of the Environment and Climate Change (MOECC) mandates the protection of existing and future sources of drinking water under the Clean Water Act, 2006 (CWA). Initiatives under the CWA include the delineation of Wellhead Protection Areas (WHPAs), significant groundwater recharge areas (SGRAs) and Highly Vulnerable Aquifers (HVAs) as well as the assessment of drinking water quality and quantity threats within Source Protection Regions. Source Protection Plans are developed under the CWA and include the restriction and prohibition of certain types of activities and land uses within WHPAs. Based on mapping completed by the CVC, the Site appears to border a WHPA-E of Peel Region's Inglewood Well 2.



2 Regional Geological and Hydrogeological Understanding

A conceptual understanding of the geological and hydrogeological system was developed through review of existing reports and available geological information. This included:

- Chapman, L.J. and Putnam, D.F. (1984) The Physiography of Southern Ontario, 3rd Edition. Ontario Geologic Survey, Special Volume 2, 270 p.;
- Cowan, W.R. (1976) Quaternary Geology of the Orangeville Area Southern Ontario. Ontario Division of Mines, Report 141, 98 p.;
- Credit Valley Conservation (1998) West Credit Subwatershed Study: Characterization Report.
- Davies, S. and Holysh, S. (2007) Groundwater Resources Study of the Credit River Watershed. Ontario Geological Survey; and,
- AquaResources Inc. (2009) Integrated Water Budget Report Tier 2: Credit Valley Source Protection Area. Credit Valley Conservation Authority.

2.1 Topography and Drainage

The Site lies within the West Credit River Subwatershed under the jurisdiction of the CVC. The West Credit River drains into the main branch of the Credit River east of Belfountain, below the Niagara Escarpment at the Forks of the Credit. The West Credit Subwatershed is an important groundwater recharge area due to the local presence of coarse-grained soils and hummocky topography. Significant groundwater discharge occurs along the West Credit River and, as a result, it is mapped as coldwater fish habitat. The West Credit Subwatershed includes the Town of Erin, the Town of Caledon, and the community of Belfountain.

Topography of the West Credit River Subwatershed varies from between approximately 375 m above sea level (masl) to approximately 475 masl. Topography within this area reflects glacial processes that deposited landforms such as streamlined hills (drumlins), topographic ridges (moraines), and high-relief hummocky topography with closed depressions. As noted above, recharge within the subwatershed is relatively high, due to extensive high permeable sediments, and is amplified in areas with hummocky topography compared to areas covered by relatively flat till plains.

Regional topography is shown on Figure 2.

2.2 Physiography

Several physiographic regions have been mapped (Chapman and Putnam, 1984) within the West Credit River Subwatershed as follows:

- Niagara Escarpment;
- Horseshoe Moraine;
- Guelph Drumlin Field; and,
- Hillsburgh Sandhills (Orangeville Moraine)

The majority of the subwatershed is comprised of the Guelph Drumlin Field and the Horseshoe Moraines regions.

A summary of each physiographic region is provided below.

Niagara Escarpment: The Niagara Escarpment is a major topographic change in the bedrock of Southern Ontario that results from differential weathering of the underlying dolostone and shale. Bedrock only outcrops within the West Credit River Subwatershed at the Niagara Escarpment and within river valleys.



The vast majority of the subwatershed is above the Escarpment where ground surface elevations are higher.

Horseshoe Moraine: The Horseshoe moraine includes the Paris, Galt, and Singhampton moraines and is described as a kame moraine deposited by ice-contact processes.

Within the subwatershed, the Paris Moraine is the dominant moraine feature and occurs in the southern portion of the study area. The Horseshoe moraine is considered a hummocky deposit primarily composed of sand to sandy silt till that is commonly referred to as the Wentworth Till. The sandy silt till results in lower infiltration rates that may be increased by the hummocky topography and closed depressions of the moraine. Sandy interbeds may be found within the Horseshoe moraine and where present may also increase permeability.

Guelph Drumlin Field: The drumlins of the Guelph drumlin field are typically composed of sandy silt till commonly referred to as the Port Stanley Till. The sandy silt till results in lower infiltration rates and do not likely contain sand and gravel interbeds. Between the streamlined drumlin hills are relatively flat meltwater channels composed of glaciofluvial sand and gravel that may extend to bedrock. Significant outwash deposits associated with the Caledon Meltwater channel occur in the subwatershed from the Niagara Escarpment west towards Erin.

Hillsburgh Sandhills (Orangeville Moraine): The Hillsburgh Sandhills / Orangeville Moraine are primarily ice contact sand and gravel. In addition to the sandy nature of this deposit, the high-relief and hummocky topography promotes increased recharge in the area. As a result, the Hillsburgh Sandhills are an important recharge area within the West Credit River Subwatershed.

Bedrock topography of the area is gently sloping towards the south / southwest and is relatively flat with local relief commonly ranging from 2 m to 6 m. An exception to the relatively flat bedrock topography is the existence of buried bedrock valleys and the steep change in elevation at the Niagara Escarpment. Specifically, within the West Credit River Subwatershed, there is a buried valley that follows the current West Credit River from Erin to Belfountain. In this location overburden materials are thicker and top of bedrock elevations are lower. In general, the bedrock surface represents a regional unconformity affected by erosion from glacial and fluvial processes.

A map of the regional physiography is shown on **Figure 3**.

2.3 Regional Geology and Hydrogeology

A conceptual understanding of the geological and hydrogeological system was developed through review of existing reports and available geological information primarily from work conducted by the Ontario Geological Survey (OGS) and reports completed for the CVC. From these resources, the West Credit River Subwatershed stratigraphy was interpreted to consist of the following units (youngest to oldest):

- Recent deposits (Overburden);
- Wentworth Till (Overburden);
- Glaciofluvial deposits / Orangeville Moraine (Overburden);
- Port Stanley Till (Overburden);
- Guelph Formation Dolostone (Bedrock);
- Amabel Formation Dolostone (a.k.a., Gasport Formation; Bedrock);
- Fossil Hill Formation Dolostone (Bedrock);
- Cabot Head Formation Shale (Bedrock);
- Manitoulin Formation Dolostone (Bedrock);



- Whirlpool Formation Sandstone (Bedrock); and,
- Queenston Formation Shale (Bedrock).

The following section provides a detailed summary of each overburden and bedrock unit.

Overburden Units

Recent Deposits: The most recent deposits consist of a mixture of gravel, sand, silt, and clay that commonly occurs along streams. Recent deposits in the area also consist of organic deposits in areas with poor drainage.

Wentworth Till: The Wentworth Till is described predominantly as a sandy silt to silty sand till and displays variable thickness, with its thickest portion found within the Paris Moraine of the Horseshoe Moraine physiographic element. The sandy silt till results in lower infiltration rates that may be increased due to the hummocky topography and closed depressions common in the Horseshoe Moraine physiographic element.

Glaciofluvial/Orangeville Moraine: The glaciofluvial / Orangeville Moraine sediments are dominated by sand and gravel. Specifically, the Orangeville Moraine is considered an ice contact kame moraine dominated by sand and gravel sediments. The coarse sediments result in higher infiltration but may be locally absent between local till units.

Port Stanley Till: The Port Stanley till is a stoney sandy silt till with low plasticity that is commonly considered the basal till unit existing above bedrock. This till is texturally similar to the Wentworth Till although it may have a greater total carbonate content. Similar to the Wentworth Till, the sandy silt till of the Port Stanley Till results in lower infiltration rates and may act as a confining unit.

Overburden geology is shown on Figure 4.

Bedrock Units

Guelph Formation: The Guelph Formation is a light brown crystalline dolostone similar to the Amabel Formation. This Formation acts as an aquifer, but is only found in the western parts of the Credit River Watershed and where found it is commonly thin and difficult to distinguish from the Amabel Formation.

Amabel Formation (a.k.a. Gasport Formation): The Amabel Formation is a light grey, crystalline dolostone with thick beds and abundant fossils and reefal structures. The Amabel Formation is regionally extensive and is considered a significant aquifer due to its high primary and secondary porosity, common fractures, and possible karstic features. Above the Niagara Escarpment the Amabel Formation is the primary surficial bedrock unit and is considered the cap rock of the escarpment.

Fossil Hill Formation: The Fossil Hill Formation of the Clinton group is a fossiliferous dolostone. This unit is commonly thin within the Credit River Watershed, with maximum thickness of approximately 3 m.

Cabot Head Formation: The Cabot Head Formation is described as a greenish grey and red silty shale that is considered a regional aquitard. This formation contains thin sandstone and limestone interbeds and abundant fossils (fossiliferous).

Manitoulin Formation: The Manitoulin Formation is a thin to medium bedded dolostone with abundant fossils and shale beds.

Whirlpool Formation: The Whirlpool Formation is a grey to reddish grey / brown fine grained quartzose sandstone.

Queenston Formation: The Queenston Formation consists of thin to thick beds of red shale and may contain interbeds of grey-green shale, limestone, or siltstone. Although the Queenston Formation is commonly considered an aquitard, when weathered its aquitard characteristics are diminished.

Bedrock geology is shown on Figure 5.

2.3.1 Groundwater Takings

In the upper Credit River Watershed, most municipal water supplies are sourced from groundwater and several municipal wells take significant amounts of water from the Guelph-Amabel regional bedrock aquifer, which also is the main aquifer underlying the Site.

The following tables summarize the details of the municipal supply wells in the upper Credit River Watershed, including the well depth below ground surface, permitted rate of water taking and average rate of water taking in 2016 as reported by the municipalities. The municipal groundwater takings indicate that the Guelph-Amabel bedrock aquifer is generally capable of supporting large groundwater takings for drinking water systems.

The closest municipal takings to this Site are the Erin municipal wells, which are approximately 4.3 Km away from the Site. The cumulative total of the Erin municipal takings were 768,031 L/day in 2016. **Table 2.1** to **Table 2.6** demonstrates that the Guelph-Amabel formations are regionally very transmissive aquifers.

Supply Well	Screened Layer	Depth (mbgs)	Permitted Water Taking Rate (L/day)	2016 Average Water Taking Rate (L/day)
2A	Guelph-Amabel	38.7	1,309,000	435,156
5/5A	Overburden	17.7	5,282,000	2,259,976
6	Guelph-Amabel	48.8	3,600,000	2,183,077
7	Guelph-Amabel	47.2	1,310,000	950,991
8C, 8C	Guelph-Amabel	79.2 76.2	654,000	311,145
9A/9B	Guelph-Amabel	17.4 17.4	878,000	679,890
10	Overburden	60.9	1,245,000	957,830
11	Guelph-Amabel	54.8	1,309,000	837,862
12	Guelph-Amabel	49.4	1,309,000	25,677

 Table 2.1
 Orangeville Groundwater Takings (Town of Orangeville, 2016)

Table 2.2	Mono Groundwater Takings (Town of Orangeville, 2017)
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Supply Well	Screened Layer	Depth (mbgs)	Permitted Water Taking Rate (L/day)	2016 Average Water Taking Rate (L/day)
MW-1	Guelph-Amabel	60	820,000	20,252

Supply Well	Screened Layer	Depth (mbgs)	Permitted Water Taking Rate (L/day)	2016 Average Water Taking Rate (L/day)
MW-3	Guelph-Amabel	55	1,571,000	322,158
MW-4	Guelph-Amabel	36	751,000	21,238
Island Lake TW1	Overburden	57.3		
Island Lake PW1	Overburden	58.8	3,932,640	300,986
Island PW2-06	Overburden	50.3		
PW1	Guelph-Amabel	25.1	CEE 200	150 214
PW2	Guelph-Amabel	25.1	655,200	150,214

Table 2.2	Mono Groundwater	Takings (Town	of Orangeville, 2017)
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 Table 2.3
 Erin Groundwater Takings (Town of Erin, 2017)

Supply Well	Screened Layer	Depth (mbgs)	Permitted Water Taking Rate (L/day)	2016 Average Water Taking Rate (L/day)
E7	Guelph-Amabel	42	2,159,998	335,342
E8	Guelph-Amabel	46	1,967,998	432,689

Table 2.4	Hillsburgh Groundwater	Takings (Town of Erin, 2017)
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Supply Well	Screened Layer	Depth (mbgs)	Permitted Water Taking Rate (L/day)	2016 Average Water Taking Rate (L/day)
H2	Guelph-Amabel	88	454,000	76 140
Н3	Guelph-Amabel	58	682,000	76,149

 Table 2.5
 Caledon Village Groundwater Takings (Regional Municipality of Peel, 2015)

Supply Well	Screened Layer	Depth (mbgs)	Permitted Water Taking Rate (L/day)	2016 Average Water Taking Rate (L/day)
Caledon Village 3	Overburden	36.1	1,964,000	-
Caledon Village 3B	Overburden	34.7	1,309,000	-
Caledon Village 4	Overburden	75.9	3,273,000	-

Supply Well	Screened Layer	Depth (mbgs)	Permitted Water Taking Rate (L/day)	2016 Average Water Taking Rate (L/day)
Alton 3	Guelph-Amabel	22	1,047,398	-

Supply Well	Screened Layer	Depth (mbgs)	Permitted Water Taking Rate (L/day)	2016 Average Water Taking Rate (L/day)
Alton 4	Guelph-Amabel	25	1,047,398	-

 Table 2.6
 Alton Groundwater Takings (Regional Municipality of Peel, 2015)

2.4 Source Protection Plan Considerations

As per the Clean Water Act, delineation of Wellhead Protection Areas (WHPA), Significant Groundwater Recharge Areas (SGRA) and Highly Vulnerable Aquifers (HVA) must be completed for the protection of existing and future drinking water sources.

Based on the Credit Valley Source Protection Area Assessment Report, the Site is located within a SGRA and partially within a HVA. The Site also borders a WHPA-E of Peel Region's Inglewood Well 2. The WHPA-E is an area associated with wells that may be Groundwater Under Direct Influence (GUDI) of surface water.

The portion of the Site that borders the WHPA-E and is within the HVA is an open space feature that will continue to be open space post-development. Therefore, no influence or impact within the WHPA-E or HVA from development of the Site is anticipated. As discussed later in this report, groundwater recharge will be maintained post-development, which fulfills the requirement for development within a SGRA.

3 Natural Heritage

3.1 Water Courses

The West Credit River is managed as a cold-water fish habitat. In the main and middle tributaries, it is home to cold-water fish such as brook trout and brown trout. The lower portion of the West Credit River supports a migratory cold water fishery, including Chinook salmon, rainbow trout and brown trout (CVC, 2009). The cold-water habitat is supported by groundwater discharge, which supports baseflow. Baseflow within the West Credit River has been estimated to be approximately 330 L/s (Davies and Holysh 2007). By comparison, an assumed groundwater taking of approximately 1.7 L/s is expected at the Site (150,750 L/day) (~ 0.5% of the total baseflow of the West Credit River). There are no other watercourses that traverse the Site. There is an intermittent drainage feature that flows onto the Site from the property to the south, and the source of the flow is considered to be wetland drainage. The drainage feature was observed to be dry during COLE site visits in fall 2017, and it appears that any flow in this feature infiltrates into the overburden in a depression and provides recharge to the groundwater system.

3.2 Wetlands

The on-Site wetlands (SWT3-2 and MAS3-1), located in the northern area of the Site, are a diverse habitat consisting of at least two organic soil vegetation types; Cattail Marsh (MAS3-1) and Willow Thicket Swamp (SWT3-2) (Savanta 2018). The Cattail Marsh is classified as a shallow marsh with the tall herb layer formed of broad-leaved cattail, blue-joint grass and reed-canary grass, while the medium layer is dominated by beaked sedge. The marsh has been confirmed as a breeding habitat for the endangered Jefferson Salamander, and is dominated by Broad-leaved Cattail (*Typha latifolia*), Reed-canary Grass (*Phalaris arundinacea*) and Blue-joint Grass (*Calamagrostis canadensis; Savanta 2018*). The Willow Thicket Swamp occurs in shallow water on an almost floating organic mat. The willow is accompanied by red-osier dogwood and bitter nightshade. Beneath the canopy of shrubs grow tall grasses – blue joint and reed



canary. The swamp is dominated by the locally rare (CVC) plant species Autumn Willow (*Salix serissima*), and is accompanied by Red-Osier Dogwood (*Cornus sericea*) and Bitter Nightshade (*Solanum dulcamara; Savanta 2018*).

The off-Site wetlands (SWM1-1 and MAM3-1), located just north of the Site, consist of a White Cedar-Hardwood Mineral Mixed Treed Swamp (SWM1-1) and a Blue-Joint Organic Meadow Marsh (MAM3-1). The EIS determined that there is no significant amphibian breeding habitat on the Site or the off-Site wetlands (Savanta 2018).

The wetland locations identified above can be seen on Figure 6.

4 Site Investigations

4.1 **Previous Investigations**

The following are summaries of previous hydrogeological investigations at the Site conducted by other consultants.

4.1.1 Terraprobe

Terraprobe conducted a hydrogeological investigation at the Site between 1988 and 1989. There were a total of 30 boreholes completed with standpipes drilled to approximately three (3) mbgs and an additional nine (9) boreholes completed with standpipes ranging between 3.6 mbgs to 18.7 mbgs in 1989. A layer of fine sand to silt material was noted at depths of up to approximately 1.4 mbgs at locations 88-2, 88-4, 88-6, 88-7, 88-13, 88-14, 88-17 and 88-18. Outwash materials were encountered at depths of approximately 2.1 mbgs at the northeast portion of the Site in the vicinity of OW-1 and approximately 15 mbgs in the vicinity of OW-2 south of the Site. Glacial till extended from close to ground surface to the base of boreholes at 88-13, 88-21 to 88-30 and OW-2.

Aquifer performance tests were conducted during the hydrogeological investigation. In 1988, a stepdrawdown test was conducted at PW-1 at rates of 1 gpm (0.08 L/s), 2.5 gpm (0.18 L/s) and 4 gpm (0.30 L/s). At PW-2, the pumping rates were set to 10 gpm (0.76 L/s), 20 gpm (1.52 L/s), 30 gpm (2.27 L/s) and 35 gpm (2.65 L/s). In 1989, a 24 hour pumping test was conducted at PW-3 at a rate of 25 gpm (1.89 L/s). Two pumping tests were performed at PW-4 at a rate of 1 gpm (0.08 L/s). Based on Terraprobe's report, the test results demonstrated that there is sufficient water supply for the proposed development at the Site.

Terraprobe conducted a private residential well survey at 63 residences in the Belfountain area in 1988 and contact was made with 13 residents. An additional private well survey was conducted by Terraprobe in 1989 at 81 residences and 31 responses were received. A third survey was conducted at select residences in 1990 in the Caledon Mountain Estates. Based on the findings from the private well surveys, Terraprobe identified that water supply from shallow dug wells had generally poor quality and quantity in contrast to drilled wells.

Based on the completed investigation, Terraprobe concluded that the proposed development of 73 lots (at that time) could be supported by groundwater supply and that conventional septic systems would be appropriate for the development. Terraprobe concluded that the development could proceed with minimal potential for impact to natural features or groundwater users.



4.1.2 W.B. Beatty & Associates

In June 2002, W.B. Beatty & Associates Limited (W.B. Beatty) conducted an assessment of water supply and wastewater servicing at the Site through a review of previously completed reports, including hydrogeological studies by Terraprobe from 1988 to 1992. W.B. Beatty commented that the sand and gravel aquifer and dolostone aquifer along the western boundary of the Site would be the most promising areas for water quantity and that water supply wells located within this area would also minimize potential interference with nearby wetlands and ponds. It was suggested that average day water supply demand could be met by a single well in the dolostone aquifer.

4.1.3 R.J. Burnside

Between June 2014 and June 2017, R.J. Burnside monitored groundwater elevations in 29 wells which included four (4) piezometers on-site and three (3) nearby residential wells. Groundwater samples were collected from monitoring wells TW1 to TW12 for water quality analysis and comparison to ODWS between December 2014 and May 2017.

R.J. Burnside completed five (5) infiltration tests at five (5) separate locations using a Turf-Tec Infiltrometer. The analyses from these infiltration tests are provided in **Section 5.4**.

Six (6) pumping tests were conducted between June 2014 and August 2014 and two (2) additional pumping tests were conducted between March 2016 and April 2016. The results are presented in **Section 5.4.** R.J. Burnside provided the data, analyses and drawings from their investigation to Manors of Belfountain for use by COLE.

4.1.4 Geotechnical Investigations

In June 2014, *exp* conducted a geotechnical investigation that involved drilling four (4) boreholes at the Site to depths ranging from 4.9 mbgs to 12 mbgs. From Boreholes 1 to 3, sand and gravel to sand and silt were found beneath a thin layer of ploughed material. A very dense sandy silt layer was encountered approximately 7 mbgs at Borehole 3 towards the southeast of the Site. It was suspected that the dolostone bedrock was found at approximately 3.2 mbgs at Borehole 4 located near the north boundary of the Site.

An additional seven (7) boreholes were drilled at the Site in August 2017 ranging from 4.6 mbgs to 8.2 mbgs. A topsoil layer approximately 20 cm to 50 cm in thickness was encountered during drilling at all boreholes. Below the layer of topsoil was a layer of reworked materials consisting of dark brown to brown silty sand mixed with trace clay to clayey, trace to some gravel, trace rootlets, and occasional boulder fragments at all boreholes from approximately 0.6 mbgs to 1.4 mbgs. Sand and gravel were encountered until termination at 8.2 mbgs.

4.2 COLE Investigations

Starting in October 2017, COLE conducted a hydrogeological investigation consisting of the following:

- Groundwater level measurements;
- Groundwater sampling;
- Review of existing geologic and hydrogeological information;
- Water balance analysis;
- Nitrate loading assessment; and
- Assessment of water taking rates and analysis of pumping test results.



Findings from the investigation are discussed further below. Boreholes, wells, and other monitoring locations shown on **Figure 6**. Monitoring wells used in the current hydrogeological investigation are outlined in **Table 4.1**. Borehole logs for monitoring wells are included as **Appendix B**.



					<u> </u>			-	-	
Well ID	Easting	Northing	Ground Elevation (masl)	Consultant	Well Stick up (m)	Well Elevation Top of Pipe (masl)	Screen Material	Depth to Bottom (mbtop)	Depth to Bottom (masl)	Depth to Bedrock (mbtop)
TW1	579485	4848275	412.7	R.J. Burnside	1.1	413.8	limestone and shale	55	54	29
TW1-09	579078	4848671	403.0	Beatty	0.69	403.7	limestone	35	34	22
TW2	579799	4848770	402.1		0.60	402.7	limestone and shale	21	20	12
TW3	579615	4848765	402.3		0.55	402.9	limestone and shale	37	36	19
TW4	579633	4849059	404.5		0.60	405.1	limestone and shale	26	36	17
TW5	579982	4849204	405.1		0.54	405.7	limestone and shale	33	32	13
TW6	580018	4849204	405.9	R.J. Burnside	0.52	406.4	limestone and shale	32	31	13
TW7	580089	4849093	405.0		0.58	405.6	limestone	23	23	7.9
TW8	579760	4849152	405.9		0.66	406.5	limestone and shale	35	35	19
TW9	579973	4848950	404.7		0.59	405.3	limestone and shale	36	35	9.8
TW10	579766	4848879	402.6		0.80	403.4	limestone	31	30	15
TW11	579655	4849078	406.1		0.70	406.8	limestone	32	37	15
TW12	579433	4848647	402.1		0.73	402.9	limestone and shale	37	37	23

Table 4.1Monitoring Well Details

Well ID	Easting	Northing	Ground Elevation (masl)	Consultant	Well Stick up (m)	Well Elevation Top of Pipe (masl)	Screen Material	Depth to Bottom (mbtop)	Depth to Bottom (masl)	Depth to Bedrock (mbtop)	
MW1- 14D	579813	4848758	400.6		0.70	401.3	clay and stones	12	12	N/A	
MW1- 14S	579812.90	4848758.30	400.6		0.70	401.3	clay and stones	8.2	7.5	N/A	
OW1	579792.70	4849322.10	390.0	R.J. Burnside	0.77	390.8	dolostone	5.9	5.1	2.1	
PW3	579257.58	4848934.12	401.3		0.44	401.8	dolostone and shale	35	35	24	
PW4	579547.70	4849264.70	383.9		1.2	385.1	shale	27	26	-	
PZ2-14	579557.10	4849228.50	389.5	-	0.87	390.3	-	1.7	0.80	-	
BH 105	579640.16	4849029.99	405.0	exp	0.85	405.8	-	-	-	-	
BH 107	579996.10	4849206.50	405.3	exp	-	-	-	-	-	-	

Table 4.1Monitoring Well Details

Note:

- Indicates unavailable data



5 Local Geological and Hydrogeological Conditions

5.1 Topography and Physiography

Topography at the Site is predominantly hummocky with closed depressions allowing for increased groundwater recharge. The Site is considered to be primarily within the Horseshoe Moraine physiographic region due to the sand content and hummocky nature of the topography. Specifically, the Site is in close proximity to Paris Moraine sediments but overlies meltwater channel glaciofluvial sediments. In the north / northeast portion of the Site there is a steep slope towards the West Credit River that likely represents the proximity of the Niagara Escarpment physiographic region.

5.2 Geology

In order to characterize the hydrogeological setting on Site, COLE developed two geologic cross-sections. The cross-sections were developed based on Site logs for boreholes completed during previous hydrogeological studies. **Figure 7** presents a plan view of the Site and location of the cross-sections. **Figure 8** and **Figure 9** present a cross-section geological understanding of the Site.

Formation	Geology	Material
Recent Deposits	Overburden	Mix of gravel, sand, silt and clay along streams and organic deposits in wetlands
Wentworth Till (aquitard)	Overburden	Sandy silt to silty sand till
Glaciofluvial / Orangeville Moraine (aquifer)	Overburden	Sand and gravel sediments
Port Stanley Till (aquitard)	Overburden	Stoney sandy silt till
Guelph Formation (aquifer)	Bedrock	Light brown crystalline dolostone
Amabel Formation (aquifer)	Bedrock	Light grey, crystalline, fossiliferous dolostone
Cabot Head Formation (aquitard)	Bedrock	Greenish grey and red silty shale
Manitoulin / Whirlpool Formation (confined aquifer)	Bedrock	Medium bedded dolostone with shaley interbeds; Grey to reddish quartzose sandstone
Queenston Formation (aquitard)	Bedrock	Red shale

Table 5.1	Summary of Geologic Units at the Site	

5.2.1 Overburden Geology

Recent deposits at the Site are primarily located within the wetlands to the north of the Site (SWT3-1 and MAS3-1). Based on borehole logs, the overburden materials within the Site are dominated by sand and gravel deposits interpreted to be glaciofluvial deposits. As a result of the prevalence of sand and gravel encountered at surface, it is interpreted that the Wentworth Till is limited in extent across the Site. The glaciofluvial sand and gravel deposits are sometimes found underlying the Wentworth Till, where the till is present.

Based on the regional stratigraphy, Port Stanley Till is expected to be the basal till occurring above bedrock at the Site. Although, based on borehole logs, a sandy silt till is not defined above bedrock across the entire Site, it is possible that the clay materials above bedrock and possibly some of the sandy silt / silty sand described above bedrock may be the Port Stanley Till.

5.2.2 Bedrock Geology

Based on borehole logs at the Site, bedrock is dominated by limestone and dolostone deposits. Although borehole logs do not differentiate the limestone and dolostone bedrock units, it is likely that they are primarily composed of the Guelph-Amabel Formation dolostone aquifer and possibly contain a thin unit of the Fossil Hill Formation.

Based on available OGS mapping, there is the potential for karst in the Belfountain area (Brunton and Dodge, 2008). Karst expressions at the surface may act as points of focused recharge. However, identifying Karst within the area is difficult as the significant overburden thickness reduces the ability to identify individual karst features. Focused recharge within thick overburden deposits may be a result of other features within the sediment, such as closed depressions, or a buried tile bed. Due to the relatively thick overburden at the Site, it will be difficult to confirm the presence of any potential karst features.

The limestone and dolostone deposits of the Guelph and Amabel Formations are underlain by shale interpreted to be the Cabot Head Formation, which acts as a regional aquitard. Borehole logs on Site do not extend deep enough to characterize the lower bedrock units and the presence / absence and thickness of the Manitoulin / Whirlpool and Queenston formations. However, off-Site boreholes and MOECC water well records indicate that the Cabot Head Formation shales are underlain by the Manitoulin / Whirlpool Formation Aquifer, followed by the Queenston Formation shale aquitard.

5.3 Hydraulic Conductivity

Six (6) different 6-hour pumping tests were conducted by R.J. Burnside in select wells (TW1 to TW6) in order to obtain an understanding of the in-situ hydraulic properties of the dolostone unit across the Site. Tests were conducted in late spring or summer month when generally drier conditions would be expected, including on June 11, 2014, July 8, 2014, July 15, 2014, August 26, 2014, and August 28, 2014.

For each test, a known pumping rate was used and drawdown and recovery were measured manually and/or with a data logger until a minimum of 95% recovery was achieved. Transmissivity estimates were subsequently obtained from the Cooper-Jacob non-equilibrium equation below.

$$T = \frac{0.183Q}{\Delta s}$$

Where,

- T transmissivity (m²/day)
- *Q* pumping rate (m³/day)
- Δs Slope of the time-drawdown graph expressed as a change in drawdown between any two times on the log scale whose ratio is 10 (one log cycle).

Hydraulic conductivity was then calculated using the equation below.

$$K = \frac{T}{b}$$

Where,

- *K* hydraulic conductivity (m/day)
- *B* thickness of saturated aquifer (m)

Distance-time curves used to estimate Δs for the above equation are shown in **Appendix C. Table 5.2** summarizes the transmissivity and hydraulic conductivity estimates obtained by R.J. Burnside using the Cooper-Jacob method. Further discussion of the pumping test results are presented in **Section 6**.

Table 5.2 Estimated Transmissivity and Hydraulic Conductivity								
Well ID	Pumping Rate (L/min)	Aquifer Thickness (m)	Transmissivity (m²/day)	Hydraulic Conductivity (m/s)				
TW1	45	23.2	9.37	4.7x10 ⁻⁶				
TW2	11.34	6.04	14.94	2.86x10 ⁻⁵				
TW3	96.6	16.12	84.85	6.1x10 ⁻⁵				
TW4	30.6	16.12	403.19	2.9x10 ⁻⁴				
TW5	75.6	16.88	26.60	1.83x10 ⁻⁵				
TW6	68.4	17.18	72.10	4.86x10 ⁻⁵				

 Table 5.2
 Estimated Transmissivity and Hydraulic Conductivity

5.4 Infiltration Rates

R.J. Burnside completed five (5) infiltration tests using a Turf-Tec Infiltrometer and two (2) infiltration tests were completed using test pits. The test results are summarized in the following table. The location of infiltration tests are shown on **Figure 6**.

Review of the infiltration test results by COLE indicates that the results seem reasonable and accurate with the exception of the some of the surface material descriptions. Surface materials at the Site are expected to be primarily sandy with some till. The higher infiltration rates seen in **Table 5.3** agree with the expected sandy sediments on Site. Raw data and graphs by R.J. Burnside are provided in **Appendix D**.

Location	Depth (m)	Materials	Stable Infiltration Rate (mm/hr)
IT1	0.33	Silt, some sand, trace clay	171
IT2	0.32	Sandy silt, firm, moist, trace clay, bobbles	29
IT4	0.36	Silty clay, some sand, cobbles	327
IT5	0.33	Clayey silt, till, soft, wet, some sand, cobbles, boulders	90
IP1	0.50	Silt, dark brown, some sand, trace clay	200
IP2	0.50	clay silt, soft with coarse gravel	420

 Table 5.3
 Infiltration Test Results

The infiltration rate values estimated by R.J. Burnside are generally quite high and reflect the high content of sand and gravel in the shallow deposits at the Site. As described in **Section 6**, the water balance for the Site indicates that groundwater recharge is generally high, reflecting the coarse grained soils and hummocky topography at the Site. As noted in the discussion of groundwater levels below, the overburden is largely unsaturated across most of the Site, which further enhances groundwater recharge.

5.5 Groundwater Levels

Historical groundwater level monitoring on Site was completed by R.J. Burnside between June 2014 and June 2017. COLE began monitoring in October 2017. Water levels from October 2017 for on-Site wells are provided in **Table 5.4** and hydrographs for wells historically monitored by R.J. Burnside are provided in **Appendix E**.

Well ID	Monitoring Point Elevation (masl)	Ground Elevation (masl)	Water Level (mbgs)	Water Level (masl)
TW1	413.80	412.74	18.16	394.59
TW1-09	403.69	403.00	15.63	387.37
TW2	402.67	402.07	11.53	390.54
TW3	402.87	402.32	16.15	386.17
TW4	405.11	404.51	19.01	385.50
TW5	405.67	405.13	16.02	389.11
TW6	406.52	405.90	14.56	391.34
TW7	405.55	404.97	12.79	392.17
TW8	406.54	405.88	20.41	385.47
TW9	405.29	404.70	14.17	390.53
TW10	403.38	402.58	15.03	387.54
TW11	406.77	406.07	20.50	385.57
TW12	402.78	402.05	14.09	387.96
MW1-14S	401.33	400.63	Dry	Dry
MW1-14D	401.33	400.63	11.26	389.37
OW1	390.78	390.01	Dry	Dry
PW3	401.77	401.33	16.12	385.22
PZ2-14	390.33	389.46	0.83	388.60

Table 5.4 Groundwater Level Measurements (October 2017)

Most wells on Site are screened within limestone and shale bedrock units (Amabel and Cabot Head Formations) and thus are considered to be representative of the bedrock groundwater flow system. A depth to groundwater map based on on-Site wells is illustrated on **Figure 10**.

Groundwater across the Site is typically 10 to 20 m below ground surface (mbgs). Near the on-Site wetland features (SWT3-2 and MAS3-1), groundwater is typically between 0 to 1 mbgs. Groundwater near the off-Site wetland features (SWM1-1 and MAM3-1) is also expected to be near ground surface; although, contours on **Figure 10** suggest that groundwater may be deeper near the off-Site wetland features. The deeper groundwater levels shown on **Figure 10** may be due to the lack of available data to constrain the contours in the vicinity of the off-Site wetland features.

In general, groundwater elevations mirrors the ground surface topography. Groundwater is typically found at greater depths in topographic highs and closer to surface in topographic lows. As a result, the depth to groundwater in the west of the Site generally decreases from south to north, with water levels closest to the surface near the wetlands in the North of the Site. In the east of the Site the depth to groundwater increases from south to north before decreasing again where elevation changes sharply.

Seasonal groundwater fluctuations are seen in the hydrographs (**Appendix E**) and indicate a general trend of decreasing water levels in the summer and fall and increasing water levels in the winter and spring. On average across the Site, seasonal water level changes are not greater than 3 m, with the exception of TW2 which seems to experience larger seasonal groundwater changes up to approximately 6 m.

5.6 Groundwater Flow and Hydraulic Gradients

Groundwater elevation contours based on on-Site wells and topographic elevations at the West Credit River can be seen on **Figure 11**.

Groundwater elevations on-Site range from approximately 385 masl to approximately 395 masl, with the water table found typically close to the bedrock / overburden interface. In general, groundwater elevations are higher in the south and lower in the north of the Site, mimicking the Site topography. Groundwater contours indicate horizontal groundwater flow within the bedrock is approximately south to north on Site, towards the West Credit River.

There have been anecdotal references to a "disappearing stream" and "underground stream" at the Site and, based on available mapping, there is the potential for karst in the Belfountain area. However, the significant overburden thickness at the Site suggests that the headwater drainage feature is a losing reach and is unlikely to be the result of local karst features. The loss of flow in the headwater drainage feature is interpreted to be the result of a losing reach once the stream crosses onto the highly permeable outwash deposits from the lower permeability Wentworth Till units to the south.

Vertical hydraulic gradients were not determined since nested monitoring wells were not installed on the Site. Regardless, based on regional mapping (Davies and Holysh, 2007), downward gradients are expected across the site. Upward gradients associated with groundwater discharge to surface is expected to occur in the West Credit River valley.

5.7 Groundwater Quality

Groundwater quality samples were collected by R.J. Burnside from twelve (12) on-Site wells between 2015 and 2017 and two (2) off-Site wells in 2015. The collected groundwater samples were sent to AGAT Laboratories for analysis of general inorganics, metals and total suspended solids to characterize the baseline groundwater quality at the Site. Results were compared to the Ontario Drinking Water Standards (ODWS) to identify potential exceedances of water quality parameters. Results for select parameters from the twelve (12) on-Site wells from March 3, 2017 are outlined in **Table 5.5** and **Table 5.6**. For full analytical results and certificates of analysis, please refer to **Appendices F** and **G**.



Review of the water quality results indicate that there were no exceedances of health-related ODWS. Results of the analysis do show exceedances of some aesthetic and operational ODWS for some samples (**Table 5.5** and **Table 5.6**). Parameters with exceedances of ODWS include total hardness, total dissolved solids, sulphate, turbidity, and iron. These parameters, with the exception of hardness, are considered aesthetic guidelines that are established for parameters that impair the taste, odour or colour of water but do not directly affect the safety of the water supply.

The water hardness at the Site and other aesthetic parameters (turbidity, sulphate, total dissolved solids, and iron) can be improved with water treatment systems for each property, including a water softener.

Information about a commonly employed residential water quality treatment unit is provided in **Appendix M** as an example for reference purposes. This example and many other residential water quality treatment systems are also capable of reducing concentrations of health-related parameters (such as nitrate); although, as noted above, there have been no exceedances of health-related ODWS from water quality results from the Site.

Water		OD	ODWS							
Quality Parameter	Units	OG	AG	RDL	TW1	TW2	TW3	TW4	TW5	TW6
Total Hardness (as CaCO3)	mg/L	80- 100	-	0.5	<mark>361</mark>	<mark>181</mark>	<mark>433</mark>	<mark>275</mark>	<mark>288</mark>	<mark>288</mark>
Total Dissolved Solids	mg/L	-	500	20	396	198	484	284	306	308
Nitrate as N	mg/L	10	-	0.1	<0.05	1.16	0.62	3.43	6.76	8.52
Nitrite as N	mg/L	1	-	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	-	500	0.2	105.0	13.8	193.0	18.9	14.1	13.5
Turbidity	NTU	-	5	0.5	<mark>135.0</mark>	3.3	<mark>15.3</mark>	0.6	1.9	<0.5
Iron	mg/L	-	0.3	0.01	0.167	<0.010	0.032	<0.010	<0.010	<0.010

Table 5.5Select Groundwater Quality Results from March 10, 2017

1.7 Sample exceeded ODWS OG or AG

RDL Reportable Detection Limit

- No value available

ODWS Ontario Drinking Water Standard

OG Operational Guideline AG Aesthetic Guideline

Table 5.6 Select Groundwater Quality Results from March 10, 2017 Continued	Table 5.6	Select Groundwater Quality Results from March 10, 2017 Continued
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Water	ODWS									
Quality Parameter	Units	OG	AG	RDL	TW7	TW8	TW9	TW10	TW11	TW12
Total Hardness (as CaCO3)	mg/L	80- 100	-	0.5	<mark>291</mark>	<mark>301</mark>	<mark>310</mark>	<mark>202</mark>	<mark>278</mark>	<mark>1020</mark>

Water		OD	ODWS							
Quality Parameter	Units	OG	AG	RDL	TW7	TW8	TW9	TW10	TW11	TW12
Total Dissolved Solids	mg/L	-	500	20	306	312	326	216	286	<mark>1400</mark>
Nitrate as N	mg/L	10	-	0.1	5.77	6.68	2.68	1.68	3.94	<0.25
Nitrite as N	mg/L	1	-	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.25
Sulphate	mg/L	-	500	0.2	14.4	31.1	50.1	14.3	19.1	<mark>896</mark>
Turbidity	NTU	-	5	0.5	1.8	<mark>113</mark>	2.0	<mark>64.8</mark>	<mark>7.4</mark>	<mark>8.6</mark>
Iron	mg/L	-	0.3	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<mark>0.665</mark>

Table 5.6	Select Groundwater Quality	Results from March 10	2017 Continued
	Select Groundwater Quant	results nom march to	, 2017 Continueu

1.7 Sample exceeded ODWS OG or AG

RDL Reportable Detection Limit

No value available

ODWS Ontario Drinking Water Standard

OG Operational Guideline

AG Aesthetic Guideline

In addition to the general groundwater quality results discussed above, groundwater samples were collected from twelve (12) on Site wells (TW1 to TW12) by R.J. Burnside between July 2014 and May 2017 and by COLE in October 2017 and analyzed for nitrate and nitrite. Nitrate concentration results are provided in in **Table 5.7**.

Water samples obtained by COLE were collected using a submersible pump. Prior to collecting samples, the monitoring wells were purged by removing three (3) well volumes from each well. The purging process removes stagnant water from the well, thereby ensuring the groundwater samples are representative of the groundwater in the formation adjacent to the screen. In addition, groundwater parameters including pH, temperature, conductivity, and turbidity were monitored and samples were collected after all parameters had stabilized.

The collected groundwater samples went to Maxxam Analytics Inc. Mississauga, for laboratory analysis of nitrate and nitrite. Results were compared to ODWS for nitrate-nitrogen, 10 mg/L, to identify potential exceedances. Results of the analysis showed no exceedances of the ODWS for nitrate for any samples. Higher concentrations (>5 mg/L) were observed within the northern portion of the Site in five (5) wells (TW5, TW6, TW7, TW8 and TW11). Average nitrate concentrations across the Site from all sampling results can be seen in **Figure 12**.

The on-Site areas with higher nitrate concentrations are likely a result of the historical and current agricultural activities occurring both on-Site and up gradient of the Site. Development of the Site will result in a reduction of the agricultural areas suspected of contributing to the on-Site nitrate concentrations by approximately 67%. Thus, development of the Site is expected to lead to a long term decrease in nitrate concentration on-Site.



	Nitrate Concentrations (mg/L)												
Well ID	Apr 2015	Jun 2015	Sept 2015	Nov 2015	Feb 2016	Mar 2016	Apr 2016	June 2016	Sept 2016	Dec 2016	Mar 2017	May 2017	Oct 2017
TW1	-	-	-		-	-	-	-	-	-	<0.05	<0.05	<0.10
TW2	0.84	0.70	1.00	0.62	-	0.58	-	1.18	0.82	0.67	1.16	1.90	1.01
TW3	-	-	-	-	-	0.54	-	-	-	-	0.62	0.58	0.21
TW4	-	-	-	-	-	3.0	-	-	-	-	3.43	3.22	1.95
TW5	6.31	8.28	7.77	7.09	-	7.80	-	6.72	7.18	6.34	6.76	7.99	8.41
TW6	7.80	8.20	7.30	-	-	-	8.23	-	-	-	8.52	9.08	7.87
TW7	-	-	-	-	8.52	7.27	-	6.32	6.97	5.97	5.77	6.87	8.13
TW8	-	-	-	-	8.25	7.76	-	5.35	7.85	7.41	6.68	5.15	6.47
TW9	-	-	-	-	3.65	3.41	-	2.99	2.17	1.51	2.68	3.02	2.81
TW10	-	-	-	-	2.41	-	-	-	-	-	1.68	0.85	1.63
TW11	-	-	-	-	4.61	5.03	-	3.00	4.08	3.58	3.94	3.00	3.41
TW12	-	-	-	-	-	<0.25	-	-	-	-	<0.25	<0.10	<0.10

Table 5.7 Nitrate Concentrations on Site

Note:

- Indicates no sample collected

5.8 Groundwater – Surface Water Interactions

5.8.1 Water Courses

A small headwater drainage feature flows from off-Site near PZ1-14 onto the Site from the south near TW2 and MW1-14, where it appears to infiltrate through a depression into the thick coarse-grained (outwash) overburden. Although this feature has been anecdotally referred to as a "disappearing stream" or "underground stream" associated with karst, the relatively thick overburden at the Site reduces the possibility of this feature being a result of local karst features. This feature is interpreted to lose flow and infiltrate as it moves from less permeable Wentworth Till in the south onto the more permeable sandy outwash sediments on-Site. Water that infiltrates across the Site is interpreted to infiltrate vertically through the coarse-grained unsaturated zone to the water table where horizontal groundwater flow is generally towards the north. The on-Site portion of the small headwater drainage feature was observed by COLE staff to be dry during a Site visit in October 2017. Therefore, this feature is interpreted to be an ephemeral feature contributing groundwater recharge after precipitation, snowmelt and freshet events.

Groundwater levels at PZ1-14, near the headwater drainage feature, are consistently below ground surface by approximately 1 m. Similarly, groundwater levels at TW2 and MW1-14 are consistently below ground surface during all times of year when data was collected indicating that this feature is not supported locally by groundwater discharge but provides a groundwater recharge function (i.e., is a losing reach). Due to the higher water table at PZ1-14 compared to TW2, MW1-14, and the rest of the Site, it is interpreted that this high water table represents a local perched water table system. The hydrograph for PZ1-14, which is provided in **Appendix E**, shows that this piezometer frequently goes dry further supporting the interpretation of a localized perched system.

No other water courses are seen on Site. Off-Site, the West Credit River likely receives groundwater contributions that maintain the base flow of this cold water fish habitat.

5.8.2 Wetlands

One piezometer, PZ2-14, was installed to a depth of approximately 1 mbgs in one of the on-Site wetland units (SWT3-2). A hydrograph illustrating water level fluctuations relative to ground surface for PZ2-14 is provided in **Appendix E**.

Examination of the water levels in PZ2-14 shows variable groundwater levels that are consistently below ground surface with the exception of very wet spring conditions when groundwater levels are only slightly above ground surface (maximum of 4 cm above ground surface). As a result, groundwater contributions to SWT3-2 are estimated to be negligible.

Although, there is no direct groundwater monitoring data for wetland unit MAS3-1 on Site, the ground elevation (as indicated by cross-section A-A' on **Figure 8**) is very similar to SWT3-2 and thus groundwater is expected to be at a similar elevation as STW3-2, or slightly deeper, as it declines towards the West Credit River. Observations made during a Site visit on November 8, 2017 confirm that groundwater is approximately 0.86 mbgs within SWT3-2 and no standing water was visible within MAS3-1.

The two off-Site wetland units (SWM1-1 / MAM3-1) do not have groundwater level monitoring data, thus, groundwater contributions cannot be accurately quantified. Based on a Site visit on November 8, 2017, SWM1-1 was observed to have standing water and wet soils. Therefore, groundwater contributions to SWM1-1 appear to be present. Although groundwater contributions to the off-Site wetlands are not quantified, they are not within the radius of influence or the radius of contribution of the closest potential on-Site supply well and the proposed development will maintain pre-development infiltration rates thus,



no groundwater impacts to the off-Site wetlands are anticipated. Additional discussion of the potential impacts to the off-Site wetland features are described in **Section 7.2.2**.

5.9 MOECC Well Records

A MOECC well records search was conducted for a 500 m radius around the Site. A total of 145 wells were identified within a 500 m radius of the Site. Based on the MOECC well records, the majority (81%) of the nearby wells were identified as water supply wells. The search results are provided in **Appendix H** and are summarized in **Table 5.8** below. The locations of nearby MOECC well records are shown on **Figure 13**.

Table 5.6 Summary of Molece Wen Records Within a 500 m Radius Around the site									
Well Use	Number of Wells	Percent of Wells							
Water Supply	118	81.38							
Abandoned	11	7.59							
Monitoring/Test Hole	8	5.52							
Observation	7	4.82							
Unfinished	1	0.69							
Total	145	100							

 Table 5.8
 Summary of MOECC Well Records within a 500 m Radius Around the Site

A search of permitted water takers within a 500 m radius around the Site was conducted in December 2017 through the MOECC digital data request process. No active permitted groundwater takers were identified.

As noted in **Section 4.1**, a private residential well survey at 63 residences in the Belfountain area was conducted by Terraprobe in 1988 and contact was made with 13 residents. An additional private well survey was conducted by Terraprobe in 1989 at 81 residences and 31 responses were received. A third survey was conducted at select residences in 1990 in the Caledon Mountain Estates. Based on the findings from the private well surveys, Terraprobe found that water supply from shallow dug wells had generally poor quality and quantity in contrast to drilled wells.

It should be noted that results from these surveys may now be outdated, and an updated well survey for the area surrounding the Site would be helpful towards understanding current groundwater usage and quality in the area.

6 Impact Assessment

6.1 Water Balance

As part of the hydrogeological investigation a water balance analysis was completed to determine predevelopment recharge and runoff conditions at the Site.

6.1.1 Background

For any system with defined boundaries, a water balance can be used to estimate the individual components of the hydrologic cycle. This exercise consists of an accounting of the transfer of water across the system's boundaries over a certain period of time whereby any difference between inflows to the system and outflows from the system is balanced by a change of storage within the system.

In order to understand the components of the hydrologic cycle under existing conditions, a water balance analysis was conducted for the Site. The discussion below provides details on the methodology used and the results obtained from the analysis. A summary of the calculations is provided in **Appendix I**.

6.1.2 Methodology

A Site scale water balance analysis was completed in order to estimate the components of the hydrologic cycle for the Site, and was modelled using the following equation:

 $P = \varDelta GS + ET + R + I$

Where:

P=Precipitation, which represents the sum of all rainfall and snowfall $\triangle GS$ =Change in groundwater storageET=EvapotranspirationR=RunoffI=Infiltration

The water balance for the Site was developed using the Thornthwaite and Mather (1955) methodology as outlined in Chapter 3 of MOECC's SWM Planning & Design Manual (MOECC, 2003). The methodology roughly estimates yearly evapotranspiration, infiltration and runoff volumes based on soil types, ground cover, topography, and annual precipitation.

Monthly mean temperature and monthly precipitation data were used in the Thornthwaite Equation to estimate the monthly potential evapotranspiration. The estimated monthly potential evapotranspiration was adjusted using a daylight correction factor to account for varying length of daylight throughout the year based on latitude. The actual evapotranspiration was then determined by accounting for a change in soil moisture storage.

The monthly water surplus (amount of water available to infiltrate or runoff) was estimated by calculating the difference between monthly precipitation and actual evapotranspiration. Infiltration was estimated by multiplying a set of infiltration factors (dependent on the topography, soil type, and land cover) to the estimated water surplus. Runoff was considered to be the remainder of the water surplus that was not infiltrated.

6.1.3 Site Water Balance

Site specific parameters used to calculate the Site water balance as described in **Section 6.1.2** were determined as follows.

Precipitation and temperature data were obtained from the Environment Canada Orangeville Weather station (Climate ID: 6155790). Climate normal data (1981-2010) were used in the water balance analysis to provide a general understanding of the climate on Site, while averaging out the effects of wet and dry years.

The Site was divided and classified according to agricultural areas and wooded areas. Infiltration factors were selected for each area from Table 3.1 in the MOECC's Stormwater Management Planning and Design Manual (MOECC, 2003). Ground cover and topography infiltration factors were informed from Site visits and using aerial photographs. Agricultural areas were considered flat lands due to closed depressions whereas wooded areas were considered hilly lands based on topographic slope.



Surficial soil infiltration factors were informed from Site borehole logs and determined to be predominantly sand. Soil moisture capacities were also determined from the MOECC 2003 document and informed by ground cover and soil type. Infiltration factors and soil moisture capacities for the different areas are summarized in **Table 6.1**.

Area	Area (ha)	Infiltration Factor (Topography)	Infiltration Factor (Soil)	Infiltration Factor (Cover)	Soil Moisture Capacity (mm)
Agricultural	50.27	0.30	0.40	0.10	75
Wooded	20.01	0.10	0.40	0.20	200

Table 6.1 Summary of Infiltration Factors and Soil Moisture Capacity

6.1.4 Water Balance Analysis Results

The results of the Site-wide pre-development water balance are summarized in **Table 6.2**. The time period used for the analysis was the 30 year climate normal period from 1981 to 2010 to allow for an understanding of average magnitudes of the components of the hydrologic cycle.

	Hydrologic Cycle	Agricultu	ural Lands	Wooded Areas			
	Component	(mm/year)	(m³/year)	(mm/year)	(m³/year)		
Innute	Precipitation	901.6	453,234	901.6	180,410		
Inputs	Total inputs		453,234		180,410		
	Evapotranspiration	526	264,422	548	109,684		
	Change in soil storage	0	0	0	0		
Outputs	Runoff	75	37,762	106	21,218		
	Infiltration	300	151,050	247	49,508		
	Totals outputs		453,234		180,410		

Table 6.2Results of Water Balance Analysis for 1981 to 2010

Based on the water balance analysis for pre-development conditions, infiltration comprises approximately 32% of the total precipitation across the entire Site, runoff comprises approximately 9% of total precipitation, and evapotranspiration comprises more than half (59%) of total precipitation. The water balance analysis shows a significant amount of infiltration on the Site. This is expected due to the closed depressions within the hummocky topography and sandy overburden materials. Details of the water balance analysis are presented in **Appendix I**.

The Thornthwaite and Mather water balance methodology provides a simplified approximation of the water balance for a given Site. The methodology does not account for yearly changes in groundwater elevations. As such, it is important to note that the evapotranspiration, runoff, and infiltration values estimated using the water balance analysis are understood to be approximations. A more detailed analysis of Site grading and potential for runoff is presented in the Functional Servicing Report prepared by COLE and submitted under separate cover.



Potential impacts to the Site water balance from the proposed development are discussed in **Section 7**. It is currently understood that infiltration measures will be utilized to maintain pre-development infiltration on Site in post-development conditions, with essentially no runoff leaving the Site up to the 100-year storm event. The stormwater management approach as well as a detailed discussion of the post-development water balance is described in the Functional Servicing Report, prepared by COLE and submitted under separate cover.

6.2 Nitrate Loading

6.2.1 Calculations

Nitrate loading analysis was completed in order to evaluate the potential impact of individual on-Site septic systems in compliance with MOECC Procedure D-5-4 and as informed through consultation with CVC. This procedure is outlined below, and assumes that every lot will have a tertiary (Level IV) treatment system such as the Waterloo Biofilter Systems Inc. standard system shown in **Appendix M** that successfully reduces total nitrogen concentrations in effluent by 50-65%.

The equation applied to estimate the influence of the septic systems on nitrate concentrations in groundwater is:

$$n_r = \frac{n_w * V_w}{V_T}$$

Where n_r is the resulting nitrate concentration at the property boundary (mg/L), n_w is the nitrate concentration in the effluent (mg/L), V_w is the volume of effluent (m³/year), and V_T is the total dilution volume (m³/year), which is a sum of annual recharge volume (as determined from the Site water balance analysis **Section 6**, assuming infiltration post-development is maintained) and effluent volume (V_w).

Nitrate loading calculations for the Site assume an effluent discharge of 1000 L/lot/day from the 67 proposed lots. It was also assumed that implementation of tertiary (Level IV) treatment systems will be applied across all 67 on-Site septic systems, resulting in a nitrate loading of 20 g/lot/day, which is half the expected concentration of 40 g/lot/day from traditional septic systems. In addition, it is understood that the planned septic systems will only produce nitrate and conversion of ammonia to nitrate (nitrification) is assumed to be complete in these systems. Therefore, it is not necessary to estimate groundwater concentrations for nitrite or un-ionized ammonia, which is also consistent with CVC review of potential septic system impacts. The analysis of nitrate loading at the property boundary is shown below and assumes an annual dilution volume from recharge of 200,558 m³/year as described in **Section 6.1**:

$$n_r = \frac{\left(20 \frac{g}{lot.day} * 1,000 \frac{mg}{g} * \frac{1}{1000 \frac{L}{lot.day}}\right) \left(1,000 \frac{L}{lot.day} * 67 lots * 365 \frac{day}{year} * \frac{m^3}{1000 L}\right)}{\left(1,000 \frac{L}{lot.day} * 67 lots * 365 \frac{day}{year} * \frac{m^3}{1000 L}\right) + \left(200,558 \frac{m^3}{year}\right)}$$
$$n_r = \frac{(20 mg.L^{-1})(24,455 m^3.year^{-1})}{227,564.2 m^3.year^{-1}} = 2.17 mg.L^{-1}$$

COLE

It is also important to note that the nitrate loading analysis outlined in the MOECC guidance does not consider the complex spatial and temporal variability of nitrate concentrations. Therefore, the nitrate loading concentration determined for the Site is an estimate of the average nitrate concentration expected across the entire Site.

6.2.2 Nitrate Loading Results

From the nitrate loading analysis, which was completed in compliance with MOECC Procedure D-5-4 and consistent with CVC's review approach, a nitrate loading concentration of approximately 2.17 mg/L is estimated at the Site boundary. This concentration is below the ODWS for nitrate of 10 mg/L and also lower than the CCME guideline for NO₃-as-N of 3 mg/L, which has been adopted by CVC. As on-Site wetland features (SWT3-2 and MAS3-1) are essentially at the Site boundary, and any groundwater seepage locations appear to be beyond the Site boundary, the CCME / CVC guideline is met at all downgradient natural features that may receive even minimal groundwater discharge.

The existing nitrate concentrations at the Site (as discussed in **Section 5.7**) are interpreted to reflect nitrate loading from on-Site and adjacent agricultural activities. With development of the Site, the area interpreted to contribute to nitrate loading from agricultural activities will be reduced by approximately 67%. As a result, it is anticipated that long-term background nitrate concentrations will decline over time.

6.2.3 Line of Higher Nitrate Concentrations

All available groundwater quality results for on-Site wells indicate that existing on-Site nitrate concentrations are below the ODWS, and long-term nitrate concentrations are anticipated to decrease due to the reduction in agricultural activity on the site. However, as a precautionary approach it is recommended that supply wells should not be installed in the northernmost portion of the Site where the highest on-Site nitrate concentration are identified. Specifically, it is recommended that supply wells not be placed north of an estimated line of higher nitrate concentrations (i.e., > 7 mg/L). The line of higher nitrate concentrations is shown on **Figure 14** and is located based on the average nitrate concentrations at test wells TW8 and TW7 of slightly less than 7 mg/L.

To identify if any additional setback distance may be required between supply wells and the line of higher nitrate concentrations, a zone of contribution analysis was completed and is discussed in **Section 6.3.4**. As discussed in **Section 6.3.4**, the zone of contribution analysis suggests that an additional setback of 7 m from the line of higher nitrate concentrations, shown as the 7 m setback line in **Figure 14**, is warranted in recognition of the estimated area from which groundwater contributes to the supply wells. Therefore, supply wells located at least 7 m upgradient (south) of the line of higher nitrate concentrations are not expected to draw groundwater from the area with higher nitrate concentrations. Review of the lot locations and dimensions on the Draft Plan indicates that there is a minimum of 9 m between the road right-of-way and the higher nitrate line. Therefore, supply wells can be located on all proposed lots in compliance with the 7 m setback recommendation. The lot layout, line of higher nitrate concentrations, and the 7 m setback line can be found in **Figure 14**. Well locations in relation to the line of higher nitrate concentrations, and the FSR.

6.3 Water Supply

6.3.1 Water Supply Analysis

As noted in **Section 2.3.1**, the main aquifer underlying the Site is the Guelph-Amabel Formation, which provides water sufficient for several large municipal groundwater takings across the Upper Credit River

Watershed. As described below, the aquifer is considered to be capable of providing sufficient water supply for the proposed development based on the analysis completed following the MOECC Procedure D-5-5. An assessment of potential impacts from the water taking is provided in **Section 7.0**. These results are generally consistent with previous assessments of water supply at the Site (Terraprobe 1990).

Peak pumping rates expected per lot at the Site were determined based on the MOECC Procedure D-5-5 with the assumption of a peak pumping rate of 3.75 L/min/person in a four bedroom house (i.e., five people). This results in a peak pumping rate of 18.75 L/min/house. The estimated peak pumping rate is conservative as peak flow rates are only expected to last for only 120 minutes/day. In addition, private wells are typically pumped intermittently, putting less stress and demand on the aquifer. As a result, the expected long-term average pumping rate is estimated to be approximately 1.56 L/min/house (2,250 L/day/house) as outlined in the MOECC Procedure D-5-5.

To investigate the safe well yield on Site, R.J. Burnside conducted six (6) pumping tests between June 11, 2014 and August 29, 2014, which would be expected to generally reflect dry conditions when lower amounts of recharge would occur. The pumping tests lasted for approximately 6 hours with pumping rates ranging from 11.34 L/min to 96.6 L/min and recovery monitored until approximately 95% recovery, as required by the MOECC Procedure D-5-5. Although one of the six pumping tests had a pumping rate less than the maximum rate indicated by MOECC guidelines outlined in Procedure D-5-5, two (2) additional 26 hour pumping tests were conducted in March and April 2016 on TW6 and TW11 at a pumping rate of 60 L/min in compliance with Procedure D-5-5. Raw data for all pumping tests is provided in **Appendix J**.

Transmissivity was estimated from pumping test results using the modified non-equilibrium equation developed by Cooper and Jacob (1946) as outlined in Driscoll (1986) and shown below:

$$T = \frac{0.183Q}{\Delta s}$$

Where,

 $T = \text{transmissivity} (m^2/\text{day})$

 $Q = pumping rate (m^3/day)$

 Δs = slope of the time-drawdown graph expressed as a change in drawdown between two times on log scale whose ratio is 10 (one log cycle). Time-drawdown curves can be found in **Appendix C**.

Transmissivity was then used to estimate drawdown after 20 years and 50 years based on the Theis (1935) solution.

$$s=\frac{Q}{4\pi T}W(u)$$

Where,

s = drawdown (m)

Q = pumping rate (m³/day)

T = transmissivity (m²/day)

And $u = \frac{r^2 S}{4Tt}$, where r = distance from centre of pumping well to drawdown location (m), S is coefficient of storage (dimensionless), and t is time since pumping started (days)

If calculated drawdown after 20 and 50 years is less than the available drawdown within the pumping well then the well is considered to have adequate water supply. The available drawdown is considered to be the distance from the static water level to the middle of the open borehole.

6.3.2 Results

Resulting estimated transmissivity values and calculated 20 year and 50 year drawdowns for the six pumping tests, completed in 2014, are provided in **Table 6.3** and calculations are provided in **Appendix K**.

			Peak Pum (18.75 L/m		Average Pumping Rate (1.56 L/min/house)
Well ID	Estimated Transmissivity (m²/day)	Available Drawdown (m)	Calculated Drawdown after 20 years (m)	Calculated Drawdown after 50 years (m)	Calculated Drawdown after 50 years (m)
TW1	9.40	23	3.5	3.8	0.32
TW2	14.9	2.2	2.3	2.4	0.20
TW3	84.9	14	0.40	0.50	0.040
TW4	403	7.1	0.10	0.10	0.010
TW5	26.6	7.5	1.3	1.4	0.12
TW6	72.1	8.2	0.50	0.60	0.050

 Table 6.3
 Pumping Test Results and Estimated Long Term Drawdown

Based on conservative available drawdown calculations, pumping tests results indicate that most wells can safely support 50 years of continuous pumping at the peak pumping rate of 18.75 L/min/house. This pumping rate exceeds the peak pumping rate likely to be realistically experienced by each well. This peak rate is only expected to occur for a total of 120 min/day and therefore results presented in **Table 6.2** represent a very conservative approximation of the drawdown that would occur after 20 and 50 years of pumping.

Based on the conservative calculations of available drawdown, TW2 was estimated to slightly exceed the available drawdown after 20 years and 50 years. This is not expected to be an issue as continuous pumping at the peak pumping rate is a significant over estimation of a likely pumping rate, which should be closer to 1.56 L/min/house of transient, not continuous, pumping. In addition, the available drawdown within TW2 represents a conservative estimate of the actual water available for drawdown. Given the expected long-term average pumping rate of 1.56 L/min/house, TW2 is only expected to experience 0.2 m of drawdown after 50 years of continuous pumping; significantly less than the available drawdown. Therefore, based on the comparison of predicted versus available drawdown in **Table 6.3**, the completed testing of the on-Site test wells is considered to confirm adequate water supply per MOECC Procedure D-5-5.

The combined water takings expected at the Site, based on an average pumping rate of 2,250 L/day/house and 67 houses, is 150,750 L/day. This is only a portion of the expected recharge which will occur on the Site (549,474 L/day), as calculated from the water balance (**Section 6.1, Appendix I**). In addition, when groundwater flow into the Site is considered (approximately 262,722 L/day), the total water takings at the



Site represent approximately 18% of the total water coming into the Site, much of which will be returned as treated effluent via septic systems.

6.3.3 Radius of Influence

Based on the calculated 50 year drawdown expected within TW1 and observation well PW1 at a pumping rate of 18.75 L/min/house, the radius of influence, beyond which no drawdown is expected to occur, was estimated. The radius of influence was estimated as per Driscoll (1986) using distance-drawdown plots to estimate the distance where zero drawdown would occur and found to be approximately 300 m, not considering recharge. However, given the more realistic pumping rate of 1.56 L/min/house, a radius of influence of approximately 100 m is calculated by this method, which does not consider the effect of recharge.

For comparison, TW4 was also used to estimate the radius of influence based on the drawdown expected after 50 years pumping at 1.56 L/min/house. Results from the analysis with TW4 also indicate a radius of influence of approximately 100 m at the Site. However, the results should be considered approximate as there are no observation wells within the radius of influence to confirm drawdown. The results of this analysis are provided in **Appendix L**. Results from the analysis of TW1 and TW4 were assumed to be representative of the expected radius of influence at the Site as they were calculated to have the largest and smallest transmissivity values (see **Table 6.3**) and therefore bracket the range of transmissivities expected at the Site.

The method described above and shown in **Appendix L** provides a conservative estimate of the radius of influence as it does not consider the influence of recharge on the calculations. Recharge on Site will significantly decrease the radius of influence since the drawdown cone is expected to expand until the recharge rate is equal to the pumping rate. Therefore, an approximate radius of influence can also be estimated from the interpreted recharge rates. Assuming a recharge rate of 300 mm/year (or 8.219x10⁻⁴ m/day; as determined in **Section 6.1**) and an average pumping rate of 1.56 L/min/house, the radius of influence would be approximately 29.5 m, resulting in an area of 2,738 m² (or 0.27 ha). Based on this analysis and an average lot size of approximately 0.64 ha, there is expected to be negligible supply interference between lots. Regardless of the calculated radius of influence, drawdown within the wells is estimated to be a maximum of 0.32 m after 50 years of continuous pumping at an average rate of 1.56 L/min/house (see **Table 6.3**). Therefore, drawdown within the radius of influence is expected to be very small.

Based on the FSR, wells on-Site will be placed a minimum of 30 m apart. Since the radius of influence of is conservatively expected to be 30 m at most, if wells are placed 30 m apart minor superposition of drawdown may occur where the radii intersect. The maximum superposition of drawdown is expected to occur at the midpoint between wells (15 m). However, interference between supply wells spaced 30 m apart will be negligible. The maximum drawdown from one well at this intersection point was conservatively calculated to be 0.11 m (**Appendix L**), which is significantly less than the available drawdown (0.5% of the available drawdown at TW1). Locations of wells on-Site are provided in the FSR.

6.3.4 Radius of Contribution

The zone of contribution is different than the zone of influence calculated above. The zone of influence discussed above outlines the distance at which there is nearly zero drawdown and therefore represents the drawdown cone of a supply well. In contrast, the zone of contribution is the area where groundwater and recharge are contributing to the supply well, and this concept is similar to well head protection areas (WHPA). This zone of contribution extends further upgradient than downgradient due to the effect of



groundwater flow direction and gradient, unlike the zone of influence, which is typically more simplistically depicted as a uniform radius around the well.

The downgradient distance from the supply well to the edge of the zone of contribution is called the stagnation or null point and can be calculated using the following equation (US EPA 1987; Fileccia 2015).

$$x = \frac{Q}{2\pi T i}$$

Where x is the distance from the well to the stagnation point (m), Q is the pumping rate (m^3/day), T is the transmissivity (m^2/day), and *i* is the horizontal hydraulic gradient (dimensionless).

By estimating the downgradient area contributing water to the supply well (distance to the stagnation point), a minimum separation distance can be determined for placing supply wells at the Site an appropriate distance from the approximated line of higher nitrate concentrations (**Figure 14**).

Based on an average pumping rate of 1.56 L/min (2.25 m^3 /day), a transmissivity of 9.4 m^2 /day, and an estimated minimum hydraulic gradient at the Site of 0.0055, the distance to the stagnation point can be calculated as below.

$$x = \frac{2.25}{2\pi(9.4)(0.0055)} = 6.9 \, m$$

Based on this analysis, a separation distance of at least 7 m should be maintained between the supply well and the line of higher nitrate concentrations. As noted above, review of the lot locations and dimensions on the Draft Plan indicates that supply wells can be located on all proposed lots in compliance with this recommendation.

7 Receptors and Impacts

7.1 Surrounding Groundwater Users

Potential long-term impacts to surrounding groundwater users outlined in **Section 5.9** are usually related to changes in groundwater quality and quantity. As the nitrate loading concentration at the Site boundary is only expected to be 2.17 mg/L, which is less than the ODWS of 10 mg/L, negative impacts to groundwater quality for surrounding groundwater users are not anticipated.

Potential long-term impacts to surrounding groundwater users related to groundwater quantity are also expected to be minimal as the radius of influence of on-Site water supply wells is not expected to be larger than 30 m (when recharge is considered), and total groundwater takings are small compared to the total input of groundwater and recharge at the Site. In addition, a large portion of the extracted groundwater will be reintroduced to the groundwater system via septic systems, further reducing impacts to surrounding groundwater users.

Based on the lot configurations shown in **Appendix A**, and the MOECC well record locations shown on **Figure 13**, the closest neighbouring well is approximately 145 m from the closest potential on-Site supply well (**Table 7.1**). As this is considerably larger than the estimated conservative radius of influence of 30 m, when recharge is considered, no significant impacts to water quantity at neighbouring wells are anticipated. In addition, residential wells in Belfountain are commonly completed in the dolostone / sandstone units associated with the Manitoulin and Whirlpool Formations, which underlie the Amabel Formation and Cabot Head Formation shales. Since on-Site supply wells will be screened in the Amabel



Formation, interference between on-Site wells and water supply wells in Belfountain are further reduced since these wells are not interpreted to obtain water from the same aquifer.

Receptor	Approximate Minimum Distance to Potential on-Site Supply Well (m)	Zone of Influence of Supply Well (m)	Approximate Separation Between Zone of Influence and Receptor (m)
Surrounding Groundwater Users	145 (lot 21)	30	115
On-Site Wetland Features	185 (lot 20)	30	155
Off-Site Wetland Features	164 (lot 49)	30	134
West Credit River	370 (lot 49)	30	340

Table 7.1	Distance from Receptors to Closest on-Site Supply Well

7.2 Natural Features

7.2.1 On-Site Wetland Features

Potential long-term impacts to wetland features are usually related to changes in groundwater contributions to the feature and groundwater quality. As existing groundwater contributions to on-Site wetland features (SWT3-2 and MAS3-1) are considered negligible, no long-term impacts to these features are expected. Similarly, as groundwater contributions to these on-Site features are considered negligible, no negative impacts are expected from groundwater quality changes, and groundwater nitrate loadings at the on-Site wetland features are expected to be lower than the CCME / CVC guideline for NO₃-as-N of 3 mg/L.

In addition, based on zone of influence analysis and the lot layout shown in **Appendix A**, the closest potential on-Site supply well is approximately 185 m from the on-Site wetland features (**Table 7.1**). As this is considerably larger than the estimated radius of influence, no significant impacts to water quantity is anticipated.

7.2.2 Off-Site Wetland Features

Potential long-term impacts to off-Site wetland features will also be related to groundwater contributions and groundwater quality. Although, groundwater contributions to off-Site wetland features (SWM1-1 and MAM3-1) are expected, negative impacts are not anticipated as it is understood that infiltration measures will be utilized to maintain that pre-development infiltration on Site will be maintained post-development.

Groundwater takings from on-Site water supply wells are also not expected to have significant impacts on off-Site wetland features as total groundwater takings are small compared to the total input of groundwater and recharge at the Site. In addition, a large portion of the extracted groundwater will be reintroduced to the groundwater system through tertiary treated septic systems, further reducing impacts to natural features.

Similarly, on-Site water supply wells are not expected to directly impact off-Site wetland features as the shortest distance between the closest potential on-Site supply well and the off-Site wetland features is



approximately 164 m, which is greater than the radius of influence of approximately 30 m, when recharge is considered (**Table 7.1**). Please refer to **Appendix A** for lot locations.

In addition, supply wells primarily obtain water in the upgradient direction whereas the off-Site wetland features are downgradient of the Site. Based on radius of contribution calculations (**Section 6.3.4**), water supply wells on-Site are interpreted to draw in groundwater from approximately 7 m in the downgradient direction. This is significantly less than the distance between the closest potential on-Site supply well and the off-Site wetland features. As a result, impacts to groundwater contributions to off-Site wetland features are expected to be minimal.

Potential long-term impacts to off-Site natural features from changes in groundwater quality are also expected to be negligible as groundwater nitrate loadings at the property boundary are expected to be lower than the CCME / CVC guideline for NO₃-as-N of 3 mg/L.

7.2.3 Feature Based Water Balance

Based on the potential long-term impacts to on- and off-Site wetland features discussed in **Section 7.2.1** and **Section 7.2.2** above, a feature based water balance is not recommended.

A feature based water balance is not recommended for the on-Site wetland features (SWT3-2 and MAS3-1) as these features receive negligible groundwater contributions; furthermore, groundwater recharge on-Site will be maintained to minimize negative impacts. In addition, based on long-term pumping at the average annual pumping rate, the radius of influence from supply wells are not estimated to reach these features and will not impact the on-Site wetlands.

A feature based water balance is not recommended for the off-Site wetland features (SWM1-1 and MAM3-1) as groundwater recharge on-Site will be maintained with infiltration measures to sustain groundwater contributions to these wetlands. These features will also not be impacted by groundwater takings from on-Site supply wells as they are outside the predicted zone of influence. In addition, nitrate loadings at the Site boundary are below the CCME / CVC guideline and not expected to impact off-Site wetlands. Finally, as outlined in the Functional Service Report (FSR), essentially all runoff from the Site up to the 100 year storm event will be contained to the Site, which is consistent with existing Site conditions, and therefore no change in hydrological conditions at off-Site wetland features from the development is anticipated.

7.2.4 Water Courses

Potential long-term impacts to the West Credit River will be related to groundwater contributions and groundwater quality. As infiltration is expected to be maintained post-development, the West Credit River is outside the zone of influence (approximate minimum distance to potential on-Site supply well is 370 m), and total groundwater takings on-Site are small and only 0.5% of the West Credit River baseflow, no changes to groundwater contributions to the West Credit River are anticipated. Similarly, long-term impacts to the West Credit River from changes in groundwater quality are expected to be minimal as groundwater nitrate loadings at the property boundary are expected to be lower than the CCME / CVC guideline for NO_3 -as-N of 3 mg/L.

7.2.5 Karst Features

Karst features have not been identified at the Site; however, the OGS has indicated that there is the potential for karst features in the local area. Potential long-term impacts to karst features will be related to a reduction of recharge to these features or changes to water quality. As infiltration is expected to be



maintained post-development, total groundwater takings on-Site are small, and site grading requirements are expected to be kept to a minimum, negative impacts to the function of any karst features that may be present are expected to be negligible. In addition, long-term impacts to karst features from changes in groundwater quality are expected to be minimal as the nitrate loading analysis demonstrates that nitrate loading from the septic systems would be small, and long-term nitrate concentrations at the Site are expected to decrease due the overall decrease in on-Site agricultural activity.

8 Summary

A summary of the hydrogeological investigation is provided below:

- The Site is located within West Credit River Subwatershed and is primarily within the Horseshoe Moraine physiographic region;
- Investigations at the Site have been completed by Terraprobe, Beatty, R.J. Burnside and COLE;
- Based on borehole logs and regional stratigraphy, the Site is generally underlain by Wentworth Till, glaciofluvial sediments, and Port Stanley Till. Bedrock units under the Site are the Guelph Formation and Amabel Formation dolostones, Cabot Head Formation shale, Manitoulin Formation dolostone, Whirlpool Formation sandstone, and Queenston Formation shale;
- Hydraulic conductivity estimates of the dolostone bedrock aquifer range from 4.7x10⁻⁶ m/s to 2.9x10⁻⁴ m/s with an average of 3.6x10⁻⁵ m/s. Infiltration rates of the overburden range from 420 mm/hr to 29 mm/hr with an average of approximately 152 mm/hr;
- Groundwater levels across the Site are typically 10 to 20 mbgs with the exception of shallower groundwater at the on-Site wetland features (SWT3-2 and MAS3-1) where it is typically 0 to 1 mbgs. In general, groundwater flow is primarily horizontal from south to north across the Site towards the West Credit River;
- On-Site groundwater quality meets the health-related ODWS for all tested parameters. Nitrate concentrations are below ODWS and generally increase from south to north across the Site. On-Site nitrate concentrations are attributed to on-Site and nearby agricultural activity;
- General groundwater quality on Site was found to have exceedances in total hardness and
 occasionally exceedances in turbidity with some occurrences of exceedances of aesthetic
 parameters such as total dissolved solids, sulphate, and iron. Water treatment systems are
 recommended to manage hard water and aesthetic water quality parameters;
- The one on-Site headwater drainage feature quickly infiltrates into the sandy overburden in the south of the Site. Groundwater is expected to discharge to the nearby West Credit River in support of base flow to the cold water fish habitat;
- Groundwater contributions to on-Site wetland features (SWT3-2 / MAS3-1) are estimated to be negligible. Qualitative investigations indicate that groundwater contributions to off-Site wetland features (SWM1-1 / MAM3-1) appear to be present;
- Water balance analysis indicates significant amounts of infiltration on the Site, which results from closed depressions within the hummocky topography and sandy overburden materials. Pre-development infiltration rates will be maintained post-development with no water leaving the Site up to the 100-year storm event;
- Nitrate loading analysis was completed in compliance with MOECC Procedure D-5-4. Nitrate loading from the 67 on-Site septic systems is expected to be 2.17 mg/L at the property

boundary, which is less than the CCME / CVC guideline for NO₃-as-N of 3 mg/L. This is provided that tertiary (Level IV) treatment systems such as the Waterloo Biofilter System Inc. standard the system that is able to reduce total nitrogen by 50-65% are installed at each house;

- CCME / CVC guideline for nitrate loading is met at all downgradient natural features that may
 receive even minimal groundwater discharge, provided tertiary (Level IV) treatment systems are
 installed at each house;
- Water quality results for the Site indicate nitrate concentrations meet the ODWS; however, it is noted that nitrate concentrations are generally higher in the northern portion of the Site. Although the reduction in agricultural activity with the development of the Site is expected to lead to long-term reductions in nitrate concentrations, it is recommended that future supply wells be located in areas where existing nitrate concentrations are less than 7 mg/L. Therefore, no supply wells will be located north of the line of higher nitrate concentrations, with a setback of at least 7 m of this line, as determined by a zone of contribution analysis. Review of the lot locations and dimensions on the Draft Plan indicates that supply wells can be located on all proposed lots in compliance with this recommendation as there is a minimum of 9 m between the road right-of-way and the 7 m setback line where wells can be located;
- A peak pumping rate of 18.75 L/min/house and average pumping rates of 1.56 L/min/house are expected, based on MOECC procedure D-5-5;
- Completed pumping tests, by R.J. Burnside, adequately demonstrate compliance with MOECC Procedure D-5-5;
- Long-term drawdown over 50 years at the average pumping rate is much less than available drawdown at all wells analyzed;
- The radius of influence of each well, based on average pumping rate, is expected to be approximately 100 m. However, this radius does not consider the influence of recharge. Therefore, the radius of influence of each well, based on average pumping rate and recharge analysis, is expected to be approximately 29.5 m, or a 0.27 ha area, which is less than the expected average lot size. Therefore, minimal supply interference is expected between private wells;
- Supply wells on-Site will be placed a minimum of 30 m apart. Since the radius of influence of each well is expected to be 30 m, if wells are placed 30 m apart minor superposition of drawdown may occur where the radii intersect. The maximum superposition of drawdown is expected to occur at the midpoint between wells (15 m). However, interference between supply wells spaced 30 m apart will be negligible;
- Overall, minimal to negligible long-term impacts are expected to surrounding groundwater users and natural features; and,
- Feature based water balances for on-Site and off-Site wetlands are not recommended, as groundwater and surface water contributions, if any, to natural features will be maintained.

9 Recommendations

Based on the presented hydrogeological investigations, the following recommendations for the development and future work are provided:

- The development can be supported by private wells based on an assessment of groundwater quality and quantity at the Site consistent with MOECC Procedure D-5-4 and D-5-5;
- The Site has appropriate subsurface conditions to support subsurface waste water disposal, and waste water servicing can be provided by private septic systems at each lot provided that tertiary (level IV) treatment systems such as the Waterloo Biofilter System Inc. standard system are installed;
- Based on nitrate concentrations, nitrate loading calculations, and radius of contribution calculations, supply wells within the Site should not be placed north of the line of higher nitrate concentrations, or within 7 m of this line to the south. Review of the lot locations and dimensions on the Draft Plan indicates that supply wells can be located on all proposed lots in compliance with this recommendation;
- The Site stormwater management plan should include implementation of LIDs to promote infiltration and maintain the Site water balance. Additional infiltration tests should be carried out at the Site to further quantify overburden infiltration rates in support of the detailed design of infiltration measures; and,
- An updated survey of private wells within 500 m of the Site may be beneficial to establish baseline conditions at those private wells prior to Site development.

10 References

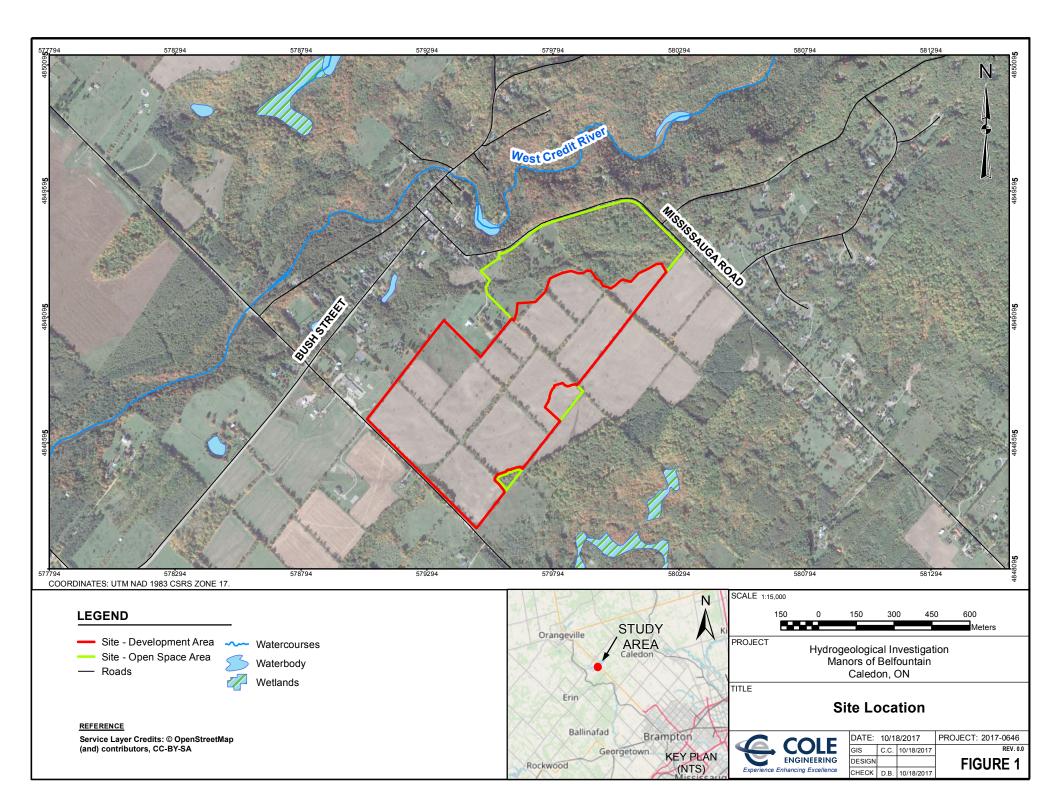
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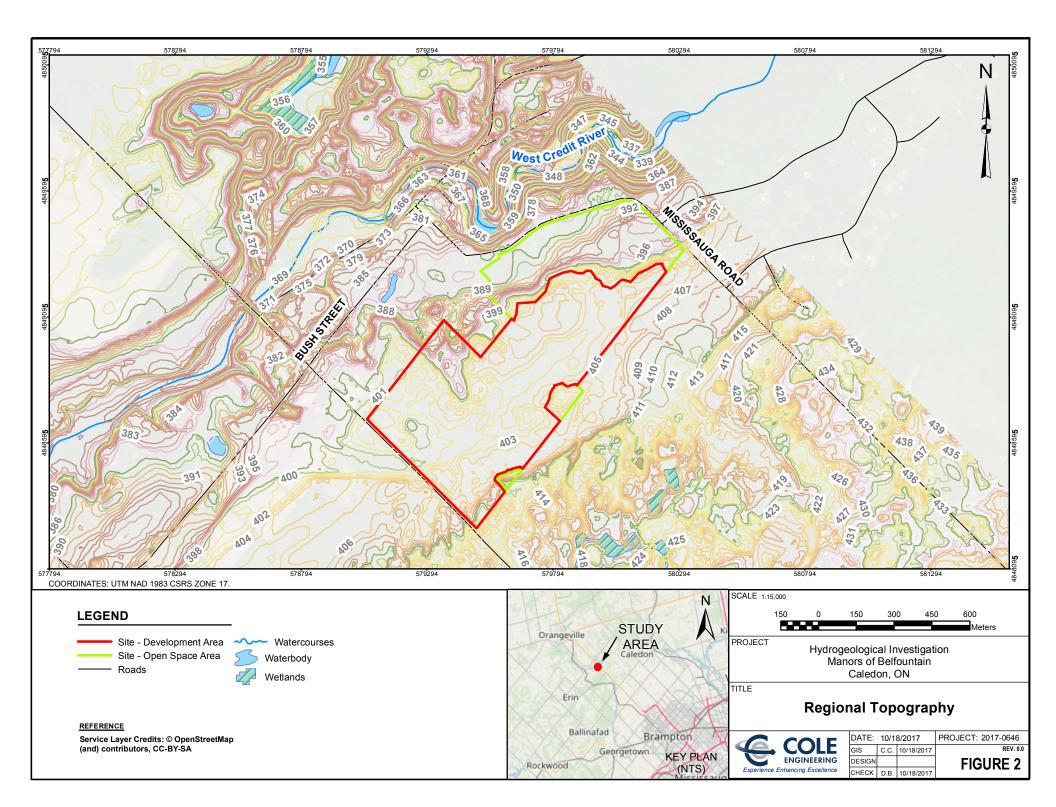
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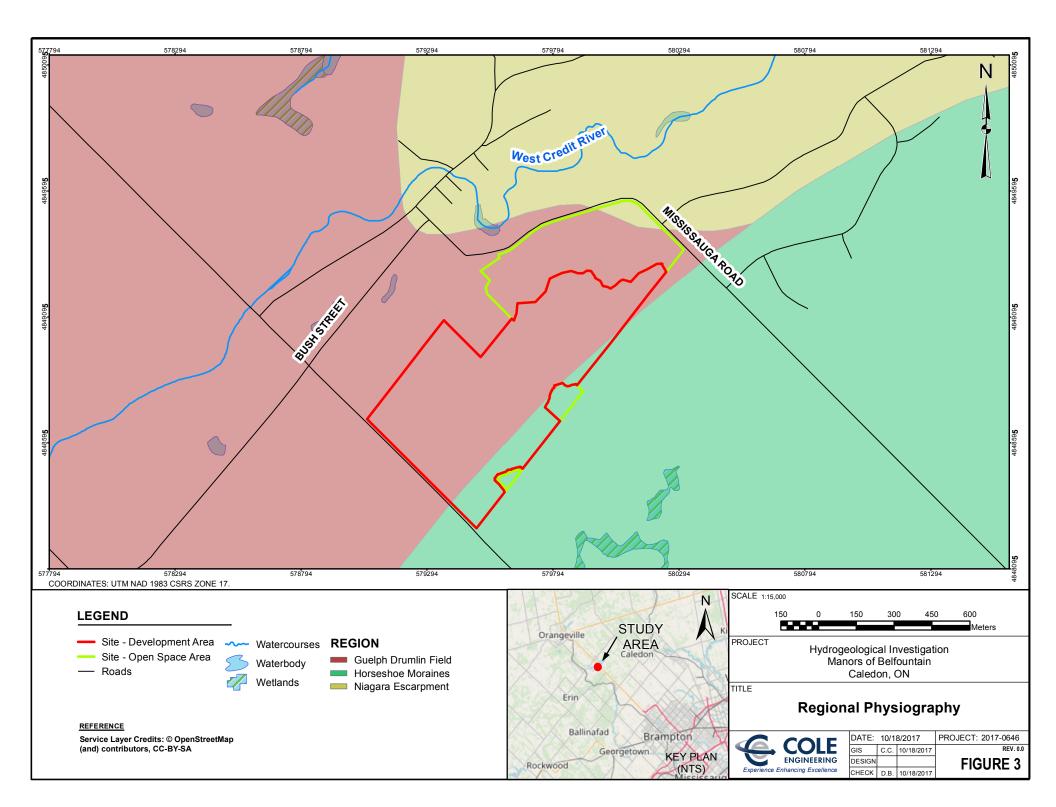
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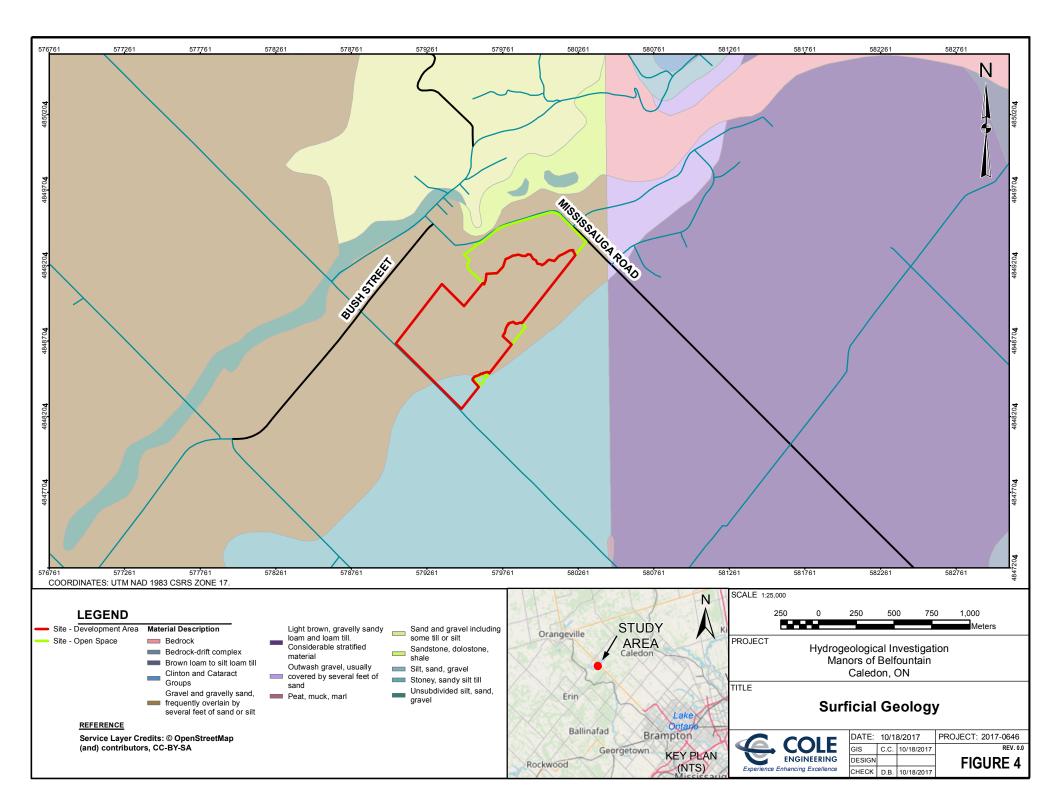
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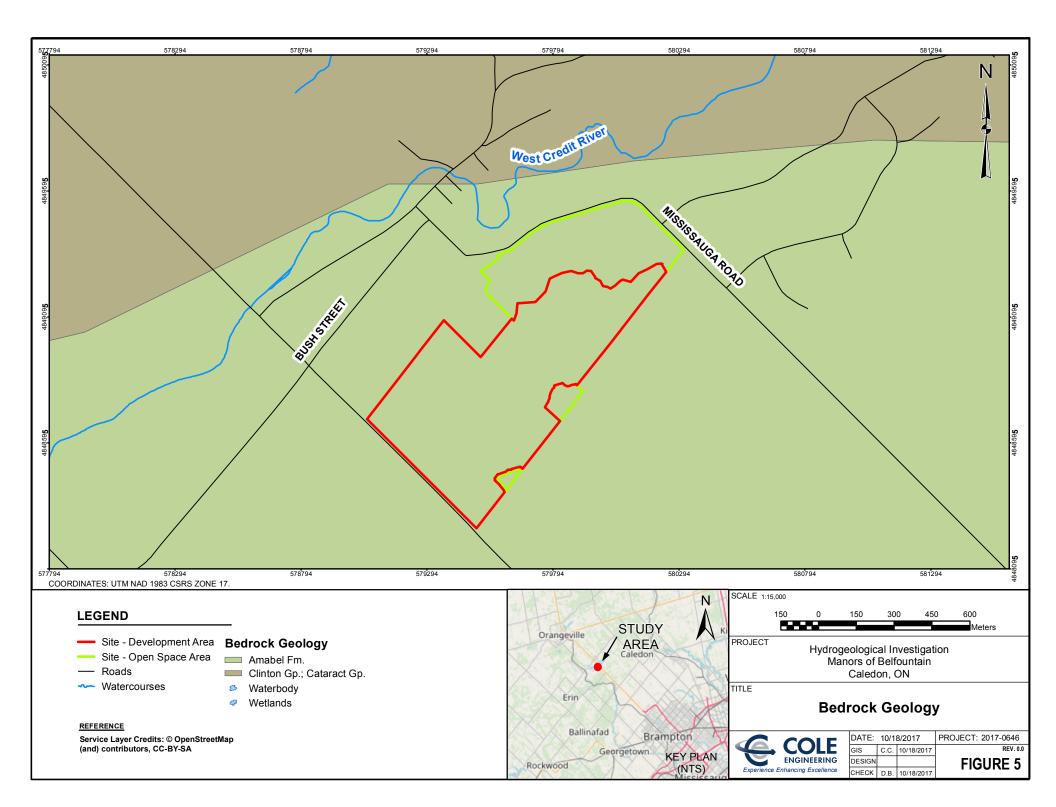
Figures

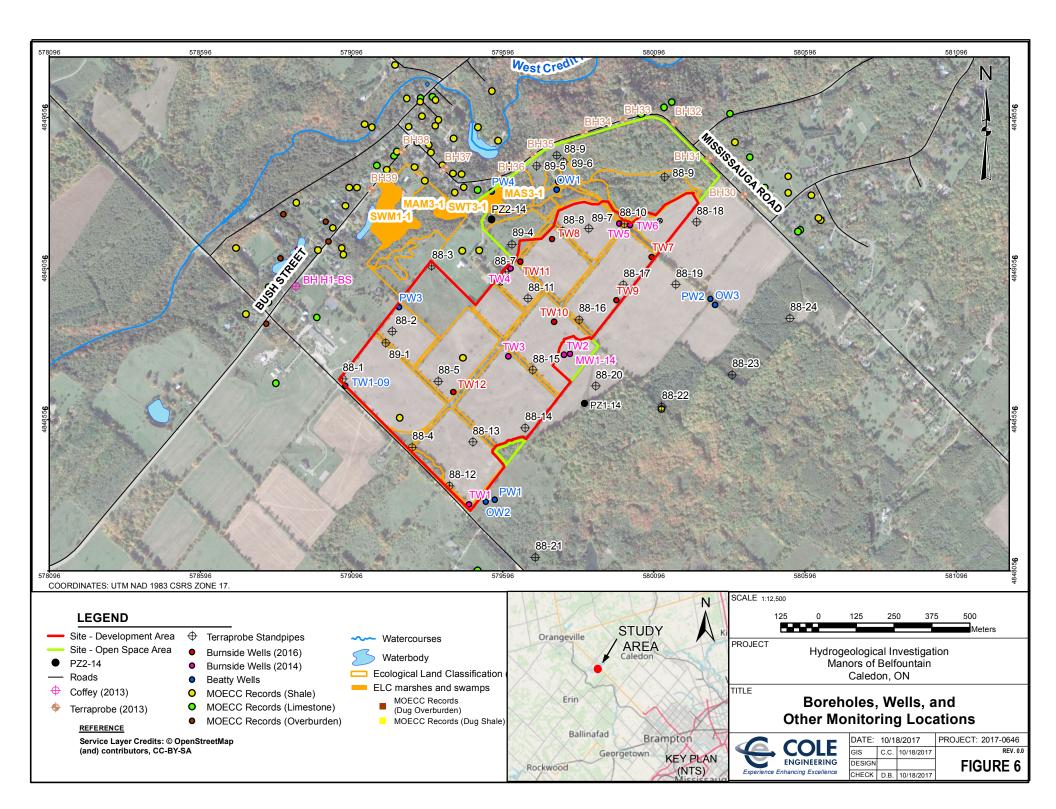


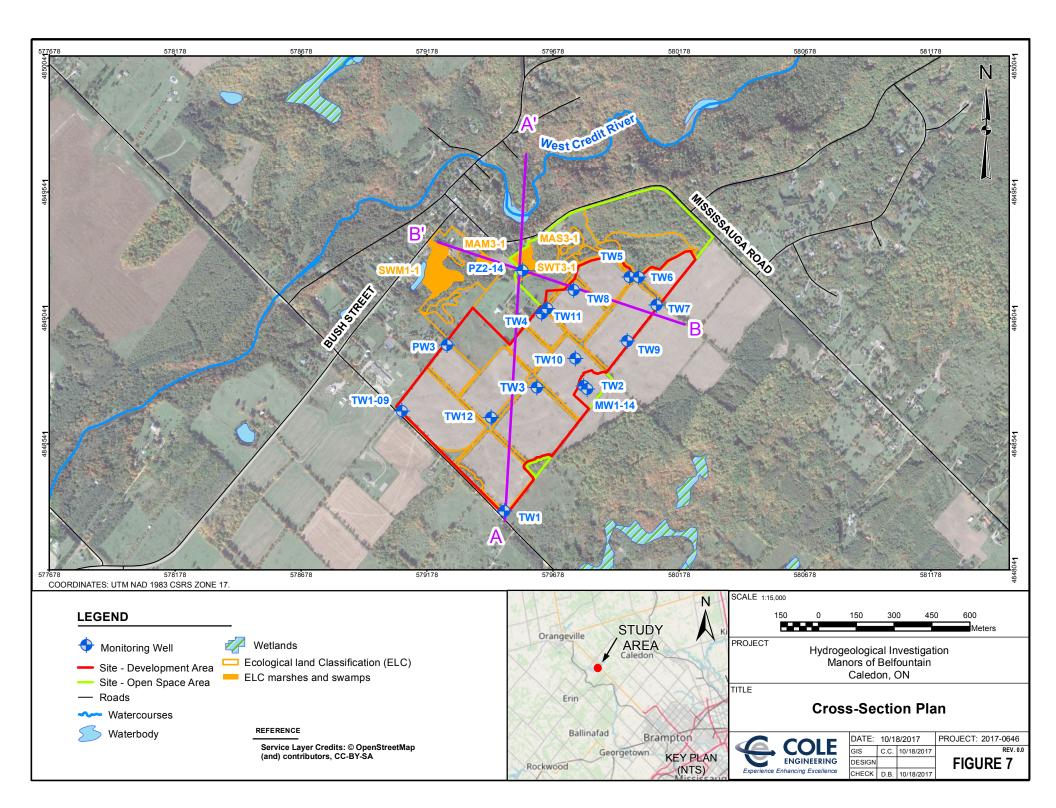


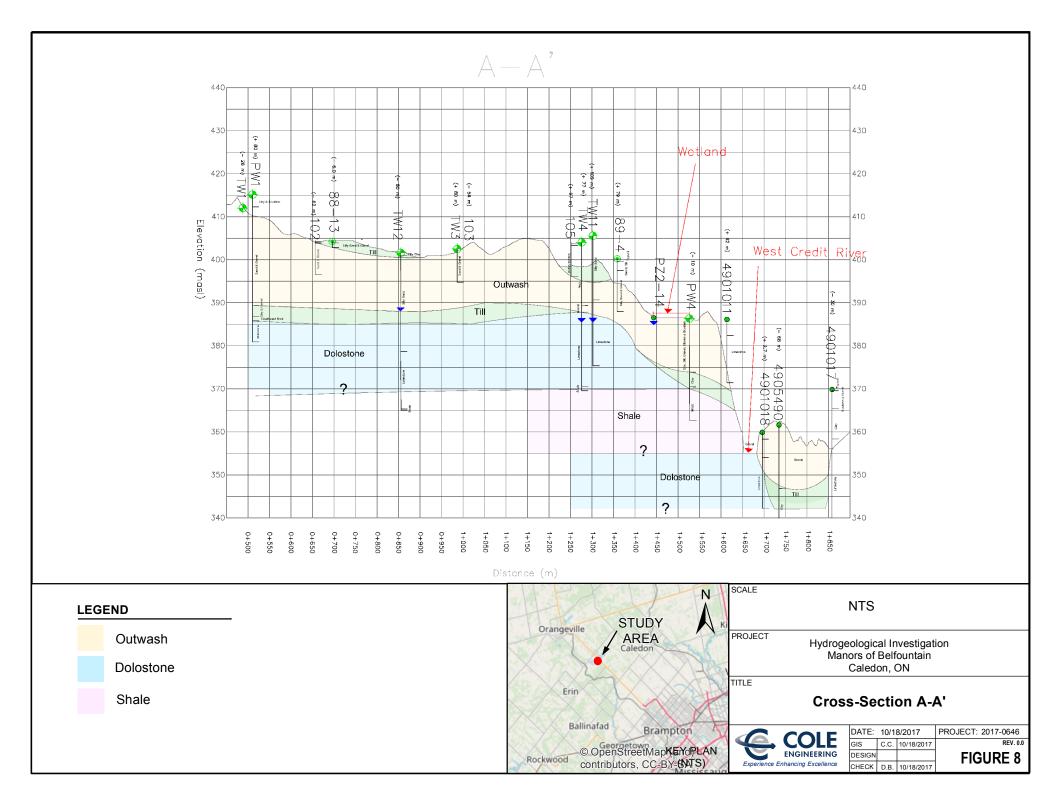


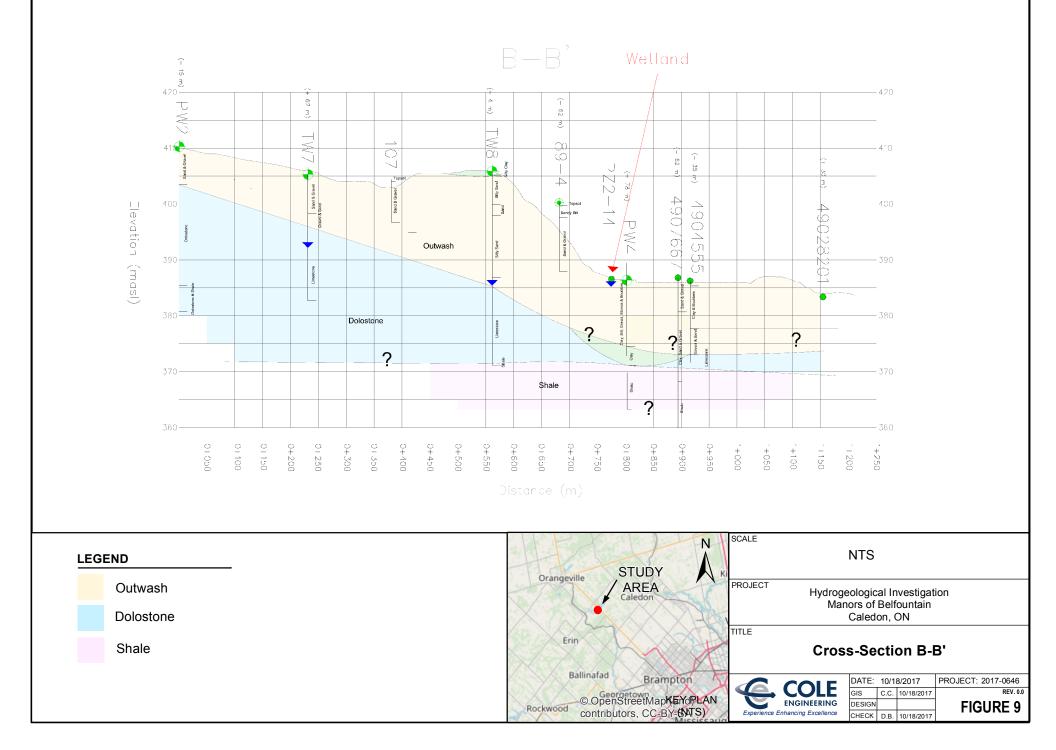


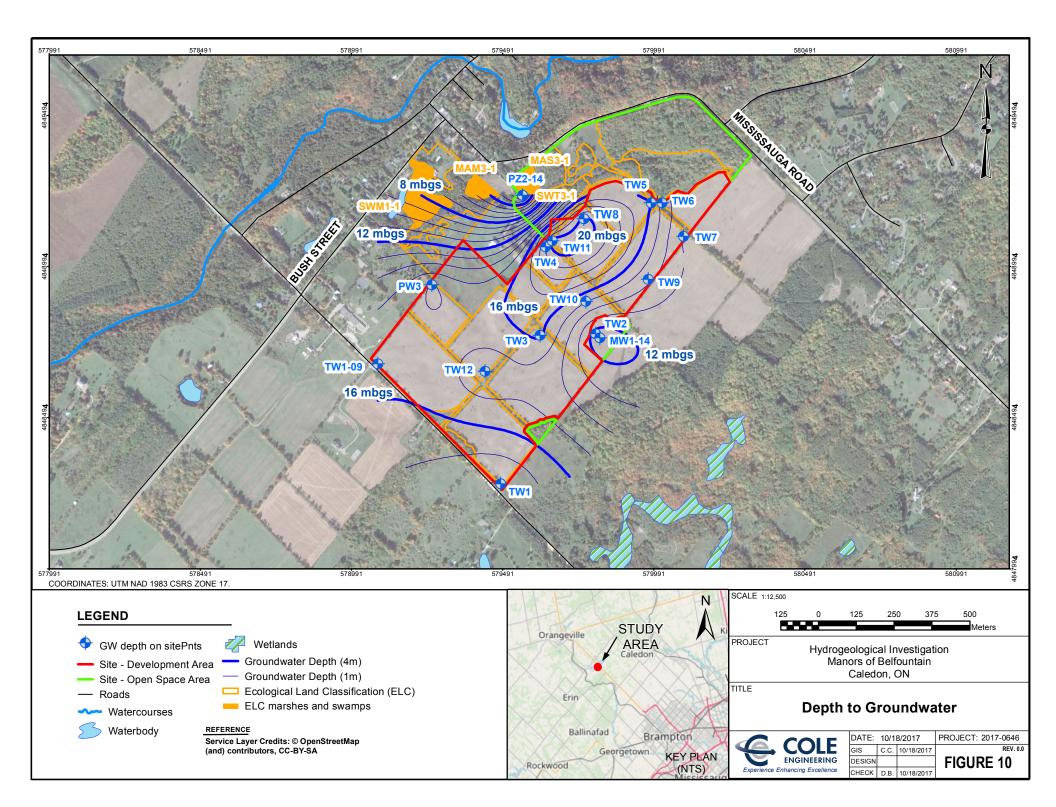


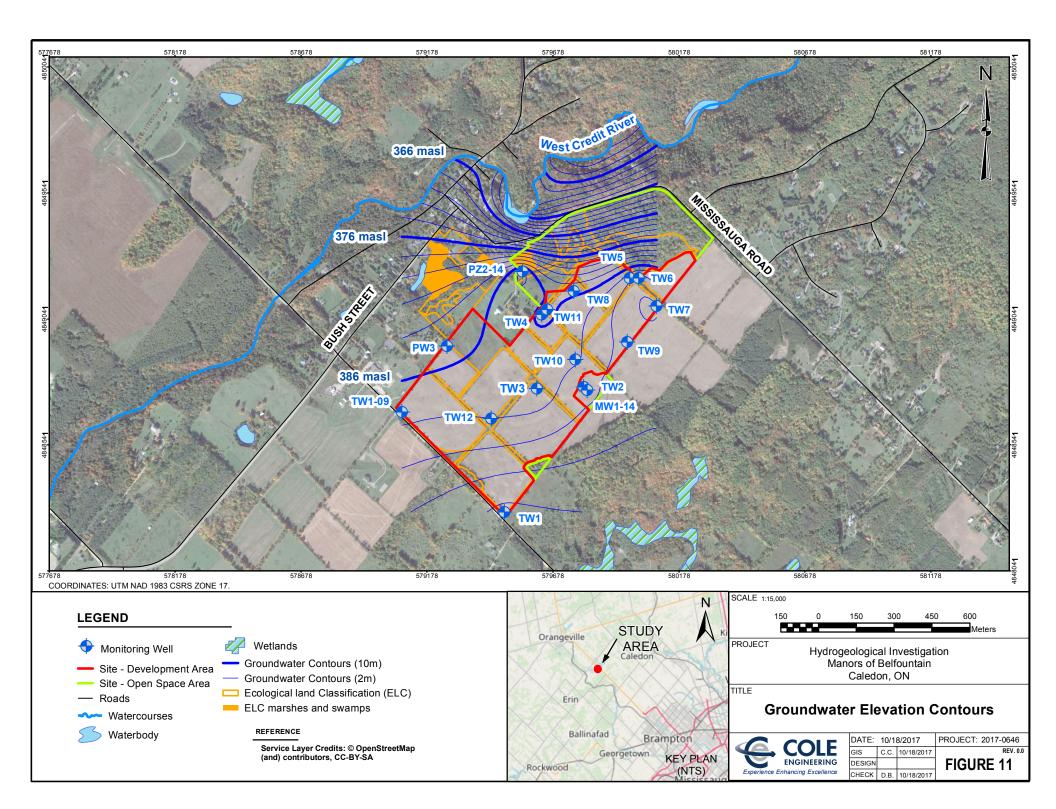


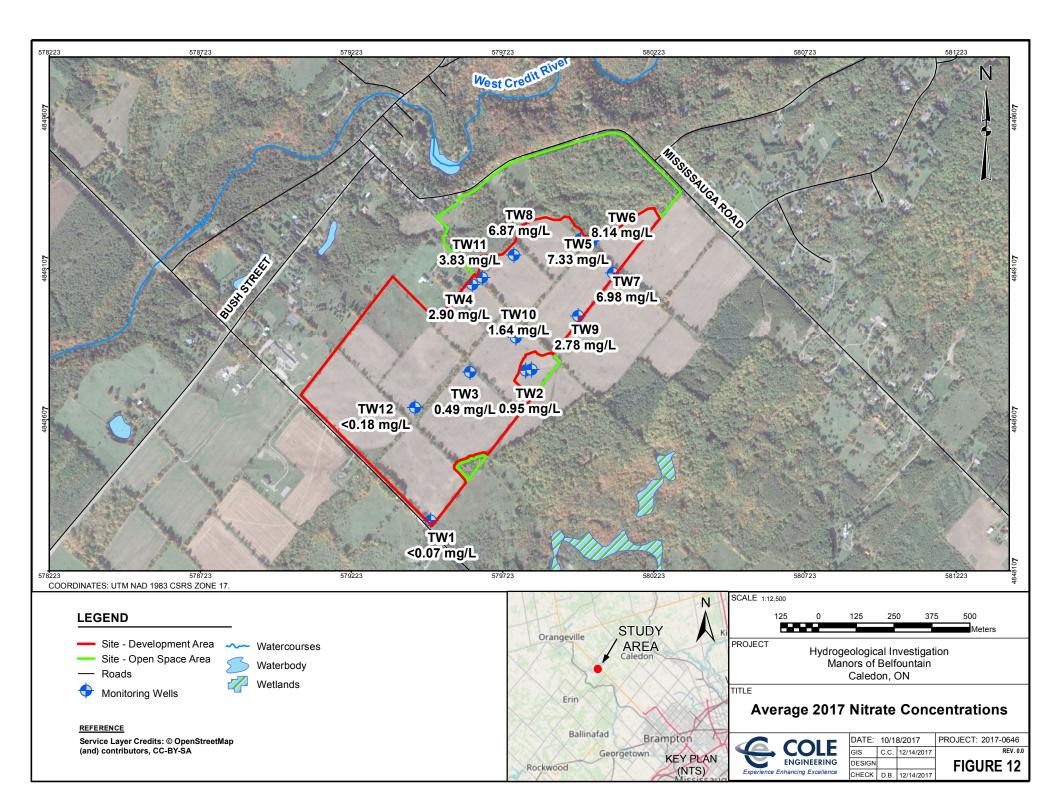


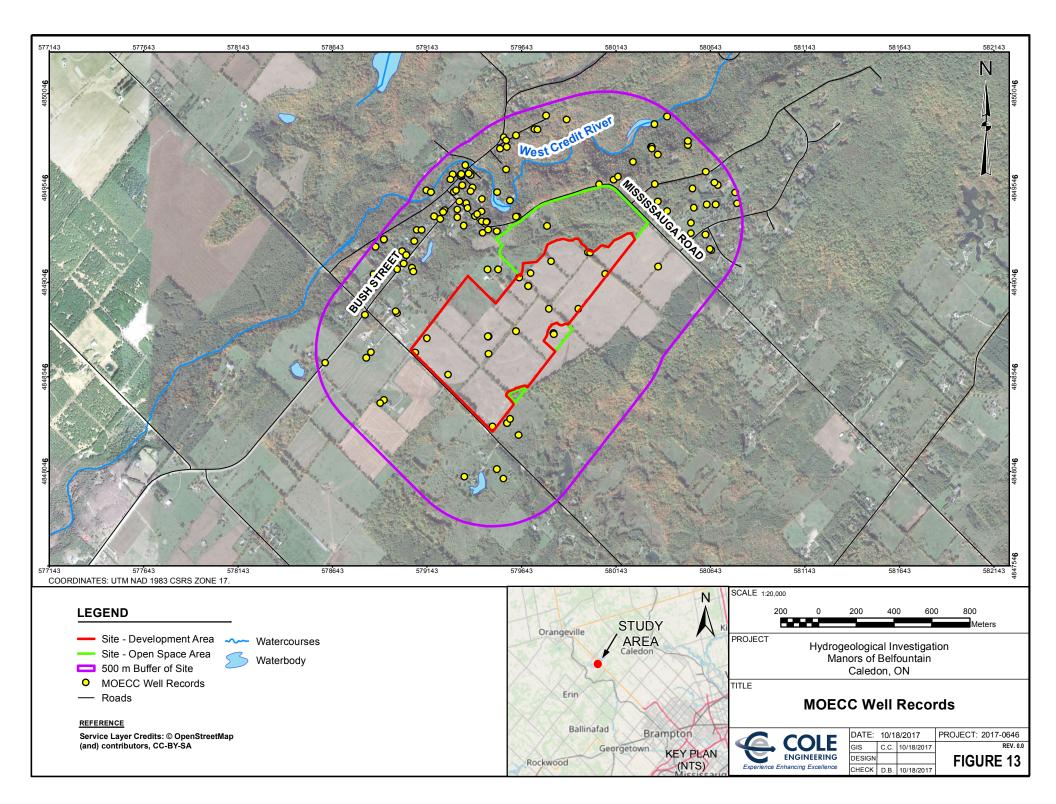


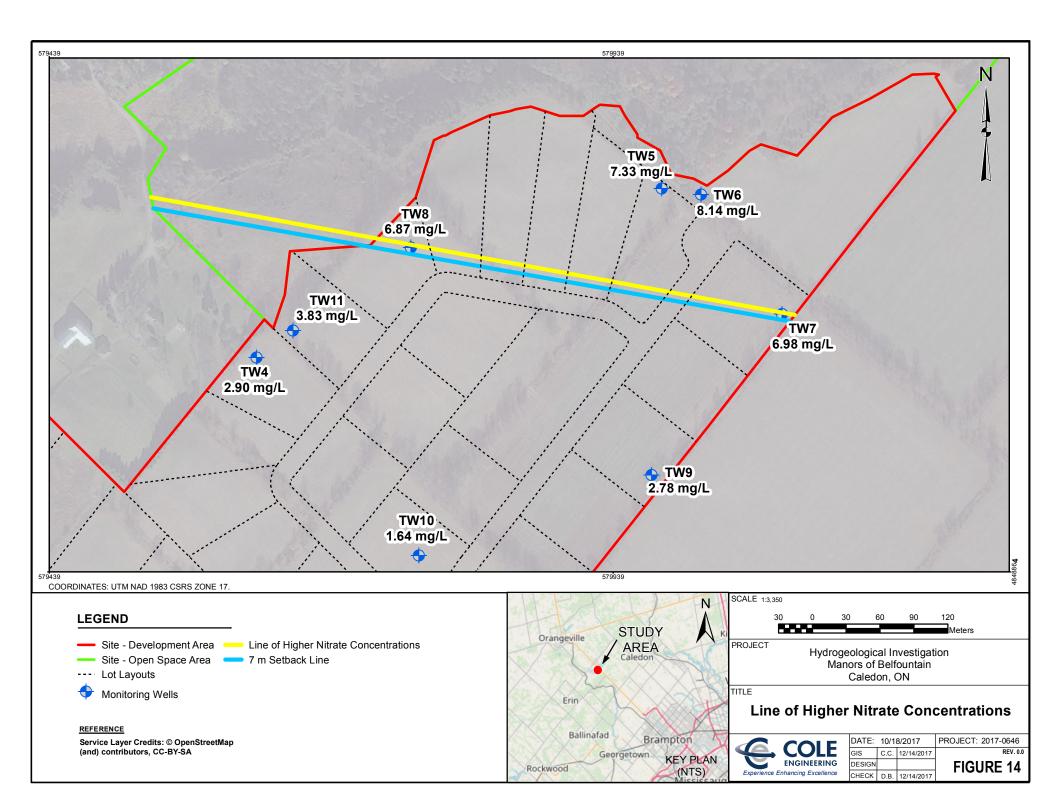




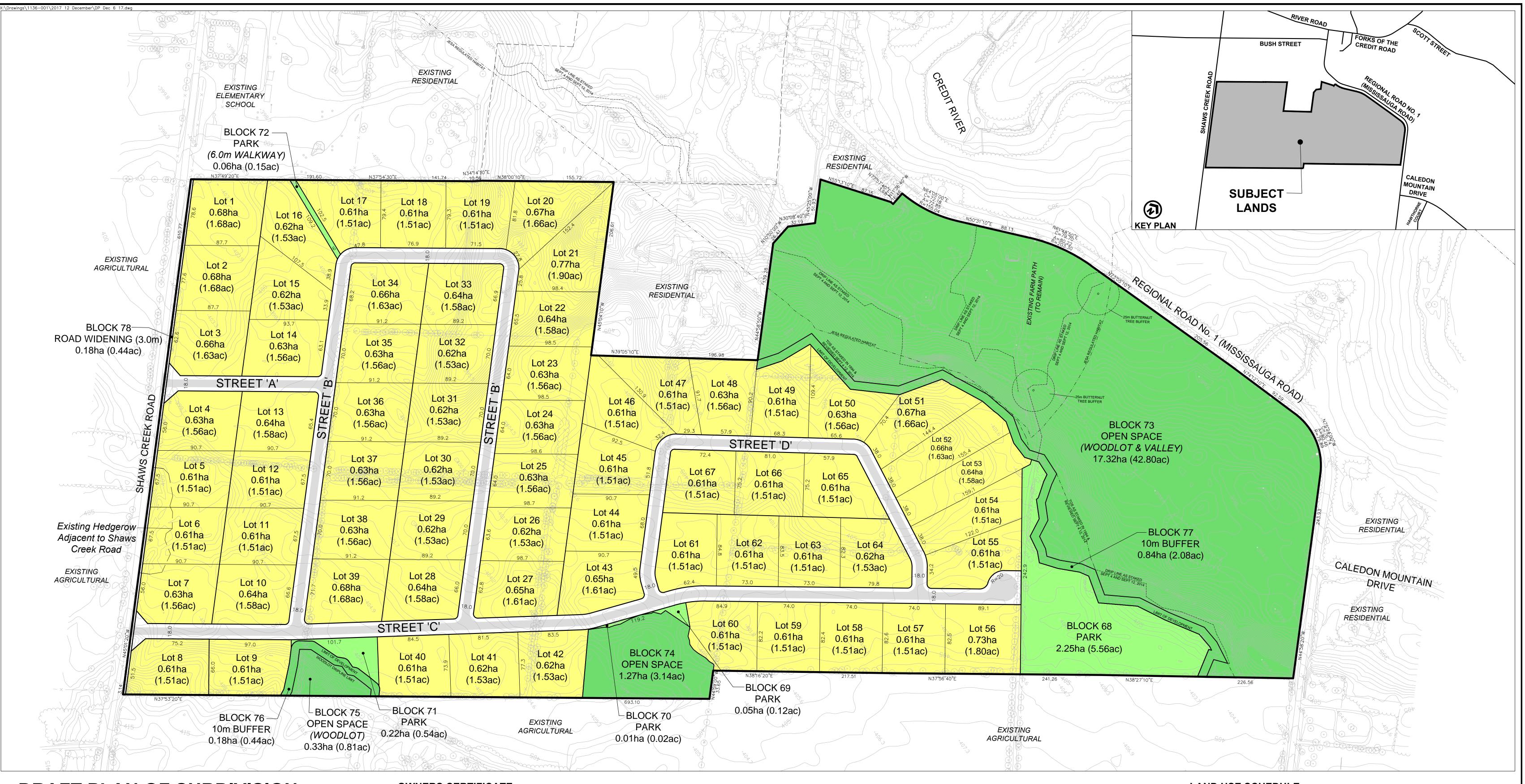








Appendix A Draft Plan of Subdivision



DRAFT PLAN OF SUBDIVISION MANORS OF BELFOUNTAIN CORP.

FILE # 21T-91015C

PART OF EAST HALF AND WEST HALF LOT 9, CONCESSION 5, W.H.S. (HAMLET OF BELFOUNTAIN), TOWN OF CALEDON **REGIONAL MUNICIPALITY OF PEEL**

OWNERS CERTIFICATE

I HEREBY AUTHORIZE GLEN SCHNARR & ASSOCIATES INC. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE TOWN OF CALEDON FOR APPROVAL.

SIGNED

JOHN SPINA, ASO MANORS OF BELFOUNTAIN CORP.

SURVEYORS CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE CORRECTLY AND ACCURATELY SHOWN.

SIGNED

ALISTER SANKEY, OLS DAVID B. SEARLES SURVEYING LTD. 4255 SHERWOODTOWNE BLVD. SUITE 206 MISSISSAUGA, ON, L4Z 1Y5 PHONE: 905-273-6840 EMAIL: info@dbsearles.ca

DATE: _____

ADDITIONAL INFORMATION

(UNDER SECTION 51(17) OF THE PLANNING ACT) INFORMATION REQUIRED BY CLAUSES A, B, C, D, E, F, G, & J ARE SHOWN ON THE DRAFT AND KEY PLANS.

H) MUNICIPAL AND PIPED WATER TO BE PROVIDED I) SANDY LOAM AND CLAY LOAM K) SANITARY AND STORM SEWERS TO BE PROVIDED

NOTES

- Local to local radii 5.0
- Streets 'A' & 'C' to Shaws Creek Rd. daylight triangles 15.0 x 15.0
- Pavement illustration is diagrammatic only

DATE:

LAND USE SCHEDULE

LAND USE	LOTS / BLOCKS	AREA (ha)	AREA (ac)	UNITS
ESTATE RESIDENTIAL	1-67	42.24	104.38	67
PARK	68-72	2.60	6.42	
OPEN SPACE	73-75	18.92	46.75	
10m BUFFER	76, 77	1.02	2.52	
ROAD WIDENING	78	0.18	0.44	
18.0m ROW - (2,886m LENGTH)		5.32	13.15	
TOTAL	78	70.28	173.67	67



Scale 1:2000 (24 x 36) December 5, 2017



Glen Schnarr & Associates Inc. URBAN & REGIONAL PLANNERS, LAND DEVELOPMENT CONSULTANTS SUITE 700 10 KINGSBRIDGE GARDEN CIRCLE, MISSISSAUGA, ONTARIO, L5R 3K6 L (905) 568-8888 FAX (905) 568-8894 www.asai.ca

Appendix B Borehole Logs

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Overburde			nment Sea			back of this form) General Desc	cription	Buch	1000		pth (<i>m/ft</i>)
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Brow	m limes	forme	2		we dit there is		1	1.942	1	9.87	39.62
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	a a start	N ⁶ 1					1.			Neger y	
Dopth S	Image: Arrorsdam Image: Arrosdam er's information E-mail Address uses Name / Organization E-mail Address wind Location (Street Number/Name) Township mad Bedrock Materials/Abandomment Sealing Record (ree estructors on the back of this form) Manicipal Participal Partitipal Participal Participal Partitipal Participa				d Testing aw Down		Recovery				
From					(m³/ft ^{\$})	Diear and sand free	45.		Water Lev		
0	10 Bent	omite	600	1.7	. 73	If pumping discontinued, give r	reason:	Static	19.19	((((((())))))))))))))))))))))))))))))))	34.76
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Meti	had of Construction			Well IIs		1 Provide Antonio		3	28.2	5 3	29.10
Cable To	ool Diamond				cial 🗌 Not used	and and	100	4	30.20	7 4	27.68
Rotary (I	Reverse) Driving	Live	estock	Test Hole	e 🗌 Monitoring	<u>6</u> hrs + <u>6</u> min		5	31.8	5	26.46
Boring	ussion	Ind	lustrial		& Air Conditioning		ng (<i>m/tt</i>)	10	33.89	10	22.70
Other, s					Status of Well	If flowing give rate (I/min / GP	M)	15	34-23	15	21.25
Inside Diameter	Open Hole OR Material	Wall		ו (<i>m/ft)</i>	Water Supply	Recommended pump depth	(m/ft)	20	34.27	20	20-73
(cm/in)	Concrete, Plastic, Steel)	(cm/īħ)	Jr		🕼 Test Hole	Recommended nump rate	1	25	24-22	25	50.00
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15.4	gaen hole in		30.78	53.94	Monitoring Hole	Well production (I/min / GPM)	1	50	14 2	50	20.10
		- 1.1	age going		(Construction)			60	39-60	60	20.09
N-SALESSAL	Construction R	ecord - Scre	en		Insufficient Supply		p of We		- 1 W		100-1
		Slot No.		1	Water Quality	Please provide a map below for	ollowing i	instructi	ions on the	back.	ſ
Outside Diameter	(indene, editaringed, eteel)		FIOII	10		k/				135	
			1.1								Se 1
Diameter			1. 1975 - 1 1		Other, <i>specify</i>	13				1	date 1
Diameter	Water Det	ails		Н		21:57				1	(S)
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	ILCIIO the Env	vironment	Ta	No. (Place Sticker an g #: A165		TW Regulation	2 903 OI			ecord
Well Owr	er's Information	Tag #: A1 Annular Space Type of Sealant Used (Material and Type) Volume Place (m*/k*) Annular Space Volume Place (m*/k*							r	
First Name	ALD	ast Name / Organ	zation	2 9 	E-mail Address					Constructed
Mailing Add	ress (Street Number/Nam	ne)		unicipality	Province	Postal Code	Т	elephone N	-	
Well Loca		Sase fine	e Kond L	Colodon	On	4760	<u>< 77</u>			
- 12 G - 1		mber/Name)	Tc	ownship		Lot	<u> </u>	Concession		
Country/Dist	wiet/Municipality			10000 of	Caledon	<u>[</u>	Provinc	54)	<i>I−I</i> ≤ Postal	Codo
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	hates Zone Easting		M	unicipal Plan and Sublo	ot Number	, de la sector	Other		l	
			in the second second	d (see instructions on the	back of this form)	-			107 VI	
General Co			1			ral Description			Dep From	th (<i>m/ft)</i> │ To
B.									f.a	2.74
i sana	and the second second	The second second				·		2.	the h	7.62
Grad	The same of the	5 / / /							62	2.2.2
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6	time of the	· m. C						į.] \$ {or	20.11
v										
		and the second				Results of We				
Depth Se From	et at (<i>m/ft</i>) To				After test of well yield,			w Down Water Level		ecovery Water Level
0.	· > Bento	aite lave	res F	. 75	Other, specify		(min) Static	(m/ft)	(min)	(m/ft)
		Save Star			If pumping discontinue	ed, give reason:	Level			
					No.		1		1	
					Pump intake set at (n/ft)	2		2	
Meth	nod of Construction		Wallille	•	Pumping rate (I/min /	GPM)	3		3	
Cable To	ool Diamono	1 🗌 Public			Duration of pumping		4		4	. AR B
Rotary (C	,					min	5		5	<u> </u>
Boring	Digging	Irrigation		_ •	Final water level end o	of pumping (m/ft)	10		10	<u></u>
Air percu					If flowing give rate (//	min / GPM)	15	1	15	
	Construction R	ecord - Casing		Status of Well			20		20	
Inside Diameter	Open Hole OR Material (Galvanized, Fibreglass,	Wall Thickness	Depth (<i>m/tt)</i>	Water Supply	Recommended pum	p depth <i>(m/ft)</i>	25		25	<u>,</u>
(cm/in)	Concrete, Plastic, Šteel)	(Gridariy	rom To	Test Hole	Recommended pum	p rate				1200 <u>0-00</u> 00 12
15.9	53-6-01	.48 1.1	1 12.49	Recharge Well	(l/min / GPM)		30	· • ()	30	
15.7	openhole	12	49 20.11	Monitoring Hole	Well production (I/mi	n / GPM)	40		40	
	ĸ			Alteration (Construction)	Disinfected?		50		50	1.5.5 1.15 1.15
				Abandoned,	🕼 Yes 🗌 No		60		60	
	Construction R	ecord - Screen		Insufficient Supply	Diana ann idean ann an 1	Map of W				
Outside Diameter <i>(cm/in</i>)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (<i>m/ft)</i> rom To	Water Quality Abandoned, other,	Please provide a map	below tollowing	Instruct	ons on the p	ack.	
(((10)))				_ specify	A second			Ę.		
<u></u>				Other, specify	1 Alexandre				N.S.	N. C.
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Businese M	Well Contractor	or and Well Tecl	27.70	tion Il Contractor's Licence No.		$\mathbb{L}^{k_{1}} \subset \mathbb{P}^{k}$				
	Emplotives Ltd.									
Business A	ddress (Street Number/Na	ame)		nicipality	Comments:					
Province	Postal Code	(<u>//dµal/MH</u> Busifiess E-m			-					
Ont	LINBR	H MAD	58 İ	UKS- LOAN	Well owner's Date	Package Delivere	ed	Minis	try Us	e Only
Bus.Telepho		ame of Well Techn			information package delivered	Y Y M M		Audit No	18	8872
Well Technic	ian's Licence No. Signature	e of Technician and	d/or Contractor	te Submitted	Date	Work Completed			a∦n (555°	
	and the second second	and the second sec			11 1	18 47 100 170	p	Received		
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P	Index A 165393 Information Result of the second	Th	53		C-71 ell F	W3 Record					
	the Env	vironment		Та	g #: A165	393	Regulation	n 903 O	Intario Wa Page		of
			Impenal	and the second				i de Activ	Faye		
First Name		ast Name /	Organization		1-	E-mail Address			[and the second	Constructed
Mailing Add	dress (Street Number/Nam	në)	y Cob	Pr Por	Iunicipality	Province	Postal Code		Telephone		ell Owner
212	A CONTRACTOR OF	aselii	re Re	od	en formalis	ON	6700	K7		11	
		nber/Name)		T	ownship	1	Lot		Concessio	n	
County/Dis	strict/Municipality				Town at Ca	ladon	Pt 9	Provin	54	1HS	l Code
0			i s		BoHourta	ίΛ.	1	Onta			
		a a 20			lunicipal Plan and Subl	ot Number	a	Other	2 ^N * 5		11 5 ⁶ 9
			1. 4.95	10	rd (see instructions on the	back of this form)					
General C	olour Most Comm	on Material		Oth	er Materials	Gene	ral Description			De From	oth (<i>m/ft)</i> To
Red	Clay 4 9	tone	\$		2 3 	***		5 1		0	10.97
O day	2 Clay 4	510	nes			-				10.97	18.89
1	1 1								1	7.89	26.21
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Death C	ot at (m/#)	and the second			Malana Di		Results of We		d Testing aw Down		2000
From						Clear and sand f		Time	Water Lev	el Time	Recovery Water Level
0.	10 B.m.	tonit.	e Gre	ist	.75		ed aive reason:	(<i>min</i>) Static		(min)	
					x		, give reason.	Level	15.00	1	23.67 20 mi
			и 171			Pump intake set at (r	n/ft)	2	19.01	2	10.0
e jun			1,000		an in china	31.1		3	20.11	3	10.75
-			- Charlender	the state of the s			GPM)	1	1.91	1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	17.00
	Conventional) 🗍 Jetting							4	21.07	4	17.09
Rotary (I Boring				-				5	24.44	5	16.00
Air percu	ussion	🗌 Inc	dustrial		an a	23.62		10	22.10	0 10	10.51
			A REPORT OF A		Status of Well	If flowing give rate (1/n	min / GPM)	15	23.08	15	16.38
Inside Diameter	Open Hole OR Material (Galvanized, Fibreolass,			(<i>m/ft</i>)	Conversion of the second		o depth (m/ft)	20	23.27	20	16.28
(cm/līn)	Concrete, Plastic, Steel)	(cm/lih)	From	То	- Test Hole		o rate	25	23.32	25	16.0d
15.9	Steel	. Mð	- 48	22.8	and the second se	(I/min/~GPM)		30	23.38		16.16
15.4	open hole	а х ⁶	22.8	35.96		Well production (I/mir	n / GPM)	40	23.46		16.07
						Disinfected?	e 1	50	23.52	50	16.02
						Yes No		60	25.55	60	15.99
Outside			1	(<i>m/ft</i>)		Please provide a map	Map of W below following			back.	
Diameter (cm/in)		Slot No.	From	То		12				No.	> 1
				v					1	7 _	ES N
					Other, <i>specny</i>	55000			1		SE !
Weter four			E 5 1. J. J. J.			5		~			- 6
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50		Ministr	v of		Well Ta	g No. (Place Sticker a	nd/or Print Below)	Th	14	1		IN4 Record
	OFICIENO the Environment surements recorded in: Definition Information Name Last Name / Organization In Owner's Information Last Name / Organization Ing Address (Street Number/Name) Last Name / Organization Into Cation Easting ress of Well Location (Street Number/Name) Northing NAD B 3 D 1 Pace Coordinates Zone I Location Easting Northing NAD 8 B 3 D 1 Pace Easting Northing NAD 8 B 3 D 2 I Coordinates Zone Easting I Coordinates Zone	Enter Charles	g #: A165;		Regulation	903 0	ntario Wa	iter Res	sources Act			
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First Name			ast Name / (Organization	e se e		E-mail Address		<u> </u>			Constructed
Mailing Add	dress (Street	t Number/Nam	ie) o er 1	y C	prpor	Aunicipality	Province	Postal Code	1	Felephone	6 a 1	ell Owner
201001 10 10 10	States and the Coordination	de Ras	eline	Road	d intention	Caledon	ON	1700	57			
		on (Street Num	nber/Name)	1945) 1946)	Т :	ownship		Lot		Concessio	n	
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	sector many sector				200 - 20 - 20	/lunicipal Plan and Suble	ot Number		Other		episa. Titeria	
	100	Irock Materia	Is/Abando	onment Sea		rd (see instructions on the	back of this form)				NUS -	
General C	olour	Most Comm	on Material		Oth	er Materials	Gene	ral Description			From	pth (<i>m/ft</i>) To
Gray	1	Clay	\$ 57	ores				1			0	14.63
15100	on /	Cloy						A	2.1	1	4.63	15.84
Buch	0	rovel	С. у П.		1.000	e e e e e e e e e e e e e e e e e e e				<u><u></u></u>	5.84	24 74
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				2 V				M	W.			
	5 g 19 1							- Ward and	ta d	dan Sta		8 <u>2 2 2</u> 2
Depth Se	et at (<i>m/ft</i>)		a subscription of the subscription of the			Volume Placed	After test of well yield,	Results of We water was:		d Testing aw Down		Recovery
From	То	0	(Material ar	nd Type)	8	(m³/ft³)	Clear and sand f	ree	Time (min)	Water Leve (m/ft)	el Time (min)	Water Level (m/ft)
0	10	lSe,	Yon, t	e 610	not -	. 75	If pumping discontinue	ed, give reason:	Static Level	19.54		19.71
			3 (M) (1	19.68		19.59
 	an alatan yang san ang	and the former of	- 1 se -territoria Franklinia				Pump intake set at (r	m/ft)	2	19.69	2	19.58
Mot	had of Car	struction		and the second se	Well Us		Pumping rate (I/min /	GPM)	3	19.69	3	19.58
Cable To	ool	Diamond				ercial 🗌 Not used	<u>30.3</u> Duration of pumping	State State (1)	4	19.69	4	19.58
					Municip 🔟 🔟		_6_hrs +r	the Course of the second s	5	19.69	5	19.58
Boring Air percu	ussion				Cooling	& Air Conditioning	Final water level end of 19 31	of pumping (m/ft)	10	19.69	10	19.575
Other, s				the state of the second second			If flowing give rate (//	min / GPM)	15	19.69	15	19.575
Inside	Open Hole	OR Material	internet with the		(<i>m/ft</i>)	Status of Well	Recommended pum	p depth (m/ft)	20	19.69	20	19.575
Diameter (cm/in)	(Galvanize Concrete,	d, Fibreglass, Plastic, Steel)		From	То	Replacement Well	30	thin a side	25	19.695	25	19.575
15.9	Stee	el	.48	*.60	17.67		Recommended pum (I/min / GPM)	p rate	30	19.695	30	19.575
15.4	ODe	hole		17.67	35.66	Observation and/or	Well production (I/min	n / GPM)	40	19.695	40	19,575
			-				Disinfected?		50	19.90	50	19-57
				2		 (Construction) Abandoned, Insufficient Supply 	Yes No		60	19.70	60	19.57
Outside	A 140		ecord - Scre		(m/ft)	Abandoned, Poor Water Quality	Please provide a map	Map of W			back	
Diameter (cm/in)			Slot No.		То	Abandoned, other, specify	11				131	1
					-		12				18	N
×				4	-	Other, <i>specify</i>	1				-	Ser 1
						th (<i>mi/ft</i>) Diameter	1 St C			1.00	and the second second	BI
100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100				Untested	From	th (<i>m/ft)</i> Diameter To (<i>cm/in</i>)				69	6 m	
		Kind of Water	: Fresh	Untested	6	17.67 22.8	521	~~~ ·		for the second s		
				Untested	17.67	35.66 15.6	Station and the	VV				
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and		00	100	eville.	Mu	unicipality	Comments:					
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	<i>~</i>							Results of We	ell Yield	d Testing	A REAL PROPERTY OF THE REAL PR	
Depth Se From	et at (<i>m/ft</i>) To	7				Volume Placed	After test of well yield,			w Down Water Leve		Water Level
0	10	Bont	lomite	Gi	out	. 95	Other, specify		<i>(min)</i> Static	(m/ft)	(min)	(m/ft)
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	e., 91 -		a hourseason	errei (Malia)	der Barris		27.5		2	18:73	2	21.33
Meth	hod of Co	Instruction			Well Us	e	Pumping rate (I/min /	GPM)	3	26.25	3	19.76
Cable To							Duration of pumping		4	22.09	4	18.67
Rotary (F		Driving	🗆 Liv	restock	Test Hol	e 🗌 Monitoring	hrs + r	nin	5	22.89	5	18-13
Boring	ussion			0	Cooling	& Air Conditioning	Final water level end o	of pumping <i>(m/ft)</i>	10	22.00	10	12230
Other, <i>s</i>							If flowing give rate (I/r	min / GPM)	15	22.22	15	16-89
Inside					h (<i>m/ītt</i>)	Status of Well	Recommended pump	depth (m/ft)	20	22.38	20	16-81
Diameter <i>(cm/in)</i>				From	То	Replacement Well	27		25	22.56	25	16.76
15.9	51	eel	. 48	+.60	13.41	Recharge Well	Recommended pump (I/min / GPM)	o rate	30	22.65	30	16.70
15.4	00.00	hali		13.40	3230	Dewatering Well	Well production (I/min	(C (GPM)	40	22.81	40	16-66
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0	10 Ben	lonite	Gim	ø	. 25	Other, specify	-	(min)	(m/ft)	(min)	(m/ft)	1
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] Rotary (F] Boring	Reverse) Driving Digging	Livest		Test Ho Cooling	le	Final water level end	-				10.70	0
] Air percu] Other, <i>sp</i>	ssion	Indust	rial	_		20.5	7		3.52	10	15.0	1
Joner, sp	Construction Re				Status of Well	If flowing give rate ((I/min / GPM)	15 /9	.92	15	15.7	6
Inside	Open Hole OR Material	Wall	Depth	(m/ft)	Water Supply	Recommended pur	mp depth (m/ft)	20 /9	2.84	20	15.7	4
Diameter (cm/lin)	(Galvanized, Fibreglass, Concrete, Plastic, Steel)	Thickness (cm/īn)	From	То	Replacement Well	30		25 19	.84	25	15.7	1
15.9	steel	.48 +	48	13.41	Recharge Well	Recommended pur (I/min / GPM)	mp rate	30 / 9	7.86	30	15.6	09
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General Co	olour Most Comm	ion Material	Othe	er Materials	Gene	ral Description			From	th (<i>m/ft)</i> To
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12 19	9.75 50		r	041.5	Other, specify		(<i>min</i>) Static	(m/ft)	(min)	(m/ft)
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- Charles (2010) - Charles (2010)	hod of Construction		Well Use		Pumping rate (I/min /	GPM)	3		3	
	Conventional)	Domestic	Commer	I Dewatering	Duration of pumping	win			- 4	
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Air percu		_ Industrial _ ☐ Other, <i>specify</i>			If flowing sive rote ()		15	S. C.	15	
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Inside Diameter <i>(cm/in</i>)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Thickness	h(<i>m//ft)</i> To	Water Supply	Recommended pump	o depth (<i>m/ft</i>)	25		25	
<u>(Crivin)</u>		(cm/ih) + rom	6.09	A Recharge Well	Recommended pump	o rate	30		30	
3.5	Plastic		10.36	Dewatering Well		(0010)	40		40	
	r 10571C	. 10 . 61	10.36	Monitoring Hole	Well production (I/mir	1 / GPM)	50		50	
				(Construction)	Disinfected?		60		60	
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Cable To Rotary (C Rotary (F Boring Air percu Other, sp Inside	Dol Conventional Reverse) Ussion pecify Cor Open Hole	Diamond Jetting Jetting Driving Digging	Cord - Cas	mestic estock gation ustrial ner, <i>specify</i>	Comm Munici Test H	ipal Iole Ing & Air	Dewate Monitor Conditioning Status of We Water Supply	sed tering oring	パマ・ス・ハ Pumping rate (ル ビマ・ノンタル Duration of pum hrs + Final water level ノン・スティ If flowing give ra Recommended	$f \in C$ $f \in C$ $f = \int GPM$ $f = \int GPM$	2 3 4 5 10 15 20	13 Gr 14.0 14.c 14.c 14.0	2 2 4 3 7 4 7 5 4 10 7 15 7 20	3 5 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.7 3.7 3.7
Cable To Rotary (C Rotary (F Boring Air percu	col Conventional, Reverse) Jssion <i>pecify</i> Cor Open Hole (Galvanize	Diamond	Cord - Cas	mestic estock gation ustrial her, <i>specify</i> sing Dept From	Comm Munici Z Test H	nerciał ipal łole ng & Air	Dewate Monito r Conditioning Status of We	sed tering oring	18.3 m Pumping rate (II CS.1LP) Duration of pum 2 hrs + C Final water level 14.251 If flowing give ra Recommended 12.3 m	$\int \epsilon c$ $f(r) = \int c r c$	2 3 4 5 10 15 20 25	13 94 14.0 14.0 14.0 14.0 14.14	2 2 4 3 7 4 7 5 4 10 7 15 7 20	3 5 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.5 3.5
Cable To Rotary (C Rotary (F Boring Air percu Other, sp Inside Diameter	col Conventional, Reverse) Jssion <i>pecify</i> Cor Open Hole (Galvanize	Diamond	Cord - Cas Wall	mestic estock gation ustrial her, <i>specify</i> sing Dept	Comm	nercial ipal lole ng & Air	Dewate Monitor Conditioning Status of We Water Supply Replacement V Test Hole Recharge Well	sed tering oring ell Well	18.3 m Pumping rate (II 28.12PH Duration of pum <u>2</u> hrs + <u>c</u> Final water level 14.28H If flowing give rate Recommended 18.3 m Recommended (<i>Imin / GPM</i>)	$f \in C$ min / GPM) = /13USGAm min = nd of pumping (m/ft) = /4C / C ate (l/min / GPM) pump depth (m/ft) $f \in C$ pump rate	2 3 4 5 10 15 20	13 99 14.0 14.c 14.c 14.17 14.17 14.17	2 4 7 4 7 5 4 10 15 20 25	3 5 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.5 3.5
Cable To Rotary (C Rotary (F Boring Air percu Other, sp Inside Diameter (cm/m)	col Conventional, Reverse) Jssion pecify Open Hole (Galvanize Concrete,	Diamond	Cord - Cas Wall Thickness (cm/in)	mestic estock gation ustrial her, <i>specify</i> sing Dept From	Comm Munici Z Test H Coolin	hercial ipal łole ng & Air	Dewate Monitor r Conditioning Status of We Water Supply Replacement V Test Hole Recharge Well Dewatering We Observation and	sed tering oring ell Well II /ell hd/or	18.3 m Pumping rate (II 28.12PH Duration of pum <u>2</u> hrs + <u>c</u> Final water level 14.28H If flowing give rate Recommended 18.3 m Recommended (<i>Imin / GPM</i>)	$\int \epsilon c$ $f(r) = \int c r $	2 3 4 5 10 15 20 25	13 94 14.0 14.0 14.0 14.0 14.17 14.17 14.17	2 4 7 4 7 5 4 10 7 15 7 20 2 25 30	(3.5 13.4 13.4 13.4 13.4 13.4 13.5 13.5 13.5
Cable To Rotary (C Rotary (F Boring Air percu Other, sp Inside Diameter (cm/m)	Conventional, Reverse) Ussion pecify Open Hole (Galvanize Concrete, \$71515	Diamond	Cord - Cas Wall Thickness (cm/in)	mestic estock gation ustrial her, <i>specify</i> sing Dept From	Comm Munici Z Test H Coolin	nercial ipal dole ng & Air	Dewate Monitor Conditioning Status of We Water Supply Replacement V Test Hole Recharge Well Dewatering We Observation an Monitoring Hole Alteration	sed tering oring ell Well kell hd/or e	18.3 m Pumping rate (II 28.12PH Duration of pum 2 hrs + C Final water level 14.25H If flowing give ra Recommended 17.3 m Recommended (I'min / GPM) 45.42PH	$\int \epsilon c$ $f(r) = \int c r $	2 3 4 5 10 15 20 25 30	13 94 14.0 14.0 14.0 14.0 14.17 14.17 14.17 14.17 14.20	2 2 3 7 4 7 5 4 10 7 15 7 20 2 25 30 40	7 5 3.4 3.4 3.4 3.4 7.7 3.7 3.7 3.7 3.3
Cable To Rotary (C Rotary (F Boring Air percu Other, sp Inside Diameter (cm/m) I & - C	Conventional, Reverse) Ussion pecify Open Hole (Galvanize Concrete, \$71515	Diamond	Wall Thickness (<i>cm/in</i>) v j	mestic estock gation ustrial her, <i>specify</i> bing Dept From + (C	Comm Munici Test H Coolin th (m/#) To	ipal dole ng & Air	Dewate Monitor Conditioning Status of We Water Supply Replacement V Test Hole Recharge Well Dewatering We Observation an Monitoring Hole Alteration (Construction) Abandoned,	ell Well (ell hd/or e	18.3 m Pumping rate (II 28.12PI Duration of pum 2 hrs + 2 Final water level 14.281 If flowing give ra Recommended 12.3 m Recommended (<i>Imin / GPM</i>) 45.42PI Well production	$\int \epsilon c$ min / GPM $m / 15 US EA m$ min end of pumping (m/ft) $/ 4\epsilon / 1c^{4}$ ate (Vmin / GPM) pump depth (m/ft) $/ \epsilon c^{4}$ pump rate $m / 12 US \delta e^{2}m$ (Vmin / GPM)	2 3 4 5 10 15 20 25 30 40	13 99 14.0 14.c 14.c 14.17 14.17 14.17 14.17 14.2 14.2	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	7 5 3.4 3.4 3.4 7.4 7.4 7.4 7.4 7.5 13.5 13.5 13.5
Cable To Rotary (C Rotary (F Boring Air percu Other, sp Inside Diameter (cm/m) 1 & - C	conventional) Reverse) Jussion pecify Open Hole (Galvanize Concrete, \$777575 Cr^25 Ju	Diamond	Vall Thickness (cm/in) v 5	mestic estock gation ustrial her, <i>specify</i> Dept From f_{\bullet} (2) g_{\bullet} (2) g_{\bullet} (2) een	Comm Munici I Test H Coolin (<i>m/R</i>) To 7, 7 22, 6	ipal fole ng & Air	Dewate Monitor Conditioning Status of We Water Supply Replacement We Test Hole Recharge Well Dewatering We Observation an Monitoring Hole Alteration (Construction) Abandoned, Insufficient Sup Abandoned, Pot	sed tering oring ell Well li (ell nd/or e) upply Poor	$\begin{array}{c c} 1 & \overline{\xi} & \overline{\xi} & \overline{\xi} & \overline{\xi} \\ \hline Pumping rate (l) \\ \hline C & \overline{\xi} & \overline{\xi} & \overline{\xi} \\ \hline Duration of pum \\ \underline{2} & hrs + \underline{\zeta} \\ \hline Duration of pum \\ \underline{2} & hrs + \underline{\zeta} \\ \hline Final water level \\ 1 & \underline{4} & \underline{2} & \underline{5} & \underline{4} \\ \hline Final water level \\ 1 & \underline{4} & \underline{2} & \underline{5} & \underline{4} \\ \hline If flowing give rates \\ \hline If flowing give rates \\ \hline Recommended \\ 1 & \underline{7} & \underline{7} & \underline{7} & \underline{7} \\ \hline Recommended \\ 1 & \underline{7} & \underline{7} & \underline{7} \\ \hline Recommended \\ 1 & \underline{7} & \underline{7} & \underline{7} \\ \hline Well production \\ \hline Disinfected? \\ \hline \hline M & Yes \\ \hline N \\ \hline \end{array}$	$\int \epsilon' \epsilon'$ $min / GPM)$ $= \int 13 US EA m$ min end of pumping (m/ft) $= \int 44 \epsilon' / \epsilon'$ ate (Vmin / GPM) pump depth (m/ft) $= \int 2 US E v^{2} m$ (Vmin / GPM) to Map of W	2 3 4 5 10 15 20 25 30 40 50 60	13 99 14.0 14.c 14.c 14.0 14.17 14.17 14.17 14.20 14.20 14.20 14.20 14.20 14.20 14.20 14.20	2 4 7 4 7 5 4 7 5 10 15 20 2 25 30 2 30 40 40 40 40 40 40 40	7 5 3.4 3.4 3.4 7.4 7.4 7.4 7.4 7.5 13.5 13.5 13.5
Cable To Rotary (C Rotary (F Boring Air percu Other, sp Inside Diameter (<i>an/m</i>) <i>I & - C</i> <i>I - C</i> <i>I - C</i> Outside Diameter	col Conventional', Reverse) Jssion pecify Open Hole (Galvanize Concrete, STIEIE C1 ² E J.C Cc	Diamond	Vall Thickness (cm/in) v 5	mestic estock gation ustrial her, <i>specify</i> Dept From f_{\bullet} (2) g_{\bullet} (2) g_{\bullet} (2) een	Comm Munici Test H Coolin th (<i>m</i> /#) To	ipal fole ng & Air	Dewate Monitor Conditioning Status of We Water Supply Replacement W Test Hole Recharge Well Dewatering We Observation an Monitoring Hole Alteration (Construction) Abandoned, Insufficient Sug Abandoned, P Water Quality Abandoned, ot	sed tering oring ell Well II (ell hd/or e) upply Poor	1 F. 3 μ m Pumping rate (ll L S. $l \perp P l$ Duration of pum 2 hrs + Final water level $12 + 2 + 2$ If flowing give rational give rationa give rational give rationa give rationa give	$\int \epsilon' \epsilon'$ $f(r) = \int c' r'	2 3 4 5 10 15 20 25 30 40 50 60	13 99 14.0 14.c 14.c 14.0 14.17 14.17 14.17 14.20 14.20 14.20 14.20 14.20 14.20 14.20 14.20	2 4 7 4 7 5 4 7 5 10 15 20 2 25 30 2 30 40 40 40 40 40 40 40	7 5 3.4 3.4 3.4 7.4 7.4 7.4 7.4 7.5 13.5 13.5 13.5
Cable To Rotary (C Rotary (F Boring Air percu Other, sp Inside Diameter (cm/m) 16-C	col Conventional', Reverse) Jssion pecify Open Hole (Galvanize Concrete, STIEIE C1 ² E J.C Cc	Diamond	Wall Thickness (cm/in) 2 5	mestic estock gation ustrial her, <i>specity</i> From 1 7 7 7 7 7 7 7 7 7 1 1 1 1 1 1 1 1 1 1	Comm Munici Ø Test H Coolin th (<i>m</i> / R) To 7, 7 22, 6 th (<i>m</i> /ft)	ipal fole ng & Air	Dewate Monitor Conditioning Status of We Water Supply Replacement Well Recharge Well Dewatering We Observation an Monitoring Hole Alteration (Construction) Abandoned, Pi Water Quality	sed tering oring ell Well II (ell hd/or e) upply Poor	1 F. 3 μ m Pumping rate (ll L S. $l \perp P l$ Duration of pum 2 hrs + Final water level $12 + 2 + 2$ If flowing give rational give rationa give rational give rationa give rationa give	$\int \epsilon' \epsilon'$ $min / GPM)$ $= \int 13 US EA m$ min end of pumping (m/ft) $= \int 44 \epsilon' / \epsilon'$ ate (Vmin / GPM) pump depth (m/ft) $= \int 2 US E v^{2} m$ (Vmin / GPM) to Map of W	2 3 4 5 10 15 20 25 30 40 50 60	13 99 14.0 14.c 14.c 14.0 14.17 14.17 14.17 14.20 14.20 14.20 14.20 14.20 14.20 14.20 14.20	2 4 7 4 7 5 4 7 5 10 15 20 2 25 30 2 30 40 40 40 40 40 40 40	3 5 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.4
Cable To Rotary (C Rotary (F Boring Air percu Other, sp Inside Diameter (<i>an/m</i>) <i>I & - C</i> <i>I - C</i> <i>I - C</i> Outside Diameter	col Conventional', Reverse) Jssion pecify Open Hole (Galvanize Concrete, STIEIE C1 ² E J.C Cc	Diamond	Wall Thickness (cm/in) 2 5	mestic estock gation ustrial her, <i>specity</i> From † (C) (C) (C) (C) (C) (C) (C) (C) (C) (C)	Comm Munici Ø Test H Coolin th (<i>m</i> / R) To 7, 7 22, 6 th (<i>m</i> /ft)	Inercial ipal fole ng & Air	Dewate Monitor Conditioning Status of We Water Supply Replacement W Test Hole Recharge Well Dewatering We Observation an Monitoring Hole Alteration (Construction) Abandoned, Insufficient Sug Abandoned, P Water Quality Abandoned, ot	sed tering oring ell Well II (ell hd/or e) upply Poor other,	1 F. 3 μ m Pumping rate (ll L S. $l \perp P l$ Duration of pum 2 hrs + Final water level $12 + 2 + 2$ If flowing give rational give rationa give rational give rationa give rationa give	$\int \epsilon' \epsilon'$ $f(r) = \int c' r'	2 3 4 5 10 15 20 25 30 40 50 60	13 99 14.0 14.c 14.c 14.0 14.17 14.17 14.17 14.20 14.20 14.20 14.20 14.20 14.20 14.20 14.20	2 4 7 4 7 5 4 7 5 10 15 20 2 25 30 2 30 40 40 40 40 40 40 40	3 5 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.4
Cable To Rotary (C Rotary (F Boring Air percu Other, sp Inside Diameter (<i>an/m</i>) <i>I & - C</i> <i>I - C</i> <i>I - C</i> Outside Diameter	col Conventional', Reverse) Jssion pecify Open Hole (Galvanize Concrete, STIEIE C1 ² E J.C Cc	Diamond	Vall Thickness (cm/in) v ý	mestic estock gation ustrial her, <i>specity</i> From † (C) (C) (C) (C) (C) (C) (C) (C) (C) (C)	□ Comm □ Munici ☑ Test H □ Coolin □ Co	ipal fole ng & Air	Dewate Monitor Conditioning Status of We Water Supply Replacement V Test Hole Recharge Well Dewatering We Observation am Monitoring Hole Alteration (Construction) Abandoned, Po Water Quality Abandoned, ot specify Other, specify	sed tering oring ell Well II (ell hd/or e) upply Poor other,	1 F. 3 μ m Pumping rate (ll L S. $l \perp P l$ Duration of pum 2 hrs + Final water level $12 + 2 + 2$ If flowing give rational give rationa give rational give rationa give rationa give	$\int \epsilon' \epsilon'$ $f(r) = \int c' r'	2 3 4 5 10 15 20 25 30 40 50 60	13 99 14.0 14.c 14.c 14.17 14.17 14.17 14.17 14.20 14.20 14.20 14.20 14.20 14.20 14.20	2 2 7 3 7 4 7 5 4 10 7 15 7 20 2 30 2 30 2 50 40 50 40 60 50 50 50 50 50 50	7 5 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.4
Cable To Rotary (C Rotary (F Boring Air percu Other, sp inside Diameter (cm/m) I & - C I & - C Utside Diameter (cm/in) Water four	bol Conventional, Reverse) Jussion pecify Open Holk (Galvanize Concrete, \$ Trefe C C C C C Participation C (Galvanize Concrete, \$ Trefe C C C C C C C C C C C C C C C D C C C C C C C C C C C C C C C C C C C	Diamond	Cord - Cas Wall Thickness (cm/in) v ý Slot No.	mestic estock gation ustrial her, <i>specify</i> From +	Comm Munici Z Test H Coolin To 7, 7 22. ¢	Hole	Dewate Monitor Conditioning Status of We Water Supply Replacement V Test Hole Recharge Well Dewatering We Observation am Monitoring Hole Observation an Monitoring Hole Observation an Monitoring Hole Alteration (Construction) Abandoned, Pi Water Quality Abandoned, ot specify Other, specify Diameter	sed tering oring ell Well II (ell nd/or e) upply Poor other, , meter	1 F. 3 μ m Pumping rate (ll L S. $l \perp P l$ Duration of pum 2 hrs + Final water level $12 + 2 + 2$ If flowing give rational give rationa give rational give rationa give rationa give	$\int \epsilon' \epsilon'$ $f(r) = \int c' r'	2 3 4 5 10 15 20 25 30 40 50 60	13 99 14.0 14.c 14.c 14.0 14.17 14.17 14.17 14.20 14.20 14.20 14.20 14.20 14.20 14.20 14.20	2 2 7 3 7 4 7 5 4 10 7 15 7 20 2 30 2 30 2 50 40 50 40 60 50 50 50 50 50 50	3 ÷ 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.4
Cable To Rotary (C Rotary (F Boring Air percu Other, sp Diameter (cm/m) 1 & - C 15. & Outside Diameter (cm/in) Water fourn 7. 4 (n	bol Conventional', Reverse) Jossion pecify Open Holk (Galvanize Concrete, STIFEFE Cr ² EJC Cr (Plastic, Ga M: (Plastic, Ga md at Depth m/ħ) □ Gas	Diamond Diamond Di Jetting Diying Digging Digging Digging Digging	Cord - Cas Wall Thickness (cm/in) 0 2 Cord - Cas Wall Thickness (cm/in) 0 2 Cord - Scree Slot No. Cord - Scree Slot No. Cord - Scree Slot No.	mestic estock gation ustrial her, specify From + 6 7. 2 Pen Dept From	□ Comm □ Munici ☑ Test H □ Coolin th (<i>m</i> /#) To ?7. ₹ ⁻ 2.2. € th (<i>m</i> /ft) To d De From	Hole	Dewate Monitor Conditioning Status of We Water Supply Replacement V Test Hole Recharge Well Dewatering We Observation an Monitoring Hole Atteration (Construction) Abandoned, Insufficient Sup Abandoned, ot specify Other, specify Diameter To (Cm	sed tering oring ell Well ll /ell nd/or e) upply Poor other, , meter nz(n)	1 F. 3 μ m Pumping rate (ll L S. $l \perp P l$ Duration of pum 2 hrs + Final water level $12 + 2 + 2$ If flowing give rational give rationa give rational give rationa give rationa give	$\int \epsilon' \epsilon'$ $f(r) = \int c' r'	2 3 4 5 10 15 20 25 30 40 50 60	13 99 14.0 14.c 14.c 14.17 14.17 14.17 14.17 14.20 14.20 14.20 14.20 14.20 14.20 14.20	2 2 7 3 7 4 7 5 4 10 7 15 7 20 2 30 2 30 2 50 40 50 40 60 50 50 50 50 50 50	3 ÷ 3 · 4 3 ·
Cable To Rotary (C Rotary (F Boring Air percu Other, sp Inside Diameter (cm/m) I E - C Outside Diameter (cm/in) Water four 7, 4 (n Water four 1, 3 (n	bol Conventional', Reverse) Jssion pecify Open Hole (Galvanize Concrete, S T F = F = F C $f^{2} = f A$ (Plastic, Ga (Plastic, Ga (Plastic, Ga mu(h) Gas hd at Depth mu(h) Gas	Diamond Diamond Di Jetting Driving Digging Digging Distruction Re con Material d, Fibreglass, Plastic, Steel) C	Liva Liva Liva Liva Liva Irrig Ind Ott Pecord - Cas Wall Thickness (cm/in) 0 5 	mestic estock gation ustrial her, <i>specify</i> From 1 - C 9 - T een Dept From From	Comm Munici G Test H Coolin th (<i>m</i> /#) To 7, 2 ⁻ 2, 2 th (<i>m</i> /ft) To	Hole	Dewater Monitor Conditioning Status of We Water Supply Replacement V Test Hole Recharge Well Dewatering We Observation am Monitoring Hole Alteration (Construction) Abandoned, Pot Water Quality Abandoned, ot specify Other, specify Diameter To (cm Construction)	sed tering oring ell Well II (ell hd/or e) upply Poor other, c meter nvin)	1 F. 3 μ m Pumping rate (ll L S. $l \perp P l$ Duration of pum 2 hrs + Final water level $12 + 2 + 2$ If flowing give rational give rationa give rational give rationa give rationa give	$\int \epsilon' \epsilon'$ $f(r) = \int c' r'	2 3 4 5 10 15 20 25 30 40 50 60	13 99 14.0 14.0 14.0 14.17 14.17 14.17 14.17 14.20 14.20 14.20 14.20 14.20 14.20 14.20 14.20 14.20 14.50 14.50 14.551	2 2 3 7 4 7 5 4 10 7 5 2 10 7 5 2 20 2 25 30 25 30 40 2 50 2 40 2 50 2 50 40 60	13.4 13.4 13.4 13.4 13.4 13.4 13.4 13.4
Cable To Rotary (C Rotary (F Boring Air percu Other, sp inside Diameter (cm/m) <i>I E - C</i> <i>I G - C</i> <i>I G - C</i> <i>I G - C</i> <i>I G - C</i> <i>Utside</i> Diameter (cm/in) Water four <i>T G (n</i> Water four <i>I 3 (n</i> Water four	Dool Conventional, Reverse) Jussion <i>pecify</i> Open Hole (Galvanize Cnrete, STIFF Cr ² = Ju Cr ² = J	□ Diamond □ Jetting □ Driving □ Digging ■ Struction Re e OR Material rd, Fibreglass, Plastic, Steel) *	A Doi	mestic estock gation ustrial her, specify From + & ? ? Peen Dept From Suntested	Comm Munici G Test H Coolin To 7, 7 2, 7 2, 6 2, 6 Colin To 7, 7 C Colin To 7, 7 C Colin To Coolin To Coolin To Coolin To Coolin To Coolin To Coolin	Hole	Dewate Monitor Conditioning Status of We Water Supply Replacement V Test Hole Recharge Well Dewatering We Observation an Monitoring Hole Alteration (Construction) Abandoned, Pi Water Quality Abandoned, ot specify Other, specify Diameter To (Construction) Construction Diameter (Construction) Construction Diameter (Construction) Construction Construction Diameter (Construction) Construction Construction Diameter Construction Constru	sed tering oring ell Well ll (ell hd/or e) upply Poor other, meter n/in) ,	1 F. 3 μ m Pumping rate (ll L S. $l \perp P l$ Duration of pum 2 hrs + Final water level $12 + 2 + 2$ If flowing give rational give rationa give rational give rationa give rationa give	$\int \epsilon' \epsilon'$ $f(r) = \int c' r'	2 3 4 5 10 15 20 25 30 40 50 60	13 99 14.0 14.0 14.0 14.17 14.17 14.17 14.17 14.20 14.20 14.20 14.20 14.20 14.20 14.20 14.20 14.20 14.50 14.50 14.551	2 2 7 3 7 4 7 5 4 10 7 15 7 20 2 30 2 30 2 50 40 50 40 60 50 50 50 50 50 50	13.4 13.4 13.4 13.4 13.4 13.4 13.4 13.4
Cable To Rotary (C Rotary (F Boring Air percu Other, sp inside Diameter (cm/m) <i>I E - C</i> <i>I G - C</i> <i>I G - C</i> <i>I G - C</i> <i>I G - C</i> <i>Utside</i> Diameter (cm/in) Water four <i>T G (n</i> Water four <i>I 3 (n</i> Water four	Dool Conventional, Reverse) Jussion <i>pecify</i> Open Holk (Galvanize Correte, \$ T FEFE C / ² E JL C / ³ E JL	Diamond Diamond Di Jetting Diying Digging Digging Digging Distruction Re C C C C C C C C C C C C C C C C C C C	Control Case C	mestic estock gation ustrial her, specify From + & C ?. ? een Dept From Huntestee Untestee	Comm Munici	Hole	Dewate Monitor Conditioning Status of We Water Supply Replacement Test Hole Recharge Well Dewatering Wel Observation an Monitoring Hole Atteration (Construction) Abandoned, Pl Water Quality Abandoned, ot specify Other, specify Diameter To Conter, specify Conter, specify Conter, specify Conter, specify Diameter Conter, specify Conter, specify Conter	sed tering oring ell Well ll (ell hd/or e) upply Poor other, meter n/in) ,	1 F. 3 μ m Pumping rate (ll L S. $l \perp P l$ Duration of pum 2 hrs + Final water level $12 + 2 + 2$ If flowing give rational give rationa give rational give rationa give rationa give	$\int \epsilon' \epsilon'$ $f(r) = \int c' r'	2 3 4 5 10 15 20 25 30 40 50 60	13 99 14.0 14.0 14.0 14.17 14.17 14.17 14.17 14.20 14.20 14.20 14.20 14.20 14.20 14.20 14.20 14.20 14.50 14.50 14.551	2 2 3 7 4 7 5 4 10 7 5 2 10 7 5 2 20 2 25 30 25 30 40 2 50 2 40 2 50 2 50 40 60	13.4 13.4 13.4 13.4 13.4 13.4 13.4 13.3 13.3
Cable To Rotary (C Rotary (F Boring Air percu Other, sr Other, sr <i>1 & C</i> <i>1 & C</i> <i>C</i> <i>C</i> <i>C</i> <i>C</i> <i>C</i>	bol Conventional', Reverse) Jssion pecify Open Hole (Galvanize Concrete, $$ Trere}$ $Cr^2 f Jac Cr (Plastic, Ga (Plastic, $	□ Diamond □ Jetting □ Driving □ Digging ■ Struction Regard a OR Material d, Fibreglass, Plastic, Steel) C A H C E Onstruction Regard aterial Ivanized. Steel) Water Det Kind of Water □ Other, spe	A Doi Livi Cord - Cas Wall Thickness (cm/in) 0 7 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	mestic estock gation ustrial her, specify From + & C ?. ? een Dept From Huntestee Untestee	Comm Munici	Hole Pation	Dewate Monitor Conditioning Status of We Water Supply Replacement V Test Hole Recharge Well Dewatering We Observation an Monitoring Hole Alteration (Construction) Abandoned, Pl Water Quality Abandoned, ot specify Other, specify Diameter Mag Other, specify Diameter Mag Construction Abandoned, ot specify Diameter Mag Construction Abandoned, ot specify Diameter Mag Construction Abandoned, ot specify Diameter Mag Construction Abandoned, ot specify Diameter Mag Construction Abandoned, ot specify Diameter Mag Construction Abandoned, ot specify Diameter Construction Abandoned, ot specify Abandoned, ot specify Abando	sed tering oring ell Well ll (ell hd/or e) upply Poor other, meter n/in) 	1 F. 3 μ m Pumping rate (ll L S. $l \perp P l$ Duration of pum 2 hrs + Final water level $12 + 2 + 2$ If flowing give rational give rationa give rational give rationa give rationa give	$\frac{\int \epsilon' \epsilon'}{ min / GPM }$ $\frac{1}{2} \frac{\int z \cdot s \cdot \epsilon A \cdot m}{ S \cdot s \cdot s \cdot \epsilon A \cdot m}$ $\frac{1}{2} \frac{1}{2} \frac{1}{$	2 3 4 5 10 15 20 25 30 40 50 60	13 99 14.0 14.0 14.0 14.17 14.17 14.17 14.17 14.20 14.20 14.20 14.20 14.20 14.20 14.20 14.20 14.20 14.50 14.50 14.551	2 2 3 7 4 7 5 4 10 7 5 2 10 7 5 2 20 2 25 30 25 30 40 2 50 2 40 2 50 2 50 40 60	13.4 13.4 13.4 13.4 13.4 13.4 13.4 13.4
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Address of	Well Location (Street Nu	mber/Name)	_	1	ownship		<u>, , , , , , , , , , , , , , , , , , , </u>	Lot	1	ncession		
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General Co		non Material			er Materials			eneral Description			Dep	th (<i>m/f</i>)
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					TOTA	L DRE,	PTH-114	FRET				
Death Ca		Annular Spa				<u></u>	After test of well y	Results of We		Cesting Down	. · · · ·	
From	et at (m/ ft) To	Type of Sealant (Material and Ty				Placed	Clear and sa	ind free		ater Level	r	ecovery Water Level
\mathcal{C}	15.0 BENT	CHITEH	- =L=PZL	6	. 3	3	Other, speci		(min) Static	(m/ 2 /	(min)	(m /k)
23.7	34.7 BENTO				.02		If pumping discon	tinued, give reason:	Level 2	1.08		29.73
21.1	JUL UZRIO	HITE [70	LEPL	/@		·			12	1.75	1	24.46
							Pump intake set		2 2	2,06	2	23-88
							30.5m	· ·	32	2,32	3	23.14
Meth	od of Construction	i 🗌 Public		ell Us omme		Not used	11 · · ·	n/3USGPm		2.56	4	12.96
	Conventional) Datting	Domes		lunicip		Dewatering	Duration of pump	0				
Rotary (F	Reverse) Driving Digging	Livesto		est Ho	le 🗌 & Air Conditio	Monitoring	L hrs + C	end of pumping (m/ft)	·	2,80	5	22.60
Air percu	ission	🗌 Industri	al	Joonny		Jung	25.73		10 2	3.30	10	22.78
Other, sp	-	Other,					If flowing give rat	e (l/min / GPM)	15 24	4.08	15	21,14
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156	CPEN HOLE	19	7.5 34	۴, 7	Alteratio	on	Disinfected?		50 2	5.47	50	21.11
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Outside Diameter	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft	·	Water (Quality oned, other,	Please provide a	map below following	instruction:	s on the ba	ack.	A
(cm/in)			From 5	То	specify		BUSH	STREET				/
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				-						VALGO		
1947 - 2014	Water De		1000.000		lole Diame					1	135	AUGA
	at Depth Kind of Wate			Dep rom	oth (<i>m4</i> 4) To	Diameter (cm/i n)				7.50		
	₩ Gas Other, sp nd at Depth Kind of Wate		ntested 4	Ð	6.4	25.0				2800		Ko
	n/ft) 🔲 Gas 🗌 Other, sp			5.4		22.2				*€	- 51	5-70
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(m	n/ft) Gas Other, sp			9.5		15.6						· var) «Laneeddydd
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WELL	IMITIATIVES	>	=		7 2	21						;
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and the second s	ner's In	formation							a tel 116a	. : . :	12		
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<u>HL</u> Well Loca		E BASE	LINE	KOA	2	CALEN	ION	Он	1700	KTC	1058	38	0200
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34.1	35.4	+ CUTTI	NGS					I i pumping disc	ontinued, give reason:	Il cever	14.70		16.84
1. adu, 1997-1998								Pump intake s	et at (m/ft)		15-38	1	15.91
					-			22.9m			15.60		15.71
Meth	od of C	onstruction			Well Us	e	çi în c	Pumping rate	. ,	11	15.86	3	15.56
Cable To		Diamond	🗌 Pub				Not used	Duration of pu	mping	4	15.98	4	15.47
Rotary (R		Driving	Live	estock	Municipa	le 🗌	Dewatering Monitoring	2_hrs+_			16.06	5	15.40
Boring	ssion	Digging	Irrig		Cooling	& Air Conditic	oning	Final water leve	el end of pumping (m/fi) 10	16.31	10	15.23
. 🗌 Other, <i>sp</i>	ecify		Oth	er, specify _					rate (I/min / GPM)	15	16.42	15	15.16
Inside	T	onstruction R	ecord - Cas Wall		ı (<i>m/₿</i>)	Status Water S	of Well	Recommonde	d pump depth (<i>m/ft</i>)	20	16.49	20	15.12
Diameter (cm4a)	(Galvan	ized, Fibreglass, e, Plastic, Steel)	Thickness (cm/int	From	To	Replace	ement Well		~ 175	25	16.53	25	15.09
160	STE	, "	n5	+ 6	11.6	E Test Ho		Recommende (I/min / GPM)	d pump rate	30	16.57	30	15.07
		ORAFEN ASTIC	•6	10,1	34,1	- Dewate Observa	-		~/12056Pin	40	16.62	40	15.03
12.8			10			- Monitori	ng Hole	Well productio	n (i/min / GPM)	50	16.66	50	15.00
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	ale referenci	Construction R	ecord - Scre	en	Ni Kasaritan		ent Supply		Map of V				
Outside Diameter		Material	Slot No.	and the second	n (<i>m/ft</i>)	Water 0		Please provide	a map below following			ack.	denification at the state of the
(cm/in)	(Plastic,	Galvanized, Steel)		From	То	Abando	ned, other,	Busy	57				7
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										l	MIG	615c	
Valatas facus		Water De				lole Diame	ter Diameter				A		AUGA
		th Kind of Wate		_ Untested	From	To	(cm/##)						7
Water foun	id at Dep	th Kind of Wate	r: Fresh	Untested	0	C.4	25.0						ドンネロ
		as Other. spe th Kind of Wate			6.4	11.6	22.2			6	340m		
		as Other, spe			11.6	35.4	15.6						
Bugin			or and Well	Technicia			Linner M				δ€	-59	5->
		ell Contractor	c			ell Contractor's	Licence No.					n	
Business Ad	ddress (S	Street Number/Na	z ame)		Μι	inicipality		Comments:			1/1 -		
15 Province	Town	Postal Code	Rueinoco	E-mail Add		RANGE	VILLE	PLASTIC	FROM 12.8. LINER 1	- 70 NSTA	ILEA		
	1	L9W3R		Λ		hues.ce	om	Well owner's	Date Package Delive	red	Minis		e Only
· .	one No. (ii	nc. area code) Na	ame of vveli i	ecnnician (Last Name,	First Name)		hinformation package delivered	Y Y Y Y X X		Audit No.Z	22	1733
Kell Technic		8287 5 nce No. Signature	COMF of Technicia	<u>007</u> in and/or Co	ontractor Da	te Submitted		Yes	Date Work Complete	d			
03	7		Brack			0160	205	X No	201602	25	Received	·	
0506E (2014/	11)		ľ			Minic	torie Con	a.			© Queen's	Printer f	or Ontario, 2014

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Do	ntarj	O and Clin	of the Envi nate Chang		Well	Tag#: A20	1493 (ow)	Regulation	J 903 C			Record
Measurem	10 - 10 ents reco	rded in: 💇 M	etric 🗌 I	mperial		A2014	-93	nogulator		Page		of (
All and a second second second	Service and the service of	formation								a - 1		
First Name	RB	PROPE	ast Name / (E-mail Address			[and the second	Constructed ell Owner
Mailing Add	dress (Stre	eet Number/Nam	ne)	0	N	lunicipality	Province	Postal Code		1	No. (inc.	area code)
Well Loca		E BASE	LIME	ROA	0	CALEDON	ON	1700	K7 °	5058	738	0200
Address of	Well Loca	ation (Street Nun		~		ownship		Lot		Concessio	'n	
IG PO County/Dis		4Aus C	REEK	KOA		Town OF	CALEDON	9	Dravin	54		L Codo
PEEL	2					BELFOUNTAI			Provin Onta			KOEF
	8 22	ne Easting		orthing	IV	Iunicipal Plan and Subl	lot Number		Other			
		7 57 9 7 edrock Materia				rd (see instructions on the	e back of this form)		<u> </u>			
General Co		Most Comm				er Materials	- i	ral Description	1		Der From	oth (<i>m/</i> #)
BROWN	5	ILTY SAI	20	5	TONES	;					0	.6
BROWN	4	HLTY SA	LND								,6	3.7
BROWN		PAVEL +		5	147						3.7	9.4
BROWN		ILTY SA									9.4	12.8
Brown		AND									12.8	14.9
GREY		IMEST	ONE								14.9	30.2
						TOTAL	DEPTH- 50	FEET	F			
Death Co	at at (an Mil)	1	Annular	and the second	and the second			Results of W	11			2
From	et at (m#) To		Type of Sea (Material an			Volume Placed (m ³ /22)	After test of well yield,		Time	aw Down Water Lev		Recovery Water Level
0	11.0	BENTON	ITE	40CEP	LUG	-24	Other, specify		(min) Static	(m/ it)	(min)	(m/ it)
							If pumping discontinue	d, give reason:	Level	15.07		16-54
								- (54)	1	15.50	1	15.17
	-					-	Pump intake set at (n 22.9m/79		2	15.84	: 2	15.14
Meth	hod of C	onstruction	and prototop	di.	Well Us	P	Pumping rate (I/min /	GPM)	3	15.99	3	15-13
Cable To	loc	Diamond	Pul	blic	Comme	rcial 🗌 Not used	Duration of pumping	3005 GPM	4	16.10	4	15.13
Rotary (C		al) 🗌 Jetting		mestic estock	Municipa	-		nin	5	16.15	5	15.13
Boring			🗌 Irrig	gation		& Air Conditioning	Final water level end o	f pumping (m/	10	16.2	c 10	15-12
Air percu			Ind	ustrial ner, <i>specify</i> _			IG-54- If flowing give rate (1/r	nin / GPM)	15	16.3		15.12
	C	onstruction Re	ecord - Cas	1		Status of Well			20	16.3		15.12
Inside Diameter	(Galvan	lole OR Material ized, Fibreglass,	Wall Thickness	Depti From	n (m緯)	Water Supply	Recommended pump		25	16-44		15.12
(cm/az)		e, Plastic, Steel)	(cm/i s) -		To	_ Test Hole	Recommended pump		30			
16.0	STEE	2	15	*.78	16.8	Recharge Well	(1/min / GPM) 45-46Pm	LUSEPA		16.47		15-11
						Observation and/or Monitoring Hole	Well production (I/min		40	16.44		15.11
15.6	OPEN	HOLE		16.8	30.2	Alteration (Construction)	Disinfected?		50	16.44		15.10
						Abandoned,	Yes No	and the second	60	16.40	60	15.10
Outside		Construction R	ecord - Scre	1	1	Abandoned, Poor	Please provide a map	Map of W			hack	
Outside Diameter (cm/in)		Material Galvanized, Steel)	Slot No.	From	n (<i>m/ft</i>) To	Water Quality	AUSH	-			DACK.	7
(Gridini)				4		specify		1		I .		/
						Other, specify						
	<u> </u>	Mater Dat	-11-		1		4			Mis	5/99	AUCA
Water four	nd at Dep	Water Det th Kind of Water		Untested	Dep	th (milt) Diameter		750				7
		as Other, spe			From	To (cm/im)	-	755	m			(C) A D
and the second sec		th Kind of Wate		K Untested			-					AD
		th Kind of Wate			6.4	16.8 22.2	_					
29.0 (n		as Other, spe			16.8	30.2 15.6		S	5<	- 700	3	>
Business N		Well Contractor	r and Well	Technicia		tion ell Contractor's Licence No.				m		
WELL	1H1	TIATIV	55			7221						
Business A	Address (S	treet Number/Na	me)		Mu	unicipality	Comments:					
19 / Province	OWN	LINE Postal Code	Busines	s E-mail Ad		RANGEVILLE						
ON		49W3R	4 into	B well:	nitidutin	us.com	Well owner's Date F	Package Deliver	ed		istry Us	
	one No. (ir	nc. area code) Na 8289	me of Well	Technician (Last Name,	First Name)	package y y	Y Y M M	ala	Audit No.	z 22	21/34
Well Technic	cian's Licen	ice No. Signature	of Jechnicia	an and/or Ø	ontractor Da	te Submitted	Yes Date V	Nork Completed				
03		o Jui	BROQ	fed	2	0160305	5 KNO 20	1602	25	Received		
0506E (2014)	/11)					Miniata Car				© Quee	n's Printer	for Ontario. 2014

Miniatoria Canu

\$ `	ntari	- '	of the Envir		Well	Tag#:/	420 ⁻	1494 ow)		wli			ecord
TW11- Measurem	- 16 ents reco	•	U U	Montal		A201	49	4	Regulation	n 903 Ontari	i o Water I Page		
		formation	- and Milletter	attan off	L		<u>/</u>				-aye		of
First Name	0 4		ast Name / C	rganization	1		<u> </u>	E-mail Addres	SS				onstructed
Mailing Add	aress (Str	ROPERT eet Number/Nan	ne)			Municipality		Province	Postal Code	Telep	by hone No. (l Owner area code)
2121	OLDI	= BASI	ELIMA	ε Ro.	40	CALFOO	~~	ON	6700	K790	583	80	200
Well Loca		ation (Street Nur	her/Name)		a <u>an) albah</u> T	Township		<u> Salahar</u> ikan Ka	Lot	Conc	ession		alin pris a pa
16 FOC	0 54,	Aus CR.		CAD		Town or	- 0	ALEDON	9		5w		
County/Dis	strict/Muni	cipality				City/Town/Village BECFOUR				Province Ontario			Code
<u>PEEC</u> UTM Coordi	C inates Zo	ne Easting	I No	rthing		Municipal Plan an				Other	6	11	COES
		75796								·····			
General Co		edrock Materia Most Comm		nment Sea		ord (see instruction her Materials	ns on the		eneral Description	<u> </u>			h (m##
BRow,		1674 5		~	TON	······································					Fro	m	то , <u>6</u>
BROW	and a second	icry G		>	, 0 A	6-2						6	3.7
Brown		FRAVEL	171411	2	4 20 0			SIGT			3.		5-4
Bran		ILTY S	a IAD		7.202			3161				4	·····
BROW		AND	+ /~/~								12.		
GREY		IMEST											30.2
01.21	e	10011271	0 14 12										////2
									₩1.10.00.1				
						TOTAL	Na	ATH - 10	4 FEET	*****			
	alandi.	n landaditata k	Annular	Space	agostigos.	<u> </u>	<u></u>		Results of We	ell Yield Te	sting	785,04	(internet internet in
Depth Se From	et at (m##)		Type of Seal (Material and			Volume Plac (m ³ /##)	ced	After test of well yi		Draw Do			ecovery Water Level
0	11-0	BENTO			136	:24		Other, specif		(min) (i		nin)	(m/n
4.14.8 ⁻¹⁰⁰ .9 ¹ .		Unit IC,	4112 []	CEFL				If pumping discont	inued, give reason:	Static Level 20	-88		21.25
										1 21.	21	1	20.86
								Pump intake set	, ,	2 21-	23	2	20.89
			a na Praca ang mana	late an and	34/511-11			22-54 /7 Pumping rate (I/m		3 21	24	3	20.89
		onstruction	Pub	lic	Comm	and the second	used	56-8LAM/		4 21	24-	4	20.89
Rotary (C		nal) 🗌 Jetting	Dor Live		Munici		-	Duration of pump	•				20.89
Boring			🗌 Irrig	ation		g & Air Conditioning	-	Final water level e	nd of pumping (m/				20.81
Air percu			Indu	ustrial er, <i>specify</i> _				2625 If flowing give rate	Winin (CPM)				20.87
Nanana (hi	iperate C	onstruction R	ecord - Cas	ing	tana kuta ka	Status of V	Vell	in nowing give rate	(mining Gr Mi)				20.87
Inside Diameter	(Galvan	lole OR Material ized, Fibreglass,	Wall Thickness		n (<i>m/Ø</i>)	Water Suppl	-	Recommended p	· · · · ·				
(cm/int		e, Plastic, Šteel)	(cm/î p)	From	То	Test Hole		22.9m / Recommended p	75 jump rate	A''			20.87
16.0	STE	EL	.5	+.8	20.7	Recharge W Dewatering		(1/min / GPM) 45.46/	- /12USGP14		. 27		20.87
au p ⁻¹ 10 ¹ 11-11						Observation Monitoring H		Well production (40 21	• ~)		20.87
15.6	OPER	HOLE		20.7	30-2			Disinfected?		⁵⁰ 入	1.25		20.87
						Abandoned,		Yes No		60 21	. 25	50	20.87
Outside		Construction R	ecord - Scre			Abandoned.	Poor	Please provide a r	Map of W	ell Locatio			
Diameter (cm/in)	(Plastic.	Material Galvanized, Steel)	Slot No.	Deptr From	n (<i>m/ft)</i> To	Water Qualit	-		H STREE	1		•	1
						specify		109	IT TIKEE				/
	-					Other, speci	ify						
Secondaria		Water Def		telaa	an Sama Ba	Hole Diameter					Miss	15	EAUGA
Water four	nd at Dep	th Kind of Wate		K Untested	De	pth (m /ft) Dia	ameter		5	55m			
		as Other, spe		11	From		cm/in) 5. 0						F
	,	th Kind of Wate	factorial free	_Untested	6.4					×	((()	~	, k
		th Kind of Wate	and the second se	Untested			2.2			~~~~~	- 64 n	0	
(11		as Other, spe			20.7		5.6						
Business N		Well Contractor	or and Well	Technicia		ation Vell Contractor's Lice	nce No.						
		ATIVES				722	1						
Business A		Street Number/Na	me)		1	Iunicipality	15	Comments:		_			
Province	WHL	Postal Code	Business	E-mail Add	iress								
01		Lgw3R		@ we	llihiti	atives-co	\sim	Well owner's Da information	ate Package Deliver		Ministry	Use	Only
	`		ime of Well T BROAD			e, First Name)		package delivered			it No.Z 2	2	1/35
Well Technic	cian's Licer	ice No. Signature	of Technicia	n and/or Co	ontractor D		1	Yes	ate Work Completed				
0506E (2014/	<u>3</u> 7 (11)	0 Am	Bread	Gest		201603			01602			nter fr	r Ontario, 2014

A.	Ministry	of the Environme	ent Well	Tag#: A20	1492 ow)		JIZ	Vell R	lecord
Tw 12	-16	nate Change		•		Regulation	903 Ontario V	Vater Res	ources Act
Measureme	ents recorded in: 🔊 🔊	letric 🗌 Imperia	ıı	A20149	2]	Pag	je <u>(</u> *	
Well Owr First Name	ter's Information	ast Name / Organi	zation	e e Carlo da entre de la composición Recordo de la composición de la composi Recordo de la composición de la composic	E-mail Address				Constructed
	PRB PROG	PERTY	CORP	······································				by We	ell Owner
	ress (Street Number/Nar	ne)	IN	Iunicipality ALEDON	Province	Postal Code			area code) 0200
Well Loca		NR NON		<u> </u>				12101	
	Well Location (Street Nur			ownship	1	Lot 9	Concess 5-6		
	O SHAWS G trict/Municipality	CRER NO		Town or Ch City/Town/Village	+Criwope		Province 7 4		I Code
PEEL	nates Zone , Easting	blasthing	/	BECFORN TH	t Number		Ontario Other	27	K0 58
	8 3 1 7 5 7 9 4	Northing		nunicipal Fiant and Soon	ot Number		Galer		
Overburde	en and Bedrock Materi		t Sealing Reco	······	1	· · · · ·		Der	oth (<i>m/ft)•</i>
General Co		non Material	Oth	er Materials	Gene	eral Description		From	To
BROW								0	- 6
BROWN	~	4.40	GRAVE					16	2.7
BROWN	-	<u> </u>	GRAVE	۷				2.7	1.6
BROW,		TAND	Care				···· book (* 146 - 5 * 14 - 5	11.6	17.4
BROWN			GRAVE GREY (17.4	
-			0/(29 (LAY	INTERMISER				36.3
GRE GRE	REY LIMEST SHALE-LIN				(ATPERCIAL SER	2.10			36.6
GILF	JAVFLETLIA	HE STORE		TOTAL DO	PTH - 120	FEET		76-7	10.0
lan estat se la c		Annular Spac	e				ell Yield Testin	າງ ີ	ascardara.
Depth Se From	et at (<i>m/11) To</i>	Type of Sealant U (Material and Type		Volume Placed (m ³ /#*)	After test of well yield.		Draw Dowr Time Water Lo		Recovery Water Level
0		WITE A		124	Other, specify		(min) (m/ 5		(m/ft)
					If pumping discontinu	ed, give reason:	Static Level 14-9	0	27.72
******							1 17.7	0 1	23.70
					Pump intake set at (30. 9 m //c	·	2 19.2	8 2	21.67
Banth	nod of Construction		Well Us		Pumping rate (l/min /		3 19.8	6 3	20.23
Cable To			Comme		45.42Pm/		4 20.0	8 4	19.56
Rotary (C	Conventional)	Domestic			Duration of pumping 2_hrs + 0		5 20.2	7 5	19.03
Boring	Digging	Irrigation		& Air Conditioning	Final water level end	of pumping (m R	10 20.5	z 10	17.47
Air percu		_ Industrial	ecify		2 7. 72	min / GPM1	15 26.9		16.70
mennekane. Mennekane	Construction R	ecord - Casing		Status of Well			20 2.7.2		
Inside Diameter	Open Hole OR Material (Galvanized, Fibreglass,	Wall Thickness	Depth (<i>m#i</i> t) om To	Water Supply	Recommended pum		25 27.2		15.99
(cm/ in)	Concrete, Plastic, Steel)			_ Test Hole	Recommended pum		30 27.4		15.79
16,0	STEEL	15 t.	8 23.6	Dewatering Well	(1/min / GPM) 45.46Pm	1205 GPin			
				Observation and/or Monitoring Hole	Well production (I/mi	n / GPM)	~>		15,47
15.6	CPEN HOLE	23	.6 36.6	 Alteration (Construction) 	Disinfected?		50 27.9	-	15.21
				Abandoned, Insufficient Supply	Yes No	8 <i>8</i>	60 27-5	8 00	15.08
Outside	Construction R Material		Depth (m/ft)	Abandoned, Poor Water Quality	Please provide a mar		ell Location instructions on the	ne back.	<u>na sente de la sente</u>
Diameter (cm/in)	(Plastic, Galvanized, Steel)	Slot No. Fr	om To	Abandoned, other,		BUSH	STREE	7	
						4	1		
				Other. specify	9				Л
	Water De			lole Diameter					/
	d at Depth Kind of Wate		ested Dep From	th (<i>m/m</i>) Diameter	x X				
	n/# Gas Other, spe d at Depth Kind of Wate		ested O	6-4 25-0	333	60	60		
	147 Gas Other, spe		6.4	23.6 22.2	V V				
	nd at Depth Kind of Wate		ested 23.6	36.6 15.6	l s	136	×		
	Well Contract	or and Well Tech		<u>[</u>		-285-> M	\sim		
	ame of Well Contractor			ell Contractor's Licence No.					
	ddress (Street Number/Na		M	7 <u>2</u> 1 unicipality	Comments:				
157	TOWNLINE	-	C	RANGE VILLE	-				
Province	Postal Code	Business E-ma	ail Address	1	Well owner's Date	Package Deliver	ed Mi	nistry Us	e Only
	one No. (inc. area code) N	ame of Well Techni	·	,	package		Audit N		1736
SIS Well Technic		BRCADE e of Jechnician and			delivered Date	Work Completed	<u> </u>	منية ييس. أخر	
	1 1 1		/	0160305		1603	O + Recaive	23 8 - 2 - 2 - 2	
0506E (2014/				Minietry's Con	- Louise				for Ontario, 2014

Minietry's Conv

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Onta Measurements r		ry of nvironment Metric 🏹 Impe	rial Well –	A 07515	1t Below)	Regulation	n 903 Ontario Pa	Water Res	Record
Well Owner's	en en ser fjærer ser herer er en er	ast Name / Orga	nization		E-mail Address				Constructed ell Owner
Mailing Address (Street Number/Na	me)		Municipality	Province	Postal Code	Telephor		area code)
Well Location									
Address of Well L	ocation (Street Nu Shaws (Tr			Township Calidon		Lot 9	Conces	sion HSV	J
County/District/M		tk ra		City/Town/Village			Province		I Code
UTM Coordinates	Zone Easting	, Northin	ıg	Belfountaiv Municipal Plan and Suble	t . ot Number		Ontario Other		
NAD 83	· · · · · ·		48673	energe - engranden die zuhlie gestendig beken konford beiter					
Overburden and General Colour		als/Abandonme non Material		ord (see instructions on the her Materials	[ral Description		Dep From	oth (<i>m/ft)</i>
Brown	Topsol	1						0	1
Brown	Sand		grave 1	Stones				1	43
Brown	fint Sa	nd						43	59
Brown	Sand		gimi,	/				59	65
Brown	Clar	-	grove	/	:			65	72
wy	4 m stone							12	112
		Annular Spa	1 - 11				ell Yield Testi		
Depth Set at (m From		Type of Sealant (Material and Ty		Volume Placed (m ³ /ft ³)	After test of well yield,		Draw Dowi Time Water L	evel Time	ecovery Water Level
0 7.	3 Bento	nit for	.t		Other, specify If pumping discontinue	al aive reason:	(min) (m/fit Static	12	(m/ft)
						su, give reason.	Level 3d.	a P 1	92.3
					Pump intake set at (r	m/ft)	2 68.7	7 2	JV P
					100 Pumping rate (Vmin /	CRM	3 71. E		759
Method o	of Construction	1 Public	Well U		45	Gring	4 73.8		73.6
Rotary (Conven	ntional) 🔲 Jetting	. Domest	ic 🗌 Munici	pal 🗌 Dewatering	Duration of pumping	min	5 75.	1	717
Rotary (Reverse Boring	Digging	Irrigatio	n 🗌 Coolin	g & Air Conditioning	Final water level end o			-	65.3
Air percussion Other, specify_		_ Industria			92.3 If flowing give rate (1/	min-/ GPM)	15 84.6	, 15	61.8
lucida de la	Construction R	1	Depth (<i>m/ft</i>)	Status of Weil	Recommended pump		20 86.4		59.6
Diameter (Gal	en Hole OR Material vanized, Fibreglass, crete, Plastic, Steel)	Wall Thickness <i>(cm/in)</i> F	From To	Water Supply Replacement Well	Recommended pum	p depth (<i>m/it)</i>	25 87.	7 25	58.2
614 5	frel	,188 0	9 73		Recommended pump (I/min / GPM)	p rate	30 88.9	/ 30	57.2
	<u>_/.</u> //			Dewatering Well Observation and/or	Well production (//mir	n / GPM)	40 89,	4 40	55.8
			•	Monitoring Hole	Disinfected?		50 91.1	50	55.0
				 (Construction) Abandoned, 	Yes No		60 9/. 4	60	54.4
Outside	Construction R	ecord - Screen		Insufficient Supply Abandoned, Poor Water Quality	Please provide a map		ell Location	he hack	
Diamotor	Material tic, Galvanized, Steel)	Slot No.	Depth (<i>m/ft)</i> From To	Abandoned, other,		-			Λ
					Fork of	Predit	KA		N
		······································		Other, <i>specify</i>		and a second	1		·
	Water De			Hole Diameter			Ų		
@ ^	epth Kind of Wate] Gas Other, <i>sp</i>		ntested De From	pth (<i>m/ft</i>) Diameter To (<i>cm/in</i>)	5		1170	,	
Water found at D	epth Kind of Wate	r: 🗌 Fresh 🌋 Ui		73 8/2			1010		
	Gas Other, special of Wate		ntested 73	112 6'18	Cres				
<u>/02 (m/ft)</u>]Gas Other, sp				23	140	′ ⊀	4	
Business Name o	2022/2022 Structure and a second structure of the	or and Well Tec		ation Vell Contractor's Licence No.	B				
FRED Business Address	CONSTAB (StreetSUN) & StreetSUN)	LE TD	N	Unicipality	Comments:				
Province 35	19 5TH LINE DFORD ON .	Business E-n	nail Address				·····		
	. (inc. area code) Ni	2		e, First Name)	Well owner's Date F information package	Package Delivere	Audit N	nistry Us ^{0.} 7	
		Thonrin	Sfort		delivered	YYMMM Vork Completed	DD	- 94	4130
Well Technician's Li	cence No. Signature	e un ecenician ar		ate Submitted 00/91/11/11/215		0910	20 MAI	3012	2010
ACOCE (40/0007)	112						e 0		0



PROJECT:Proposed SubdivisionLOCATION:BelfountainCLIENT:Enterac

LOG OF BOREHOLE PW-1

DATE: May 27 to June 2, 1988 EQUIPMENT: -ELEVATION DATUM: Geodetic

HYDRAULIC CONDUCTIVITY DETAILS OF INSTALLATION SAMPLES STRATIGRAPHY ELEV. STRAT. PLOT RECOVERY DESCRIPTION 0HI 0HI 0HI 0HI ELEV. VALUES DEPTH DEPTH NUMBER WATER CONTENT түре PW-1 PERCENT 40 30 10 20 ż GROUND SURFACE 415.0 0/0 CLAY AND BOULDERS õ D, 70 412.3 • 2.7 ٥. SAND AND GRAVEL, 410 some boulders 0 D (OUTWASH) 0 ۰ c ٠D o . . 0 * ۰ ، 405 . 🛡 ۰D. 403.8 0. SAND, GRAVEL, 11.2 0,0 BOULDERS -• . o Ö . • 0 σ - 400 0 0 י ں 897.6 17.4 0.0 SAND AND GRAVEL •, - 395 o . . ۰. . v З . . ۰v 0 390 \$89.4 25.6 CLAY AND GRAVEL c 0 3 (TILL) \$86.8 ้อ 28.2 Continued..... - 385 Field Supervisor Drawn by:_ NOTES:

Checked by:_



PROJECT:Proposed SudivisionLOCATION:BelfountainCLIENT:Enterac

LOG OF BOREHOLE PW-1

CON'T

DATE: May 27 to June 2, 1988 EQUIPMENT: -ELEVATION DATUM: Geodetic

	STRATIGRAPHY		SA	MPLE	s		HYD			UCTI	VITY		DETAILS	OF INSTALLATION
ELEV.	DESCRIPTION	LOT			ទួ	ERY	1×1	0 1	10 11	о и 		ELEV. DEPTH		
DEPTH		STRAT.PLOT	NUMBER	ш d	N' VALUES	RECOVERY	WAT PERG	ER C	ONTE					
			2 Z	ТҮРЕ	z	RE BE		o 2	0 30) 4 	0			
_385.8	WEATHERED ROCK	==												
29.2		==										-		K.
	DOLOSTONE	==												V,
<u>380.9</u> 34.1							1	<u> </u>				- 380	<u> </u>	
			. 											
Π														
h														
														•
H .														
												Π		
H														
				4.									1. A. A.	
H												H		
	·											Н		
Ц	N													
												H		
														-
												H		
												H		
										2				
Π							Į							
												Ц		
H										1				
H										<u> </u>			<u> </u>	
														eld Supervisor
TON	res: Water found at 29	.2m												rawn by: hecked by:



Proposed Sudivision PROJECT Belfountain LOCATION: CLIENT: Enterac

LOG OF BOREHOLE PW-2

DATE: June 3 to June 10, 1988 EQUIPMENT: ---ELEVATION DATUM: Geodetic

	STRATIGRAPHY		SAI	MPLE	s		HYDR		NDUC	TIVITY	1	DETAILS OF INSTALLA	ATION
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	ТҮРЕ	N' VALUES	RECOVERY	Into WAT PERCI		ENT	0H 	ELEV. DEPTH		
<u>413.0</u> <u>406.1</u> - 6.9	SAND AND GRAVEL		N/	E	7			, 2	30	40	410	200mm d steel casing. 6.9m	
	(Amabel Formation										400	open in r	ocl
<u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u> <u>-</u>)mm(
	SHALE (Manitoulin formation)		-									5	
29.	6 End of Borehole												-
-												Field Supervisor.	
NO.	TES:											Drawn by: Checked by:	



LOG OF BOREHOLE PW-3

PROJECT: Enterac Belfountain LOCATION: _Belfountain

DATE: _____July 2, 1989 EQUIPMENT:

CLIENT: Enterac ELEVATION DATUM: Geodetic PENETRATION RESISTANCE WATER CONTENT SAMPLES STRATIGRAPHY m. PERCENT O BLOW 5/0.3 m DESCRIPTION ELEVATION ELEV. DEPTH STRAT. PLOI 'N' VALUES 10 20 30 40 GROUND WATER NUMBER SHEAR STRENGTH, kPa m. TYPE Ŵр ŵ 10 20 30 Ground Surface 402.4 \sim 402.1 TOPSOIL 0.3 Brown - : • 402 SAND AND GRAVEL AND D-STONES 401 . (logged by Well Drillers) 0 400 . J Ð 399 -D. 398 -397 -396 -0 395 -394 ò 393_ ΰ Ŋ. 392 -391 10.7 Brown ' Ð CLAY, GRAVEL AND 391-SILT 9 390.2 0 390-12.2 Continued ... NOTES: 1) Water encountered at 24.4 m and 33.5 m depth. 2) Water level at 385.5 m (elevation) on September 10, 1989. 3) Hole logged by well driller.

. . . .



PROJECT: Enterac Belfountain DATE: July 2, 1989

LOG OF BOREHOLE PW-3

	STRATIGRAPHY			SA	MPLE	s	m.	BLOWS	ATION RI	:SISIAN *	UE.	PERCEN	IT O	NTENT
LEV. EPTH M.	DESCRIPTION	STRAT. PLOT	GROUND WATER	NUMBER	түре	N' VALUES	ELEVATION SCALE	10		30 4		⊢ ₩f	~**	Wi
402.4	Ground Surface	STR/		INN	4	ż	S ELE				I	10	20	30
402.1		22												
	Brown	- : •					402 -							
	SAND AND GRAVEL AND	· · ·												
	STONES	0												
		, o ,					401 _	.						
	(logged by Well	• •												
	Drillers)													
							400 _							
		0												
		D												
							399 _		-					
			. .											
		0-				· .								
		0.					398 -							
		· .	·]											
		 					397 -							
	х.	0-												
			0				396 -							
		• • •												
			4											
		0 - 0					395 -							
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	. •	0.												-
1					1		200							
		U.	p				392 -							
391. 10.	7 7 Brown '	D D	1											
	CLAY, GRAVEL AND	0	0			1						1		
	SILT	. 0	1		1		391-							
		•	ð											
390.		<u> </u>	,	_		<u> </u>		1						
12.	2 Continued						390-	1						
NOTES					1							4		



LOG OF BOREHOLE PW-3 CONT...

Enterac Belfountain PROJECT: LOCATION: _____Belfountain

Enterac CLIENT: _

EQUIPMENT: _

ELEVATION DATUM: Geodetic

88164 FILE:___

ELEV.	STRATIGRAPHY DESCRIPTION	TET		SA	MPLE		m. z	BLOW	\$/0.3 m			E	PERCE	R CC	NTEN C	T
m.		STRAT. PLO	WATER	NUMBER	ТҮРЕ	'N' VALUES	ELEVATION SCALE		20 AR ST	RENG	40 TH, k	Pa	10 10			
390.2	brown		<u> </u>	-			ш 390 :									-
		0					1									
1	CLAY, GRAVEL & SILT	0														
		10					389-									
		3					209									
]		U														ĺ
		0/					388									
		6														
		v .o								·						
-							387-									
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1		10				· .										
-		. p					386-	_								
1		0	v													
-			<u>₹</u>													
-		0					.385 -	-								
-		3 0														
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1		0						ĺ								
		0					383~	-		1.						
-		0														
-		0	•.				382-									
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-		0														
-1							381									
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4		0					380									ļ
		0									.					
_		۰ ا					379									
-	· · · · · · · · · · · · · · · · · · ·															
378.	3	0			.											
24. 378.	1 grey-brown 0 DOLOSTONE	<u> </u>					378									
24.	4 Continued															
Ц	,						0.7.7									
NOTE	e.						377									

222	Terrap	orobe
	PROJECT:	Entera
	LOCATION:	Belfou
\mathbf{U}	OUTNIT.	Entera

LOG OF BOREHOLE PW-3 CONT ...

PROJECT: Enterac Belfountain LOCATION: Belfountain

CLIENT: Enterac

DATE: _____July 2, 1989

EQUIPMENT:

FILE: 88164

ELEVATION DATUM: Geodetic

	STRATIGRAPHY			SA	MPLE		m	BLOWS		×		WATER	τО	
ELEV. DEPTH m.	DESCRIPTION	STŖAT. PLOT	9 œ	EB		'N' VALUES	ELEVATION SCALE	10 SHEA	20 R STRE		40 1. kPa			
		ŖAT.	GROUND WATER	NUMBER	TYPE	Y' VAL	LEVA	ancA	JINE	l	1	Wp 10	20	W1 30
378.0	grey brown	<u>ta</u>	5-	z		÷	<u> </u>				+			Ť
		ĹŹ,												
	DOLOSTONE	4												ļ
-		Ę				1	377 —							
-		-4												
		Ź												
		+	1				376							
4		Ź												
-		4	-								ł			
-		Z.	7				375 _							
4		7	~				,,,,	1 1						
-		ГZ	-						•					
-						·								
4		4	4				374 -	-						
-			7											
		F	-											
		· Z	7				373 _	_						
-		H	7											
-		E	7		ľ									
-			7				372 -				1			•
-		4	7											
-			7											
		Z,	- :											
371.							371 _							
	· · · · ·	-/	4											
-	DOLOSTONE		7											
-		7	7				370 -	_						
369.		4												
	g brown	¥7:	-	ŀ						•				
- 52.		Ľ	7				369 -							
_	DOLOSTONE	Ľ					1505							
-		. -4	4											
-			Z				1							-
_		. 7	4				368 ·	-						
-		Ź												
-		7	4											
367	.0 .4 blue	=	_				367	-						
- 33		· 1=	:											
-	SHALE	=	=											
366.		·····			-+	+	366	-	+					
36.	3 End of Borehole													
												ł		i
						1								
	1			11				1						

LOG OF BOREHOLE PW-4

		Enterac -	Belf	ount	ain			DA	TE:	July	7 4,	19	89			
	LOCATION:	Belfounta	in					EQ		T:				_		LE- 88
		<u></u>					MPLE						ISTANCE			
	STRATIGR DESCRIPTION			5			(mrtc		m. z	BLOW	S/0.3 m 20	I I			CENT	
DEPTH m.				STRAT. PLOI	GROUND WATER	NUMBER	ТҮРЕ	N' VALUES	ELEVATION SCALE	1		1	ATH, kPa	- `	₩р	 W1
	Ground Surface				GRC	n v		,,	S ELE			<u> </u>			10 :	20 30
385.9	TOPSOIL			NN					386 -							
0.3	brown			1.												
	CLAY, S STONES	LLT, GRAV & BOULDER	νει, s	0												
				0					385-							
				10	>											
-				° ,					384-							
				0			-									
1	(logiani	l by well		0												
	drille	er)))))					383-			-				
				0												
$\frac{1}{2}$					-				382							
				0					502-							
_				0	1											
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				0					270-							
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_									375	-						
-				$\left(\right)$	 											
374.0				ł	0		.		374							
12.2					<u>'-</u>			1		-		-				
					.				373		ļ					

CLIENT: __

LOG OF BOREHOLE PW-4 CONT...

Enterac - Belfountain PROJECT: _ Belfountain LOCATION: ___

Enterac

DATE: _____July 4, 1989

EQUIPMENT: _____

ELEVATION DATUM: Geodetic FILE: 88164

PENETRATION RESISTANCE WATER CONTENT STRATIGRAPHY SAMPLES m. BLOWS/0.3 m PERCENT () x ELEVATION SCALE ELEV. DESCRIPTION STRAT. PLOI N' VALUES 10 20 30 40 NUMBER DEPTH GROUND WATER SHEAR STRENGTH, kPa m. TYPE WI. Wp 10 374.0 20 30 brown O CLAY, SILT, GRAVEL G STONES & BOULDERS 373 -372 . 371.3 14.9 blue 2 371 _ CLAY 370 _ 369 ~ ۰. 367.9 368.L 18.3 red = = = = = SHALE = 367.0 = = 19.2 blue _ 367-= = _ SHALE = = = = = 366_ \equiv = = _ = = = 364.9 365. 21.3 Continued ... NOTES:



LOCATION: ____

LOG OF BOREHOLE PW-4 CONT...

Enterac - Belfountain PROJECT: ___ Belfountain

July 4, 1989 DATE: _

EQUIPMENT: _

88164

Enterac ELEVATION DATUM: Geodetic CLIENT: _____ FILE: PENETRATION RESISTANCE WATER CONTENT STRATIGRAPHY SAMPLES m. PERCENT O 8LOWS/0.3 m x ELEV. DESCRIPTION ELEVATION SCALE STRAT. PLOT N' VALUES 10 20 30 40 **GROUND** WATER NUMBER DEPTH m. SHEAR STRENGTH, kPa TYPE Wp WL 364.9 10 20 30 red = = Ξ SHALE = = = 364 -= = = 363.3 - = 22.9 Blue Ξ = = 363 -SHALE . = = = = = = 362~ = = = = = = Ξ 361 = = _ ____ 360.0 360 26.2 End of Borehole 359 ۰. NOTES:



ELEV.

DEPTH

Terraprobe

STRATIGRAPHY .

GROUND SURFACE

DESCRIPTION

PROJECT: Proposed Sudivision

STRAT. PLOT

NUMBER

LOCATION: Belfountain CLIENT: Enterac

LOG OF BOREHOLE OW-1

April 24 - 25, 1988 DATE EQUIPMENT: Mobile B-61 - rotary

ELEVATION DATUM Geodetic

SAN	PLE	s		HYDRAULIC CONDUCTIVIT	/	DETAILS OF	INSTALLATION
		UES	ΞRΥ		ELEV.		
NUMBER	гүре	N, VALU	RECOVERY	WATER CONTENT PERCENT 10 20 30 40		OW1−1	OW2-2
1	AS	-					

390.0	GROUND SURFACE	5		ž	<u>∔</u>	z	<u>~</u>	n +		+		<u> </u>		- VIE VIE
	Dense SAND AND GRAVEL	0.0.									1			440.6
	numerous boulders		ht	1	AS	_					1		-	
387.9			H	-	<u>AS</u>	_			ĺ		-		-	
	Grey DOLOSTONE,	==	\square											
Н	weakly fractured	==	Щ	2.	AS	. <u>-</u>								× 3.0
	(Amabel Formation)	=												·]··
		==	kt	3	CS	_							285	· · · · · ·
-284.9					00									5.1
5.1	End of Borehole													
							•							
H														
Ц														
H														
H													+280	
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	Concrete seal and pro	tect	iv	re p	ipe	at	grade	•						Field Supervisor
NOT	ES: Installations in sepa	rate	h	ole	s.									Drawn by: Checked by:
1														CHECKED DY



PROJECT: Proposed Sudivision LOCATION: Belfountain CLIENT: Enterac

LOG OF BOREHOLE OW-2

DATE: March 24 - April 7, 1988 EQUIPMENT: Mobile B-Gl - rotary ELEVATION DATUM: Geodetic

	STRATIGRAPHY		SA	MPLE	s		HYDF		CONDL	CTIVIT	1	DETAILS OF	INSTALLATION
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	~		ES	ЕКҮ	[r]	0 1*		1 1 1	ELEV. DEPTH	7 1	t 3
DEFIN		RAT. F	NUMBER	ш	N' VALUES	RECOVERY	WAT		ONTEN	т		QW2-1 	OW2-3 0W2'-4
417.0	GROUND SURFACE	STE	ž	түре	z	RE		o 20	30	40			
	Brown Dense	。 · 、 ·											
	SAND AND GRAVEL,	0									415		
	(OUTWASH)	* 0 * • . • •											
	numerous cobbles and boulders.	· • • • • • • • • • • • • • • • • • • •	1	CS									
	Very difficult drilling.	· , 0 . 0 . 0					• .				410		
	6.8 to 8.8m	 0											9.1
	12.1 to 14,0m loss of mud	, D	2	CS	- - -						405		4 - 11.9
402.0	circulation at 8.0 to 9.5m and 12.1 to 15m.	 D 									-403		DRY
	Grey-Brown Damp	0.	3	CS	-	- -	:						15.1
	SAND, SILT, some gravel and cobbles		•								400		
	(TILL)	· 3	- - -	CS	- - -			•					
	water encountered at 25m.	0'2	•										22.2
391.0		00	╶╁┼╴	CS	5						- 390		- 27.0
	loss of mud circulation 27 to 29m. 7	 	. \ 6	C	S								
30.	3 Continued												
NOT	εs: OW2 - 1 and 2-2 in OQ2 - 3 and 2-4 in	same sepa	hole rate	e. hol	es.	_1			<u> </u>	<u> </u>		Drawn	Supervisor by: ed by:



PROJECT:Proposed SudivisionLOCATION:BelfountainCLIENT:Enterac

LOG OF BOREHOLE OW-2

DATE: March 24 - April 7, 1988 EQUIPMENT: Mobile B-G1 - rotary ELEVATION DATUM: Geodetic

	STRATIGRAPHY		SA	APLE	s		HYDE	AULK	COND	NCTIN	/117		DETAILS OF INSTALLATION
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	түре	N' VALUES	RECOVERY	[In	O I		N 01	o	ELEV. DEPTH	
	7 Continued		ñ z	7	z	RE		0 2	30) 4	o 	 	
- 30.1 	DOLOSTONE (Amabel Formation) loss of mud											385 	31.0
										•			
NO	OW2 - 1 and 2-2 in OW2 - 3 and 2-4 in	same sena	hol	e. hol	.es.								Field Supervisor Drawn by:
													Checked by:



PROJECT: Proposed Sudivision LOCATION: Belfountain

CLIENT: Enterac

LOG OF BOREHOLE OW-3

DATE: April 7 - 11, 1988 EQUIPMENT: Mobile B-61 - rotary ELEVATION DATUM: Geodetic

	STRATIGRAPHY			SAM	PLE	s		HYC	RAUL			стілі	۲γ		DETAIL	_s of	INSTA	LLATION
ELEV.	DESCRIPTION	LOT				S	ΞRΥ	4			1×10	ыо		ELEV. DEPTH		~1	б	
DEPTH		STRAT. PLOT		NUMBER	ш	N' VALUES	RECOVERY		TER	CON	ITEN	Г		02	0М3-1	0W3-2	0W3-3	
413.0		STR		MON	түре	, v.	REC	1		20	30	40			10	10 	Ö	
	Brown Dense SAND AND GRAVEL,	° ' °.													2	4F	17	1.0
	numerous boulders	0. . 	H	1	CS									H				
	(OUTWASH)	• D	Щ	1	65								•	410				3.0
																:4 F:	- 4-	4.0
		٥ ٥ 	H															
		0 3 3 •	4	2	CS									H			·[-]·[
406.0		. 0	$\left\{ \right\}$			ļ								H .		-		7.0
7.0	Grey DOLOSTONE	==	14	3	CS				1					+ 405			+	
	(Amabel Formation))==												H			. +	
		=												Ц			+	
		==	4	4	CS			1.										
	loss of mud circulation below	=															+	
	9m; switch to air	==												400			+	
	rotary, appears	= =															+	•
Π	highly fractured	==	-				•										-	
	water encountered	===	. M	5	CS	1												
.1	at 21m.	=							.				·	Π			1	
		==												+ 395				
H																	11	
		=	-H			-								H.			+	80.9
		=	H	6	CS	+				.								00.7
		==												Η				
		=	-					•						+ 390	H			23.0
		===	-											Н	17			-
387.						-								H	4	K-	-4	25.0
25.3	Black to Grey DOLOSTONE AND	===	-11	7	CS	_								Н	,	-	· · :]	
	SHALE	===	-													- '		
	(Manitoulin Formation)	=	-											- 385		`` <i>``</i> .'		
383.9	9		-													<u> </u>		28.3
29.	1 End of Borehole																	29.1
П																		
NOT	Es: Concrete seal and pro	otec	ti	ve	pipe	e at	grad	le.								Field S Drawn	uperviso hv:	r <u>.</u>
NUL	All wells installed	in s	amo	e h	ole	•										Checke		
L												·						



PROJECT: LOCATION: CLIENT:

Proposed Sudivision Belfountain Enterac LOG OF BOREHOLE OW-4

DATE: April 20 - 24, 1988 EQUIPMENT: Mobile B-61 ELEVATION DATUM: Geodetic

	STRATIGRAPHY			SAMPL	ES		HYD	RAULI		DUCT	ΓΙνΙΤΥ	[DETAIL	S OF IN	ISTALLATION
ELEV. DEPTH	DESCRIPTION	LOT			S	ERY		к., Сі 10 і:				ELEV. DEPTH	, r	5	τ i
		STRAT. PLOT	NUMBER	ω	N' VALUES	RECOVERY	WA		ONT	ENT			0W4-1	0W4-2	0W4-3 0W4-4
441.0		STR	NUN	ТҮРЕ	> 7	REC		CENT	0	30	40		0	0	00
	Brown Dense		Π									440			╫║╫
	SAND AND GRAVEL,														
	numerous cobbles and boulders														
	(OUTWASH)			L CS											6.4
	—— increasing content of fines below 7m.						•					-			Dry
	loss of mud circulation at 8-9m, 15.1 to 16.2 30.1 to base at hole	m		2 CS								430			9.0
426.0 15.0															14.2
	SAND AND GRAVEL, SILT,			3 CS			1					425			, [], , , , [], , , , 1, , , , 1, , , , 1, , , , , 1, , , ,
	numerous cobbles and boulders			CS											
	(TILL)											420			
															_
												419		2	
411.0													N		3.3
438:9	SAND AND GRAVEL			5 CS										/ /	1
408.0	AMABEL DOLOSTONE			7 CS			I					410	[[:日.		3.0
33.0 NOTE	End of Borehole 5: OW4-1 and 4-2 install	ha	in	samo	hole	្ត ្រារ	4-3	and	4-	4 i	nsta	illed i	F 1 -	leid Super	
	same hole. Concrete	sea	1 a	nd pr	otec	tive	pip	e at	gr	ade	•	LLUU I		rawn by:_ hecked by	
	· · · · · · · · · · · · · · · · · · ·														

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Terraprobe

LOG OF BOREHOLE 88-13

PROJECT: Proposed Sudivision LOCATION: Belfountain

CLIENT: Enterac

Sudivision	DATE:	<u>April 28,</u>	1988	
	EQUIPMENT:	CME 55		
	ELEVATION D	ATUM:	-	FILE:88164

	STRATIGRAPHY				SAI	VIPLE		m.		TRATIO /S/0.3 m		x X	5	PERCI			ENT
ELEV. DEPTH M.	DESCRIPTION	STŖAT. PLOT	GROUND WATER		NUMBEH	ТҮРЕ	N' VALUES	ELEVATION SCALE	10 J SHE	20 AR ST	1				 /p 0	20	 ₩[
<u> </u>	Ground Surface		<u>5</u> >	+	z		ż	ш						'	ľ—	1	30
	TOPSOIL.	~~	$\exists [$											1			
0.3	Brown Loose Damp																
	SILT, trace sand			M	1	SS	8	-	×								
1.4	Brown Dense Damp	1 1								\backslash							
	SILTY SAND AND GRAVEL,				2	SS	27				`.x						
-	occasional cobbles																
	(TILL)		•	:	3	SS	62										
		· · ·		\mathbb{N}	4	SS	82/	11"									
3.5	End of Borehole																
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NOTES	: 1. Borehole caving at 3	1	<u> </u>		1	_	1			<u> </u>	<u> </u>				_1		1



LOG OF BOREHOLE 89-4

DATE: <u>August 22, 1989</u> EQUIPMENT: CME 55 Belfountain

ELEVATION DATUM: Geodetic FILE:88164

Enterac CLIENT:

LOCATION: _

	STRATIGRAPHY				SAI	MPLE	s	m.		TRATIO VS/0.3 m		13 IAN X	υĽ	PERC	ENT (NTEN D	1
ELEV. DEPTH M.	DESCRIPTION	STŖAT. PLOT	GROUND WATER		NUMBER	TYPE	N' VALUES	ELEVATION	10	20 AR ST	30	40			 /p	{ WI	
399.6	Ground Surface	STR,	ξĂ		Z	4	ż	а Ца Ца							0 2	0 30	·
399.0	TOPSOIL	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~						399 -									
0.6	Brown Dense to Moi Very Dense	st 1.			1	SS	27				×				o		
	SANDY SILT,	•						0.00						/			
	some clay, trace gravel				2	SS	68/	398 - 11						0			
396.9	(TILL)				3	SS	47	397 ⁻	-					 0 			
2.7	Brown Very Moi Dense	st 'o'			4	SS	83							- O			
	SAND AND GRAVEL,	₁ 10			· · ·			396 ⁻	_								
	some silt	· · ·															
-				И	5	SS	100	/5" 395	_					- O			
	OUTWASH	· · · · · · · · · · · · · · · · · · ·						394	-								
-					6	SS	85				5						
		· o · .						393	-								
		0 .						392	-								
			1 11		7	SS	42	1					×	0			
		0 0						391									
390_5		.0.								<u> </u>			<u> </u>				
9.1																	



LOCATION: ...

LOG OF BOREHOLE 89-4 CON'T

Belfountain Subdivision PROJECT: Belfountain

August 22, 1989 DATE: _ CME 55 EQUIPMENT: ____

ELEVATION DATUM: Geodetic FILE:88164

CLIENT: ____Enterac

	STRATIGRAPHY				SA	MPLE	S	m.		TRATIO VS/0.3 m		STAN	CE	WAT PERC	ER CO	<mark>ЭМТ</mark> О	ENT	•
ELEV. DEPTH m.	DESCRIPTION	STŖAT. PLOT	Q M		E U		N' VALUES	ELEVATION SCALE	10		30	40			 			
		βAT.	GROUND WATER		NUMBER	ТҮРЕ	I' VAI	LEVA SCA	ənc			ал, I	кга		Vp Io	20	WI 30	
	Continued Brown Very Moist				z		4	ш								Ť		
	Dense	0		\mathbb{N}	8	SS	60						_	0				-
	SAND AND GRAVEL,	0	20	Π				390 -										
	SAND AND GRAVEL,	0.	NR															-
	trace to some silt		NC															
┡┥								389 -										-
		0.		ſ	9	SS	65						د	0				-
H		00																-
H		• •						388 -										⊢
<u> -</u>	OUTWASH	·						500										-
<u>387.3</u>			, , ,	. _	10	SS	100	/5"						-				
-12.3	End of Borehole																	-
	Auger Refusal						ĺ	387 .			·							Ļ
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NOTES:																		

$\frac{17}{2} \frac{579290}{68} E$ $\frac{584849168}{100} Ontario Water Res$ Elev. $\frac{581260}{100} WATER WE$ $\frac{29}{100} \frac{1260}{100} FEEL$ $\frac{29}{100} \frac{100}{100} FEEL$ $\frac{29}{100} \frac{100}{100} FEEL$ $\frac{29}{100} \frac{100}{100} FEEL$	LL REC Township, Village, T Date completed	Act 0 ORD Cown or City (day	march	EDON 1965 year)
OwnerCorner Sandstone Quaries Ltd.	Address Belf	ountain,	Untario.	
Casing and Screen Record		-	ng Test	
Inside diameter of casing 5"				
Total length of casing			· · · · · · · · · · · · · · · · · · ·	G.P.M.
Type of screen	Pumping level			
Length of screen			hrs.	
Depth to top of screen			of test clear	
Diameter of finished hole 5"			e4	
	with pump setti	ng of 🚺 🕽	.00 feet belo	w ground surface
Well Log				r Record
Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
Hardpan and boulders	0	25		
Gravel Red and blue shale	25 36	<u> </u>	90-115	fresh
For what purpose(s) is the water to be used? Is well on upland, in valley, or on hillside? Upland Drilling or Boring Firm Water Well Drilling Address R. H. GADKE - PHONE 123W1 Licence Number	road and	am below sho d lot line. I	n of Well ow distances of we ndicate north by	ell from arrow.
Licence Number Donald Goll Name of Driller or Borer Donald Goll Address Harriston, Ont Date (Sizerature of Licensed Drilling of Boring Contractor)	···· 1000	° 9	200 44 7	A.

UTM 17×579608 5×4849117 The Ontario Water Resolution Elev. 5×1955 WATER WELL Racin 24	L RE	on Act	49 Nº CALE	1011 Dow
Collinty or District	- · · ·	e, Town or City Ə 1	JUNE	1965
Con		(day		ST NOBTA
	ress		(su	ELPH
Casing and Screen Record		Pumpin	g Test	,
Inside diameter of casing Total length of casing Type of screen Length of screen Depth to top of screen Diameter of finished hole H''	Pumping leve Duration of t Water clear of Recommended	g rate 3 el 42 est pumping or cloudy at end of ed pumping rate	F I L test CLE	ዎ ና? G.P.M.
	with pump s	etting of 4		w ground surface
Well Log			Depth(s) at	r Record Kind of water
Overburden and Bedrock Record	From ft.	To ft.	which water(s) found	(fresh, salty, sulphur)
BLD WELL LIGHT GREY LIMESTONE	0	/ 2 -/ 8	HOYT	FRESH
For what purpose(s) is the water to be used? HOUSE Is well on upland, in valley, or on hillside? $Upland$. Drilling or Boring Firm $\angle A D Co$ $DAILLINCC$ $A \neq D$ $\angle A P \angle O A A T \cdot O N$ CO Address $R. R. H$ $HILLS BURGH$ Licence Number 1874 Name of Driller or Borer THOMAS $\angle ANG$ Address $HILLSBURGH$, $R. R. I$ Date $Date$	road	agram below shov and lot line. In	of Well v distances of we idicate north by	arrow.
Form 7 15M-60-4138 OWRC COPY			CSS.S8	

$\frac{47M_{2}}{M_{1}} \frac{1}{M_{1}} \frac{1}{M_{1}$	ownsh Date co ress Sta Tes Pur Du	RECO ip, Village, To mpleted Toro tic level t-pumping ra mping level ration of test p	Act DRD into Ont Pumpi ate	May month mg Test	62 1 ISSION 1962 yea	(r) G.P.M.
Depth to top of screen nil	Wa	ter clear or cl	oudy at end	of test		
Diameter of finished hole 64 inch				e		
	wi	th pump settin	ng of	feet belo		
Well Log	T	<u> </u>		Depth(s) at	r Reco	ord of water
Overburden and Bedrock Record		From ft.	To ft.	which water(s) found	(fres	sh, salty, 11phur)
top soil		0 1	1 15	dry ho	Le	nil
boulders gravel		15	22			
gray clay, gravel rock lt. gray		22	62			
red shale		62	100			
Total depth - 100 gt.						
For what purpose(s) is the water to be used? domestic Is well on upland, in valley, or on hillside? hillside Drilling or Boring Firm J L Graham Drilling Contractor Address 119 Renfield St. Guelph Ont. Licence Number 481 Licence Number		road and ERIN - 4MI.	am below sh	on of Well ow distances of w Indicate north by	ell from arrow	n Fe # 10 High 6 4 4
Name of Driller or Borer Address Address Date J L Graham per (Signature of Licensed Drilling or Boring Contractor) Form 7 15M Sets 60-5930 OWRC COPY		Bert	U	258.58		

Elever Basin 2 C Peel WATER WEI	Cownship, Village, Township, Vil	ORD own or City 6th (day	Add UL No. ONTARIO W RESOURCES CON Net. Caledon May 196 month t. Pumping Test To 1 30 ft ing 2 hrs. at end of test clear ing rate 1 70 ft feet below Water To Depth(s) at which water(s) found 5 75 ft 19 58 75 Location of Well clow show distances of well line. Indicate north by MA	1962 01 8 WATER MMISSION 62 year)	
Contract Server Pererd		Pumpin	ng Test		
Casing and screen kecolu Inside diameter of casing 6‡ inch Total length of casing 20 ft Type of screen nil Length of screen nil Depth to top of screen 6¼ inch Diameter of finished hole 6¼ inch	Test-pumping ra Pumping level Duration of test p Water clear or cl Recommended	ate 1 60 ft pumping oudy at end o pumping rate	2 hrs. f test clear l	G.P.M. G.P.M.	
M. 172 ISTIGISGITE Image: Signa of Sig			Wate	r Record	
ONTARIO were Resources Commission Act Bin 2: I I I Point WATER WELL RECORD Rain 2: I I Point Township, Vilage, Town or City Caledon Bain 2: I I Point Lot. Date completed 16th May 196 Rain 2: I I Point Lot. Date completed 16th May 196 Rain 2: I I Point Lot. Date completed 16th May 196 County of Date Casing and Screen Record Pumping Test Township, Vilage, Town or City Caledon Total length of casing 20 ft Tost length of casing 21 ft Duration of stat pumping Tast 1 Depth to top of screen fill Duration of stat pumping. Tast 1 Duration of stat pumping. Tast 1 Diameter of finished hole 64 inch Static level Ot ft Duration of stat pumping. Tast 1 Well Log Well Well Well Well Well Cast pumping ft ft 1 Tight grave root Grave root ft ft ft Well ft 1 1 1 1 1 1 1 1 1			Kind of water (fresh, salty, sulphur)		
gravel gray clay light gray rock	5 19	19 58		fresh	
domestic Is well on upland, in valley, or on hillside? hillside Drilling or Boring Firm J L Graham Drilling Contractor	road and	am below sho 1 lot line. I:	w distances of w	ell from arrow. # To HT Jag-	
Name of Driller or Borer Robert Graham Address 210 Waverley Drive Guelph Ont. June 12th 1962 J L Graham per MCL (Signature of Licensed Drilling or Boring Contractor) Form 7 15M Sets 60-5930			to Setten Bans	Ann + The	

N / W			vironment esources Act	CORI	40 (D	>/16	Ē
ONTARIO 2. CHECK CORR	SPACES PROVIDED	11	904555.	MUNICIP. 449 00	2. H ₁ S ₁	W	
DEFI	TOWNSHIP, BOROUGH, CITY, TOWN		3	CON., BLOCK, TRACT. SUR	VET ETC.		009
	ALE		ONT	•	DATE COMPL	ETED MOL	78-53 YZY
	B 44 9 0 18		1262	RC. BASIN CODE		· 10	
1 2 ¹¹ 10 12	DG OF OVERBURDEN AN	24 25	K MATERIALS	(SEE INSTRUCTIONS)			
ENERAL COLOUR COMMON MATERIAL	OTHER MATERIAI	LS		GENERAL DESCRIPTION	ų ty	DEP1 FROM	TH - FEET
BROWN TOPSOIL						0	3
	BOULDERS	-				3	28
WHITE GRAVEL	+ SAND					28 43	43
WHITE LIMEST	ONE (S	OFT)			-	43	70
·				W P C	1		
				OWRC			
	· · ·			p-9			
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		. 12 <u>0</u>	n n f à l (e				
31 DIQUIZEORA 1 DIORA 32 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	869513 004311		0.948115				
41) WATER RECORD	51 CASING & OPE	EN HOLE RE		SIZE(S) OF OPENING (SLOT NO.)	31-33 DIAMET	ER 34-38	75 LENGTH
AT - FEET KIND OF WATER		WALL DE ICKNESS NCHES FROM		MATERIAL AND TYPE		INCHES DEPTH TO CO OF SCREEN	
0043 10-13 1 6 FRESH 3 SULPHUR 14	10-11 1 D STEEL 12		13-16	5	<u></u>		FEE
15-18 1 _ FRESH 3 _ SULPHUR ¹⁹ 2 _ SALTY 4 _ MINERAL	5 4 OPEN HOLE	88. O		61 PLUGG	NG & SEAL		CORD
20-23 1 _ FRESH 3 _ SULPHUR 24 2 _ SALTY 4 _ MINERAL	17-18 1 🖸 STEEL 19 2 🖸 GALVANIZED 3 🗌 CONCRETE		20-23	FROM TO 10-13 14-17	MATERIAL AND		D PACKER, ETC
25-28 1 [] FRESH 3 [] SULPHUR 29 2 [] SALTY 4 [] MINERAL	05 4 OPEN HOLE 24-25 1 D STEEL 26	44	27-30	18-21 22-25			
30-33 1 🗍 FRESH 3 🗍 SULPHUR ³⁴ 8	2 🗍 GALVANIZED 3 🗍 CONCRETE			26-29 30-33	80		
2 SALTY 4 MINERAL	4 OPEN HOLE	4G		LOCATION			
TI PUMP 2 BAILER OODS	GPM 2 15-16 HOURS 1	0 17-18 MINS	IN DIAGR	AM BELOW SHOW DISTA			DAND
STATIC WATER LEVEL LEVEL END OF PUMPING UATER 1 19-21 22-24 IS MINUTES	LEVELS DURING 2 CRECC		LOT ID				\wedge
₩ 09 032 020°	-28 29-31 009 32-34 EET 29-31 009 FEET	35-37 FEET	LIN	a la			K,
IF FLOWING 38-41 PUMP INTAKE	1 DELEAR 2	EST 42	LOT 9	- distant			
COMPARENCE PUMP TYPE RECOMMENDED PUMP TYPE PUMP	ED 43-45 RECOMMENDED	46-49	T	14			/
SHALLOW DEEP SETTING O 50-53 000.2 GPM./FT. SP		GPM.	NY NY	L. 100			
FINAL 54 I WATER SUPPLY	5 🗌 ABANDONED, INSUFFICI 6 🗍 ABANDONED, POOR QUA		X-t				
STATUS OF WELL 4 C RECHARGE WELL	7 D, UNFINISHED		A	144 . 2.) 4 1-4 . 4.	. 4	, k
55-56 1 1 DOMESTIC 2 STOCK	5 COMMERCIAL 6 MUNICIPAL			v			
WATER 3 IRRIGATION USE 4 4 INDUSTRIAL	7 D PUBLIC SUPPLY 8 D COOLING OR AIR CONDITION		V	*	1V	,	
D □ other 57 >	9 🗋 NOT USE	±D		2			
OF 3 C ROTARY (REVERS DRILLING 4 ROTARY (AIR) 5 AIR PERCUSSION	9 🗍 DRIVING		DRILLERS REMARKS:				
NAME OF WELL CONTRACTOR		E NUMBER	DATA	58 CONTRACTOR 5	9-62 DAJE RELEI	P17	<u>م</u> 53-
ADDRESS	The 3.	513			DR		
V Inglawood	Var	E NUMBER	HS LU 3	$\left(\Box_{\mathbf{Z}} \right)$			J-B.
NAME OF DRILLER OR BORER							P [/
0	, <u> </u>		2				<u>, / Y</u>
Signature of contractor		72	OFFICE		CSS.S8		wi

					40 P/16 8
Ster.				CORD	
			4905490	49002	HS W OS
COUNTY OR DISTRICT	TOWNSHIP, BOROL	IGH, CITY, TOWN, VILLAGE		CON., BLOCK, TRACT, SURVEY, E	WHS : OOG
	S	<u> </u>	BELFO		10 ALT 77
1 2 M 1	Into The Ontorio Water Resources Adt Into A 905430 Galaxies Into A 905430 Galaxies A 905430 Galaxies Into A 905430 Galaxies A 905430 Galaxies A 905430 Galaxies Into A 905430 Galaxies A 905430 Galaxies A 905430 Galaxies Into Galaxies Galaxies Galaxies Galaxies Galaxies Galaxies Into Galaxies Galaxies Galaxies Galaxies Galaxies Galaxies Into Galaxies				
	The Order Resources Act Without and the second and the Control of the Second and		DEPTH - FEET		
GENERAL COLOUR COMMON M	Control Water Resources Art Yes Allow A 905430 Handborn Control Water Resources Art Yes Allow A 905430 Handborn Control Water Resources Art Yes Allow A 905430 Handborn Control Water Resources Art Yes Allow A 2005430 Handborn Control Water Resources Art Yes Allow A 2005430 Handborn Control Water Resources Art Yes Allow Allow Articles Artin Artin Artin Articles Articles Articles Articles Artin Article		FROM TO		
BROWN COTA GREY CLA	International and the second		48 80		
GIREY CLA			80 95		
GREY CLA	The Ontorio Water Resources Act MIO A 905430 Galaxies MIO A 905430 Galaxies A 4000000000000000000000000000000000000		95 112		
DRFY KOCH		CLAY RI	(191:5		143 180
					112100
	L COBODOSID	00915205185	01112205124	61:4322605	
32 10 14 WATER BECOR		NG & OPEN HOLE		54 52 512E+51 OF OPENING 31- 15107 NO 1 512E+51 OF OPENING 31-	65 75 80 33 DIAMETER 34-38 LENGTH 39-40
WATR FOUND KIND OF WATE		RIAL THICKNESS		MATERIAL AND TYPE	INCHES FEET DEPTH TO TOP 41-44 80 OF SCREEN
SO 2 SALTY	MINERAL 04 GAL	ANIZED 1/00 (o 0 /19™ □		FEET
2 🗌 SALTY 4 🗍 !	MINERAL 4 0 OPE	N HOLE	20-23	DEPTH SET AT - FEET MAT	CEMENT GROUT
2 SALTY 4 .		1			
2 🗌 SALTY 4 🗍	The Onitario Water Resources Act Yo And Comparison Applies and Comparison				
Z SALTY 4	MINERAL 4 OPE				
	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	15-16 0 17-18 HOUR O MINS	IN DIAGRA		
END OF		2 C RECOVERY	LOT LINE	INDICATE NORTH BY ARRO	DW.
FEET FEET FEET FEET STEET	مسجود والمسجود والمسجود والمتحدث والمسجود والمحد والمسجود والمسجود والمسجود والمسجود والمحد والمح	FEET FEET			
C)         IF FLOWING.         38-41           C)         DIVE RATE         38-41           C)         RECOMMENDED PUNP TYPE         GPM	90 FEET 1			( T	
3	SETTING 090 FEET PITE	M 0 5		, m	
				WELLT	and the second sec
	THOLE 7 UNFINIS				
	CK 6 MUNICIPAL			12.1	
	USTRIAL & COOLING OR	AIR CONDITIONING			
	FARY (REVERSE) 8 🗍 FARY (AIR) 9 🗍	JETTING			SM
		LICENCE NUMBER		58 CONTRA 7 7 1.62 DA	VTE RECEI 2 10278 3-51 40
ADDRESS RIH	11.7	G 2332			14. 42128
		LICENCE NUMBER	D REMARKS:		
SIGNATURE OF CONTRACTOR			H Channed		.87
		MO YR	Creander		FORM 7 MOE 07-091
					-

Ministry of the	WATI	The Ontario Water Resources A	
Ontario 78/17 LEBINY ONLY I		906673	
	TOWNSHIP. BOROUGH CITY, TOWN, VILLAGE	CON. BLOCK, TRACT, SURVEY ETC	
DEPEL OWNER (SURNAME FIRST) 28.47	CALEDON CALED	(al) - 5 V	1H5 (-10)
BelFounTAIN Church	ADDRE MAINS		OMPLETED 4 53
	1324 4849 1231	D384 RC BASIN CODE	
	OG OF OVERBURDEN AND BEDROCK	MATERIALS (SEE INSTRUCTIONS)	47
GENERAL COLOUR NOST	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH FEET
BROWN CLAY	SAND, STONES		0 35
Red "	GRAVEL		35 45
GRey "	1,	-	45 60
BLUE Shale			60 85
GRey Rock			85 105
Blue Shale			105 120
Red "			120 130
		TOTAL Dept	7 130 ft.
31			
41 WATER RECORD	51 CASING & OPEN HOLE REC	ORD	AMETER 34-38 LENGTH 39-40
WATER FOUND AT - FEET 10-13 1 S. FRESH 3 DSULPHUR	INSIDE WALL DEPTH DIAM MATERIAL THICKNESS INCHES INCHES FROM		INCHES FEET DEPTH TO TOP 41-44 10 OF SCREEN
90 2 SALTY 4 MINERALS 6 GAS	10-11 1 SSTEEL 12 2 D GALVANIZED 3 D CONCRETE - 188 0		FEET
120 2 SALTY 4 MINERALS 6 GAS	5 DPLASTIC	64 20-23 DEPTH SET AT - FEET	
20-23 1 □ FRESH 3 □SULPHUR ²⁴ 2 □ Salty 4 □ Minerals 6 □ Gas	5 ¹ DSTEEL 5 ² DGALVANIZED 3 CONCRETE 4 ROPER HOLE 64	130 FROM TO MATERIAL	AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
25-28 1 🗌 FRESH 3 🗆 SULPHUR 29 2 🗌 SALTY 6 🗆 GAS		27-30 18-27 22-25	
30-33 , □ FRESH 3 □ SULPHUR 34 4 □ MINERALS 2 □ SALTY 6 □ GAS	2 □ GALVANIZED 3 □ CONCRETE 4 □ OPEN HOLE 5 □ PLASTIC	26-29 30-33 60	
PUNPING TEST METHOD IO PUMPING RATI			
STATIC WATER LEVEL 25	3 GPM	IN DIAGRAM BELOW SHOW DISTANCES OF WEL	
LEVEL END OF WATER L	2 X RECOVERY	LOT LINE INDICATE NORTH BY ARROW.	L FROM ROAD AND TV.
57 19-21 22-24 15 MINUTES 57 FEET 1/2 FEET FE	" 57" H-H 33-37	Village of Belfounitain	
Z IF FLOWING, 38-41 PUMP INTAKE GIVE RATE	SET AT WATER AT END OF TEST 42	Belfounitain	
IF FLOWING GIVE RATE BECOMMENDED PUMP TYPE RECOMMENDED PUMP TYPE PUMP	PUMPING		main ST.
SO-53	125 FEET RATE 3 GPM	Bush ST.	37.
FINAL SA WATER SUPPLY	B ABANDONED. INSUFFICIENT SUPPLY	Rin 70'	J100'
STATUS 2 OBSERVATION WEL 3 TEST HOLE OF WELL 4 RECHARGE WELL	LL . ABANDONED. POOR QUALITY 7 UNFINISHED	RiN OCTO	
55-56 1 2 DOMESTIC	9 D DEWATERING 5 D COMMERCIAL	Church.	
WATER 2 STOCK 3 I IRRIGATION USE 4 I INDUSTRIAL	MUNICIPAL     DUBLIC SUPPLY     COOLING OR AIR CONDITIONING		
	COOLING OR AIR CONDITIONING     USED		
METHOD 57 CABLE TOOL	6 DORING TIONAL) 7 DIAMOND		
			15808
I AIR PERCUSSION	DIGGING OTHER DRI	LLERS REMARKS	
		DATA SE CONTRACTOR 59-62 DATE RECEIV SOURCE	EP 14-1987
BURNELL TECHNICIAN ADDRESS LUELCH ONT. NAME OF KELL TECHNICIAN J. HAWKINS SIGNATURE OF TECHNICIAN/CONTRACTOR	SE OF	DATE OF INSPECTION INSPECTOR	
NAME OF WELL TECHNICIAN	WELL TECHNICIAN'S DLICENCE NUMBER	REMARKS	
SIGNATURE OF TECHNICIAN/CONTRACTOR			
091	SUBMISSION DATE DAY 030 MO. 08 YR.87		)

ଚ୍ଚ	Ministry of the			•		د در میرو				r Resourc		~~	
	Environ	ment			NA				EL		RE	CU	RD
Ontario			SPACES PROVIDED	PPLICABLE	11	49	907	667		90:02	H.S.	M.	
	DISTRICT			OROUGH. CIT	TOWN. HLLAGE		1	Ć	ON BLOCK	TRACT. SURVEY	ETC		LOT 9 25-27
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103	5-18 1 🗆 FRE			CONCRETE OPEN HOLE PLASTIC	100		60	<b>61</b>	F F				ORD
20	0-23 1 🗆 FRE 2 🗌 SAL		1 1 2 3	STEEL GALVANIZED CONCRETE OPEN HOLE		62	103		10-13	10	ATERIAL AND		ACKER ETC )
25	5-26 1 🗆 FRE 2 🛄 SAL		24-25 1	PLASTIC STEEL 26			27-	30	<u>)</u> ((	22-25	<u>) ೧</u>		
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	R-H<	=(	, 214 (	LUT	N114 632	SEO	DATE OF I	NSPECTION		INSPECTOR			
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Ministry of Environme and Energ	ent			TI	ne Ontario Water WATER WE		
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County or District	<b>A</b>	Townshin/Borough	City/Town/Village	24	Con block tract sur		10"
		Address		<u> </u>	Date complete		48-53
1		Northin	BUSTIS		C Basin Code ii	da mon	iv
2	л <u>н</u> <u>і</u> . М <u>10</u>		BEDROCK MA	rERIALS (see instr	uctions)		47
General colour	Most common materia	al Other mate	rials		eral description	Dept From	h – feet To
BROWN	Clay	Bolders		De	ENSE	0	18
BROWN	Clay	STONE STONE	<u>s</u>		<u>и</u>	18	40
BLUE Blue	<u>Clay</u>	STONES	>			40 8.F	99
SREY	Line stone				YARD	99	131
RED	Shale				ARD	131	168
							×
2		51 CASING & OPEN			of opening 31-33 Diame	ter 34-38 Length	75
ater found – feet	Kind of water	Inside Wall diam Material thickr inches inche	ess Depth -	To (Slot		indics	fe
	Fresh 3 🗋 Sulphur 14 4 🗋 Minerals Salty 6 🗋 Gas	10-11 1 <b>1 3</b> Steel 12 2 □ Galvanized 3 □ Concrete		13-16 <b>O</b>	rial and type	Depth at top o	feet
	Fresh 3 □ Sulphur 19 4 □ Minerals Salty ₆ □ Gas	A      Open hole     5     Plastic	0	102	PLUGGING & SEA		<b>D</b>
	Fresh 3 🗌 Sulphur 24 A 🗋 Minerals 6 🗋 Gas	17-18 1 Concrete	100	20-23 Depth se	X Annular space	Cement grout, ber	
25 - 28 1	Fresh 3 🗌 Sulphur 29		102	27:50 Depth se	2017 Hole f	luge a	ins
30-33 3 🗆	Saity         ₀         Gas           Fresh         3         □         Sulphur         34         60           A         □         Minerals         6         □         Gas	2 Galvanized 3 Concrete 4 Open hole 5 Plastic		29 00 18 21	Clay		
Pumping test me		GPM 2.4 Hours	Z-18 Ains		LOCATION OF WELL		
	J Baller /ater level 25 nd of pumping Water levels of		<del></del>	In diagram below sh Indicate north by arr	ow distances of well from ow.	road and lot lir	ne.
68	22-24 15 minutes 3	$\begin{array}{c c} \text{10 minutes} \\ 1/4 \\ 2^{9.31} \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ 1/4 \\ $	es 35-37	٨			
feet If flowing give ra	1 .	at Water at end of test	<u>feet</u> 12	T.		-1	
Recommended	GPM pump type Recommended pump setting	feet Clear Clou 43-45 Recommended pump rate	46-49	N/		2	
50-53	X Deep	<i>UL</i> '' A		h		6 3 E	
NAL STATUS	ply 5 🗌 Abandoned,	, insufficient supply 🤋 🗋 Unfinished			× 684	A L	
2 Observation	on well 6 Abandoned, 7 Abandoned	, poor quality 10 🗌 Replacement w (Other)			Woll - 1	5/2	
ATER USE	55-56		$\parallel z$			N 4	
: Domestic 2 D Stock 3 D Irrigation	6 🔲 Municipal 7 🗋 Public suppl	10 Other	с,	-	1 20	14	
₄ [] Industrial	8 🗌 Cooling & ai	ir conditioning		BUSH	1 WST		
📊 🙀 Cable too				\		-	
2 ☐ Rotary (co 3 ☐ Rotary (re 4 ☐ Rotary (ai	onventional) ₆ Doring everse) ₇ Diamond ir) ₈ Jetting	10 Digging 11 Dother				17329	5
	o Well Soill	Well Contractor's Licer		ce 58 Confi	650 M	AY 26 K	∞
Address P.O. BOX		Ion - Out. LOHI	Date Date	of inspection	Inspector		
	nician /	Well Technician's Licer T-0,278		arks		(	H
Signature of Technic		Submission date				css. s	J





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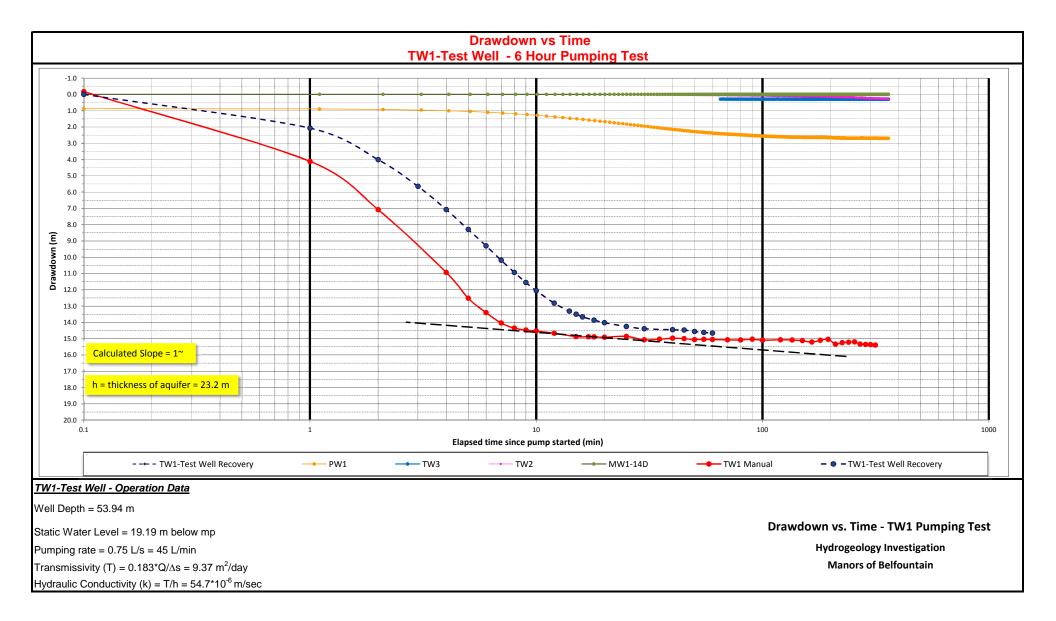
The Ontario Water Resources Act WATER WELL RECORD

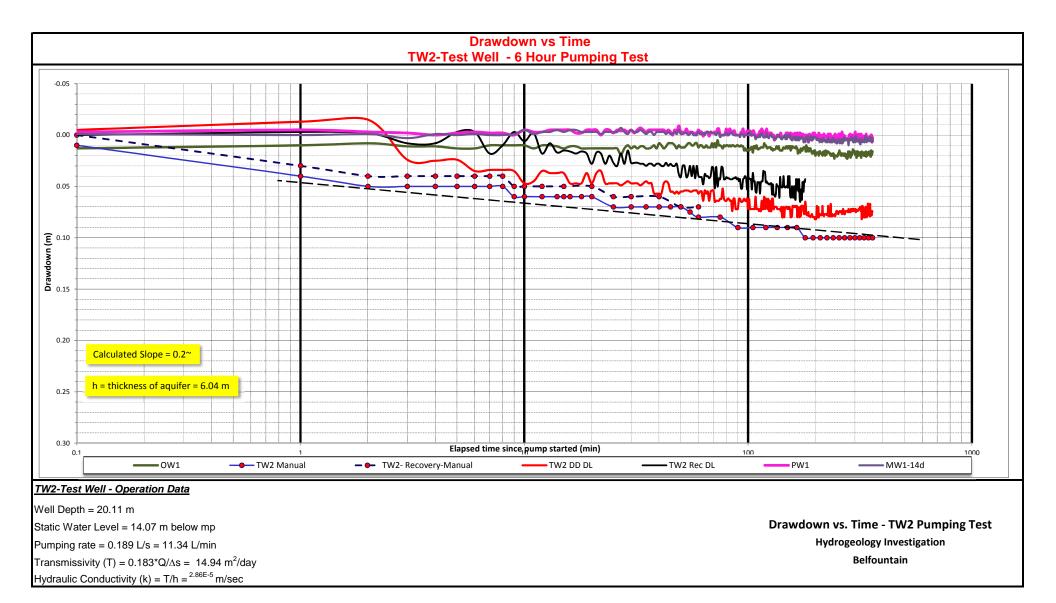
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		BELFOUR. Address	TAIN		Date		48-53
		17211 OLD M			completed	day m	997 onth year
21	M 10 15	Northing	RC Elevati	30 31			iv 47
		FOVERBURDEN AND BEDR	OCK MATERIALS (s			De	pth – feet
General colour	Most common material	Other materials		General descripti		From	To
	TOP SOIL					0	1
BROWN	SANDY GRAVEL	Rocks				1	15
BROWN	GRAVIEL	CLAY			,	15	42
GREY	CLAY	Rocies				42	54
RED	SHALE					54	63
GREEN	SHALE					63	105
GREY LIGHT	LIMESTONE SHALE			w 14		105	129
GREY	SANDSTONE					129	142
RED	SHALE					142	149
GREEN						149	170
REA_	SHALE						
31 32 1		<u>╷╷╷╷╷╷╷╷</u> ╷╷╷				┉╫╍┉┹╾╺┖┈┚╶╺┶╼ ╺	
	14 15 21 51 51	CASING & OPEN HOLE	RECORD	54 Sizes of opening	31-33 Diameter	34-38 Len	75 80 gth 39-40
Water found at - feet	Kind of water diam inches	Wall Material thickness inches	Depth – feet From To	Material and type	i	inches	feet
10-13 1 115 2	Fresh ³ Sulphur ¹⁴ Minerals	Steel ¹²	+1 11 55 1	Material and type		Depth at top	of screen 30
15-18 1	PFresh ³ Sulphur ¹⁹ 64	3 Concrete 4 Open hole 5 Plastic	7'6" 58'6"		GING & SEALIN	IC RECO	20
140 ²	□ Salty 6 □ Gas □ Fresh 3 □ Sulphur 24 □ Salty 0 □ Officer 24 ↓ 0 □ Salty 0 □ Officer 24 ↓ 0 □ Salty 0 □ Officer 24 ↓ 0 □ Officer 24		20-23	🖌 Annular s		Abandon	
170		3 Concrete 4 Open hole 5 Plastic	520 1700	Depth set at - feet           From         To           10-13         14-17	Material and type (Ce		entonite, etc.)
25-28 1	□ Fresh ³ □ Sulphur ²⁹ □ Salty ⁴ □ Minerals 24-25 6 □ Gas		27-30	10-13 2.5 18-21 22-25	BENTON	ITE	
	□ Fresh ³ □ Sulphur ³⁴ ⁶⁰ 4 □ Minerals	<ul> <li>Concrete</li> <li>Open hole</li> </ul>		26-29 30-33 8	D		
2	□ Salty 6 □ Gas	5 🗌 Plastic	l				
71 Pumping test		Duration of pumping 17-18 PMi. Hours Mins		LOCATION below show distance		ad and lot	line
Static level	end of pumping	Pumping 2 Recovery	Indicate no	orth by arrow.			
19-21 76'/''	²²⁻²⁴ 15 minutes 16 3 3 113 0 132 1	, 32–44 i _35–37		3			
feet If flowing give	feet feet 1 e rate ³⁸⁻⁴¹ .Pump intake set at	eet         feet         feet           Water at end of test         42		411	BELFOUR	ITAIN	.1
Necommende	ed pump type Recommended 4	eet Clear Cloudy 45 Recommended 46-49		57			
Shallow	Deep pump setting	eet 2 GPM	RGN'L RG	2 11			
FINAL STATU	US OF WELL 54			02 .	个		
<ol> <li>Water s</li> <li>Observa</li> </ol>	supply 5 Abandoned, insufficient ation well 6 Abandoned, poor qua	ent supply ⁹		0	750		
3 🗋 Testhol 4 🗍 Recharg				MAIN		$\mathbf{x}$	
WATER USE	55-56 stic ⁵ Commercial	9 🗌 Not used		157		20'	
2 🛛 Stock 3 🗌 Irrigatio	on 7 DPublic supply	10 🗌 Other				$\mathbf{v}$	
4 🗌 Industr		,,			RGN'L A		
1 🗌 Cable 1	tool 5 CONSTRUCTION 57	9 🔲 Driving					
2 Rotary 3 C Rotary 4 Rotary	(conventional) 6 🔲 Boring (reverse) 7 📋 Diamond	¹⁰ Digging 11 Other				184	518
			Data	SB Contractor	59-62 Date rec	eived	63-68 8
Name of Well Co		Well Contractor's Licence No.		⁵⁸ Contracctor			1997
Address	ANK DRILLING SERVICE		ш Date of inspection	Inspector			
Box 416 Name of Well Tex	ELORAONIT NOB 15	O Well Technician's Licence No.	Remarks				1
Jim B	) ROADF007 hnician/Contractor	TO 370 Submission date	Remarks		CSS.	\$8	R
	nnician/Contractor	69 10 97 day mo yr	Z				) Front Form

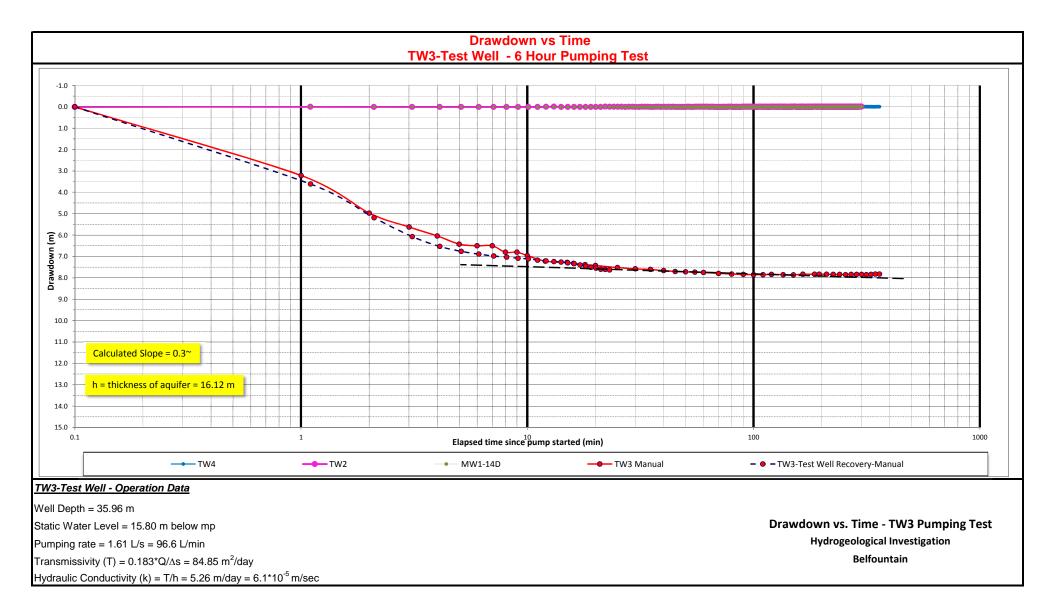
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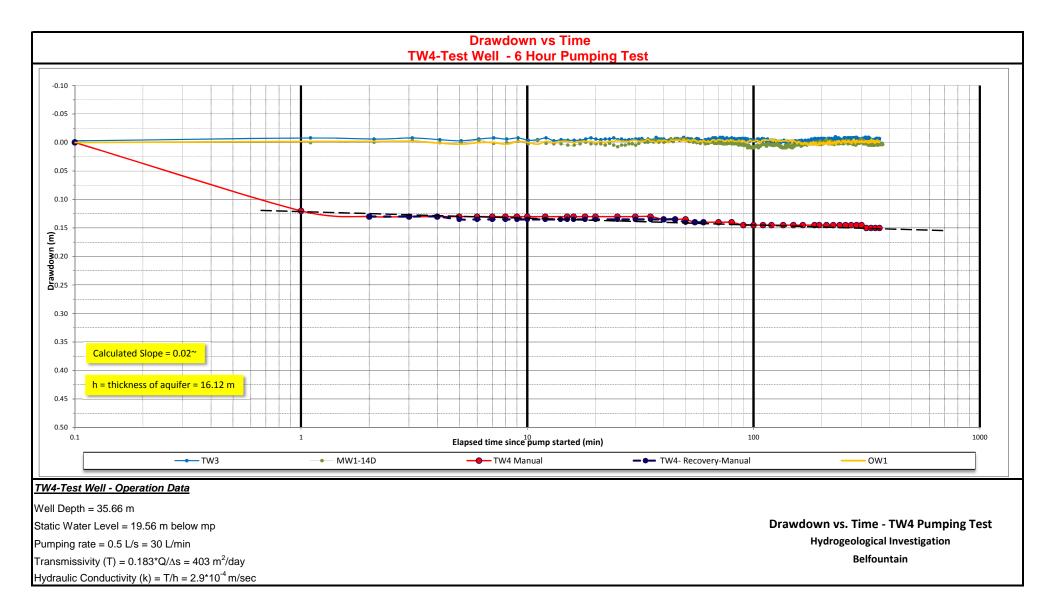
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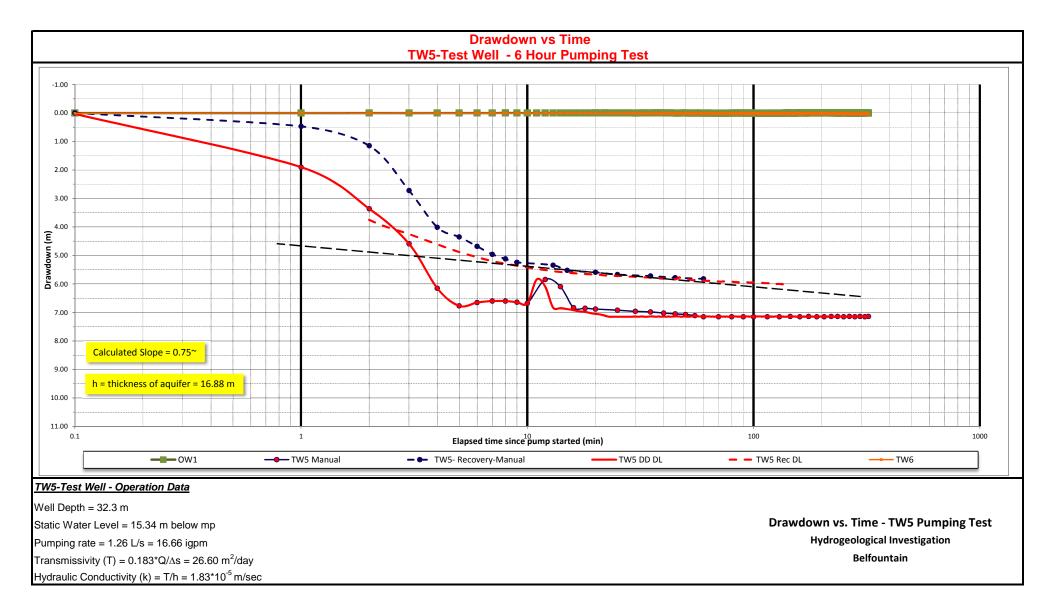
Appendix C Drawdown-Time Curves

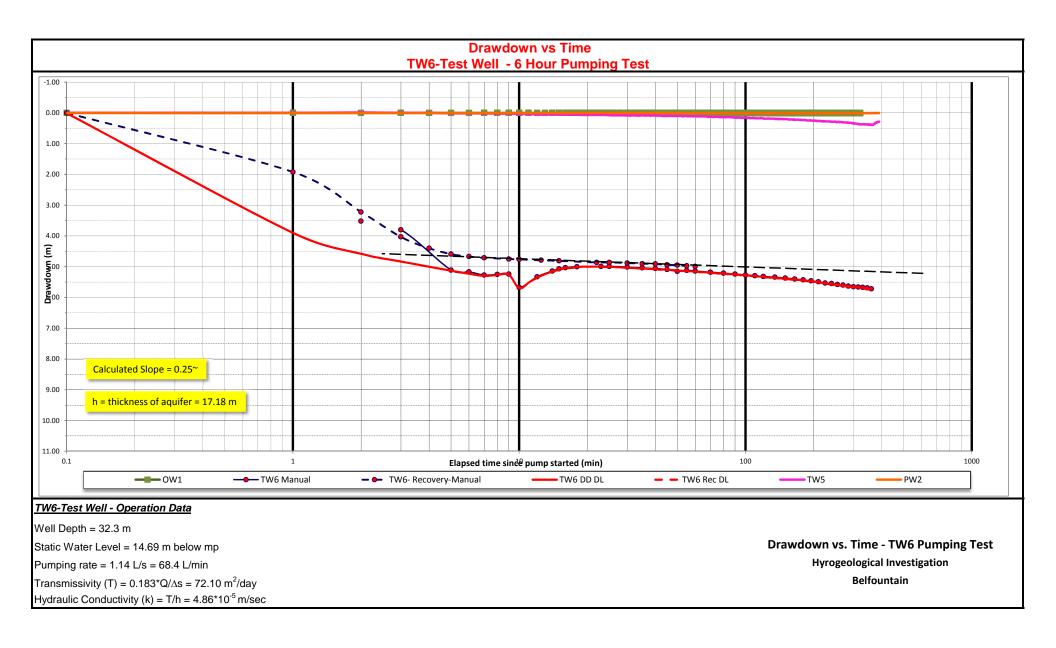


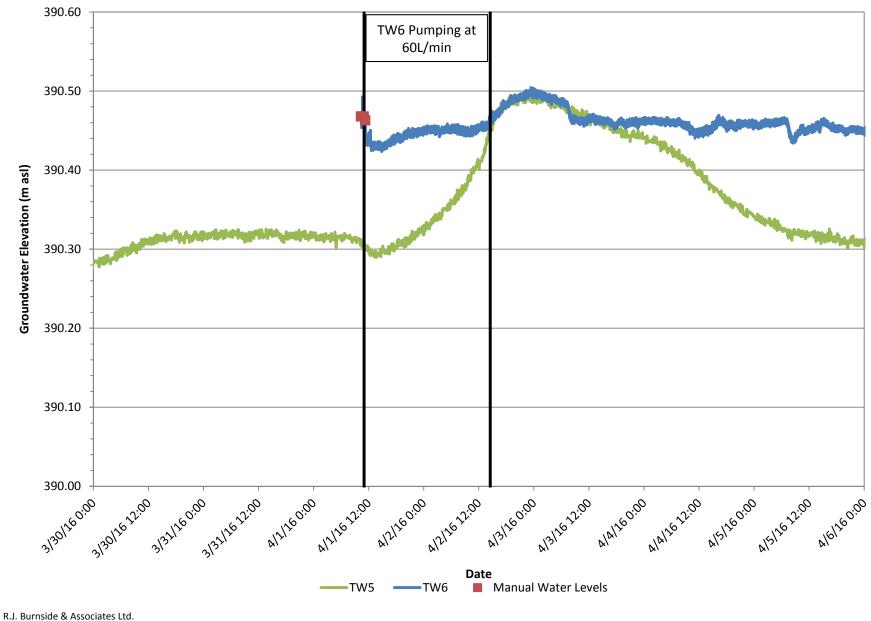










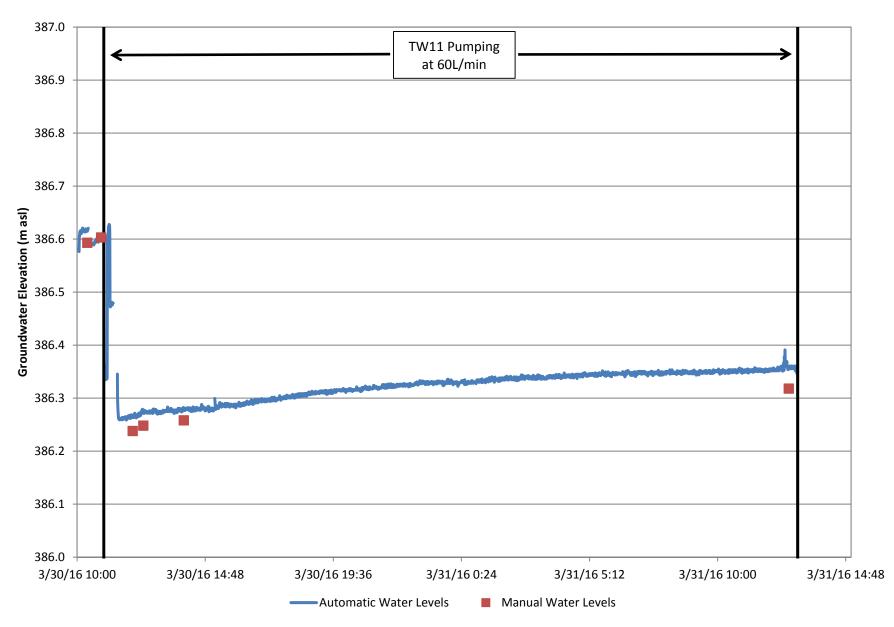


Prepared by: SQ Updated by: TH (COLE) December 19, 2017



Appendix TW6 Pumping Test

# TW11 26 Hour Pumping Test Hydrograph





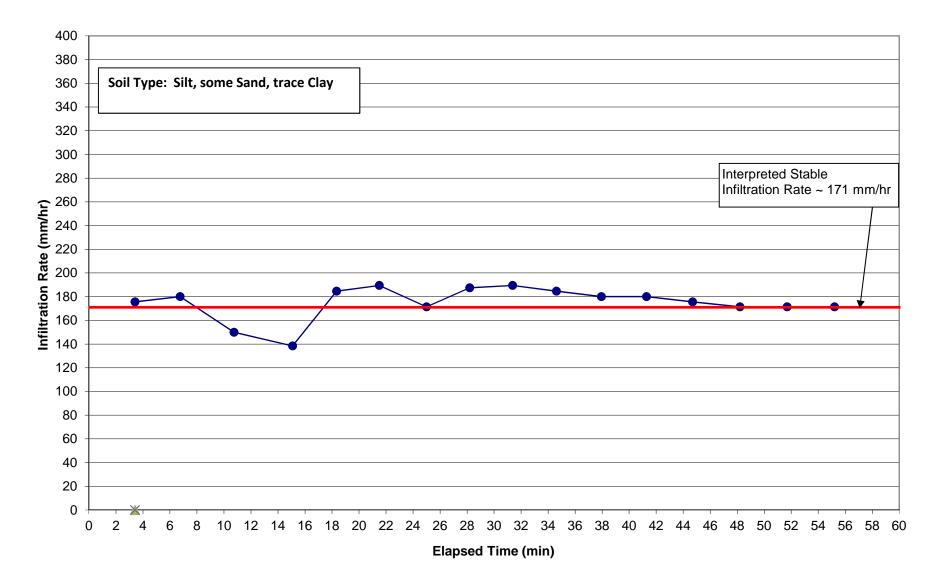
Appendix D Infiltration Data

#### Infiltration Test - IT1

Soil Type: Depth: Location: Silt, brown, soft, moist, some sand, trace clay 0.33 m Belfountain

Elapsed Time	Interval Time	Interval Time	Interval Time	Readings	Infiltration Rate	Infiltration Rate
min	sec	min	hour	mm	mm/h	mm/day
3.42	205	3.42	0.06	10	176	4214.63
6.75	200	3.33	0.06	10	180	4320
10.75	240	4.00	0.07	10	150	3600
15.08	260	4.33	0.07	10	138	3323
18.33	195	3.25	0.05	10	185	4431
21.50	190	3.17	0.05	10	189	4547
25.00	210	3.50	0.06	10	171	4114
28.20	192	3.20	0.05	10	188	4500
31.37	190	3.17	0.05	10	189	4547
34.62	195	3.25	0.05	10	185	4431
37.95	200	3.33	0.06	10	180	4320
41.28	200	3.33	0.06	10	180	4320
44.70	205	3.42	0.06	10	176	4215
48.20	210	3.50	0.06	10	171	4114
51.70	210	3.50	0.06	10	171	4114
55.20	210	3.50	0.06	10	171	4114

# Infiltration Rate at IT1

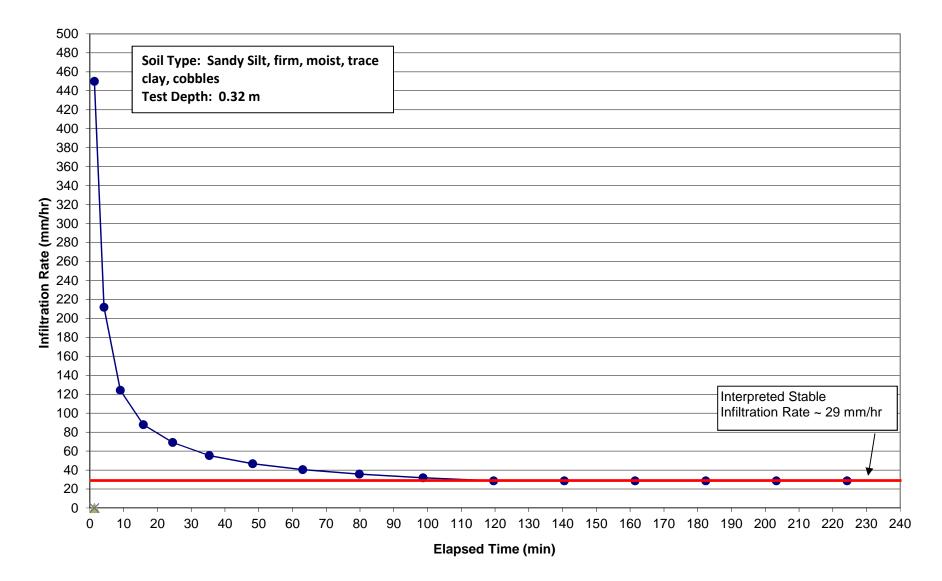


#### Infiltration Test - IT2

Soil Type: Depth: Location: Sandy Silt, firm, moist, trace clay, cobbles 0.32 m Belfountain

Elapsed Time	Interval Time	Interval Time	Interval Time	Readings	Infiltration Rate	Infiltration Rate
min	sec	min	hour	mm	mm/h	mm/day
1.33	80	1.33	0.02	10	450	10800.00
4.17	170	2.83	0.05	10	212	5082
9.00	290	4.83	0.08	10	124	2979
15.83	410	6.83	0.11	10	88	2107
24.50	520	8.67	0.14	10	69	1662
35.33	650	10.83	0.18	10	55	1329
48.18	771	12.85	0.21	10	47	1121
63.02	890	14.83	0.25	10	40	971
79.82	1008	16.80	0.28	10	36	857
98.65	1130	18.83	0.31	10	32	765
119.57	1255	20.92	0.35	10	29	688
140.52	1257	20.95	0.35	10	29	687
161.47	1257	20.95	0.35	10	29	687
182.37	1254	20.90	0.35	10	29	689
203.30	1256	20.93	0.35	10	29	688
224.25	1257	20.95	0.35	10	29	687

# Infiltration Rate at IT2

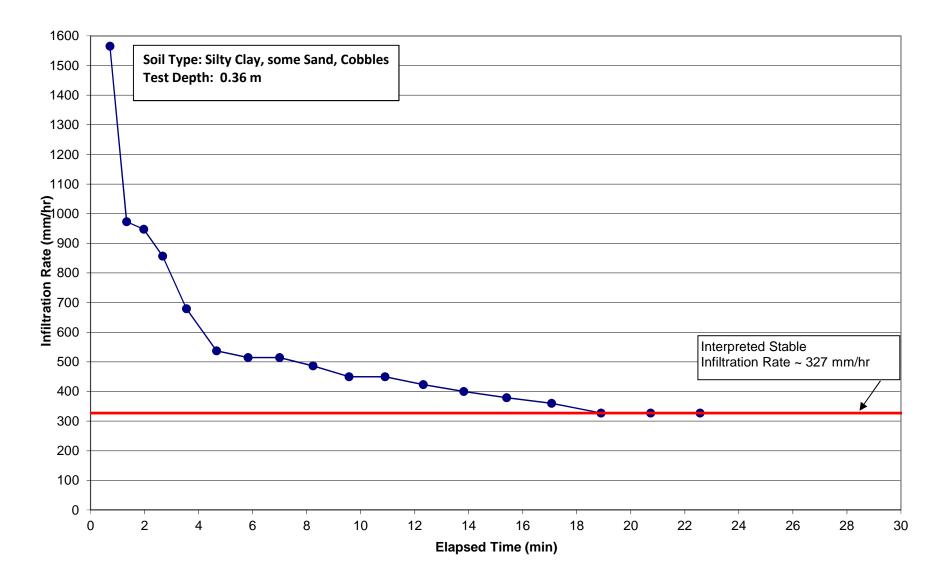


#### **Infiltration Test - IT4**

Soil Type:	Silty Clay, some Sand, cobbles
Depth:	0.36 m
Location:	Belfountain

Elapsed Time	Interval Time	Interval Time	Interval Time	Readings	Infiltration Rate	Infiltration Rate
min	sec	min	hour	mm	mm/h	mm/day
0.33	20	0.33	0.01	10	1800	43200
0.72	23	0.38	0.01	10	1565	37565
1.33	37	0.62	0.01	10	973	23351
1.97	38	0.63	0.01	10	947	22737
2.67	42	0.70	0.01	10	857	20571
3.55	53	0.88	0.01	10	679	16302
4.67	67	1.12	0.02	10	537	12896
5.83	70	1.17	0.02	10	514	12343
7.00	70	1.17	0.02	10	514	12343
8.23	74	1.23	0.02	10	486	11676
9.57	80	1.33	0.02	10	450	10800
10.90	80	1.33	0.02	10	450	10800
12.32	85	1.42	0.02	10	424	10165
13.82	90	1.50	0.03	10	400	9600
15.40	95	1.58	0.03	10	379	9095
17.07	100	1.67	0.03	10	360	8640
18.90	110	1.83	0.03	10	327	7855
20.73	110	1.83	0.03	10	327	7855
22.57	110	1.83	0.03	10	327	7855

# **Infiltration Rate at IT4**

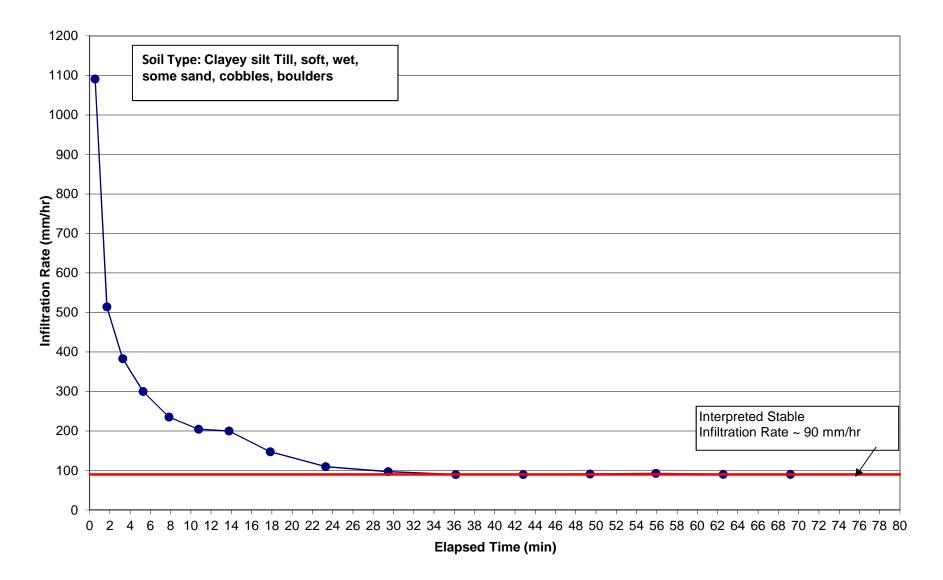


#### Infiltration Test - IT5

Soil Type:	Clayey silt Till, soft, wet, some sand, cobbles, boulders
Depth:	0.38 m
Location:	Belfountain

Elapsed Time	Interval Time	Interval Time	Interval Time	Readings	Infiltration Rate	Infiltration Rate
min	sec	min	hour	mm	mm/h	mm/day
0.55	33	0.55	0.01	10	1091	26182
1.72	70	1.17	0.02	10	514	12343
3.28	94	1.57	0.03	10	383	9191
5.28	120	2.00	0.03	10	300	7200
7.83	153	2.55	0.04	10	235	5647
10.77	176	2.93	0.05	10	205	4909
13.77	180	3.00	0.05	10	200	4800
17.83	244	4.07	0.07	10	148	3541
23.30	328	5.47	0.09	10	110	2634
29.48	371	6.18	0.10	10	97	2329
36.15	400	6.67	0.11	10	90	2160
42.82	400	6.67	0.11	10	90	2160
49.42	396	6.60	0.11	10	91	2182
55.90	389	6.48	0.11	10	93	2221
62.55	399	6.65	0.11	10	90	2165
69.18	398	6.63	0.11	10	90	2171

# **Infiltration Rate at IT5**

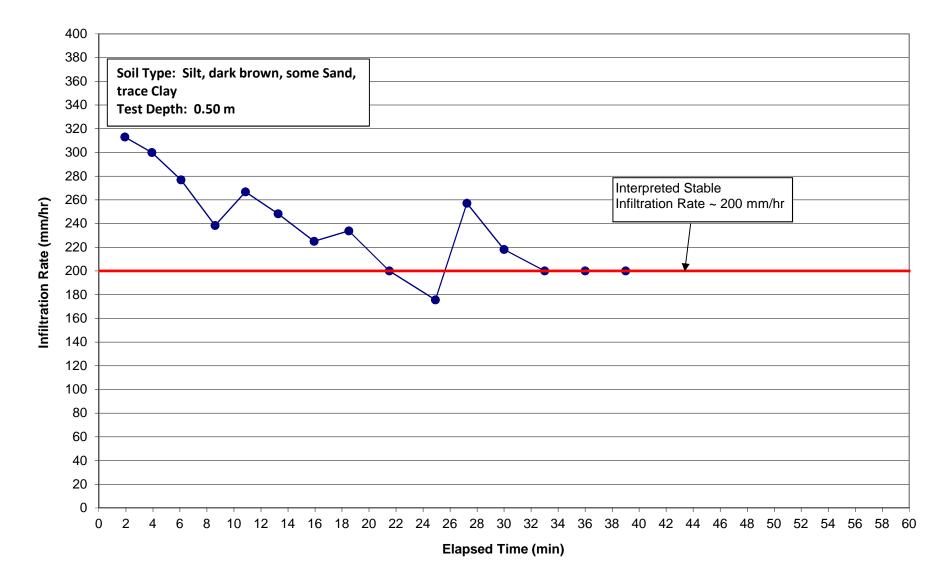


#### Infiltration Test - IP1

Soil Type: Pit Size: Location: Silt, dark brown, soft, moist, some sand, trace clay 0.60 m x 0.60 m x 0.50 m Belfountain

Elapsed Time	Interval Time	Interval Time	Interval Time	Readings	Infiltration Rate	Infiltration Rate
min	sec	min	hour	mm	mm/h	mm/day
		0.00				
1.92	115	1.92	0.03	10	313	7513
3.92	120	2.00	0.03	10	300	7200
6.08	130	2.17	0.04	10	277	6646
8.60	151	2.52	0.04	10	238	5722
10.85	135	2.25	0.04	10	267	6400
13.27	145	2.42	0.04	10	248	5959
15.93	160	2.67	0.04	10	225	5400
18.50	154	2.57	0.04	10	234	5610
21.50	180	3.00	0.05	10	200	4800
24.92	205	3.42	0.06	10	176	4215
27.25	140	2.33	0.04	10	257	6171
30.00	165	2.75	0.05	10	218	5236
33.00	180	3.00	0.05	10	200	4800
36.00	180	3.00	0.05	10	200	4800
39.00	180	3.00	0.05	10	200	4800

# Infiltration Rate at IP1

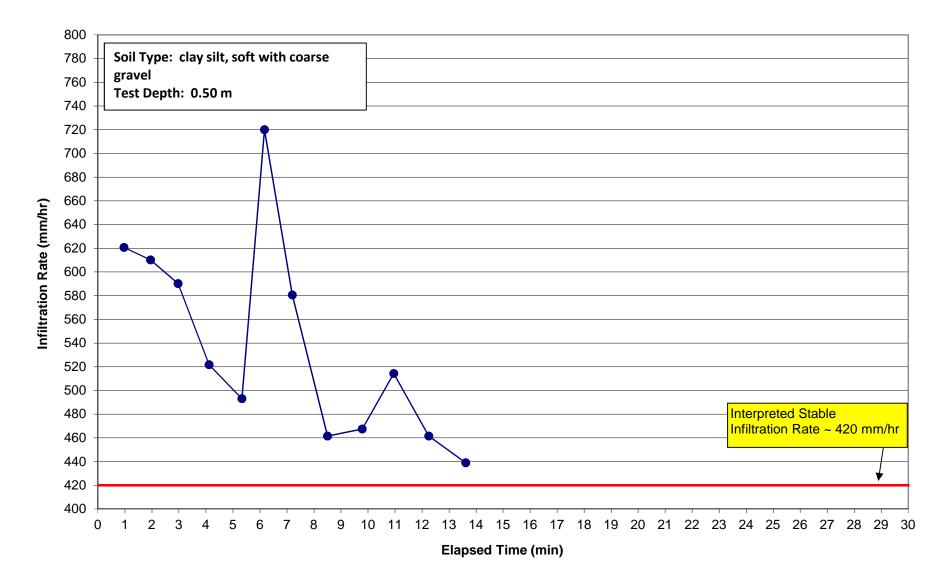


#### Infiltration Test - IP2

Soil Type:clay silt, soft with coarse gravelDepth:0.60 m x 0.60 m x 0.50 mLocation:Belfountain

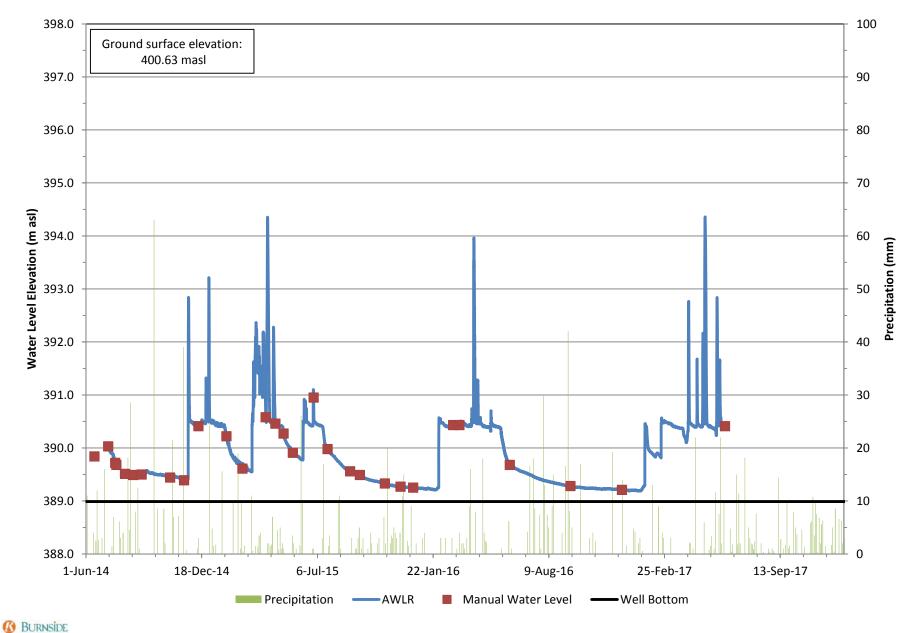
Elapsed Time	Interval Time	Interval Time	Interval Time	Readings	Infiltration Rate	Infiltration Rate
min	sec	min	hour	mm	mm/h	mm/day
		0.00				
0.97	58	0.97	0.02	10	621	14897
1.95	59	0.98	0.02	10	610	14644
2.97	61	1.02	0.02	10	590	14164
4.12	69	1.15	0.02	10	522	12522
5.33	73	1.22	0.02	10	493	11836
6.17	50	0.83	0.01	10	720	17280
7.20	62	1.03	0.02	10	581	13935
8.50	78	1.30	0.02	10	462	11077
9.78	77	1.28	0.02	10	468	11221
10.95	70	1.17	0.02	10	514	12343
12.25	78	1.30	0.02	10	462	11077
13.62	82	1.37	0.02	10	439	10537

# Infiltration Rate at IP2



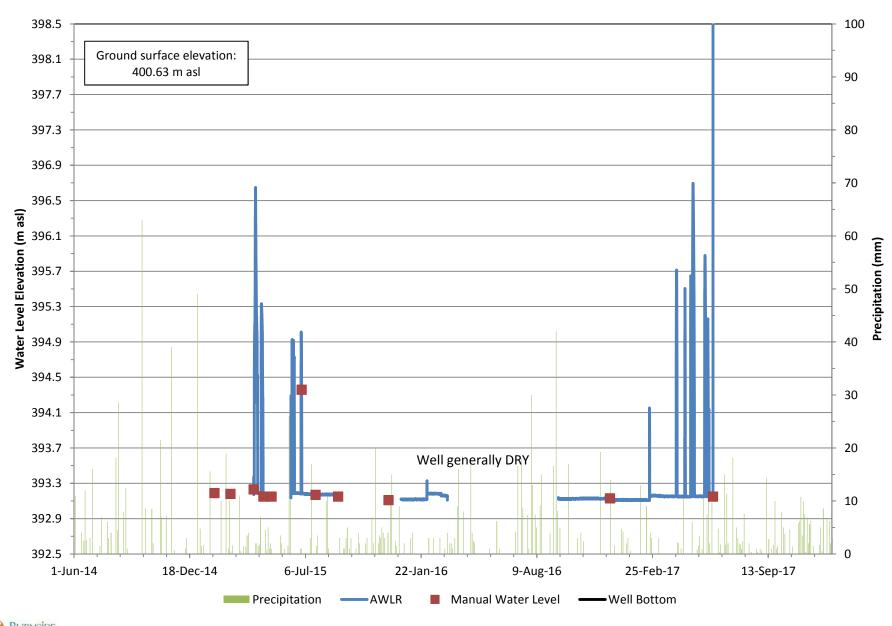
Appendix E Hydrographs

### Manors of Belfountain Hydrogeological Investigation Groundwater Monitoirng MW1D-14 Hydrograph



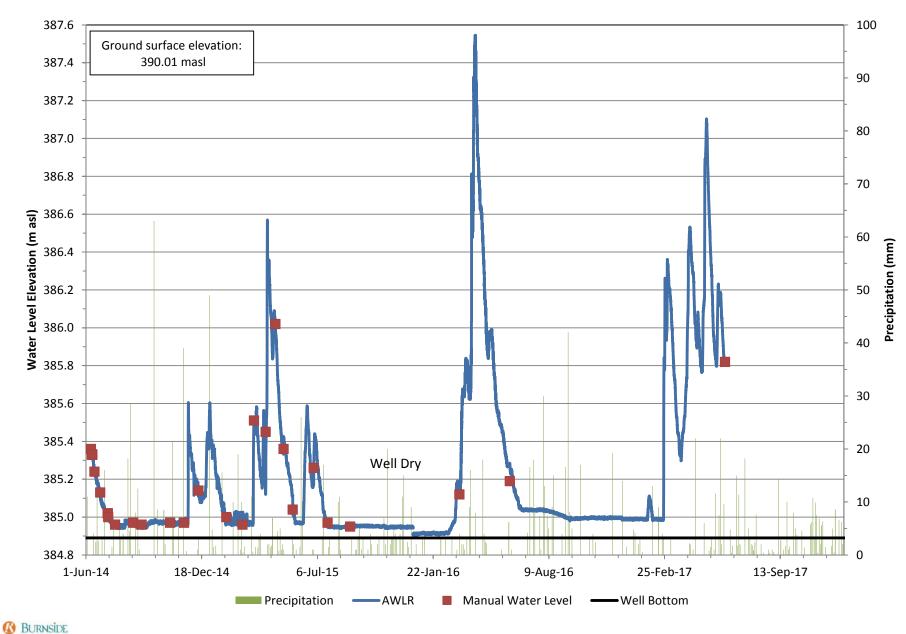


# Manors of Belfountain Hydrogeological Investigation Groundwater Monitoirng MW1S-14 Hydrograph



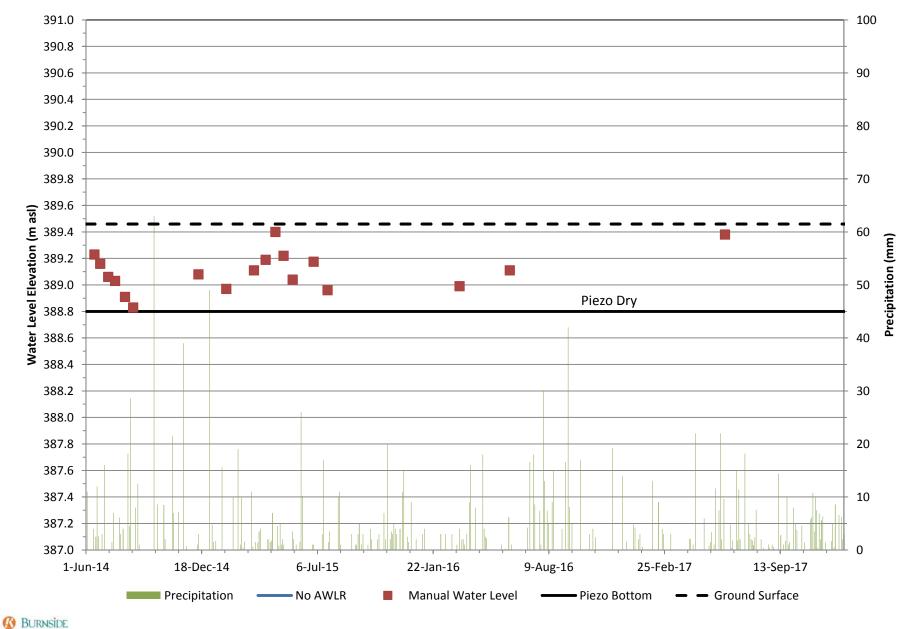


# Manors of Belfountain Hydrogeological Investigation Groundwater Monitoirng OW1 Hydrograph



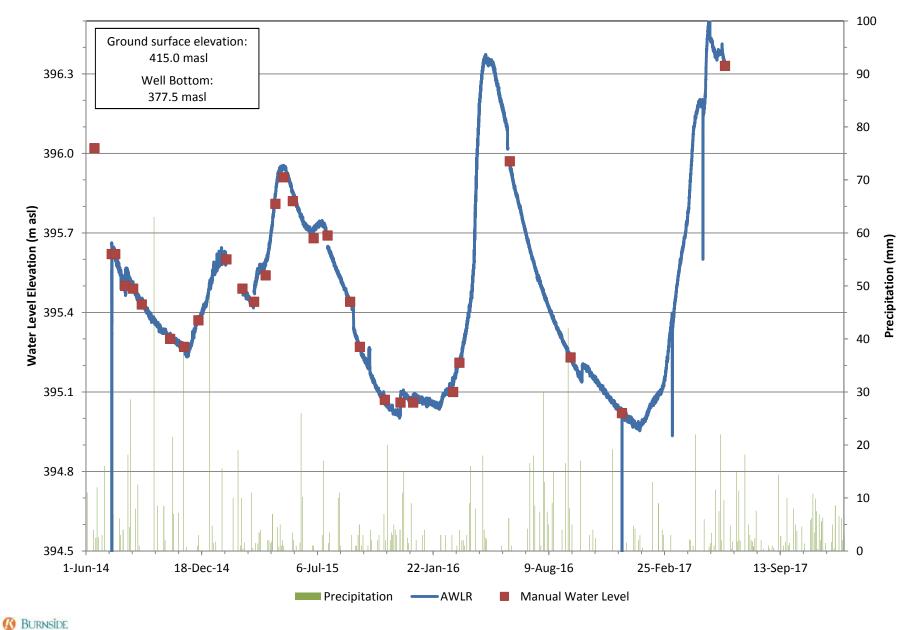


## Manors of Belfountain Hydrogeological Investigation Groundwater Monitoirng Piezo beside PZ2-14 Hydrograph



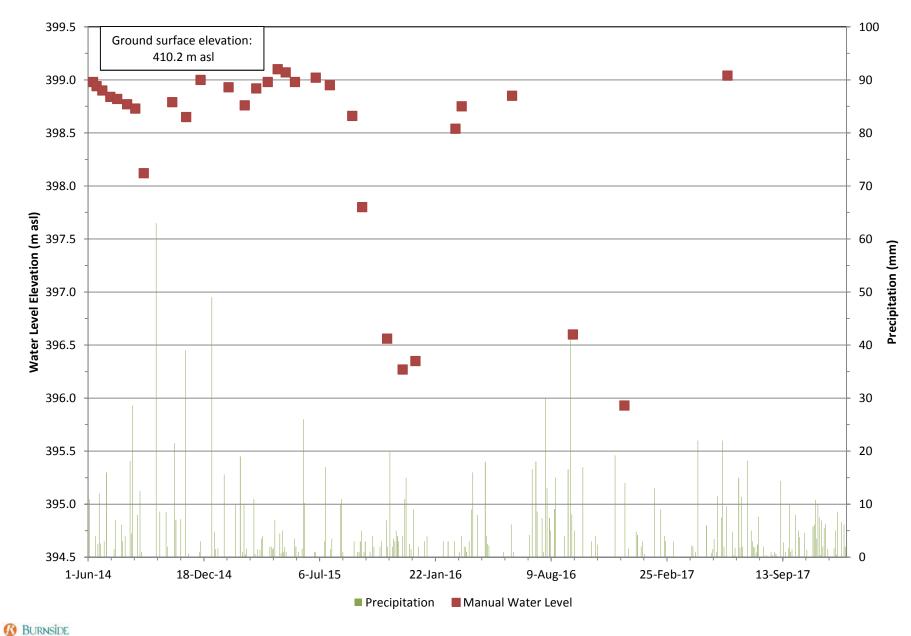


# Manors of Belfountain Hydrogeological Investigation Groundwater Monitoirng PW1 Hydrograph



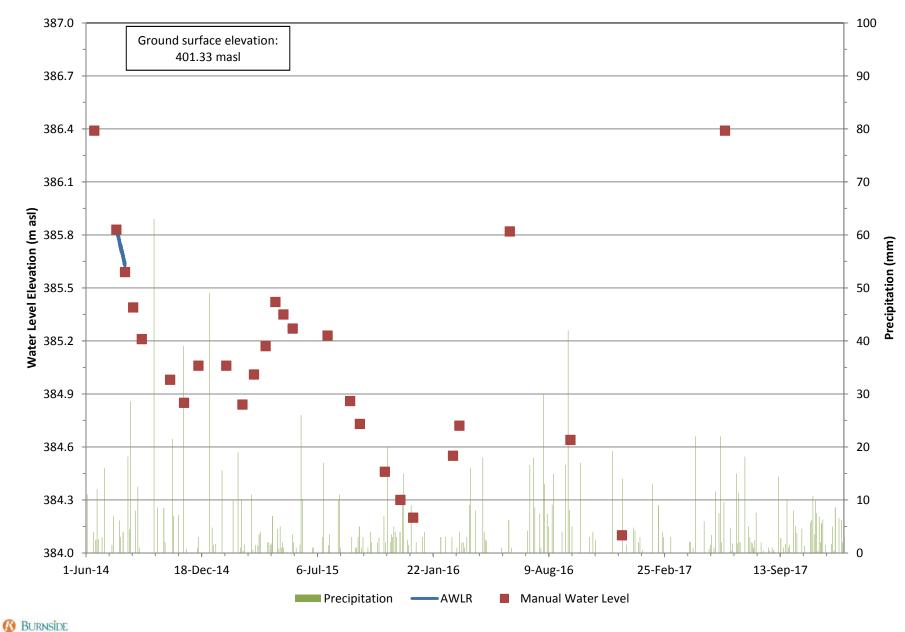


### Manors of Belfountain Hydrogeological Investigation Groundwater Monitoirng PW2 Hydrograph



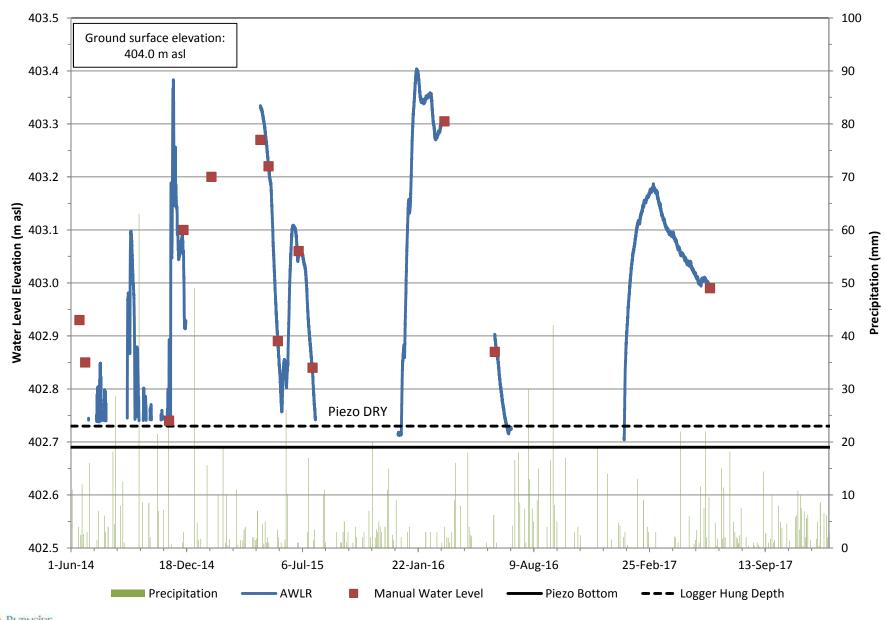


# Manors of Belfountain Hydrogeological Investigation Groundwater Monitoirng PW3 Hydrograph



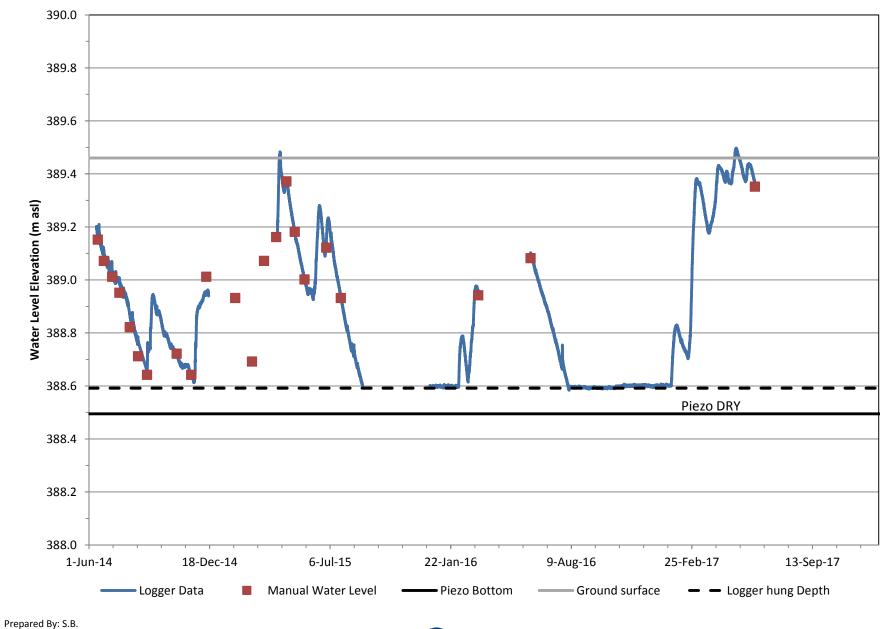


# Manors of Belfountain Hydrogeological Investigation Groundwater Monitoirng PZ1-14 Hydrograph



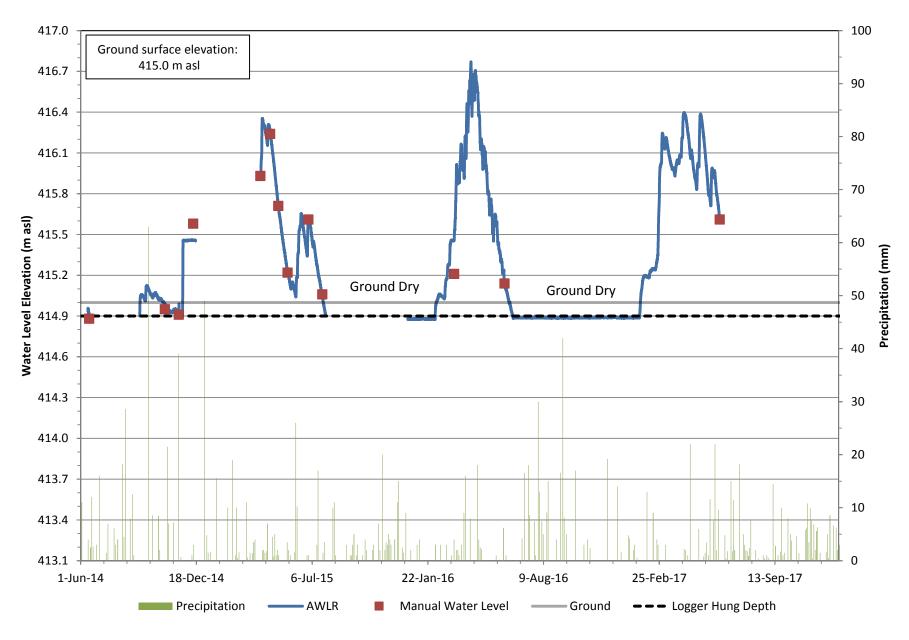


# Manors of Belfountain Hydrogeological Investigation Groundwater Monitoirng PZ2-14 Hydrograph (2)





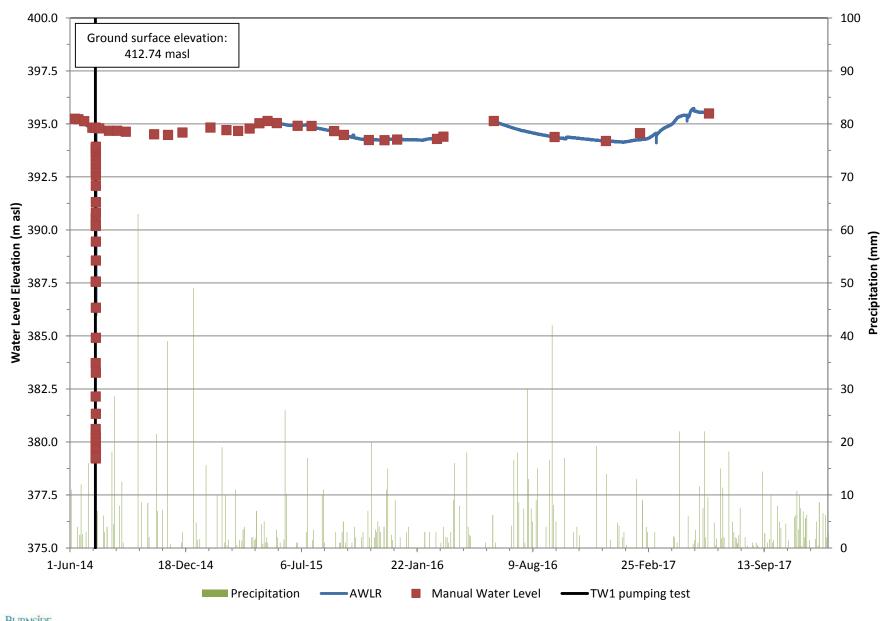
# Manors of Belfountain Hydrogeological Investigation Groundwater Monitoirng SG1-14 Hydrograph





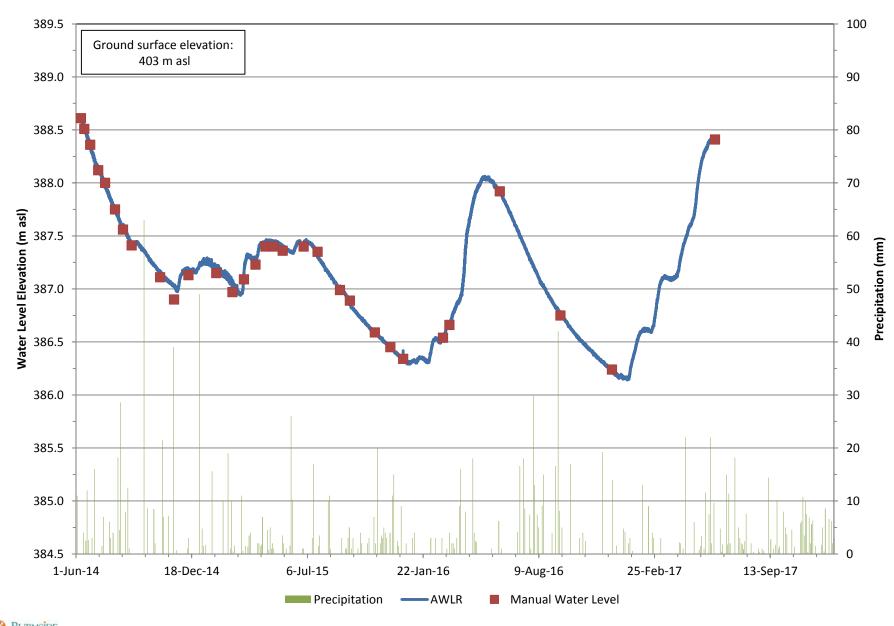


# Manors of Belfountain Hydrogeological Investigation Groundwater Monitoirng TW1 Hydrograph



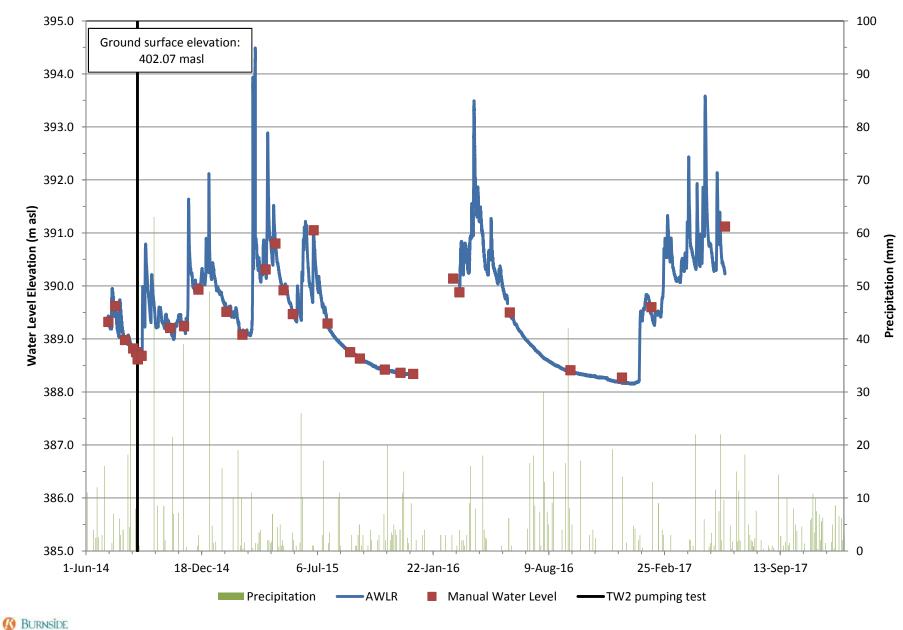


# Manors of Belfountain Hydrogeological Investigation Groundwater Monitoirng TW1-09 Hydrograph



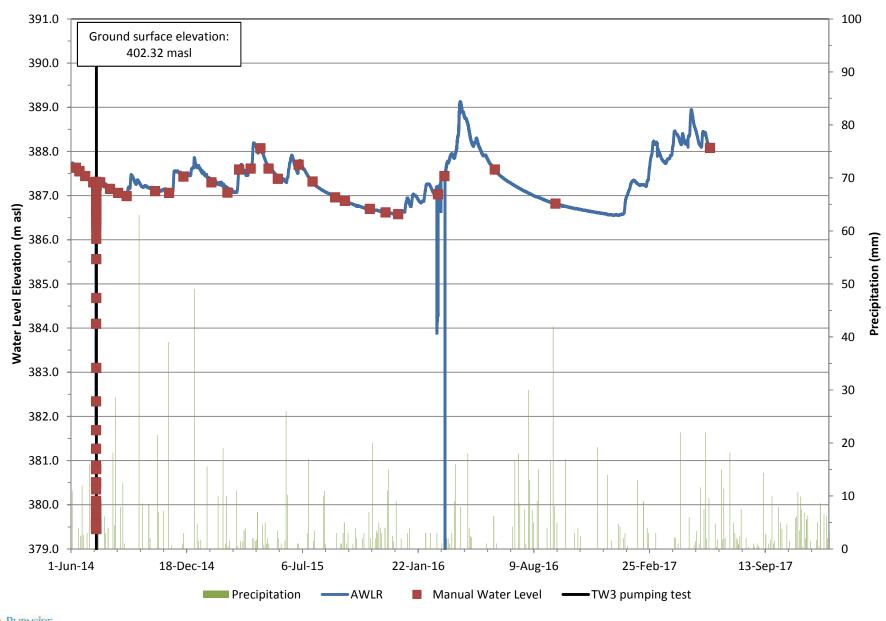


# Manors of Belfountain Hydrogeological Investigation Groundwater Monitoirng TW2 (A165390) Hydrograph





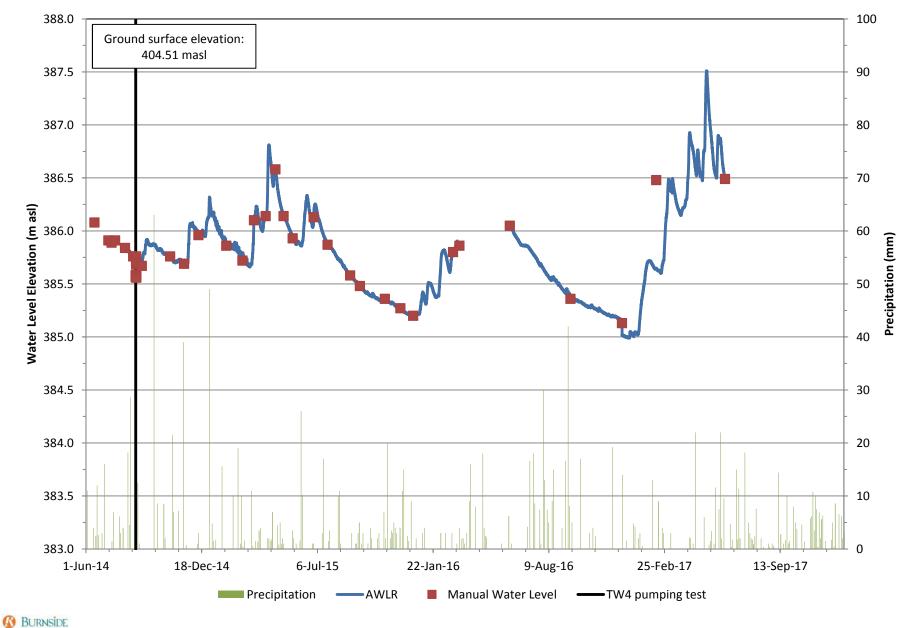
### Manors of Belfountain Hydrogeological Investigation Groundwater Monitoirng TW3 Hydrograph



BURNSIDE Prepared By: S.B. Updated By: T.H. (COLE) 12/12/2017



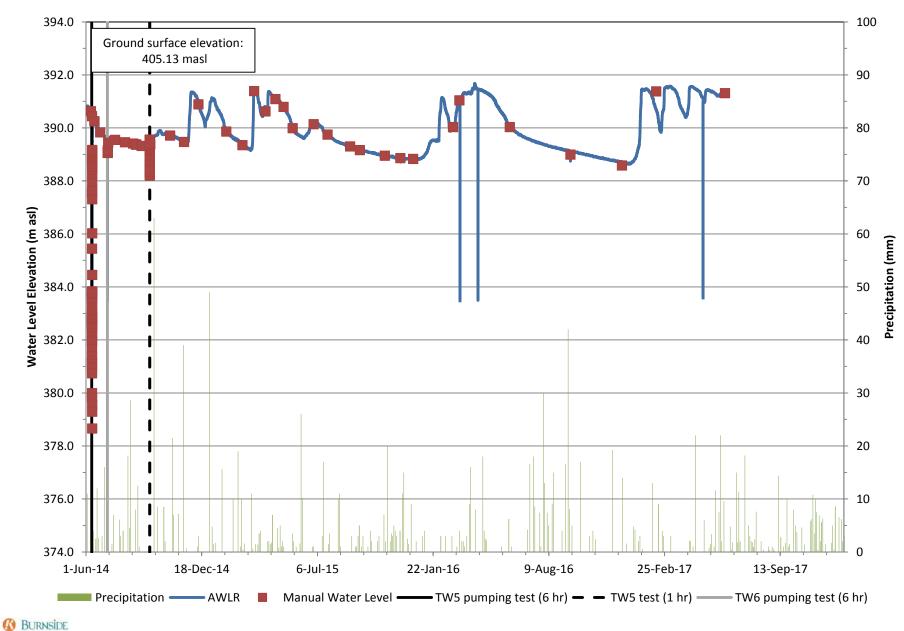
### Manors of Belfountain Hydrogeological Investigation Groundwater Monitoirng TW4 Hydrograph



Prepared By: S.B. Updated By: T.H. (COLE) 12/12/2017

picutre]

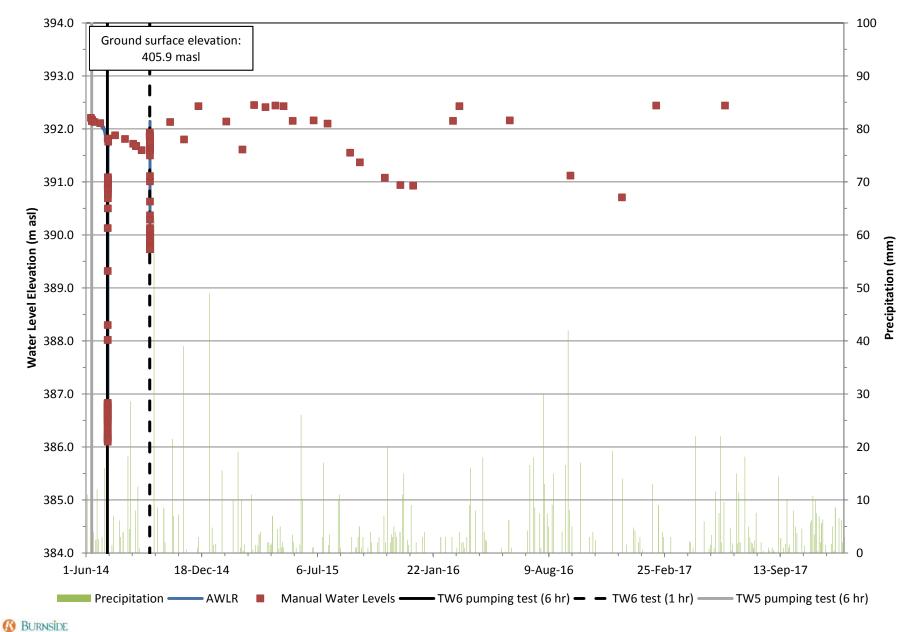
### Manors of Belfountain Hydrogeological Investigation Groundwater Monitoirng TW5 Hydrograph



Prepared By: S.B. Updated By: T.H. (COLE) 12/12/2017



### Manors of Belfountain Hydrogeological Investigation Groundwater Monitoirng TW6 Hydrograph



Prepared By: S.B. Updated By: T.H. (COLE) 12/12/2017



Appendix F Groundwater Quality

			Wentib			1 112				0111	
		Sa	ample Date	12/04/2014	04/07/2015	06/29/2015	09/17/2015	11/26/2015	12/04/2014	04/07/2015	06/29/2015
		Lab	sample ID	6152997	6430214	6701615	6988488	7237258	6153004	6430223	6701613
Sample Parameter	Unit	ODWS Criteria	RDL								
Electrical Conductivity	uS/cm		2	-	595	-	596	-	-	601	-
pН	pH Units	6.5 - 8.5	NA	-	7.92	-	8.16	-	-	8.1	-
Saturation pH				-	7.00	-	6.99	-	-	6.98	-
Langelier Index				-	0.92	-	1.17	-	-	1.12	-
Total Hardness (as CaCO3)	mg/L	80-100	0.5	-	281	-	295	-	-	265	-
Total Dissolved Solids	mg/L	500	20	-	304	-	330	-	-	294	-
Alkalinity (as CaCO3)	mg/L	30-500	5	-	259	-	251	-	-	265	-
Bicarbonate (as CaCO3)	mg/L		5		259		251	-	-	265	-
Carbonate (as CaCO3)	mg/L	-	5	-	<5	-	<5	-	-	<5	-
Hydroxide (as CaCO3)	mg/L		5		<5		<5			<5	-
Fluoride	mg/L	1.5	0.1		< 0.05	-	<0.25	-	-	< 0.05	-
Chloride	mg/L	250	0.2		22.3		22.9			3.48	
Nitrate as N	mg/L	10	0.1	6.51	3.44	4.15	2.75	2.12	0.89	0.85	1.89
Nitrite as N	mg/L	1	0.1	-	<0.05	4.15	<0.25	< 0.05	0.89	< 0.05	1.09
Bromide	mg/L	-	0.1		<0.05		<0.25	-		<0.05	
Sulphate	mg/L	500	0.1		18.2		22.0			<0.05	-
Ortho Phosphate as P	mg/L	- 500	0.2		<0.10	-	<0.50	-	-	<0.10	-
Reactive Silica	mg/L mg/L	-	0.2		<0.10		<0.50	-		<0.10	-
Ammonia as N	mg/L mg/L	-	0.05		0.3	-	<0.02		-	0.08	
	3	-	0.02	-	<0.05	-	<0.02	-	-	0.08	-
Total Phosphorus	mg/L				<0.05		<0.05				
Total Organic Carbon	mg/L TCU	-	0.5	-		-		-	-	2	-
Colour		5	5	-	<5	-	<5	-	-	<5	-
Furbidity	NTU	5	0.5	-	4.6	-	1.2	-	-	269	-
Calcium	mg/L	-	0.05	-	73.6	-	77.6	-	-	71.9	-
Magnesium	mg/L	-	0.05	-	23.5	-	24.7	-	-	20.7	-
Sodium	mg/L	200	0.05	-	8.20	-	9.37	-	-	7.68	-
Potassium	mg/L	-	0.05	-	0.90	-	0.84	-	-	2.16	-
Aluminum	mg/L	0.1	0.004	-	< 0.004	-	< 0.004	-	-	< 0.004	-
Antimony	mg/L	0.006	0.003	-	< 0.003	-	< 0.003	-	-	< 0.003	-
Arsenic	mg/L	0.025	0.003	-	< 0.003	-	< 0.003	-	-	< 0.003	-
Barium	mg/L	1	0.002	-	0.056	-	0.050	-	-	0.048	-
Beryllium	mg/L	-	0.001	-	<0.001	-	<0.001	-	-	<0.001	-
Boron	mg/L	5	0.01	-	<0.010	-	<0.010	-	-	<0.010	-
Cadmium	mg/L	0.005	0.001	-	<0.001	-	<0.001	-	-	<0.001	-
Chromium	mg/L	0.05	0.003	-	0.005	-	< 0.003	-	-	< 0.003	-
Cobalt	mg/L	-	0.001	-	<0.001	-	< 0.001	-	-	< 0.001	-
Copper	mg/L	1	0.003	-	< 0.003	-	< 0.003	-	-	< 0.003	-
Iron	mg/L	0.3	0.01		<0.010	-	<0.010	-	-	<0.010	-
Lead	mg/L	0.01	0.002	-	< 0.002	-	< 0.002	-	-	< 0.002	-
Manganese	mg/L	0.05	0.002		< 0.002	-	< 0.002	-	-	< 0.002	-
Mercury	mg/L	0.001	0.0001	-	< 0.0001	-	< 0.0001	-	-	< 0.0001	-
Volybdenum	mg/L	-	0.002	-	< 0.002	-	< 0.002	-	-	< 0.002	-
Nickel	mg/L	-	0.003	-	< 0.003	-	0.004	-	-	< 0.003	-
Selenium	mg/L	0.01	0.004	-	< 0.004	-	< 0.004	-	-	< 0.004	-
Silver	mg/L	-	0.002	-	< 0.002	-	< 0.002	-	-	< 0.002	-
Strontium	mg/L	-	0.005	-	0.126	-	0.126	-	-	0.102	-
Thallium	mg/L	-	0.006	-	< 0.006	-	<0.006	-	-	< 0.006	-
Tin	mg/L	-	0.002	-	< 0.002	-	<0.002	-	-	<0.000	-
Titanium	mg/L		0.002		<0.002	-	<0.002	-	-	<0.002	-
Tungsten	mg/L		0.002	-	<0.002		<0.002			<0.002	-
Uranium	mg/L	0.02	0.002	-	<0.010	-	<0.002			<0.010	-
Vanadium	mg/L	0.02	0.002	-	-0.002		-0.002	+		-0.002	<u> </u>

PW2

OW1

< 0.002

0.017

< 0.004

0.6

.

Zinc Zirconium % Difference/ Ion Balance Notes:

Vanadium

ODWS = Ontario Drinking Water Standards

mg/L mg/L

mg/L

%

RDL = Reportable Detection Limit

-' = No value available

Indicates exceedance of ODWS criteria

Samples 7607710-7607739 required dilution prior to analysis for Anions due to the presence of non-target lons; the RDLs were adjusted to reflect the dilution.

-

-

< 0.002

0.022

< 0.004

3.400

-

0.002

0.005

0.004

NA

5

-

-

Well ID



-

< 0.002

0.021

< 0.004

0.104

			Well ID	τv	W1					T١	N2				
		Sa	ample Date	05/02/2017	03/10/2017	04/07/2015	06/29/2015	09/17/2015	11/26/2015	03/08/2016	06/02/2016	09/15/2016	12/13/2016	03/10/2017	05/02/2017
		Lab	sample ID	8358383	8244996	6430142	6701611	6988471	7237258	7430218	7607710	7853176	8091589	8244997	8358385
Sample Parameter	Unit	ODWS Criteria	RDL												
Electrical Conductivity	uS/cm		2	-	705	478	-	561	-	-	526	575	-	392	-
pH	pH Units	6.5 - 8.5	NA	-	8.14	7.89	-	8.14	-	-	8.03	8.17	-	8.02	-
Saturation pH				-	6.89	7.15	-	6.96	-	-	6.97	6.96	-	7.36	-
Langelier Index				-	1.25	0.74	-	1.18	-	-	1.06	1.21	-	0.66	-
Total Hardness (as CaCO3)	mg/L	80-100	0.5	-	361	224	-	299	-	-	276	294	-	181	-
Total Dissolved Solids	mg/L	500	20	-	396	262	-	308	-	-	290	308	-	198	-
Alkalinity (as CaCO3)	mg/L	30-500	5	-	256	212	-	263	-	-	264	271	-	163	-
Bicarbonate (as CaCO3)	mg/L	-	5	-	256	212	-	263	-	-	264	271	-	163	-
Carbonate (as CaCO3)	mg/L	-	5	-	<5	<5	-	<5	-	-	<5	<5	-	<5	-
Hydroxide (as CaCO3)	mg/L	-	5	-	<5	<5	-	<5	-	-	<5	<5	-	<5	-
Fluoride	mg/L	1.5	0.1	-	0.19	< 0.05	-	<0.25	-	-	<0.10	< 0.05	-	< 0.05	-
Chloride	mg/L	250	0.2	-	14.30	18.80	-	6.85	-	-	5.59	5.96	-	16.70	-
Nitrate as N	mg/L	10	0.1	< 0.05	< 0.05	0.84	0.70	1.00	0.62	0.58	1.18	0.82	0.67	1.16	1.90
Nitrite as N	mg/L	1	0.1	< 0.05	< 0.05	< 0.05	-	<0.25	< 0.05	-	<0.10	< 0.05	-	< 0.05	< 0.05
Bromide	mg/L	-	0.1	-	< 0.05	< 0.05	-	<0.25	-	-	<0.10	< 0.05	-	< 0.05	-
Sulphate	mg/L	500	0.2	-	105.0	10.0	-	23.5	-	-	19.0	25.6	-	13.8	-
Ortho Phosphate as P	mg/L	-	0.2	-	<0.10	0.35	-	< 0.50	-	-	<0.20	<0.10	-	<0.10	-
Reactive Silica	mg/L	-	0.05	-	12.70	5.78	-	11.50	-	-	9.90	11.80	-	3.65	-
Ammonia as N	mg/L	-	0.02	-	< 0.02	< 0.02	-	<0.02	-	-	< 0.02	<0.02	-	0.04	-
Total Phosphorus	mg/L	-	0.05	-	< 0.05	< 0.05	-	< 0.05	-	-	< 0.05	0.05	-	< 0.05	-
Total Organic Carbon	mg/L	-	0.5	-	1.3	1.7	-	1.1	-	-	0.7	1.1	-	2.4	-
Colour	TČU	5	5	-	<5	<5	-	<5	-	-	<5	<5	-	<5	-
Turbidity	NTU	5	0.5	-	135.0	2.7	-	4.3	-	-	6.4	110.0	-	3.3	-
Calcium	mg/L	-	0.05	-	97.9	60.9	-	79.5	-	-	73.3	77.6	-	48.8	-
Magnesium	mg/L	-	0.05	-	28.4	17.5	-	24.3	-	-	22.6	24.3	-	14.4	-
Sodium	mg/L	200	0.05	-	5.27	6.79	-	3.47	-	-	2.65	3.10	-	6.39	-
Potassium	ma/L		0.05	-	1.18	1.53	-	1.12	-	-	1.03	1.12	-	1.26	-
Aluminum	ma/L	0.1	0.004	-	0.006	< 0.004	-	< 0.004	-	-	0.006	0.014	-	0.017	-
Antimony	mg/L	0.006	0.003	-	< 0.003	< 0.003	-	< 0.003	-	-	< 0.003	< 0.003	-	< 0.003	-
Arsenic	mg/L	0.025	0.003	-	0.006	< 0.003	-	< 0.003	-	-	< 0.003	< 0.003	-	< 0.003	-
Barium	mg/L	1	0.002	-	0.073	0.042	-	0.088	-	-	0.063	0.092	-	0.030	-
Beryllium	mg/L	-	0.001	-	< 0.001	< 0.001	-	< 0.001	-	-	< 0.001	< 0.001	-	< 0.001	-
Boron	mg/L	5	0.01	-	0.016	0.010	-	< 0.010	-	-	0.012	< 0.010	-	< 0.010	-
Cadmium	mg/L	0.005	0.001	-	< 0.001	< 0.001	-	< 0.001	-	-	< 0.001	< 0.001	-	< 0.001	-
Chromium	mg/L	0.05	0.003	-	< 0.003	0.005	-	< 0.003	-	-	< 0.003	< 0.003	-	< 0.003	-
Cobalt	mg/L	-	0.001	-	< 0.001	< 0.001	-	< 0.001	-	-	< 0.001	< 0.001	-	< 0.001	-
Copper	mg/L	1	0.003	-	< 0.003	< 0.003	-	< 0.003	-	-	< 0.003	< 0.003	-	< 0.003	-
Iron	mg/L	0.3	0.01	-	0.167	< 0.010	-	< 0.010	-	-	< 0.010	<0.010	-	<0.010	-
Lead	mg/L	0.01	0.002	-	< 0.002	< 0.002	-	< 0.002	-	-	< 0.002	< 0.002	-	< 0.002	-
Manganese	mg/L	0.05	0.002	-	0.019	< 0.002	-	< 0.002	-	-	0.004	0.003	-	< 0.002	-
Mercury	mg/L	0.001	0.0001	-	< 0.0001	< 0.0001	-	< 0.0001	-	-	< 0.0001	< 0.0001	-	< 0.0001	-
Molybdenum	mg/L	-	0.002	-	<0.002	< 0.002	-	<0.002	-	-	< 0.002	<0.002	-	<0.002	-
Nickel	mg/L	-	0.003	-	< 0.003	< 0.003	-	0.004	-	-	< 0.003	< 0.003	-	< 0.003	-
Selenium	mg/L	0.01	0.004	-	< 0.004	< 0.004	-	< 0.004	-	-	< 0.004	< 0.004	-	< 0.004	-
Silver	mg/L	-	0.002	-	< 0.002	< 0.002	-	< 0.002	-	-	< 0.002	<0.002	-	< 0.002	-
Strontium	mg/L	-	0.005	-	0.588	0.087	-	0.128	-	-	0.122	0.134	-	0.078	-
Thallium	mg/L	-	0.006	-	< 0.006	< 0.006	-	< 0.006	-	-	< 0.006	< 0.006	-	< 0.006	-
Tin	mg/L		0.002	-	< 0.002	< 0.002	-	< 0.002	-	-	< 0.002	< 0.002	-	< 0.002	-
Titanium	mg/L	-	0.002	-	< 0.002	< 0.002	-	<0.002	-	-	< 0.002	<0.002	-	<0.002	-
Tungsten	mg/L	-	0.01	-	<0.010	<0.010	-	<0.010	-	-	<0.010	<0.010	-	<0.010	-
Uranium	mg/L	0.02	0.002	-	< 0.002	< 0.002	-	< 0.002	-	-	< 0.002	< 0.002	-	< 0.002	-
Vanadium	mg/L	-	0.002	-	< 0.002	< 0.002	-	<0.002	-	-	< 0.002	<0.002	-	<0.002	-
Zinc	ma/L	5	0.005	-	0.034	0.012	-	0.010	-	-	0.010	0.009	-	0.011	-
Zirconium	mg/L	-	0.000	-	< 0.004	< 0.004	-	< 0.004	-	-	< 0.004	< 0.003	-	< 0.004	-
								1.09			2.23	1.18			

RDL = Reportable Detection Limit

-' = No value available



			Well ID		TW3		T	N4
		S	ample Date	03/08/2016	03/10/2017	05/02/2017	03/10/2017	05/02/201
			sample ID	7430216	8245003	8358386	8245009	8358387
Sample Parameter	Unit	ODWS Criteria	RDL					
Electrical Conductivity	uS/cm		2	-	802	-	558	-
ρΗ	pH Units	6.5 - 8.5	NA	-	8.14	-	8.10	-
Saturation pH				-	6.83	-	6.99	-
Langelier Index				-	1.31	-	1.11	-
Total Hardness (as CaCO3)	mg/L	80-100	0.5	-	433	-	275	-
Total Dissolved Solids	mg/L	500	20	-	484	-	284	-
Alkalinity (as CaCO3)	mg/L	30-500	5	-	248	-	250	-
Bicarbonate (as CaCO3)	mg/L	-	5	-	248	-	250	-
Carbonate (as CaCO3)	mg/L	-	5	-	<5	-	<5	-
Hydroxide (as CaCO3)	mg/L	-	5	-	<5	-	<5	-
Fluoride	mg/L	1.5	0.1	-	0.1	-	< 0.05	-
Chloride	mg/L	250	0.2	-	3.41	-	12.60	-
Nitrate as N	mg/L	10	0.1	0.54	0.62	0.58	3.43	3.22
Nitrite as N	mg/L	1	0.1	-	< 0.05	< 0.05	< 0.05	< 0.05
Bromide	mg/L	-	0.1	-	< 0.05	-	<0.05	-
Sulphate	mg/L	500	0.2	-	193.0	-	18.9	-
Ortho Phosphate as P	mg/L	-	0.2	-	<0.10	-	<0.10	-
Reactive Silica	mg/L	-	0.05	-	10.70	-	7.28	-
Ammonia as N	mg/L	-	0.02	-	0.14	-	< 0.02	-
Total Phosphorus	mg/L	-	0.05	-	< 0.05	-	<0.05	-
Total Organic Carbon	mg/L		0.5	-	0.7	-	1.2	-
Colour	TCU	5	5	-	<5	-	<5	-
Turbidity	NTU	5	0.5	-	15.3	-	0.6	-
Calcium	mg/L	-	0.05	-	122.0	-	74.1	-
Vagnesium	mg/L	-	0.05	-	31.1	-	21.8	-
Sodium	mg/L	200	0.05	-	3.42	-	5.36	-
Potassium	mg/L	-	0.05	-	1.28	-	1.01	-
Aluminum	mg/L	0.1	0.004	-	0.008	-	0.011	-
Antimony	mg/L	0.006	0.003	-	< 0.003	-	< 0.003	-
Arsenic	mg/L	0.025	0.003	-	<0.003	-	< 0.003	-
Barium	mg/L	1	0.002		0.045		0.053	-
Beryllium	mg/L	-	0.002	-	<0.001	-	< 0.001	-
Boron	mg/L	5	0.001	-	0.020	-	<0.001	-
Cadmium	mg/L	0.005	0.001	-	<0.001	-	<0.001	-
Chromium	mg/L	0.05	0.003	-	< 0.003	-	< 0.003	-
Cobalt	mg/L	-	0.003	-	<0.003	-	<0.003	-
Copper	mg/L	1	0.003	-	< 0.003	-	< 0.003	-
Iron	mg/L	0.3	0.003	-	0.032		<0.003	
Lead	mg/L	0.01	0.002		< 0.032	-	<0.002	
Vanganese	mg/L	0.05	0.002	-	0.002		<0.002	
Variganese	mg/L	0.001	0.002	-	< 0.0001	-	<0.002	-
Volybdenum	mg/L	-	0.0001	-	0.002	-	< 0.0001	
Nickel	mg/L		0.002	-	< 0.002	-	<0.002	-
Selenium	mg/L	0.01	0.003		< 0.003	-	< 0.003	-
Silver	mg/L	-	0.004	-	<0.004		<0.004	
Strontium	mg/L	-	0.002		0.916	-	0.121	
Thallium	mg/L	-	0.005		< 0.006	-	< 0.006	-
Tin	mg/L	-	0.008		< 0.008	-	< 0.008	-
Titanium	mg/L		0.002	-	0.002	-	<0.002	-
Tungsten	mg/L mg/L	-	0.002	-	<0.003	-	<0.002	-
Jranium		0.02	0.001	-	<0.010	-	<0.010	-
	mg/L	0.02	0.002		<0.002	-	<0.002	-
Vanadium Zinc	mg/L	- 5		-		-		-
	mg/L		0.005		0.032	-	0.013	-
Zirconium	mg/L	-	0.004	-	< 0.004	-	<0.004 2.07	-
% Difference/ Ion Balance	%	-	NA	-	1.57	-	2.07	

RDL = Reportable Detection Limit

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			Well ID					T١	N5				
			ample Date	04/07/2015	06/29/2015	09/17/2015	11/26/2015	03/08/2016	06/02/2016	09/15/2016	12/13/2016	03/10/2017	05/02/2017
			sample ID	6430199	6701614	6988482	7237247	7430208	7607719	7853172	8091594	8245015	8358388
Sample Parameter	Unit	ODWS Criteria	RDL										
Electrical Conductivity	uS/cm		2	592	-	655	-	-	606	667	-	604	-
эH	pH Units	6.5 - 8.5	NA	7.90	-	8.12	-	-	8.10	8.08	-	8.12	-
Saturation pH				7.02	-	7.01	-	-	6.99	7.04	-	7.00	-
angelier Index				0.88	-	1.11	-	-	1.11	1.04	-	1.12	-
Total Hardness (as CaCO3)	mg/L	80-100	0.5	285	-	301	-	-	298	280	-	288	-
otal Dissolved Solids	mg/L	500	20	302	-	368	-	-	326	358	-	306	-
Alkalinity (as CaCO3)	mg/L	30-500	5	244	-	234	-	-	251	237	-	249	-
Bicarbonate (as CaCO3)	mg/L	-	5	244	-	234	-	-	251	237	-	249	-
Carbonate (as CaCO3)	mg/L	-	5	<5	-	<5	-	-	<5	<5	-	<5	-
lydroxide (as CaCO3)	mg/L	-	5	<5	-	<5	-	-	<5	<5	-	<5	-
luoride	mg/L	1.5	0.1	< 0.05	-	<0.25	-	-	<0.10	<0.10	-	< 0.05	-
Chloride	mg/L	250	0.2	19.80	-	37.90	-	-	24.3	41.20	-	20.20	
litrate as N	mg/L	10	0.1	6.31	8.28	7.77	7.09	7.80	6.72	7.18	6.34	6.76	7.99
litrite as N	mg/L	1	0.1	< 0.05	-	<0.25	-	-	<0.10	<0.10	-	< 0.05	< 0.05
Bromide	mg/L	-	0.1	< 0.05	-	<0.25	-	-	<0.10	<0.10	-	< 0.05	-
Sulphate	mg/L	500	0.2	14.5	-	22.8	-	-	16.8	20.1	-	14.1	-
Ortho Phosphate as P	mg/L	-	0.2	<0.10	-	< 0.50	-	-	<0.20	<0.20	-	<0.10	-
Reactive Silica	mg/L	-	0.05	6.79	-	7.42	-	-	7.49	7.43	-	7.03	-
Ammonia as N	mg/L	-	0.02	< 0.02	-	< 0.02	-	-	< 0.02	< 0.02	-	< 0.02	-
otal Phosphorus	mg/L	-	0.05	< 0.05	-	< 0.05	-	-	< 0.05	< 0.05	-	< 0.05	-
otal Organic Carbon	mg/L	-	0.5	0.6	-	1.0	-	-	<0.5	0.6	-	0.7	-
olour	TČU	5	5	<5	-	<5	-	-	<5	<5	-	<5	-
urbidity	NTU	5	0.5	1.5	-	8.2	-	-	2.5	1.7	-	1.9	-
alcium	mg/L	-	0.05	80.2	-	83.4	-	-	81.5	76.6	-	79.3	-
lagnesium	mg/L	-	0.05	20.5	-	22.6	-	-	23.0	21.6	-	21.9	-
Sodium	mg/L	200	0.05	7.24	-	15.80	-	-	9.66	16.00	-	8.93	-
Potassium	mg/L	-	0.05	1.02	-	1.13	-	-	0.91	0.90	-	0.91	-
Aluminum	mg/L	0.1	0.004	< 0.004		< 0.004		-	0.006	0.010		0.013	-
Antimony	mg/L	0.006	0.003	<0.003	-	< 0.003		-	< 0.003	< 0.003		< 0.003	-
Arsenic	mg/L	0.025	0.003	< 0.003	-	< 0.003		-	< 0.003	< 0.003	-	< 0.003	-
Barium	mg/L	1	0.002	0.110	-	0.110		-	0.112	0.112	-	0.110	-
Beryllium	mg/L		0.001	<0.001		< 0.001			< 0.001	< 0.001		< 0.001	
Boron	mg/L	5	0.001	0.011	-	<0.001	-	-	0.011	< 0.010		<0.001	-
Cadmium	mg/L	0.005	0.001	<0.001	-	<0.001	-	-	< 0.001	<0.001		<0.010	-
Chromium	mg/L	0.005	0.003	0.004	-	<0.001		-	< 0.003	< 0.003		<0.001	-
Cobalt	mg/L	-	0.003	< 0.004	-	<0.003		-	<0.003	<0.003		<0.003	-
Copper	mg/L	1	0.003	<0.001	-	<0.001	-	-	< 0.003	< 0.003		<0.001	-
oppei	mg/L	0.3	0.003	<0.003	-	<0.003	-	-	<0.003	<0.003	-	<0.003	-
ead	mg/L	0.01	0.002	<0.010	-	<0.010	-		<0.010	<0.010		<0.010	
	mg/L	0.01	0.002	<0.002	-	< 0.002	-	-	<0.002	<0.002		<0.002	
langanese lercury	mg/L	0.001	0.002	<0.002		<0.002	-		<0.002	<0.002		<0.002	-
folybdenum	mg/L	0.001	0.0001	<0.0001	-	<0.0001	-		<0.0001	<0.0001		<0.0001	-
lickel	mg/L mg/L		0.002	<0.002	-	<0.002		-	<0.002	<0.002	-	<0.002	-
		0.01	0.003	<0.003	-	< 0.004	-		<0.003	< 0.003	-	<0.003	
elenium	mg/L	0.01	0.004	<0.004	-	<0.004	-	-	<0.004	<0.004		<0.004	-
liver	mg/L												
trontium	mg/L	-	0.005	0.154	-	0.184	-	-	0.153	0.155		0.162	-
hallium	mg/L		0.006	< 0.006		< 0.006			< 0.006	< 0.006		<0.006	
ïn	mg/L	-	0.002	< 0.002	-	< 0.002	-	-	< 0.002	< 0.002	-	< 0.002	-
itanium	mg/L	-	0.002	< 0.002	-	< 0.002	-	-	< 0.002	< 0.002	-	< 0.002	-
ungsten	mg/L	-	0.01	<0.010	-	<0.010	-	-	<0.010	<0.010	-	<0.010	-
Jranium	mg/L	0.02	0.002	< 0.002	-	< 0.002	-	-	< 0.002	< 0.002	-	< 0.002	-
anadium	mg/L	-	0.002	<0.002	-	< 0.002	-	-	<0.002	<0.002	-	<0.002	-
linc	mg/L	5	0.005	0.019	-	0.018	-	-	0.026	0.016	-	0.024	-
lirconium	mg/L	-	0.004	< 0.004	-	< 0.004	-	-	< 0.004	< 0.004	-	<0.004	-
6 Difference/ Ion Balance	%	-	NA	1.30	-	0.30	-	-	1.02	3.91	-	1.24	-

RDL = Reportable Detection Limit

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			Well ID				TW6			
		Sa	ample Date	04/07/2015	06/29/2015	11/26/2015	04/01/2016	04/02/2016	03/10/2017	05/02/201
			sample ID	6430206	6701612	7237256	7471115	7471117	8245021	8358389
Sample Parameter	Unit	ODWS Criteria	RDL							
Electrical Conductivity	uS/cm		2	602	-	-	-	-	612	-
н	pH Units	6.5 - 8.5	NA	8.14	-	-	-	-	8.10	-
Saturation pH				7.02	-	-	-	-	7.01	-
angelier Index				1.12	-	-	-	-	1.09	-
Fotal Hardness (as CaCO3)	mg/L	80-100	0.5	283	-	-	-	-	288	-
Total Dissolved Solids	mg/L	500	20	314	-	-	-	-	308	-
Alkalinity (as CaCO3)	mg/L	30-500	5	245	-	-	-	-	245	-
Bicarbonate (as CaCO3)	mg/L	-	5	245	-	-	-	-	245	-
Carbonate (as CaCO3)	mg/L	-	5	<5	-	-	-	-	<5	-
Hydroxide (as CaCO3)	mg/L	-	5	<5	-	-	-	-	<5	-
Fluoride	mg/L	1.5	0.1	<0.05	-	-	-	-	<0.05	-
Chloride	mg/L	250	0.2	24.3	-	-	-	-	21.80	-
Nitrate as N	mg/L	10	0.1	7.80	8.20	7.30	7.89	8.23	8.52	9.08
Nitrite as N	mg/L	1	0.1	< 0.05	-	-	-	-	< 0.05	<0.10
Bromide	mg/L	-	0.1	<0.05	-	-	-	-	< 0.05	-
Sulphate	mg/L	500	0.2	15.3	-	-	-	-	13.5	-
Ortho Phosphate as P	mg/L		0.2	<0.10	-	-	-	-	<0.10	-
Reactive Silica	mg/L	-	0.05	6.87	-	-	-	-	7.01	-
Ammonia as N	mg/L		0.02	<0.02	-	-	-	-	<0.02	-
Fotal Phosphorus	mg/L	-	0.05	< 0.05	-	-	-	-	< 0.05	-
Fotal Organic Carbon	mg/L	-	0.5	0.6	-	-	-	-	0.7	-
Colour	TCU	5	5	<5	-	-	-	-	<5	-
Furbidity	NTU	5	0.5	6.8	-	-	-	-	<0.5	-
Calcium	mg/L	•	0.05	79.7	-	-	-	-	79.9	-
Magnesium	mg/L	-	0.05	20.3	-	-	-	-	21.6	-
Sodium	mg/L	200	0.05	8.54	-	-	-	-	8.87	-
Potassium	mg/L	-	0.05	0.98	-	-	-	-	0.86	-
Aluminum	mg/L	0.1	0.004	< 0.004	-	-	-	-	0.006	-
Antimony	mg/L	0.006	0.003	< 0.003	-	-	-	-	< 0.003	-
Arsenic	mg/L	0.025	0.003	< 0.003	-	-	-	-	< 0.003	-
Barium	mg/L	1	0.002	0.088	-	-	-	-	0.105	-
Beryllium	mg/L	-	0.001	<0.001	-	-	-	-	< 0.001	-
Boron	mg/L	5	0.01	<0.010	-	-	-	-	<0.010	-
Cadmium	mg/L	0.005	0.001	<0.001	-	-	-	-	< 0.001	-
Chromium	mg/L	0.05	0.003	0.008	-	-	-	-	< 0.003	-
Cobalt	mg/L	-	0.001	<0.001	-	-	-	-	< 0.001	-
Copper	mg/L	1	0.003	< 0.003	-	-	-	-	< 0.003	-
ron	mg/L	0.3	0.01	<0.010	-	-	-	-	<0.010	-
_ead	mg/L	0.01	0.002	<0.002	-	-	-	-	< 0.002	-
Vanganese	mg/L	0.05	0.002	<0.002	-	-	-	-	< 0.002	-
Mercury	mg/L	0.001	0.0001	<0.0001	-	-	-	-	<0.0001	-
Molybdenum	mg/L		0.002	<0.002	-	-	-	-	< 0.002	-
Nickel	mg/L	-	0.003	< 0.003	-	-	-	-	< 0.003	-
Selenium	mg/L	0.01	0.004	< 0.004	-	-	-	-	< 0.004	-
Silver	mg/L	-	0.002	<0.002	-	-	-	-	< 0.002	-
Strontium	mg/L		0.005	0.139	-	-	-	-	0.156	-
Thallium	mg/L	-	0.006	<0.006	-	-	-	-	< 0.006	-
<b>Fin</b>	mg/L	-	0.002	<0.002	-	-	-	-	< 0.002	-
litanium	mg/L	-	0.002	< 0.002	-	-	-	-	< 0.002	-
Fungsten	mg/L	-	0.01	<0.010	-	-	-	-	<0.010	-
Jranium	mg/L	0.02	0.002	< 0.002	-	-	-	-	< 0.002	-
/anadium	mg/L	-	0.002	0.003	-	-	-	-	< 0.002	-
Zinc	mg/L	5	0.005	0.014	-	-	-	-	0.017	-
Zirconium	mg/L	-	0.004	< 0.004	-	-	-	-	< 0.004	-
% Difference/ Ion Balance	%	-	NA	3.3					1.84	

RDL = Reportable Detection Limit

-' = No value available



			Well ID				тν	V7			
		Sa	ample Date	02/19/2016	02/19/2016	03/08/2016	06/02/2016	09/15/2016	12/13/2016	03/10/2017	05/02/2017
			sample ID	7395659	7395664	7430212	7607713	7853182	8091592	8245027	8358390
Sample Parameter	Unit	ODWS Criteria	RDL								
Electrical Conductivity	uS/cm		2	587	-	-	585	606	-	592	-
pН	pH Units	6.5 - 8.5	NA	7.88	-	-	8.07	8.14	-	8.11	-
Saturation pH				6.99	-	-	6.96	7.01	-	6.98	-
Langelier Index				0.89	-	-	1.11	1.13	-	1.13	-
Total Hardness (as CaCO3)	mg/L	80-100	0.5	280	-	-	303	284	-	291	-
Total Dissolved Solids	mg/L	500	20	354	-	-	326	334	-	306	-
Alkalinity (as CaCO3)	mg/L	30-500	5	262	-	-	261	247	-	260	-
Bicarbonate (as CaCO3)	mg/L	-	5	262	-	-	261	247	-	260	-
Carbonate (as CaCO3)	mg/L	-	5	<5	-	-	<5	<5	-	<5	-
Hydroxide (as CaCO3)	mg/L	-	5	<5	-	-	<5	<5	-	<5	-
Fluoride	mg/L	1.5	0.1	<0.25	-	-	<0.10	<0.10	-	< 0.05	-
Chloride	mg/L	250	0.2	18.3	-	-	15.2	17.4	-	12.5	-
Nitrate as N	mg/L	10	0.1	8.52	8.00	7.27	6.32	6.97	5.96	5.77	6.87
Nitrite as N	mg/L	1	0.1	<0.25	-	-	<0.10	<0.10	-	< 0.05	<0.05
Bromide	mg/L	-	0.1	<0.25	-	-	<0.10	<0.10	-	< 0.05	-
Sulphate	mg/L	500	0.2	20.6	-	-	16.4	18.5	-	14.4	-
Ortho Phosphate as P	mg/L	-	0.2	< 0.50	-	-	<0.20	<0.20	-	<0.10	-
Reactive Silica	mg/L	-	0.05	7.03	-	-	7.14	7.12	-	6.72	-
Ammonia as N	mg/L	-	0.02	0.1	-	-	< 0.02	< 0.02	-	0.03	-
Total Phosphorus	mg/L	-	0.05	< 0.05	-	-	< 0.05	< 0.05	-	< 0.05	-
Total Organic Carbon	mg/L	-	0.5	0.6	-	-	0.5	1.0	-	0.6	-
Colour	TCU	5	5	<5	-	-	<5	<5	-	<5	-
Turbidity	NTU	5	0.5	3.9	-	-	3.7	4.8	-	1.8	-
Calcium	mg/L	-	0.05	77.2	-	-	83.2	77.5	-	80.0	-
Magnesium	mg/L	-	0.05	21.2	-	-	23.1	21.9	-	22.2	-
Sodium	mg/L	200	0.05	5.60		-	5.15	6.44		4.86	-
Potassium	mg/L	-	0.05	1.00	-	-	0.89	0.87	-	0.92	-
Aluminum	mg/L	0.1	0.004	< 0.004			0.009	0.012		0.009	
Antimony	mg/L	0.006	0.003	< 0.003	-	-	< 0.003	< 0.003	-	< 0.003	-
Arsenic	mg/L	0.025	0.003	<0.003		-	< 0.003	< 0.003		< 0.003	-
Barium	mg/L	1	0.002	0.093		-	0.101	0.099		0.109	-
Beryllium	mg/L	-	0.002	< 0.001		-	<0.001	< 0.001	-	< 0.001	-
Boron	mg/L	5	0.001	<0.001	-	-	0.012	<0.010	-	0.010	-
Cadmium	mg/L	0.005	0.001	<0.001		-	<0.0012	<0.001	-	< 0.001	
Chromium	mg/L	0.005	0.001	< 0.003			<0.001	<0.001		< 0.001	
Cobalt	mg/L	-	0.003	<0.003	-	-	<0.003	<0.003	-	< 0.003	-
		1	0.001	< 0.003			<0.001	<0.001		< 0.001	
Copper	mg/L mg/L	0.3	0.003	<0.003	-	-	<0.003	<0.003	-	<0.003	-
Iron Lead	mg/L	0.01	0.001	<0.010		-	<0.010	<0.010		<0.010	
Lead Manganese	mg/L mg/L	0.01	0.002	<0.002	-	-	<0.002	<0.002	-	<0.002	-
	U U	0.001	0.002	<0.002	-	-	<0.002	<0.002	-	<0.002	-
Mercury	mg/L		0.0001	< 0.0001		-	<0.0001	<0.0001		< 0.0001	
Molybdenum	mg/L	-	0.002	<0.002	-	-	<0.002	<0.002	-	< 0.002	-
Nickel	mg/L	- 0.01	0.003	<0.003	-	-	<0.003	<0.003	-	< 0.003	
Selenium	mg/L	-	0.004	<0.004	-	-	<0.004	<0.004	-	<0.004	-
Silver	mg/L										
Strontium	mg/L	-	0.005	0.106	-	-	0.132	0.124	-	0.136	-
Thallium	mg/L	-	0.006	< 0.006	-	-	< 0.006	< 0.006	-	< 0.006	-
Tin	mg/L	-	0.002	< 0.002	-	-	< 0.002	< 0.002	-	< 0.002	-
Titanium	mg/L	-	0.002	<0.002	-	-	<0.002	< 0.002	-	< 0.002	-
Tungsten	mg/L	-	0.01	<0.010	-	-	<0.010	< 0.010	-	< 0.010	-
Uranium	mg/L	0.02	0.002	< 0.002	-	-	< 0.002	< 0.002	-	< 0.002	-
Vanadium	mg/L	-	0.002	<0.002	-	-	< 0.002	<0.002	-	< 0.002	-
Zinc	mg/L	5	0.005	0.017	-	-	0.035	0.020	-	0.029	-
Zirconium	mg/L	-	0.004	< 0.004	-	-	< 0.004	< 0.004	-	< 0.004	-
% Difference/ Ion Balance	%	-	NA	7.26	-	-	1.11	2.78	-	1.69	-

% Difference/ Ion Balance %
Notes:
ODWS = Ontario Drinking Water Standards

RDL = Reportable Detection Limit

-' = No value available



			Well ID				т	V8			
		Sa	ample Date	02/23/2016	02/23/2016	03/07/2016	06/02/2016	09/15/2016	12/13/2016	03/10/2017	05/02/2017
		Lab	sample ID	7401690	7401689	7426611	7607726	7853189	8091595	8245033	8358391
Sample Parameter	Unit	ODWS Criteria	RDL		•						
Electrical Conductivity	uS/cm		2	606	-	-	627	598	-	604	-
ρΗ	pH Units	6.5 - 8.5	NA	8.02	-	-	8.17	8.08	-	8.12	-
Saturation pH				6.96	-	-	6.95	7.01	-	6.98	-
Langelier Index				1.06	-	-	1.22	1.07	-	1.14	-
Total Hardness (as CaCO3)	mg/L	80-100	0.5	315	-	-	324	296	-	301	-
Total Dissolved Solids	mg/L	500	20	368	-	-	358	364	-	312	-
Alkalinity (as CaCO3)	mg/L	30-500	5	254	-	-	251	238	-	251	-
Bicarbonate (as CaCO3)	mg/L	-	5	254	-	-	251	238	-	251	-
Carbonate (as CaCO3)	mg/L	-	5	<5	-	-	<5	<5	-	<5	-
Hydroxide (as CaCO3)	mg/L	-	5	<5	-	-	<5	<5	-	<5	-
Fluoride	mg/L	1.5	0.1	<0.25	-	-	<0.10	<0.10	-	<0.05	-
Chloride	mg/L	250	0.2	10.4	-	-	11.0	9.46		9.54	-
Nitrate as N	mg/L	10	0.1	8.25	7.93	7.76	5.35	7.85	7.41	6.68	5.15
Nitrite as N	mg/L	1	0.1	<0.25	-	-	<0.10	<0.10	-	< 0.05	< 0.05
Bromide	mg/L	-	0.1	<0.25	-	-	<0.10	<0.10	-	<0.05	-
Sulphate	mg/L	500	0.2	49.1	-	-	58.0	43.5	-	31.1	-
Ortho Phosphate as P	mg/L	-	0.2	<0.50	-	-	<0.20	<0.20	-	<0.10	-
Reactive Silica	mg/L	-	0.05	7.60	-	-	7.75	7.49	-	7.18	-
Ammonia as N	mg/L	-	0.02	<0.02		-	<0.02	<0.02	-	0.15	-
Total Phosphorus	mg/L	-	0.02	<0.02	-	-	0.05	0.06	-	0.08	-
Total Organic Carbon	mg/L	-	0.5	0.6	-		0.7	1.5	-	1.1	-
Colour	TCU	5	5	<5	-	-	<5	<5	-	<5	-
Furbidity	NTU	5	0.5	21.1		-	53.6	113	-	113	-
Calcium	mg/L	-	0.05	85.6	-	-	88.3	80.6	-	81.6	-
Magnesium	mg/L		0.05	24.7			25.1	22.9		23.6	
Sodium	mg/L	200	0.05	4.69	-	-	4.72	3.22	-	3.67	-
Potassium	mg/L	-	0.05	1.30		-	1.34	1.17	-	1.12	-
Aluminum	mg/L	0.1	0.004	< 0.004	-	-	0.011	0.011	-	< 0.004	-
Antimony	mg/L	0.006	0.004	<0.004	-	-	< 0.003	< 0.003	-	< 0.003	-
Arsenic	mg/L	0.025	0.003	<0.003	-	-	< 0.003	0.003	-	< 0.003	-
Barium	mg/L	1	0.003	0.110	-	-	0.087	0.085	-	0.099	-
Beryllium	mg/L	-	0.002	<0.001	-	-	< 0.001	< 0.003	-	< 0.000	-
Boron	mg/L	5	0.001	0.013	-	-	0.025	0.022		0.011	
Cadmium	mg/L	0.005	0.001	<0.013	-	-	<0.025	<0.022	-	< 0.001	-
Chromium	Ŭ	0.005	0.001	< 0.001	-		<0.001	< 0.003	-	< 0.003	
	mg/L	0.05	0.003	<0.003	-	-	<0.003	<0.003	-	<0.003	-
Cobalt	mg/L mg/L	- 1	0.001	<0.001		-	<0.001	<0.001	-	< 0.001	-
Copper	mg/L	0.3	0.003	<0.003	-	-	<0.003	<0.003	-	<0.003	-
ron		0.01	0.002	<0.002			<0.002	<0.002		< 0.002	
Lead	mg/L mg/L	0.01	0.002	<0.002	-	-	<0.002	<0.002	-	<0.002	
Manganese		0.05	0.002	<0.007	-		<0.005	<0.005		<0.002	-
Mercury	mg/L	0.001	0.0001	<0.0001	-	-	<0.0001		-	<0.0001	-
Molybdenum	mg/L	-	0.002	<0.002	-	-	<0.002	<0.002	-	<0.002	
Nickel	mg/L					-			-		
Selenium	mg/L	0.01	0.004	< 0.004	-	-	< 0.004	< 0.004		< 0.004	-
Silver	mg/L		0.002	< 0.002			< 0.002	< 0.002		< 0.002	
Strontium	mg/L	-	0.005	0.44	-	-	1.42	1.66	-	0.55	
Fhallium	mg/L		0.006	< 0.006				< 0.006		< 0.006	
Tin Tito a live	mg/L	-	0.002	< 0.002	-	-	< 0.002	< 0.002	-	< 0.002	-
Titanium	mg/L	-	0.002	< 0.002			< 0.002	< 0.002	-	< 0.002	
Tungsten	mg/L	-	0.01	< 0.010	-	-	<0.010	< 0.010	-	< 0.010	-
Jranium	mg/L	0.02	0.002	< 0.002	-	-	< 0.002	< 0.002	-	< 0.002	-
Vanadium	mg/L	-	0.002	<0.002	-	-	< 0.002	<0.002	-	<0.002	-
Zinc	mg/L	5	0.005	0.016	-	-	0.023	0.024	-	0.017	-
Zirconium	mg/L										-

RDL = Reportable Detection Limit

-' = No value available



			Well ID				TW9					TW10	
		Sa	ample Date	02/26/2016	02/26/2016	03/08/2016	06/02/2016	09/15/2016	12/13/2016	03/10/2017	03/10/2017	02/25/2016	05/02/2017
			sample ID	7410959	7410958	7430214	7607733	7853195	8091593	8245039	8245045	7408001	8358393
Sample Parameter	Unit	ODWS Criteria	RDL										
Electrical Conductivity	uS/cm		2	610	-	-	601	594	-	620	430	-	-
pH	pH Units	6.5 - 8.5	NA	8.02	-	-	8.10	8.15	-	8.10	8.06	-	-
Saturation pH	-			6.94	-	-	6.95	7.00	-	6.90	7.26	-	-
Langelier Index		00.400	0.5	1.08	-	-	1.15	1.15	-	1.20	0.80	-	-
Total Hardness (as CaCO3)	mg/L	80-100 500	0.5	310 332		-	314 334	289 332		310	202 216	-	-
Total Dissolved Solids Alkalinity (as CaCO3)	mg/L mg/L	30-500	20 5	265	-	-	257	249	-	326 294	182	-	-
Bicarbonate (as CaCO3)	mg/L	-	5	265			257	249	-	294	182	-	-
Carbonate (as CaCO3)	mg/L	-	5	<5	-	-	<5	<5	-	<5	<5	-	-
Hydroxide (as CaCO3)	mg/L	-	5	<5	-	-	<5	<5	-	<5	<5	-	-
Fluoride	mg/L	1.5	0.1	<0.05	-	-	<0.10	<0.05	-	<0.05	<0.05	-	-
Chloride	mg/L	250	0.2	9.37	-	-	9.32	9.76	-	8.84	14.40	-	-
Nitrate as N	mg/L	10	0.1	3.26	3.65	3.41	2.99	2.17	1.51	2.68	1.68	2.41	0.85
Nitrite as N	mg/L	10	0.1	< 0.05	-	-	<0.10	< 0.05	-	< 0.05	< 0.05	-	< 0.05
Bromide	mg/L	-	0.1	< 0.05	-	-	<0.10	< 0.05	-	< 0.05	< 0.05	-	-
Sulphate	mg/L	500	0.2	50.0	-	-	50.5	45.3	-	50.1	14.3	-	-
Ortho Phosphate as P	mg/L	-	0.2	<0.10	-	-	<0.20	<0.10	-	<0.10	<0.10	-	-
Reactive Silica	mg/L	-	0.05	8.72	-	-	8.60	8.77	-	8.42	4.56	-	-
Ammonia as N	mg/L	-	0.02	< 0.02	-	-	< 0.02	< 0.02	-	0.09	0.03	-	-
Total Phosphorus	mg/L	-	0.05	< 0.05	-	-	< 0.05	< 0.05	-	< 0.05	0.06	-	-
Total Organic Carbon	mg/L	-	0.5	0.6	-	-	0.6	0.9	-	0.8	2.1	-	-
Colour	TCU	5	5	<5	-	-	<5	<5	-	<5	<5	-	-
Turbidity	NTU	5	0.5	10.4	-	-	3.5	2.4	-	2.0	64.8	-	-
Calcium	mg/L	-	0.05	82.4	-	-	82.5	76.2	-	81.5	54.3	-	-
Magnesium	mg/L	-	0.05	25.4	-	-	26.2	23.9	-	25.8	16.2	-	-
Sodium	mg/L	200	0.05	3.99	-	-	3.91	4.03	-	4.17	5.76	-	-
Potassium	mg/L	-	0.05	1.19	-	-	0.98	0.89	-	0.99	1.21	-	-
Aluminum	mg/L	0.1	0.004	< 0.004	-	-	< 0.004	0.01	-	0.009	0.014	-	-
Antimony	mg/L	0.006	0.003	<0.003	-	-	<0.003	< 0.003	-	< 0.003	<0.003	-	-
Arsenic	mg/L	0.025	0.003	< 0.003	-	-	< 0.003	< 0.003	-	< 0.003	< 0.003	-	-
Barium	mg/L	1	0.002	0.070	-	-	0.069	0.074	-	0.074	0.036	-	-
Beryllium	mg/L	-	0.001	< 0.001	-	-	< 0.001	< 0.001	-	< 0.001	<0.001	-	-
Boron	mg/L	5	0.01	0.014	-	-	0.013	0.010	-	0.012	< 0.010	-	-
Cadmium	mg/L	0.005	0.001	<0.001	-	-	< 0.001	< 0.001	-	< 0.001	< 0.001	-	-
Chromium	mg/L	0.05	0.003	0.005	-	-	< 0.003	< 0.003	-	< 0.003	< 0.003	-	-
Cobalt	mg/L	-	0.001	< 0.001	-	-	<0.001 <0.003	<0.001	-	< 0.001	<0.001	-	-
Copper	mg/L	1 0.3	0.003	<0.003 < 0.010	-	-	<0.003	<0.003	-	<0.003 <0.010	<0.003 <0.010	-	-
Iron	mg/L	0.01	0.002	< 0.010	-		<0.010	<0.010	-	<0.010	<0.010	-	-
Lead	mg/L mg/L	0.01	0.002	<0.002	-	-	<0.002	<0.002	-	<0.002	0.002	-	-
Manganese Mercury	mg/L	0.001	0.002	<0.002			<0.002	<0.002		<0.002	<0.009		-
Molybdenum	mg/L	-	0.0001	<0.0001			< 0.0001	< 0.0001		< 0.0001	<0.0001		-
Nickel	mg/L	-	0.002	<0.002	-	-	<0.002	< 0.002	-	<0.002	<0.002	-	
Selenium	mg/L	0.01	0.003	< 0.003	-		<0.003	< 0.003	-	< 0.003	< 0.003	-	
Silver	mg/L	-	0.004	<0.004	-	-	<0.004	<0.004	-	<0.004	<0.004	-	-
Strontium	mg/L	-	0.002	0.320	-	-	0.296	0.279	-	0.339	0.083	-	-
Thallium	mg/L	-	0.006	< 0.006	-	-	< 0.006	< 0.006	-	< 0.006	< 0.006	-	-
Tin	mg/L	-	0.002	< 0.002	-	-	< 0.002	< 0.002	-	< 0.002	< 0.002	-	-
Titanium	mg/L	-	0.002	< 0.002	-	-	< 0.002	< 0.002	-	< 0.002	< 0.002	-	-
Tungsten	mg/L	-	0.01	<0.010	-	-	< 0.010	<0.010	-	<0.010	< 0.010	-	-
Uranium	mg/L	0.02	0.002	< 0.002	-	-	< 0.002	< 0.002	-	< 0.002	< 0.002	-	-
Vanadium	mg/L	-	0.002	< 0.002	-	-	< 0.002	< 0.002	-	< 0.002	< 0.002	-	-
Zinc	mg/L	5	0.005	0.022	-	-	0.031	0.028	-	0.037	0.016	-	-
Zirconium	mg/L	-	0.004	< 0.004	-	-	< 0.004	< 0.004	-	< 0.004	< 0.004	-	-
% Difference/ Ion Balance	%	-	NA	3.26	-	-	1.52	3.13	-	6.98	1.56	-	-

RDL = Reportable Detection Limit

-' = No value available



			Well ID					ти	/11				
			ample Date		02/29/2016	03/30/2016	03/07/2016	03/31/2016	06/02/2016	09/15/2016	12/13/2016	03/10/2017	05/02/2017
			sample ID	7413129	7413121	7471112	7426610	7471114	7607739	7853203	8091596	8245052	8358394
Sample Parameter	Unit	ODWS Criteria	RDL										
Electrical Conductivity	uS/cm		2	607	-	-	-	-	572	589	-	568	-
H	pH Units	6.5 - 8.5	NA	8.00	-	-	-	-	8.08	8.20	-	8.16	-
Saturation pH	_			6.95	-	-	-	-	6.95	6.99	-	6.99	-
angelier Index				1.05	-	-	-	-	1.13	1.21	-	1.17	-
otal Hardness (as CaCO3)	mg/L	80-100	0.5	303	-	-	-	-	289	286	-	278	-
otal Dissolved Solids	mg/L	500	20	326	-	-	-	-	300	314	-	286	-
Ikalinity (as CaCO3)	mg/L	30-500	5	267	-	-	-	-	262	258	-	249	-
Bicarbonate (as CaCO3)	mg/L	-	5	267	-	-	-	-	262	258	-	249	-
Carbonate (as CaCO3)	mg/L	-	5	<5	-	-	-	-	<5	<5	-	<5	-
lydroxide (as CaCO3)	mg/L	-	5	<5	-	-	-	-	<5	<5	-	<5	-
luoride	mg/L	1.5	0.1	<0.10	-	-	-	-	<0.10	<0.05	-	< 0.05	-
Chloride	mg/L	250	0.2	12.8	-	-	-	-	18.4	12.7	-	13.9	-
Nitrate as N	mg/L	10	0.1	4.58	4.61	3.46	5.03	3.37	3.00	4.08	3.58	3.94	3.00
litrite as N	mg/L	1	0.1	<0.10	-	-	-	-	<0.10	<0.05	-	< 0.05	< 0.05
Bromide	mg/L	-	0.1	<0.10	-	-	-	-	<0.10	<0.05	-	<0.05	-
Sulphate	mg/L	500	0.2	21.3	-	-	-	-	17.3	21.3	-	19.1	-
Ortho Phosphate as P	mg/L	-	0.2	<0.20	-	-	-	-	<0.20	<0.10	-	<0.10	-
Reactive Silica	mg/L	-	0.05	8.05	-	-	-	-	7.67	7.88	-	7.19	-
Ammonia as N	mg/L	-	0.02	< 0.02	-	-	-	-	< 0.02	< 0.02	-	< 0.02	-
otal Phosphorus	mg/L	-	0.05	< 0.05	-	-	-	-	< 0.05	< 0.05	-	< 0.05	-
otal Organic Carbon	mg/L	-	0.5	0.7	-	-	-	-	1.1	0.8	-	1.6	-
Colour	TCU	5	5	<5	-	-	-	-	<5	<5	-	<5	-
urbidity	NTU	5	0.5	2.9	-	-	-	-	10.2	4.9	-	7.4	-
Calcium	mg/L	-	0.05	81.7	-	-	-	-	78.3	77.5	-	75.0	-
Agnesium	mg/L	-	0.05	24.0	-	-	-	-	22.8	22.4	-	22.0	-
Sodium	mg/L	200	0.05	5.39	-	-	-	-	7.26	5.49	-	5.82	-
Potassium	mg/L		0.05	1.01	-	-	-	-	0.99	0.97	-	0.98	-
Aluminum	mg/L	0.1	0.004	<0.004	-	-	-	-	< 0.004	0.013	-	0.011	-
Antimony	mg/L	0.006	0.003	< 0.003	-	-	-	-	< 0.003	< 0.003	-	< 0.003	-
Arsenic	mg/L	0.025	0.003	< 0.003	-	-	-	-	< 0.003	< 0.003	-	< 0.003	-
Barium	mg/L	1	0.002	0.060	-	-	-	-	0.056	0.059	-	0.061	-
Beryllium	mg/L	-	0.001	<0.001	-	-	-	-	< 0.001	< 0.001	-	< 0.001	-
Boron	mg/L	5	0.01	<0.010				-	0.010	<0.010	-	0.010	
Cadmium	mg/L	0.005	0.001	<0.001	-	-	-	-	< 0.001	<0.001	-	< 0.001	-
Chromium	mg/L	0.05	0.003	< 0.003					< 0.003	< 0.003		< 0.003	
Cobalt	mg/L	-	0.003	< 0.003	-	-	-	-	<0.003	<0.003	-	<0.003	-
Copper	mg/L	1	0.001	< 0.003					< 0.003	< 0.003		< 0.001	
ron	mg/L	0.3	0.003	< 0.010					<0.003	<0.003		<0.003	-
ead	mg/L	0.01	0.002	< 0.010	-	-	-	-	<0.002	<0.002	-	<0.002	
langanese	mg/L	0.01	0.002	<0.002		-		-	<0.002	<0.002	-	<0.002	
Aanganese Aercury	mg/L	0.001	0.002	<0.002					<0.002	<0.002		<0.002	-
	mg/L	-	0.0001	<0.0001					<0.0001	<0.0001		<0.0001	-
1olybdenum lickel	mg/L mg/L	-	0.002	<0.002	-	-	-	-	<0.002	<0.002	-	<0.002	
selenium	mg/L	- 0.01	0.003	< 0.003					< 0.003	< 0.003		<0.003	
Silver	mg/L mg/L	-	0.004	<0.004	-	-	-	-	<0.004	<0.004	-	<0.004	-
					-	-	-	-			-		
trontium	mg/L	-	0.005	0.132					0.123	0.128		0.129	-
hallium	mg/L	-	0.006	< 0.006	-	-	-	-	< 0.006	< 0.006	-	< 0.006	-
in .	mg/L	-	0.002	< 0.002	-	-	-	-	< 0.002	< 0.002	-	< 0.002	-
itanium	mg/L	-	0.002	< 0.002	-	-	-	-	< 0.002	< 0.002	-	< 0.002	-
ungsten	mg/L	-	0.01	<0.010	-	-	-	-	<0.010	<0.010	-	< 0.010	-
Iranium	mg/L	0.02	0.002	<0.002	-	-	-	-	< 0.002	< 0.002	-	< 0.002	-
anadium	mg/L	-	0.002	<0.002	-	-	-	-	< 0.002	< 0.002	-	<0.002	-
inc	mg/L	5	0.005	0.013	-	-	-	-	0.024	0.016	-	0.015	-
lirconium	mg/L	-	0.004	< 0.004	-	-	-	-	< 0.004	< 0.004	-	<0.004	-
6 Difference/ Ion Balance	%	-	NA	1.24	-	-	-	-	1.67	2.28	-	1.85	

RDL = Reportable Detection Limit

-' = No value available



			Well ID		т	N12	
		Sa	ample Date	03/01/2016	03/01/2016	03/10/2017	05/02/2017
			sample ID	7417874	7417866	8245058	8358397
Sample Parameter	Unit	ODWS Criteria	RDL				
Electrical Conductivity	uS/cm		2	1740	-	1730	-
pH	pH Units	6.5 - 8.5	NA	7.92	-	7.95	-
Saturation pH				6.6	-	6.61	-
Langelier Index				1.32	-	1.34	-
Total Hardness (as CaCO3)	mg/L	80-100	0.5	1010	-	1020	-
Total Dissolved Solids	mg/L	500	20	1480	-	1400	-
Alkalinity (as CaCO3)	mg/L	30-500	5	195	-	192	-
Bicarbonate (as CaCO3)	mg/L	-	5	195	-	192	-
Carbonate (as CaCO3)	mg/L	-	5	<5	-	<5	-
Hydroxide (as CaCO3)	mg/L	-	5	<5	-	<5	-
Fluoride	mg/L	1.5	0.1	<0.25	-	<0.25	-
Chloride	mg/L	250	0.2	2.3	-	2.11	-
Nitrate as N	mg/L	10	0.1	<0.25	<0.25	<0.25	<0.10
Nitrite as N	mg/L	1	0.1	<0.25	-	<0.25	<0.10
Bromide	mg/L	-	0.1	<0.25	-	<0.25	-
Sulphate	mg/L	500	0.2	875	-	896	-
Ortho Phosphate as P	mg/L	-	0.2	<0.50	-	<0.50	-
Reactive Silica	mg/L	-	0.05	14.2	-	13.1	-
Ammonia as N	mg/L		0.02	0.08	-	< 0.02	-
Total Phosphorus	mg/L	-	0.05	<0.05	-	< 0.05	-
Total Organic Carbon	mg/L	-	0.5	<0.5	-	0.6	-
Colour	TCU	5	5	<5	-	<5	-
Turbidity	NTU	5	0.5	5	-	8.6	-
Calcium	mg/L	-	0.05	320	-	318	-
Magnesium	mg/L	-	0.05	51.6	-	54.3	-
Sodium	mg/L	200	0.05	7.51	-	8.43	-
Potassium	mg/L	-	0.05	1.91	-	1.95	-
Aluminum	mg/L	0.1	0.004	< 0.004	-	0.008	-
Antimony	mg/L	0.006	0.003	< 0.003	-	< 0.003	-
Arsenic	mg/L	0.025	0.003	0.013	-	0.013	-
Barium	mg/L	1	0.002	0.005	-	0.012	-
Beryllium	mg/L	-	0.001	<0.001	-	<0.001	-
Boron	mg/L	5	0.01	0.055	-	0.058	-
Cadmium	mg/L	0.005	0.001	<0.001	-	<0.001	-
Chromium	mg/L	0.05	0.003	< 0.003	-	< 0.003	-
Cobalt	mg/L	-	0.001	<0.001	-	<0.001	-
Copper	mg/L	1	0.003	<0.003	-	< 0.003	-
Iron	mg/L	0.3	0.01	0.401	-	0.665	-
Lead	mg/L	0.01	0.002	<0.002	-	< 0.002	-
Manganese	mg/L	0.05	0.002	0.026	-	0.030	-
Mercury	mg/L	0.001	0.0001	<0.0001	-	<0.0001	-
Molybdenum	mg/L	-	0.002	0.004	-	0.005	-
Nickel	mg/L	-	0.003	< 0.003	-	< 0.003	-
Selenium	mg/L	0.01	0.004	< 0.004	-	< 0.004	-
Silver	mg/L	-	0.002	< 0.002	-	<0.002	-
Strontium	mg/L	-	0.005	3.52	-	3.86	-
Thallium	mg/L	-	0.006	< 0.006	-	< 0.006	-
Tin .	mg/L	-	0.002	< 0.002	-	< 0.002	-
Titanium	mg/L	-	0.002	0.012	-	0.013	-
Tungsten	mg/L	-	0.01	< 0.010	-	< 0.010	-
Uranium	mg/L	0.02	0.002	< 0.002	-	< 0.002	-
Vanadium	mg/L	-	0.002	< 0.002	-	< 0.002	-
Zinc	mg/L	5	0.005	0.036	-	0.046	-
Zirconium	mg/L	-	0.004	< 0.004	-	< 0.004	-
% Difference/ Ion Balance	%		NA	3.66	-	4.11	-

 
 Notes:
 ODWS = Ontario Drinking Water Standards
 RDL = Reportable Detection Limit

-' = No value available

Indicates exceedance of ODWS criteria Samples 7607710-7607739 required dilution prior to analysis for Anions due



Appendix G Certificates of Analysis



#### CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

#### **ATTENTION TO: Dwight Smikle**

PROJECT: 300033273

#### AGAT WORK ORDER: 14W924797

WATER ANALYSIS REVIEWED BY: Mike Muneswar, BSc (Chem), Senior Inorganic Analyst

#### DATE REPORTED: Dec 08, 2014

PAGES (INCLUDING COVER): 4

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES		

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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Page 1 of 4



## **Certificate of Analysis**

AGAT WORK ORDER: 14W924797 PROJECT: 300033273

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle

SAMPLED BY:Sean Quinlan

					Nitrate (W	ater)
DATE RECEIVED: 2014-12-05						DATE REPORTED: 2014-12-08
		SAMPLE DES	CRIPTION:	PW2	OW1	
		SAM	PLE TYPE:	Water	Water	
		DATE	SAMPLED:	12/4/2014	12/4/2014	
Parameter	Unit	G/S	RDL	6152997	6153004	
Nitrate as N	mg/L		0.05	6.51	0.89	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

Mile Muneauson



### **Quality Assurance**

#### CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

SAMPLING SITE:

AGAT WORK ORDER: 14W924797

**ATTENTION TO: Dwight Smikle** 

SAMPLED BY:Sean Quinlan

Water Analysis															
RPT Date: Dec 08, 2014 DUPLICATE					E		REFEREN	ICE MA	TERIAL	METHOD	BLAN	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured Limits		Recoverv	Lii	ptable nits	Recovery	Acceptable Limits		
		ld					Value	Lower	Upper	1		Upper			Upper
Nitrate (Water)															
Nitrate as N	6150673		<0.5	<0.5	0.0%	< 0.05	95%	90%	110%	99%	90%	110%	104%	80%	120%

Certified By:

Mile Munemon

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Page 3 of 4



## **Method Summary**

CLIENT NAME: R.J. BURNSIDE & ASSOC	IATES LTD	AGAT WORK ORE	)ER: 14W924797
PROJECT: 300033273		ATTENTION TO: D	wight Smikle
SAMPLING SITE:		SAMPLED BY:Sea	ın Quinlan
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH

	Serrates Relinquistance By Print Name and Signit SEAN QUININAN SQUINC 41			OW1 400-14 11-15 6W	y jo:45	Sample Identification Date Time Sample Matrix	Legend Matrix       Report Information - reports         GW       Ground Water       O       Oil         SW       Surface Water       P       Paint       1. Name:       Dwight         SD       Sediment       S       Soil       2. Name:       Dwight       Small         Email:       Durght       Soil       Email:       Durght       Small       Soil	Contact: Address:	e To Same: Yes 🗹 y:	Project: 300033 4 20 PO: AGAT Quotation #: Please note, if quotation number is not provided, client will be billed full price for analysis.	Contact: DW16HT SMIKLE Address: 292 Speedvale Ave Guelah ON Phone: 823-4995 Fax: 836-547	RNSIDE	Chain of Custody Record	I JUD) U DO U DO
M Want M Man Star	EC IN Samples Received					# of Comments Comments Metals Metals	kle ersbunside. com	If "Yes", please use the Drinking Water Chain of Custody Form	No Is this a drinking water sample? (potable water intended for human consumption) Ves	e one	Table Region Indicate one Indic	Regulatory Requirements	P: 905	2.0,2.1,2.2 Laboratories www.agatlabs.com
Jine Whi	hela A Dec 14 Pinh					ORPs: DRPs: FOC NO ₃ Nutrier NO ₃ VOC: CCME ABNS PAHS Chlorop PCBS	Fractions 1 to 4	g □ pH TKN	Is this submission for a Record of Site Condition?	Prov. Water Quality     Objectives (PWQO)     None     None     OR     OR     Date Recu	CCME Other (specify)	Regulation 558	P: 905.712.5100 · F: 905.712.5122 Notes:	5835 Coopers Avenue Mississauga, ON L4Z 1Y2 • webearth.agatlabs.com
White Copy- AGAT Nº: 46237	Pink Copy - Client Page of Yellow Copy - AGAT			*		TCLP N Sewer	ochlorine Pesticides Metals/Inorganics Use trate		Morning of Dec 8 th *TAT is exclusive of weekends and statutory holidays	2 Working Days 1 Working Day Required (Rush surcharges may apply):	<ul> <li>5 to 7 Working Days</li> <li>Rush TAT (please provide prior notification)</li> <li>Rush Surcharges Apply</li> <li>3 Working Days</li> </ul>	Turnaround Time Required (TAT) Required* Regular TAT		Laboratory Use Only 123/29 Arrival Temperature: 1/23/29

f



CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Dwight Smikle

PROJECT: 300033273

AGAT WORK ORDER: 15T047356

WATER ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

DATE REPORTED: Dec 04, 2015

PAGES (INCLUDING COVER): 5

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES	

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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Page 1 of 5

Results relate only to the items tested and to all the items tested

All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request



## Certificate of Analysis

AGAT WORK ORDER: 15T047356 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

### CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

#### ATTENTION TO: Dwight Smikle

SAMPLED BY:MV

	Nitrate/Nitrite (Water)										
DATE RECEIVED: 2015-11-27								DATE REPORTED: 2015-12-04			
		SAMPLE DES	CRIPTION:	TW5	TW6	PW2	TW2				
		SAM	PLE TYPE:	Water	Water	Water	Water				
		DATE	SAMPLED:	11/26/2015	11/26/2015	11/26/2015	11/26/2015				
Parameter	Unit	G/S	RDL	7237247	7237256	7237257	7237258				
Nitrate as N	mg/L		0.05	7.09	7.30	2.12	0.62				
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05				

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

Amanjot Bhela



### Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

AGAT WORK ORDER: 15T047356

ATTENTION TO: Dwight Smikle

SAMPLING SITE:

SAMPLED BY:MV

			vvau	<b>5</b> 1 7 11	laryo								
		C	UPLICAT	E		REFEREN	ICE MATER	RIAL METH	DD BLAN	K SPIKE	MAT	RIX SPI	KE
Batch	Sample	Dup #1	Dup #2	RPD	Method Blank				1 11		Recovery	Lir	ptable nits
	IQ					value	Lower Up	per	Lowe	Upper		Lower	Upper
7238301 7238301		<0.25 <0.25	<0.25 <0.25	NA NA	< 0.05 < 0.05	90% NA					96% 91%	80% 80%	120% 120%
	7238301	7238301	Batch         Sample Id         Dup #1           7238301         <0.25	DUPLICAT           Batch         Sample Id         Dup #1         Dup #2           7238301         <0.25	Batch         Sample Id         Dup #1         Dup #2         RPD           7238301         <0.25	Junct State       Batch     Sample Id     Dup #1     Dup #2     RPD     Method Blank       7238301     <0.25	DUPLICATE     REFEREN       Batch     Sample Id     Dup #1     Dup #2     RPD     Method Blank     Measured Value       7238301     <0.25	Provide state       Batch     Sample Id     Dup #1     Dup #2     RPD     Method Blank     REFERENCE MATER       7238301     <0.25	Batch     Sample Id     Dup #1     Dup #2     RPD     Method Blank     Measured Value     Acceptable Limits     Recover       7238301     <0.25	Provide state       Batch     Sample Id     Dup #1     Dup #2     RPD     Method Blank     REFERENCE MATERIAL     METHOD BLAN       7238301     <0.25	REFERENCE MATERIAL     METHOD BLANK SPIKE       Batch     Sample Id     Dup #1     Dup #2     RPD     Method Blank     Method Blank     Acceptable Limits Lower     Recovery     Acceptable Limits       7238301     <0.25	REFERENCE MATERIAL     METHOD BLANK SPIKE     MAT       Batch     Sample Id     Dup #1     Dup #2     RPD     Method Blank     Method Value     Acceptable Limits     Acceptable       7238301     <0.25	REFERENCE MATERIAL     METHOD BLANK SPIKE     MATRIX SPI       Batch     Sample     Dup #1     Dup #2     RPD     Method     Blank     Acceptable     Acc

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By:

Amanjot Bhela

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Page 3 of 5



## Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD AGAT WORK ORDER: 15T047356 PROJECT: 300033273 ATTENTION TO: Dwight Smikle SAMPLING SITE: SAMPLED BY:MV PARAMETER AGAT S.O.P LITERATURE REFERENCE ANALYTICAL TECHNIQUE Water Analysis SM 4110 B Nitrate as N INOR-93-6004 ION CHROMATOGRAPH Nitrite as N INOR-93-6004 SM 4110 B ION CHROMATOGRAPH

Samples Ridinquation By (Print Na Sanfales Ridinquation By (Print Na Sanfales Ridinquation By (Print Na	765 762 762	AGAT Quote #: Pleaser  Invoice Information: Company: Contact: Address: Email: Sample Identification	The
ne and Stant		note	dy Red frank
A Charles	1/24/15	number is not pro-	
	11:00	Time	If this is a Drink
Date		it be billed full price for a BIII To Same: Ye ad Containers	Lab Inking Water sa
Тпе	600 600	ror atrabusk Yes I No I Sample	Aboratories
Sumpled Required By (Print Sumpled Required By (Print Sumples Reconced By Nem		Sample Matrix Legend B Biota GW Ground Water O Oil P Paint SD Sediment SW Surface Water Comments/ Special Instructions	Water Chain of C tory Requi all applicable boxes ition 153/04 tion 153/04 Park Park Park e (check One) se es to f Site Cor
Ngmb Dod Sign):		Metals and Inorganics Metal Scan Hydride Forming Metals	N Ph: 905.74 Sustody Form (potable water rements: No F Sewer Use Sanitary Sanitary Storm Region Indition?
	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Client Custom Metals ORPs: B-HWS CI CN Cr ⁶⁺ EC FOC PNO ₂ /NO ₂ Total N Hg PH SAR Nutrients: TP NH ₃ TKN NO ₃ NO ₂ PNO ₂ /NO ₂ Volatiles: VOC BTEX THM	
Date Date		Volatiles: VOC BTEX THM CCME Fractions 1 to 4 ABNs PAHs	5835 Cooperts Avenue sauga. Ontario L42 1Y2 webearth.agatlabs.com ded for human consumption ded for human consumption ded for human consumption cocME CCME CCME Prov. Water Quality Objectives (PWQO) Objectives (PWQO) Other Indicate One Notate of Analysis (es No
Date Time Ne Pag		Chiorophenois PCBs Organochiorine Pesticides TCLP Metals/Inorganics Sewer Use	Laboratory Use Only Work Order #: 1510473 Cooler Quantity: Arrival Temperatures: Custody Seal Intact: 14es ING Custody Seal Intact: 14es ING Notes: Turnaround Time (TAT) Required: Regular TAT A 5 to 7 Business D: Rush TAT (mash surcharges Arreb) 3 Business 2 Business D: Days 2 Business C Days 2 Business C Please provide prior notification for *TAT is exclusive of weekends and statu
Page			ratory Use Only Quantity: Quantity: Permeratures: Imperatures: Imperature: Imperature: Imperatures: Imperatures: Imperatures: Imperatures: Imperatures: Imperatures: Imperatures: <t< td=""></t<>



CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Dwight Smikle

PROJECT: Belfountain

AGAT WORK ORDER: 15T990997

WATER ANALYSIS REVIEWED BY: Anthony Dapaah, PhD (Chem), Inorganic Lab Manager

DATE REPORTED: Jul 08, 2015

PAGES (INCLUDING COVER): 5

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES	

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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Page 1 of 5

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Certificate of Analysis

AGAT WORK ORDER: 15T990997

PROJECT: Belfountain

5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle

SAMPLED BY:Sean Quinlan

					Nitrate (V	Vater)			
DATE RECEIVED: 2015-06-30									DATE REPORTED: 2015-07-08
		SAMPLE DES	CRIPTION:	TW2	TW6	OW1	TW5	PW2	
		SAM	PLE TYPE:	Water	Water	Water	Water	Water	
		DATES	SAMPLED:	6/29/2015	6/29/2015	6/29/2015	6/29/2015	6/29/2015	
Parameter	Unit	G/S	RDL	6701611	6701612	6701613	6701614	6701615	
Nitrate as N	mg/L		0.05	0.70	8.20	1.89	8.28	4.15	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard



Certified By:



Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: Belfountain

SAMPLING SITE:

AGAT WORK ORDER: 15T990997

ATTENTION TO: Dwight Smikle

SAMPLED BY:Sean Quinlan .

	Water Analysis														
RPT Date: Jul 08, 2015			D	UPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Blan		Method Blank	Blank Measured		otable nits	Recovery	Acceptable Limits		Recovery	Acceptable Limits	
		ia					Value	Lower	Upper		Lower	Upper		Lower	Upper
Nitrate (Water) Nitrate as N	6698272		14.4	14.3	0.7%	< 0.05	96%	90%	110%	107%	90%	110%	106%	80%	120%





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Page 3 of 5



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOC	IATES LTD	AGAT WORK ORE	DER: 15T990997						
PROJECT: Belfountain		ATTENTION TO: Dwight Smikle							
SAMPLING SITE:		SAMPLED BY:Sean Quinlan							
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE						
Water Analysis	·	·							
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH						

Samples Relinquianed By (Print Name and Sign): SGAN OU IN LAN Samples Relinquianed By (Print Name and Sign): Date	29.54 15 12.00 1 9:20 1 10:20 1 10:00 1	t: Please note: If quotation number is not provided a nformation: Date 1 Sample Identification Sampled Sa	Image: Stand Stan
Schutzer Received By (Print Varies and Sign):		Special Instructions Solution Sample Matrix Sw Solution Solution Biota Legend Biota Legend Surface Water Oliment Water Metals and Inorganics Metals Metal Scan Hydride Forming Metals Client Custom Metals ORPs: B-HWS Orf** Ec FOC No/VNO2 Total N Hg DH SAR Nutrients: TP NH3 TKN No3 NO2 NO4/NO2 THM COdatiles: Voc BTEX THM CCME Fractions 1 to 4 ABNs	Fax: Solution Sol
→305 ⁻¹ /-×6 Page of		PAHs Chlorophenols PCBs Organochlorine Pesticides TCLP Metals/Inorganics Sewer Use Nitrak	Laboratory Use Only Work Order #: ISTAGOGAL Cooler Quantity:

Page 5 of 5



Certificate of Analysis

AGAT WORK ORDER: 15W020701 **PROJECT: Belfountain**

5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle

SAMPLED BY:

			Wat	er Quality A	ssessment		
DATE RECEIVED: 2015-09-18							DATE REPORTED: 2015-09-28
		AMPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED:	TW2 Water 9/17/2015	TW6 Water 9/17/2015	TW5 Water 9/17/2015	PW2 Water 9/17/2015	
Parameter	Unit	G/S RDL	6988471	6988476	6988482	6988488	
Electrical Conductivity	uS/cm	2	561	661	655	596	
pH	pH Units	NA	8.14	8.11	8.12	8.16	
Saturation pH			6.96	7.01	7.01	6.99	
Langelier Index			1.18	1.10	1.11	1.17	
Total Hardness (as CaCO3)	mg/L	0.5	299	302	301	295	
Total Dissolved Solids	mg/L	20	308	356	368	330	
Alkalinity (as CaCO3)	mg/L	5	263	235	234	251	
Bicarbonate (as CaCO3)	mg/L	5	263	235	234	251	
Carbonate (as CaCO3)	mg/L	5	<5	<5	<5	<5	
Hydroxide (as CaCO3)	mg/L	5	<5	<5	<5	<5	
Fluoride	mg/L	0.25	<0.25	<0.25	<0.25	<0.25	
Chloride	mg/L	0.50	6.85	38.1	37.9	22.9	
Nitrate as N	mg/L	0.25	1.00	7.48	7.77	2.75	
Nitrite as N	mg/L	0.25	<0.25	<0.25	<0.25	<0.25	
Bromide	mg/L	0.25	<0.25	<0.25	<0.25	<0.25	
Sulphate	mg/L	0.50	23.5	23.2	22.8	22.0	
Ortho Phosphate as P	mg/L	0.50	<0.50	<0.50	<0.50	<0.50	
Reactive Silica	mg/L	0.05	11.5	7.07	7.42	8.45	
Ammonia as N	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	
Total Phosphorus	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	
Total Organic Carbon	mg/L	0.5	1.1	0.6	1.0	0.7	
Colour	TCU	5	<5	<5	<5	<5	
Turbidity	NTU	0.5	4.3	1.1	8.2	1.2	
Calcium	mg/L	0.05	79.5	83.1	83.4	77.6	
Magnesium	mg/L	0.05	24.3	23.0	22.6	24.7	
Sodium	mg/L	0.05	3.47	16.5	15.8	9.37	
Potassium	mg/L	0.05	1.12	0.99	1.13	0.84	
Aluminum	mg/L	0.004	< 0.004	< 0.004	< 0.004	<0.004	
Antimony	mg/L	0.003	<0.003	<0.003	< 0.003	< 0.003	
Arsenic	mg/L	0.003	<0.003	<0.003	<0.003	< 0.003	





Certificate of Analysis

AGAT WORK ORDER: 15W020701 PROJECT: Belfountain 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle
SAMPLED BY:

Water Quality Assessment DATE RECEIVED: 2015-09-18 **DATE REPORTED: 2015-09-28** SAMPLE DESCRIPTION: TW2 TW6 TW5 PW2 SAMPLE TYPE: Water Water Water Water DATE SAMPLED: 9/17/2015 9/17/2015 9/17/2015 9/17/2015 RDL 6988471 6988476 6988482 6988488 Parameter Unit G/S Barium mg/L 0.002 0.088 0.107 0.110 0.050 Beryllium 0.001 < 0.001 < 0.001 < 0.001 < 0.001 mg/L Boron 0.010 < 0.010 <0.010 < 0.010 mg/L < 0.010 <0.001 < 0.001 Cadmium mg/L 0.001 < 0.001 < 0.001 Chromium mg/L 0.003 < 0.003 < 0.003 < 0.003 < 0.003 Cobalt mg/L 0.001 < 0.001 < 0.001 < 0.001 < 0.001 Copper mg/L 0.003 < 0.003 < 0.003 < 0.003 < 0.003 Iron mg/L 0.010 <0.010 < 0.010 <0.010 < 0.010 0.002 < 0.002 < 0.002 < 0.002 < 0.002 Lead mg/L Manganese mg/L 0.002 < 0.002 < 0.002 < 0.002 < 0.002 Mercury mg/L 0.0001 < 0.0001 < 0.0001 < 0.0001 < 0.0001 0.002 < 0.002 < 0.002 < 0.002 < 0.002 Molybdenum mg/L Nickel 0.004 0.004 0.004 0.003 0.004 mg/L Selenium < 0.004 < 0.004 mg/L 0.004 < 0.004 < 0.004 Silver mg/L 0.002 < 0.002 < 0.002 < 0.002 < 0.002 Strontium mg/L 0.005 0.128 0.193 0.184 0.126 Thallium mg/L 0.006 <0.006 < 0.006 < 0.006 < 0.006 Tin mg/L 0.002 <0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 Titanium mg/L 0.002 < 0.002 < 0.002 Tungsten mg/L 0.010 <0.010 < 0.010 <0.010 < 0.010 Uranium mg/L 0.002 < 0.002 < 0.002 < 0.002 < 0.002 Vanadium mg/L 0.002 < 0.002 < 0.002 < 0.002 < 0.002 Zinc mg/L 0.005 0.010 0.018 0.018 0.021 Zirconium mg/L 0.004 < 0.004 < 0.004 < 0.004 < 0.004 % Difference/ Ion Balance % NA 1.09 0.0657 0.298 0.104

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard



Certified By:



Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: Belfountain

SAMPLING SITE:

AGAT WORK ORDER: 15W020701

ATTENTION TO: Dwight Smikle SAMPLED BY:

Water Analysis

water Analysis														
RPT Date: Sep 28, 2015	[DUPLICATE			REFEREN	REFERENCE MATERIAL		METHOD BLANK SPIKE			MAT	KE		
PARAMETER	Batch Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	1 1		Recovery		ptable nits
						, and a	Lower	Upper		Lower	Upper		Lower	Upper
Water Quality Assessment														
Electrical Conductivity	6988394	576	577	0.2%	< 2	100%	80%	120%	NA			NA		
рН	6988394	8.14	8.07	0.9%	NA	99%	90%	110%	NA			NA		
Total Dissolved Solids	6993029	198	196	1.0%	< 20	100%	80%	120%	NA			NA		
Alkalinity (as CaCO3)	6988394	201	201	0.0%	< 5	96%	80%	120%	NA			NA		
Bicarbonate (as CaCO3)	6988394	201	201	0.0%	< 5	NA			NA			NA		
Carbonate (as CaCO3)	6988394	<5	<5	0.0%	< 5	NA			NA			NA		
Hydroxide (as CaCO3)	6988394	<5	<5	0.0%	< 5	NA			NA			NA		
Fluoride	6988476 698847	6 <0.25	<0.25	0.0%	< 0.05	105%	90%	110%	107%	90%	110%	101%	80%	120%
Chloride	6988476 698847	38.1	39.3	3.1%	< 0.10	96%	90%	110%	103%	90%	110%	104%	80%	120%
Nitrate as N	6988476 698847	5 7.48	7.63	2.0%	< 0.05	93%	90%	110%	104%	90%	110%	105%	80%	120%
Nitrite as N	6988476 698847	6 <0.25	<0.25	0.0%	< 0.05	NA	90%	110%	100%	90%	110%	98%	80%	120%
Bromide	6988476 698847	6 <0.25	<0.25	0.0%	< 0.05	109%	90%	110%	101%	90%	110%	98%	80%	120%
Sulphate	6988476 698847	5 23.2	23.7	2.1%	< 0.10	108%	90%	110%	104%	90%	110%	103%	80%	120%
Ortho Phosphate as P	6988476 698847	6 <0.50	<0.50	0.0%	< 0.10	102%	90%	110%	96%	90%	110%	99%	80%	120%
Reactive Silica	6970809	10.6	10.6	0.0%	< 0.05	98%	90%	110%	101%	90%	110%	89%	80%	120%
Ammonia as N	6984408	<0.02	<0.02	0.0%	< 0.02	102%	90%	110%	103%	90%	110%	99%	80%	120%
Total Phosphorus	6985416	0.98	1.00	2.0%	< 0.05	96%	80%	120%	93%	90%	110%	97%	70%	130%
Total Organic Carbon	6985404	15.5	16.0	3.2%	< 0.5	93%	90%	110%	108%	90%	110%	83%	80%	120%
Colour	6984708	126	126	0.0%	< 5	103%	90%	110%	NA			NA		
Turbidity	6988488 698848	3 1.2	1.3	8.0%	< 0.5	94%	90%	110%	NA			NA		
Calcium	6985382	57.8	58.8	1.7%	< 0.05	105%	90%	110%	101%	90%	110%	103%	70%	130%
Magnesium	6985382	31.4	31.8	1.3%	< 0.05	102%	90%	110%	98%	90%	110%	100%	70%	130%
Sodium	6985382	14.8	14.7	0.7%	< 0.05	104%	90%	110%	101%	90%	110%	104%	70%	130%
Potassium	6985382	5.51	5.60	1.6%	< 0.05	104%	90%	110%	101%	90%	110%	107%	70%	130%
Aluminum	6987565	0.006	0.006	0.0%	< 0.004	103%	90%	110%	109%	90%	110%	103%	70%	130%
Antimony	6987565	<0.003	<0.003	0.0%	< 0.003	108%	90%	110%	105%	90%	110%	106%	70%	130%
Arsenic	6987565	< 0.003	< 0.003	0.0%	< 0.003	107%	90%	110%	110%	90%	110%	113%	70%	130%
Barium	6987565	0.120	0.121	0.8%	< 0.002	106%	90%	110%	107%	90%	110%	104%	70%	130%
Beryllium	6987565	<0.001	<0.001	0.0%	< 0.001	103%	90%	110%	108%	90%	110%	106%	70%	130%
Boron	6987565	0.146	0.143	2.1%	< 0.010	104%	90%	110%	108%	90%	110%	100%	70%	130%
Cadmium	6987565	<0.001	<0.001	0.0%	< 0.001	101%	90%	110%	104%	90%	110%	102%	70%	130%
Chromium	6987565	<0.003	< 0.003	0.0%	< 0.003	103%	90%	110%	109%	90%	110%	100%	70%	130%
Cobalt	6987565	<0.001	<0.001	0.0%	< 0.001	103%	90%	110%	107%	90%	110%	102%	70%	130%
Copper	6987565	<0.003	<0.003	0.0%	< 0.003	102%	90%	110%	108%	90%	110%	93%	70%	130%
Iron	6987565	<0.010	<0.010	0.0%	< 0.010	102%	90%	110%	100%	90%	110%	96%	70%	130%
Lead	6987565	<0.002	<0.002	0.0%	< 0.002	104%	90%	110%	105%	90%	110%	105%	70%	130%
Manganese	6987565	0.003	0.003	0.0%	< 0.002			110%	107%	90%	110%	87%	70%	130%
Mercury	6985826	<0.0001	<0.0001	0.0%	< 0.0001		90%	110%	98%	90%	110%	96%	80%	120%
Molybdenum	6987565	<0.002	<0.002	0.0%	< 0.002	96%	90%	110%	97%	90%	110%	98%	70%	130%

AGAT QUALITY ASSURANCE REPORT (V1)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Page 3 of 8



Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: Belfountain

SAMPLING SITE:

AGAT WORK ORDER: 15W020701 ATTENTION TO: Dwight Smikle

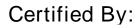
SAMPLED BY:

Water Analysis (Continued)

						`		,							
RPT Date: Sep 28, 2015		DUPLICATE				REFEREN	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured Value		ptable nits	Recovery	Acceptable Limits		Recovery	1 1 1 1	eptable mits
		ld						Lower	Upper]	Lower	Upper		Lower	Upper
Nickel	6987565		0.006	0.006	0.0%	< 0.003	103%	90%	110%	107%	90%	110%	98%	70%	130%
Selenium	6987565		<0.004	<0.004	0.0%	< 0.004	98%	90%	110%	102%	90%	110%	114%	70%	130%
Silver	6987565		<0.002	< 0.002	0.0%	< 0.002	100%	90%	110%	114%	90%	110%	86%	70%	130%
Strontium	6987565		0.179	0.178	0.6%	< 0.005	103%	90%	110%	105%	90%	110%	106%	70%	130%
Thallium	6987565		<0.006	<0.006	0.0%	< 0.006	101%	90%	110%	102%	90%	110%	103%	70%	130%
Tin	6987565		<0.002	<0.002	0.0%	< 0.002	103%	90%	110%	105%	90%	110%	102%	70%	130%
Titanium	6987565		<0.002	<0.002	0.0%	< 0.002	104%	90%	110%	103%	90%	110%	99%	70%	130%
Tungsten	6987565		<0.010	<0.010	0.0%	< 0.010	107%	90%	110%	101%	90%	110%	105%	70%	130%
Uranium	6987565		<0.002	<0.002	0.0%	< 0.002	96%	90%	110%	95%	90%	110%	100%	70%	130%
Vanadium	6987565		<0.002	<0.002	0.0%	< 0.002	102%	90%	110%	108%	90%	110%	104%	70%	130%
Zinc	6987565		<0.005	<0.005	0.0%	< 0.005	101%	90%	110%	107%	90%	110%	105%	70%	130%
Zirconium	6987565		<0.004	<0.004	0.0%	< 0.004	93%	90%	110%	99%	90%	110%	96%	70%	130%

Comments: NA signifies Not Applicable

QA Qualifier for Silver: In a multi-element scan up to 10% of analytes may exceed the quoted limits for lab control standards and matrix spike by up to 10% absolute and the spike is deemed acceptable.





AGAT QUALITY ASSURANCE REPORT (V1)

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Page 4 of 8



QA Violation

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: Belfountain

AGAT WORK ORDER: 15W020701 ATTENTION TO: Dwight Smikle

RPT Date: Sep 28, 2015					REFERENCE MATERIAL			SPIKE	MATRIX SPIKE		
PARAMETER	Sample Id	Sample Description	Measured			Recovery	Acceptable Limits		Recovery	Acceptable Limits	
			Value	Lower	Upper		Lower	Upper		Lower	Upper
Water Quality Assessment											
Silver		TW2	100%	90%	110%	114%	90%	110%	86%	70%	130%

Comments: NA signifies Not Applicable

QA Qualifier for Silver: In a multi-element scan up to 10% of analytes may exceed the quoted limits for lab control standards and matrix spike by up to 10% absolute and the spike is deemed acceptable.

AGAT QUALITY ASSURANCE REPORT (V1)

Page 5 of 8

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Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: Belfountain

AGAT WORK ORDER: 15W020701 ATTENTION TO: Dwight Smikle

		SAMPLED BY:									
SAMPLING SITE:		SAMPLED BY:	1								
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE								
Water Analysis	· ·										
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE								
рН	INOR-93-6000	SM 4500-H+ B	PC TITRATE								
Saturation pH		SM 2320 B	CALCULATION								
Langelier Index		SM 2330B	CALCULATION								
Total Hardness (as CaCO3)	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES								
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE								
Alkalinity (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE								
Bicarbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE								
Carbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE								
Hydroxide (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE								
Fluoride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH								
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH								
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH								
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH								
Bromide	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH								
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH								
Ortho Phosphate as P	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH								
Reactive Silica	INOR-93-6047	AQ2 EPA-122A & SM 4500 SiO2 D	AQ2 DISCRETE ANALYSER								
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH3-F	LACHAT FIA								
Total Phosphorus	INOR-93-6057	QuikChem 10-115-01-3-A & SM 4500-P I	LACHAT FIA								
Total Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310	SHIMADZU CARBON ANALYZER								
Colour	INOR-93-6046	SM 2120 B	SPECTROPHOTOMETER								
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER								
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES								
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES								
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES								
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES								
Aluminum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Iron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Manganese	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Mercury	MET-93-6100	EPA SW 846 7470 & 245.1	CVAAS								
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Strontium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Thallium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: Belfountain

AGAT WORK ORDER: 15W020701 ATTENTION TO: Dwight Smikle

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Tin	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Titanium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Tungsten	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zirconium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
% Difference/ Ion Balance		SM 1030 E	CALCULATION

Samples Reinquaned By (from Name and Sam) Sector (Prime Name and Sam) Samples Reinquaned By (from Name and Sem)	TWE	hformation:	Chain of Custody R Report Information: Company: Contact: Address: Phone: Reports to be sent to: 1. Email: 2. Email: Project Information: Project Information: Project Information: Stite Location: Sampled By:
	175pt15	Date Sampled S	Record Record Smikk Speedys Speedys Speedys Speedys Speedys Smikke Smik Smik Smik Smik Smik Smik Smik Smik
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and the second s	40000	Bill To Same: Yes	nking Water
is Time	12 62 GW	ror availate	vater sample, please use Drinking Vater sample, please use Drinking Please one of Plea
4. OO Samplies Proceived By Print W Samplies Brashved By Print W		Sample Matrix Legend B Biota GW Ground Water O Oil P Paint S Soil Sediment SW Surface Water Comments/	Nater Chain of tory Requi all applicable boxes) ion 153/04 ion 153/04 orm ark ark Julture e (<i>Checkt One</i>) e (<i>Checkt One</i>) e Submission of Site Cor
lame and Sign:		Metals and Inorganics Metal Scan	P Custody Form (pol
NB THE		Hydride Forming Metals Client Custom Metals	Ph: 905.; Prom (potable wate ants: Vo Sewer Use Sanitary Istorm
Part and a state of the state o		ORPs: B-HWS Cr CN Cr ⁴⁺ EC FOC NO ₂ /NO ₂ Total N Hg PH SAR Nutrients: TP NH, TKN NO ₃ NO ₂ NO ₃ /NO ₂ Disable Volatiles: VOC BTEX THM	5835 Coopers Avenue Mississauga, Ontario L42 1Y2 s.712.6100 Fax: 905.712.5122 webearth.agatiabs.com webearth.agatiabs.com Regulatory Requirement Regulation S58 CCME Drov. Water Quality Objectives (PWQO) Indicate One Report Guideline on Certificate of Analysis Yes X NO
Dana Guine Client		Volatiles: 🛛 VOC 🗋 BTEX 🗍 THM CCME Fractions 1 to 4 ABNs	5835 Coopers Avenue sauga, Ontario L42 1Y2 webearth.agattabs.com ded for human consumption ded for human consumption ded for human consumption ded for human consumption deg for human consumption deg for human consumption later Degu (PWQO) Objectives (PWQO) Objectives (PWQO) Objectives (PWQO) Dother Indicate One A Guideline on cate of Analysis es X No
IT I Yello		PAHs Chlorophenols	
Date Date Date Date Date Date Date Date		PCBs Organochlorine Pesticides TCLP Metals/Inorganics	Laboratory Use Only Work Order #: 1500 Cooler Quantity: Arrival Temperatures: 9 Custody Seal Intact: 9 Notes: 9 Custody Seal Intact: 9 Notes: 9 Custody Seal Intact: 9 Custody Seal Int
Page Page	XXX	Sewer Use TDS Various Inorganics	le of of of the second se
Page		Metals Mercury	Image: Second statutory holidays Image: Second statutory holidays
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	2		s 1 Business Day 'Apply): 'sh TAT 'y holidays



CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Dwight Smikle

PROJECT: 300033273

AGAT WORK ORDER: 15W960815

WATER ANALYSIS REVIEWED BY: Mike Muneswar, BSc (Chem), Senior Inorganic Analyst

DATE REPORTED: Apr 15, 2015

PAGES (INCLUDING COVER): 8

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

<u>*NOTES</u>		

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

Member of: Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA) Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA) AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Page 1 of 8



AGAT WORK ORDER: 15W960815 PROJECT: 300033273

5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle

SAMPLED BY:

		Wat	er Quality A	ssessment	- Groundwa	ater Sample	S	
DATE RECEIVED: 2015-04-08								DATE REPORTED: 2015-04-15
_		AMPLE DESCRIPTION SAMPLE TYPE DATE SAMPLEI	: Water D: 4/7/2015	TW5 Water 4/7/2015	TW6 Water 4/7/2015	PW2 Water 4/7/2015	OW1 Water 4/7/2015	
Parameter	Unit	G/S RDL	6430142	6430199	6430206	6430214	6430223	
Electrical Conductivity	uS/cm	2	478	592	602	595	601	
pH Octometics with	pH Units	NA	7.89	7.90	8.14	7.92	8.10	
Saturation pH			7.15	7.02	7.02	7.00	6.98	
Langelier Index		0.5	0.74	0.88	1.12	0.92	1.12	
Total Hardness (as CaCO3)	mg/L	0.5	224	285	283	281	265	
Total Dissolved Solids	mg/L	20	262	302	314	304	294	
Alkalinity (as CaCO3)	mg/L	5	212	244	245	259	265	
Bicarbonate (as CaCO3)	mg/L	5	212	244	245	259	265	
Carbonate (as CaCO3)	mg/L	5	<5	<5	<5	<5	<5	
Hydroxide (as CaCO3)	mg/L	5	<5	<5	<5	<5	<5	
Fluoride	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Chloride	mg/L	0.10	18.8	19.8	24.3	22.3	3.48	
Nitrate as N	mg/L	0.05	0.84	6.31	7.80	3.44	0.85	
Nitrite as N	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Bromide	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Sulphate	mg/L	0.10	9.96	14.5	15.3	18.2	14.0	
Ortho Phosphate as P	mg/L	0.10	0.35	<0.10	<0.10	<0.10	<0.10	
Reactive Silica	mg/L	0.05	5.78	6.79	6.87	7.52	5.38	
Ammonia as N	mg/L	0.02	<0.02	<0.02	<0.02	0.30	0.08	
Total Phosphorus	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	0.17	
Total Organic Carbon	mg/L	0.5	1.7	0.6	0.6	0.5	2.0	
Colour	TCU	5	<5	<5	<5	<5	<5	
Turbidity	NTU	0.5	2.7	1.5	6.8	4.6	269	
Calcium	mg/L	0.05	60.9	80.2	79.7	73.6	71.9	
Magnesium	mg/L	0.05	17.5	20.5	20.3	23.5	20.7	
Sodium	mg/L	0.05	6.79	7.24	8.54	8.20	7.68	
Potassium	mg/L	0.05	1.53	1.02	0.98	0.90	2.16	
Aluminum	mg/L	0.004	<0.004	<0.004	< 0.004	< 0.004	<0.004	
Antimony	mg/L	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	
Arsenic	mg/L	0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	

Certified By:

Mile Muneman



AGAT WORK ORDER: 15W960815 PROJECT: 300033273

5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle

SAMPLED BY:

		Water	Quality As	ssessment	- Groundwa	ter Sample	S	
DATE RECEIVED: 2015-04-08								DATE REPORTED: 2015-04-15
	S	AMPLE DESCRIPTION:	TW2	TW5	TW6	PW2	OW1	
		SAMPLE TYPE:	Water	Water	Water	Water	Water	
		DATE SAMPLED:	4/7/2015	4/7/2015	4/7/2015	4/7/2015	4/7/2015	
Parameter	Unit	G/S RDL	6430142	6430199	6430206	6430214	6430223	
Barium	mg/L	0.002	0.042	0.110	0.088	0.056	0.048	
Beryllium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Boron	mg/L	0.010	0.010	0.011	<0.010	<0.010	<0.010	
Cadmium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Chromium	mg/L	0.003	0.005	0.004	0.008	0.005	< 0.003	
Cobalt	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Copper	mg/L	0.003	<0.003	< 0.003	< 0.003	<0.003	< 0.003	
ron	mg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
ead	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	< 0.002	
Manganese	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	< 0.002	
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Molybdenum	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Nickel	mg/L	0.003	<0.003	< 0.003	< 0.003	<0.003	< 0.003	
Selenium	mg/L	0.004	< 0.004	< 0.004	< 0.004	<0.004	< 0.004	
Silver	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	< 0.002	
Strontium	mg/L	0.005	0.087	0.154	0.139	0.126	0.102	
Fhallium	mg/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006	
Гin	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Fitanium	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Fungsten	mg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Jranium	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
/anadium	mg/L	0.002	<0.002	<0.002	0.003	<0.002	<0.002	
Zinc	mg/L	0.005	0.012	0.019	0.014	0.022	0.017	
Zirconium	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	< 0.004	
% Difference/ Ion Balance		0.1	2.3	1.3	3.3	3.4	0.6	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Mile Muneman



Quality Assurance

Water Analysia

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

SAMPLING SITE:

AGAT WORK ORDER: 15W960815

ATTENTION TO: Dwight Smikle

SAMPLED BY:

RPT Date: Apr 15, 2015 DUPLICATE Method Blank REFERENCE MATERIAL Value METHOD BLANK SPIKE Acceptable Limits Acceptable Limits Acceptable Limits Recovery Acceptabl		
PARAMETER Batch Sample Id Dup #1 Dup #2 RPD Blank Measured Value Limits Lower Recovery Limits Lower Recovery Limits Recovery Limits <th>/ATRIX SF</th> <th>ЧКЕ</th>	/ATRIX SF	ЧКЕ
Water Quality Assessment - Groundwater Samples Electrical Conductivity 6428305 6200 6200 0.0% <2	1 1	eptable imits
Electrical Conductivity 6428305 6200 6200 0.0% < 2	Lowe	er Upper
pH 6428305 7.71 7.43 3.7% NA 100% 90% 110% NA NA Total Dissolved Solids 6430142 6430142 262 262 0.0% < 20		
Total Dissolved Solids 6430142 6430142 262 262 0.0% < 20 96% 80% 120% NA NA Alkalinity (as CaCO3) 6428305 518 524 1.2% < 5	۱	
Alkalinity (as CaCO3) 6428305 518 524 1.2% < 5		
Bicarbonate (as CaCO3) 6428305 518 524 1.2% < 5 NA NA NA Carbonate (as CaCO3) 6428305 <5		
Carbonate (as CaCO3) 6428305 <5 <5 0.0% <5 NA NA NA Hydroxide (as CaCO3) 6428305 <5		
Hydroxide (as CaCO3) 6428305 <5 <5 0.0% <5 NA NA NA Fluoride 6430050 <0.25	L .	
Fluoride 6430050 <0.25 <0.25 0.0% <0.05 108% 90% 110% 104% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 100% 90% 110% 100% 90% 110% 100% 90% 110% 100% 90% 110% 100% 90% 110% 100% 90% 110% 100% 90% 110% 100% 90% 110% 100% 90% 110% 100% 90% 110% 100% 90% 110% 100% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% <td>L .</td> <td></td>	L .	
Chloride 6430050 172 167 2.9% < 0.10 101% 90% 110% 105% 90% 110% 10 Nitrate as N 6430050 <0.25		
Nitrate as N 6430050 <0.25 <0.25 0.0% <0.05 92% 90% 110% 102% 90% 110% 10 Nitrite as N 6430050 <0.25	6 80%	5 120%
Nitrite as N 6430050 <0.25 <0.25 0.0% <0.05 NA 90% 110% 98% 90% 110% 92 Bromide 6430050 <0.25	% 80%	5 120%
Bromide 6430050 <0.25 <0.25 0.0% < 0.05 110% 90% 110% 100% 90% 110% 10	% 80%	5 120%
Bromide 6430050 <0.25 <0.25 0.0% < 0.05 110% 90% 110% 100% 90% 110% 10	6 80%	5 120%
	% 80%	5 120%
		5 120%
Ortho Phosphate as P 6430050 <0.50 <0.50 0.0% < 0.10 104% 90% 110% 95% 90% 110% 10.		
Reactive Silica 6432724 12.2 12.2 0.0% < 0.05 96% 90% 110% 97% 90% 110% 96		
Ammonia as N 6429741 0.25 0.23 8.3% < 0.02 107% 90% 110% 99% 90% 110% 10	% 80%	5 120%
Total Phosphorus 6430142 6430142 < 0.05 < 0.05 0.0% < 0.05 100% 80% 120% 95% 90% 110% 10.		
Total Organic Carbon 6430142 6430142 1.7 1.8 5.7% < 0.5 95% 90% 110% 10% 94		
Colour 6430142 6430142 < 5 < 5 0.0% < 5 103% 90% 110% NA N		
Turbidity 6430199 6430199 1.5 1.4 6.9% < 0.5 106% 90% 110% NA N		
Calcium 6430214 6430214 73.6 73.5 0.1% < 0.05 100% 90% 110% 98% 90% 110% 93	6 70%	5 130%
Magnesium 6430214 6430214 23.5 23.6 0.4% < 0.05 97% 90% 110% 94% 90% 110% 93		
Sodium 6430214 6430214 8.20 8.23 0.4% < 0.05 99% 90% 110% 97% 90% 110% 94		
Potassium 6430214 6430214 0.90 0.90 0.0% < 0.05 101% 90% 110% 99% 90% 110% 99		
Aluminum 6430223 6430223 < 0.004 < 0.004 0.0% < 0.004 105% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 10% <td></td> <td></td>		
Antimony 6430223 6430223 < 0.003 < 0.003 0.0% < 0.003 96% 90% 110% 100% 90% 110% 96	6 70%	5 130%
Arsenic 6430223 6430223 < 0.003 < 0.003 0.0% < 0.003 10% 90% 110% 90% 90% 110% 90%		
Barium 6430223 6430223 0.048 0.048 0.0% < 0.002 98% 90% 110% 102% 90% 110% 10		
Beryllium 6430223 6430223 < 0.001 < 0.001 0.0% < 0.001 97% 90% 110% 102% 90% 110% 101%		
Boron 6430223 6430223 < 0.010 0.010 10.5% < 0.010 97% 90% 110% 110% 90% 110% 10		
Cadmium 6430223 6430223 < 0.001 < 0.001 0.0% < 0.001 101% 90% 110% 104% 90% 110% 10	0/ 7 00/	5 130%
Chromium 6430223 6430223 < 0.003 < 0.003 0.003 101% 90% 110% 90% 110% 90% 110% 90% 110% 90% 110% 10% <th< td=""><td></td><td></td></th<>		
Cobalt 6430223 6430223 6430223 < 0.001 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 < 0.003 <th< td=""><td></td><td></td></th<>		
Copper 6430223 6430223 < 0.001 < 0.001 0.0% < 0.001 96% 90% 110% 90% 90% 110% 90% 90% 110%<		5 130% 5 130%
Iron 6430223 6430223 < 0.003 < 0.003 < 0.00% < 0.003 99% 90% 110% 96% 90% 110% 92% 110% 92%		5 130% 5 130%
Lead 6430223 6430223 < 0.002 < 0.002 0.0% < 0.002 103% 90% 110% 107% 90% 110% 10	% 70%	5 130%
-		
Molybdenum 6430223 6430223 < 0.002 < 0.002 0.0% < 0.002 97% 90% 110% 100% 90% 110% 10	/0 /0%	5 130%

AGAT QUALITY ASSURANCE REPORT (V1)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

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Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

SAMPLING SITE:

AGAT WORK ORDER: 15W960815 ATTENTION TO: Dwight Smikle

SAMPLED BY:

Water Analysis (Continued)

						`		,							
RPT Date: Apr 15, 2015			C	UPLICATE	=		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	1.10	ptable nits	Recovery	1.10	ptable nits
		ia					value	Lower	Upper	-	Lower	Upper	-	Lower	Upper
Nickel	6430223 6	6430223	< 0.003	< 0.003	0.0%	< 0.003	103%	90%	110%	101%	90%	110%	100%	70%	130%
Selenium	6430223 6	6430223	< 0.004	< 0.004	0.0%	< 0.004	100%	90%	110%	104%	90%	110%	96%	70%	130%
Silver	6430223 6	6430223	< 0.002	< 0.002	0.0%	< 0.002	101%	90%	110%	110%	90%	110%	101%	70%	130%
Strontium	6430223 6	6430223	0.102	0.097	5.0%	< 0.005	101%	90%	110%	107%	90%	110%	103%	70%	130%
Thallium	6430223 6	6430223	< 0.006	< 0.006	0.0%	< 0.006	100%	90%	110%	105%	90%	110%	101%	70%	130%
Tin	6430223 6	6430223	< 0.002	< 0.002	0.0%	< 0.002	93%	90%	110%	102%	90%	110%	97%	70%	130%
Titanium	6430223 6	6430223	< 0.002	< 0.002	0.0%	< 0.002	98%	90%	110%	103%	90%	110%	99%	70%	130%
Tungsten	6430223 6	6430223	< 0.010	< 0.010	0.0%	< 0.010	97%	90%	110%	105%	90%	110%	101%	70%	130%
Uranium	6430223 6	6430223	< 0.002	< 0.002	0.0%	< 0.002	97%	90%	110%	108%	90%	110%	102%	70%	130%
Vanadium	6430223 6	6430223	0.003	0.003	0.0%	< 0.002	101%	90%	110%	105%	90%	110%	99%	70%	130%
Zinc	6430223 6	6430223	0.017	0.016	6.1%	< 0.005	102%	90%	110%	107%	90%	110%	101%	70%	130%
Zirconium	6430223 6	6430223	< 0.004	< 0.004	0.0%	< 0.004	100%	90%	110%	102%	90%	110%	100%	70%	130%

Comments: NA signifies Not Applicable

Certified By:

Mile Mimenian

AGAT QUALITY ASSURANCE REPORT (V1)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Page 5 of 8



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

AGAT WORK ORDER: 15W960815 ATTENTION TO: Dwight Smikle

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
рН	INOR-93-6000	SM 4500-H+ B	PC TITRATE
Saturation pH		SM 2320 B	CALCULATION
Langelier Index		SM 2330B	CALCULATION
Total Hardness (as CaCO3)	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE
Alkalinity (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Bicarbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Carbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Hydroxide (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Fluoride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Bromide	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Ortho Phosphate as P	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Reactive Silica	INOR-93-6047	AQ2 EPA-122A & SM 4500 SiO2 D	AQ2 DISCRETE ANALYSER
Ammonia as N	INOR-93-6002	AQ2 EPA-103A & SM 4500 NH3-F	AQ-2 DISCRETE ANALYZER
Total Phosphorus	INOR-93-6057	QuikChem 10-115-01-3-A & SM 4500-P I	LACHAT FIA
Total Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310	SHIMADZU CARBON ANALYZER
Colour	INOR-93-6046	SM 2120 B	SPECTROPHOTOMETER
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Aluminum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Iron	MET-93-6103	EPA SW-846 6020A & 200.8 EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8 EPA SW-846 6020A & 200.8	ICP-MS
	MET-93-6103	EPA SW-846 6020A & 200.8 EPA SW-846 6020A & 200.8	ICP-MS
Manganese		EPA SW-846 6020A & 200.8 EPA SW 846 7470 & 245.1	CVAAS
Mercury	MET-93-6100		
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8 EPA SW-846 6020A & 200.8	ICP-MS
Selenium	MET-93-6103		ICP-MS
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Strontium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Thallium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Tin	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

AGAT WORK ORDER: 15W960815 ATTENTION TO: Dwight Smikle

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Titanium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Tungsten	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zirconium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
% Difference/ Ion Balance		SM 1030 E	CALCULATION

Samples Reinquisned by (Finit Name and Sign): Occument ID: (XV:78-1541,006)	Samples Beingulähed By (Pring Lame and Sign):					220	04-1-20	TWS	TW2	Sample Identification	Controlle	SD Sediment S Soil	GW Ground Water O Oil		Address:	Company:	Invoice To	Please note, if quotatic client will be billed	AGAT Quotation #:	Project: 300033273	Gulph	Address: 292-Spe	Company: BURNSI	Client Information	Chain of Custody			
	Scan Qualan				F 11, 00		7.00	9:50	7 Apr. 1 15 11:00	Date Time Sampled Sampled	Email:	2. Name:	1. Name:	Report Information -		Salle, tes A	Same: Ve	Please note, if quotation number is not provided client will be billed full price for analysis.		PO	A ON	educie Ave	SER		Record			
Date/ Iime	100				V				0 GW 6	Sample # of Matrix Containers			Att Smikle	reports to be s	Drinko									Regu		Labor		
Saturbus Received by (Print Name an	Samples Received By (Print Nagree an M. K. W. W. M.							Cield Cilka	metals + Mea	Comments Site/Sample Information		A NO	210		If "Yes", please use the Drinking Water Chain of Custody Form	(potable water intended for numan consumption)	Is this a drinking water sample?	Soil Texture (check one)	Agriculture	Res/Park	Ind/Com	Table	Regulation 153/04 (reg. 511 Amend.)	Regulatory Requirements		aboratories	0.2/1.2/0.5	
A Apr	& Joy Marian							20	CUT/	Metal Hydrid Client	Scan e Forn Custor	m Meta	etals als			1			Storm	Sanitary	Indicate one	Region	Sewer Use		P: 905.71:	www.agatlabs.com	o`2	
6 1 15 93	Dare yme - O	E								II FOO	:	Cr+6- N- TP NO ₂	_	Hg Hg	□ pH KN	Yes		None			Other (specify)	CCME	Regulation 558		P: 905.712.5100 · F: 905.712.5122	L4Z 1Y2 www.agatlabs.com • webearth.agatlabs.com	5835 Coopers Avenue Mississauga, ON	
White Copy- AGAT	Pink Copy - Client									ABNS PAHS Chioro PCBS Organo	pheno ochlori	ils ine Pes	tlcides					OR	(0) 1 Working Day		Rush TAT (please provi Rush Surcharges Apply	5 to 7 Working Days	Regular TAT	Turnaround			Yenue Laboratory Use Only 3a, ON Arrival Temperature:	
^N ? 5368	Page (<	<	<	<	5	TCLP N Sewer			n ncs			*TAT is exclusive of weekends and statutory holidays	Date Required (Rush surcharges may apply):		g Days g Day	g Days	Rush TAT (please provide prior notification) Rush Surcharges Apply	orking Days		Turnaround Time Required (TAT) Required*	ice	15W960815	r Use Only ature:	
Date learned May 31 2613	of 1													3		vry holidays	y):				Ŭ			Required*		ري دو		



CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Jim Baxter

PROJECT: 3000 33273

AGAT WORK ORDER: 16T069988

WATER ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

DATE REPORTED: Feb 22, 2016

PAGES (INCLUDING COVER): 9

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES VERSION 1:Partial Report Issued Feb 22nd 2016.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

Page 1 of 9

Member of: Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA) Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA)

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Results relate only to the items tested and to all the items tested All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request



AGAT WORK ORDER: 16T069988 PROJECT: 3000 33273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Jim Baxter

SAMPLED BY:

				ate (Water)
				DATE REPORTED: 2016-02-22
S	SAMPLE DES	CRIPTION:	TW7 (12:50)	
	SAM	PLE TYPE:	Water	
	DATE S	SAMPLED:	2/19/2016	
Unit	G/S	RDL	7395664	
mg/L		0.25	8.00	
	Unit	SAMI DATE S Unit G / S	SAMPLE TYPE: DATE SAMPLED: Unit G / S RDL	SAMPLE DESCRIPTION: TW7 (12:50) SAMPLE TYPE: Water DATE SAMPLED: 2/19/2016 Unit G / S RDL 7395664

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7395664 Elevated RDL indicates the degree of sample dilution prior to the analysis for anions in order to keep analyte within the calibration range of the instrument and to reduce matrix interference.

Certified By:

Amanjot Bhela



AGAT WORK ORDER: 16T069988 PROJECT: 3000 33273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Jim Baxter

SAMPLED BY:

			Water C	uality Assessment (mg/L)
DATE RECEIVED: 2016-02-19				DATE REPORTED: 2016-02-22
Deremeter	S. Unit	AMPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED: G / S RDL	TW7 Water 2/19/2016 7395659	
Parameter Electrical Conductivity	uS/cm	2 G/S RDL	587	
pH	pH Units	NA	7.88	
Saturation pH	priorito		6.99	
Langelier Index			0.89	
Total Hardness (as CaCO3)	mg/L	0.5	280	
Total Dissolved Solids	mg/L	20	354	
Alkalinity (as CaCO3)	mg/L	5	262	
Bicarbonate (as CaCO3)	mg/L	5	262	
Carbonate (as CaCO3)	mg/L	5	<5	
Hydroxide (as CaCO3)	mg/L	5	<5	
Fluoride	mg/L	0.25	<0.25	
Chloride	mg/L	0.50	18.3	
Nitrate as N	mg/L	0.25	8.52	
Nitrite as N	mg/L	0.25	<0.25	
Bromide	mg/L	0.25	<0.25	
Sulphate	mg/L	0.50	20.6	
Ortho Phosphate as P	mg/L	0.50	<0.50	
Reactive Silica	mg/L	0.05		
Ammonia as N	mg/L	0.02		
Total Phosphorus	mg/L	0.05	<0.05	
Total Organic Carbon	mg/L	0.5	0.6	
Colour	TCU	5	<5	
Turbidity	NTU	0.5	3.9	
Calcium	mg/L	0.05	77.2	
Magnesium	mg/L	0.05	21.2	
Sodium	mg/L	0.05	5.60	
Potassium	mg/L	0.05	1.00	
Aluminum	mg/L	0.004	< 0.004	
Antimony	mg/L	0.003	<0.003	
Arsenic	mg/L	0.003	< 0.003	

Certified By:

Page 3 of 9

Amanjot Bhela



AGAT WORK ORDER: 16T069988 PROJECT: 3000 33273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Jim Baxter

SAMPLED BY:

ATE RECEIVED: 2016-02-19)			DATE REPORTED: 2	2016-02-22
	S	SAMPLE DESCRIPTION:	TW7		
		SAMPLE TYPE:	Water		
		DATE SAMPLED:	2/19/2016		
Parameter	Unit	G/S RDL	7395659		
arium	mg/L	0.002	0.093		
eryllium	mg/L	0.001	<0.001		
oron	mg/L	0.010	<0.010		
admium	mg/L	0.001	<0.001		
hromium	mg/L	0.003	<0.003		
obalt	mg/L	0.001	<0.001		
opper	mg/L	0.003	<0.003		
on	mg/L	0.010	<0.010		
ead	mg/L	0.002	<0.002		
anganese	mg/L	0.002	<0.002		
ercury	mg/L	0.0001	<0.0001		
olybdenum	mg/L	0.002	<0.002		
ickel	mg/L	0.003	<0.003		
elenium	mg/L	0.004	<0.004		
lver	mg/L	0.002	<0.002		
trontium	mg/L	0.005	0.106		
nallium	mg/L	0.006	<0.006		
n	mg/L	0.002	<0.002		
tanium	mg/L	0.002	<0.002		
ungsten	mg/L	0.010	<0.010		
ranium	mg/L	0.002	<0.002		
anadium	mg/L	0.002	<0.002		
nc	mg/L	0.005	0.017		
rconium	mg/L	0.004	<0.004		
Difference/ Ion Balance	%	NA	7.32		

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7395659 Elevated RDL indicates the degree of sample dilution prior to the analysis for anions in order to keep analyte within the calibration range of the instrument and to reduce matrix interference.

Certified By:

Amanjot Bhela



Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 3000 33273

SAMPLING SITE:

AGAT WORK ORDER: 16T069988

ATTENTION TO: Jim Baxter

SAMPLED BY:

				Wate	er Ar	alysi	S								
RPT Date: Feb 22, 2016			D	UPLICATE			REFEREN	ICE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		otable hits	Recovery		ptable nits	Recovery		ptable nits
FARAMETER	Batch	ld	Dup #1	Dup #2	RFD		Value	Lower	Upper	Recovery	Lower	Upper	Recovery	Lower	Upper
Water Quality Assessment (mg/L))														
Electrical Conductivity	7397209		1320	1320	0.0%	< 2	98%	80%	120%	NA			NA		
рН	7397209		8.11	8.02	1.1%	NA	99%	90%	110%	NA			NA		
Total Dissolved Solids	7393504		552	562	1.8%	< 20	96%	80%	120%	NA			NA		
Alkalinity (as CaCO3)	7397209		336	337	0.3%	< 5	102%	80%	120%	NA			NA		
Bicarbonate (as CaCO3)	7397209		336	337	0.3%	< 5	NA			NA			NA		
Carbonate (as CaCO3)	7397209		<5	<5	NA	< 5	NA			NA			NA		
Hydroxide (as CaCO3)	7397209		<5	<5	NA	< 5	NA			NA			NA		
Fluoride	7395664 739	95664	<0.25	<0.25	NA	< 0.05	99%	90%	110%	93%	90%	110%	89%	80%	120%
Chloride	7395664 739	95664	16.8	16.8	0.0%	< 0.10	105%	90%	110%	98%	90%	110%	96%	80%	120%
Nitrate as N	7395664 739	95664	8.00	7.88	1.5%	< 0.05	98%	90%	110%	101%	90%	110%	113%	80%	120%
Nitrite as N	7395664 739	95664	<0.25	<0.25	NA	< 0.05	NA	90%	110%	98%	90%	110%	113%	80%	120%
Bromide	7395664 739	95664	<0.25	<0.25	NA	< 0.05	108%	90%	110%	104%	90%	110%	112%	80%	120%
Sulphate	7395664 739	95664	18.9	18.4	2.7%	< 0.10	104%	90%	110%	95%	90%	110%	102%	80%	120%
Ortho Phosphate as P	7395664 739	95664	<0.50	<0.50	NA	< 0.10	95%	90%	110%	90%	90%	110%	92%	80%	120%
Total Phosphorus	7396488		<0.05	<0.05	NA	< 0.05	102%	80%	120%	95%	90%	110%	102%	70%	130%
Total Organic Carbon	7396282		<0.5	<0.5	NA	< 0.5	96%	90%	110%	103%	90%	110%	99%	80%	120%
Colour	7396488		<5	<5	NA	< 5	102%	90%	110%	NA			NA		
Turbidity	7396488		<0.5	<0.5	NA	< 0.5	100%	90%	110%	NA			NA		
Calcium	7395659 739	95659	77.2	76.9	0.4%	< 0.05	105%	90%	110%	104%	90%	110%	89%	70%	130%
Magnesium	7395659 739	95659	21.2	21.6	1.9%	< 0.05	98%	90%	110%	98%	90%	110%	86%	70%	130%
Sodium	7395659 739	95659	5.60	5.64	0.7%	< 0.05	101%	90%	110%	102%	90%	110%	95%	70%	130%
Potassium	7395659 739	95659	1.00	1.02	2.0%	< 0.05	101%	90%	110%	102%	90%	110%	106%	70%	130%
Antimony	7394156		< 0.003	< 0.003	NA	< 0.003	94%	90%	110%	92%	90%	110%	97%	70%	130%
Arsenic	7394156		< 0.003	< 0.003	NA	< 0.003	98%	90%	110%	96%	90%	110%	114%	70%	130%
Barium	7394156		0.453	0.447	1.3%	< 0.002	96%	90%	110%	97%	90%	110%	92%	70%	130%
Beryllium	7394156		< 0.001	< 0.001	NA	< 0.001	91%	90%	110%	97%	90%	110%	98%	70%	130%
Boron	7394156		0.040	0.039	NA	< 0.010	100%	90%	110%	101%	90%	110%	106%	70%	130%
Cadmium	7394156		< 0.001	< 0.001	NA	< 0.001	94%	90%	110%	94%	90%	110%	99%	70%	130%
Chromium	7394156		0.009	0.009	NA	< 0.003	100%	90%	110%	101%	90%	110%	104%	70%	130%
Cobalt	7394156		< 0.001	< 0.001	NA	< 0.001	101%	90%	110%	102%	90%	110%	105%	70%	130%
Copper	7394156		< 0.003	< 0.003	NA	< 0.003	99%	90%	110%	101%	90%	110%	102%	70%	130%
Iron	7394156		7.79	7.51	3.7%	< 0.010	102%		110%	101%		110%	110%	70%	
Lead	7394156		< 0.002	< 0.002	NA	< 0.002	92%	90%	110%	91%	90%	110%	91%	70%	130%
Manganese	7394156		1.35	1.35	0.0%	< 0.002	97%		110%	97%		110%	80%		130%
Mercury	7395659 739	95659	<0.0001	<0.0001	NA	< 0.0001	99%		110%	98%		110%	99%	80%	120%
Molybdenum	7394156		0.002	0.002	NA	< 0.002	94%	90%	110%	95%	90%	110%	101%	70%	130%
Nickel	7394156		< 0.003	< 0.003	NA	< 0.003	106%		110%	106%		110%	108%		130%
Selenium	7394156		< 0.004	< 0.004	NA	< 0.004	102%		110%	99%		110%	119%		130%
Silver	7394156		< 0.002	< 0.002	NA	< 0.002	95%		110%	105%		110%	102%		130%
															5 . (0

AGAT QUALITY ASSURANCE REPORT (V1)

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Page 5 of 9



Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 3000 33273

SAMPLING SITE:

AGAT WORK ORDER: 16T069988 ATTENTION TO: Jim Baxter

SAMPLED BY:

Water Analysis (Continued)

					•	•		,							
RPT Date: Feb 22, 2016			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MAT	RIX SPI	IKE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Lin	ptable nits	Recovery	Acceptable Limits	
		ld						Lower	Upper		Lower	Upper		Lower	Upper
Strontium	7394156		0.496	0.488	1.6%	< 0.005	94%	90%	110%	96%	90%	110%	95%	70%	130%
Thallium	7394156		< 0.006	< 0.006	NA	< 0.006	100%	90%	110%	100%	90%	110%	101%	70%	130%
Tin	7394156		< 0.002	< 0.002	NA	< 0.002	97%	90%	110%	92%	90%	110%	98%	70%	130%
Titanium	7394156		0.002	0.003	NA	< 0.002	97%	90%	110%	96%	90%	110%	104%	70%	130%
Tungsten	7394156		< 0.010	< 0.010	NA	< 0.010	96%	90%	110%	90%	90%	110%	101%	70%	130%
Uranium	7394156		< 0.002	< 0.002	NA	< 0.002	97%	90%	110%	91%	90%	110%	97%	70%	130%
Vanadium	7394156		< 0.002	< 0.002	NA	< 0.002	91%	90%	110%	95%	90%	110%	101%	70%	130%
Zinc	7394156		< 0.005	< 0.005	NA	< 0.005	97%	90%	110%	98%	90%	110%	101%	70%	130%
Zirconium	7394156		< 0.004	< 0.004	NA	< 0.004	101%	90%	110%	97%	90%	110%	108%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By:

Amanjot Bhela

Page 6 of 9

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Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 3000 33273

SAMPLING SITE:

AGAT WORK ORDER: 16T069988

ATTENTION TO: JI	m Baxter
SAMPLED BV	

AGAT S.O.P INOR-93-6004 INOR-93-6000 INOR-93-6000 MET-93-6105 INOR-93-6028 INOR-93-6000	LITERATURE REFERENCE SM 4110 B SM 2510 B SM 4500-H+ B SM 2320 B SM 2330B EPA SW-846 6010C & 200.7	ANALYTICAL TECHNIQUE ION CHROMATOGRAPH PC TITRATE PC TITRATE CALCULATION CALCULATION
INOR-93-6000 INOR-93-6000 MET-93-6105 INOR-93-6028 INOR-93-6000	SM 2510 B SM 4500-H+ B SM 2320 B SM 2330B EPA SW-846 6010C & 200.7	PC TITRATE PC TITRATE CALCULATION
INOR-93-6000 INOR-93-6000 MET-93-6105 INOR-93-6028 INOR-93-6000	SM 2510 B SM 4500-H+ B SM 2320 B SM 2330B EPA SW-846 6010C & 200.7	PC TITRATE PC TITRATE CALCULATION
INOR-93-6000 MET-93-6105 INOR-93-6028 INOR-93-6000	SM 4500-H+ B SM 2320 B SM 2330B EPA SW-846 6010C & 200.7	PC TITRATE CALCULATION
MET-93-6105 INOR-93-6028 INOR-93-6000	SM 2320 B SM 2330B EPA SW-846 6010C & 200.7	CALCULATION
INOR-93-6028 INOR-93-6000	SM 2330B EPA SW-846 6010C & 200.7	
INOR-93-6028 INOR-93-6000	EPA SW-846 6010C & 200.7	CALCULATION
INOR-93-6028 INOR-93-6000		
INOR-93-6000	011 05 10 0	ICP/OES
	SM 2540 C	BALANCE
	SM 2320 B	PC TITRATE
INOR-93-6000	SM 2320 B	PC TITRATE
INOR-93-6000	SM 2320 B	PC TITRATE
INOR-93-6000	SM 2320 B	PC TITRATE
		ION CHROMATOGRAPH
		AQ2 DISCRETE ANALYSER
INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500	LACHAT FIA
INOR-93-6057	QuikChem 10-115-01-3-A & SM 4500-P I	LACHAT FIA
INOR-93-6049	EPA 415.1 & SM 5310	SHIMADZU CARBON ANALYZER
INOR-93-6046	SM 2120 B	SPECTROPHOTOMETER
INOR-93-6044	SM 2130 B	NEPHELOMETER
MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
	EPA SW-846 6010C & 200.7	ICP/OES
	EPA SW-846 6020A & 200.8	ICP-MS
	EPA SW-846 6020A & 200.8	ICP-MS
		CVAAS
		ICP-MS
	INOR-93-6000 INOR-93-6004 INOR-93-6004 INOR-93-6004 INOR-93-6004 INOR-93-6004 INOR-93-6004 INOR-93-6047 INOR-93-6059 INOR-93-6057 INOR-93-6049 INOR-93-6046 INOR-93-6044 MET-93-6105	INOR-93-6000SM 2320 BINOR-93-6004SM 4110 BINOR-93-6057AQ2 EPA-122A & SM 4500 SiO2 DINOR-93-6059QuikChem 10-115-01-3-A & SM 4500INOR-93-6057QuikChem 10-115-01-3-A & SM 4500-P IINOR-93-6046SM 2120 BINOR-93-6046SM 2120 BINOR-93-6046SM 2130 BMET-93-6105EPA SW-846 6010C & 200.7MET-93-6105EPA SW-846 6010C & 200.7MET-93-6105EPA SW-846 6010C & 200.7MET-93-6105EPA SW-846 6020A & 200.8MET-93-6103EPA SW-846 6020A & 200.8



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 3000 33273

AGAT WORK ORDER: 16T069988

ATTENTION TO: Jim Baxter

SAMPLING SITE:		SAMPLED BY:									
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE								
Tin	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Titanium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Tungsten	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Zirconium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
% Difference/ Ion Balance		SM 1030 E	CALCULATION								

Samples Relinquished By (Print Name and Sign):	3	ていて	Sample Identification	nformati	Chain of Custody Report Information: Company: Contact: Address: Phone: Reports to be sent to: 1. Email: 2. Email:
k Mato	TCO INVAIS	Fib 19/245 10:56	Date Time Sampled Sampled	Pease note: If quidabloin numbor is not provided, client will be billed full prive for analysis On: Bill To Same: Yes	Record Record Barber Barber Societ
Deter Time Date Time		- ~	# of Sample d Containers Matrix	lir be billed full price for analysis. Bill To Same: Yes I No I	Image: place Image: place Drinking Water sample, please use Drinking V Image: place Image: place
Samples Received By (Print Name and Sign): Samples Received By (Print Name and Sign):			Comments/ Special Instructions	Sample Matrix Legend B Biota GW Ground Water O Oil P Paint S Soil S Soil S Sediment SW Surface Water	Vater Chain of (Vater Chain of (tory Requi all applicable boxes) ion 153/04 ion 153/04 difuere One om arrk liture e check one) e cof Site Con
ed By (Print Kame and Sign): d By (Print Name and Sign):			Metal Hydrid Client	e Forming Metals Custom Metals	Ph: 905.71 Ph: 905.71
Plnk Copy - c			Cr ⁶⁺ Tota Nutrie NO ₃ Volatil	B-HWS CI CN CI CN DEC FOC NO_y/NO_2 NO_y/NO_2 CI CI IN Hg DpH SAR Application CI CI IN Hg DpH SAR Application CI CI	5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2 webearth.agatlabs.com ater intended for human consumption) o Regulatory Requirement Regulation 558 ccME prov. Water Quality objectives (PWQO) other Indicate of Analysis Yes XN0
Date Time Pag Date Time N°: T Date Time N°: T			PCBs Organo	phenols ochlorine Pesticides Aetals/Inorganics Use	Labo Work C Cooler Arrival Rush Rush
e of _		*	As W W	Antis	Business by Contract Business bays r notification for ra
01 1					1 Business Day vs Apply): vy Apply):

Page 9 of 9



CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Jim Baxter

PROJECT: 3000 33273

AGAT WORK ORDER: 16T069988

WATER ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

DATE REPORTED: Feb 23, 2016

PAGES (INCLUDING COVER): 9

VERSION*: 2

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES VERSION 2:Full Report Issued Feb 22nd 2016.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V2)

Member of: Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA) Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA) AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Page 1 of 9

Results relate only to the items tested and to all the items tested All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request



AGAT WORK ORDER: 16T069988 PROJECT: 3000 33273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Jim Baxter

SAMPLED BY:

Nitrate (Water)											
DATE RECEIVED: 2016-02-19					DATE REPORTED: 2016-02-23						
	S	AMPLE DES	CRIPTION:	TW7 (12:50)							
		SAM	PLE TYPE:	Water							
		DATE S	SAMPLED:	2/19/2016							
Parameter	Unit	G/S	RDL	7395664							
Nitrate as N	mg/L		0.25	8.00							

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7395664 Elevated RDL indicates the degree of sample dilution prior to the analysis for anions in order to keep analyte within the calibration range of the instrument and to reduce matrix interference.

Certified By:



AGAT WORK ORDER: 16T069988 PROJECT: 3000 33273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Jim Baxter

SAMPLED BY:

			Water Qu	ality Assessment (mg/L)
DATE RECEIVED: 2016-02-19				DATE REPORTED: 2016-02-23
Parameter	S Unit	AMPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED: G / S RDL	TW7 Water 2/19/2016 7395659	
Electrical Conductivity	uS/cm	2	587	
pH	pH Units	NA	7.88	
Saturation pH	F		6.99	
Langelier Index			0.89	
Total Hardness (as CaCO3)	mg/L	0.5	280	
Total Dissolved Solids	mg/L	20	354	
Alkalinity (as CaCO3)	mg/L	5	262	
Bicarbonate (as CaCO3)	mg/L	5	262	
Carbonate (as CaCO3)	mg/L	5	<5	
Hydroxide (as CaCO3)	mg/L	5	<5	
Fluoride	mg/L	0.25	<0.25	
Chloride	mg/L	0.50	18.3	
Nitrate as N	mg/L	0.25	8.52	
Nitrite as N	mg/L	0.25	<0.25	
Bromide	mg/L	0.25	<0.25	
Sulphate	mg/L	0.50	20.6	
Ortho Phosphate as P	mg/L	0.50	<0.50	
Reactive Silica	mg/L	0.05	7.03	
Ammonia as N	mg/L	0.02	0.10	
Total Phosphorus	mg/L	0.05	<0.05	
Total Organic Carbon	mg/L	0.5	0.6	
Colour	TCU	5	<5	
Turbidity	NTU	0.5	3.9	
Calcium	mg/L	0.05	77.2	
Magnesium	mg/L	0.05	21.2	
Sodium	mg/L	0.05	5.60	
Potassium	mg/L	0.05	1.00	
Aluminum	mg/L	0.004	< 0.004	
Antimony	mg/L	0.003	<0.003	
Arsenic	mg/L	0.003	<0.003	

Certified By:

Page 3 of 9

Amanjot Bhela



AGAT WORK ORDER: 16T069988 PROJECT: 3000 33273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Jim Baxter

SAMPLED BY:

DATE RECEIVED: 2016-02-19	9			DATE REPORTED: 2016-02-2
	S	SAMPLE DESCRIPTION	: TW7	
		SAMPLE TYPE	Water	
		DATE SAMPLED	2/19/2016	
Parameter	Unit	G/S RDL	7395659	
Barium	mg/L	0.002	0.093	
Beryllium	mg/L	0.001	<0.001	
Boron	mg/L	0.010	<0.010	
Cadmium	mg/L	0.001	<0.001	
Chromium	mg/L	0.003	<0.003	
Cobalt	mg/L	0.001	<0.001	
Copper	mg/L	0.003	<0.003	
on	mg/L	0.010	<0.010	
ead	mg/L	0.002	<0.002	
langanese	mg/L	0.002	<0.002	
lercury	mg/L	0.0001	<0.0001	
lolybdenum	mg/L	0.002	<0.002	
lickel	mg/L	0.003	<0.003	
Selenium	mg/L	0.004	<0.004	
Silver	mg/L	0.002	<0.002	
Strontium	mg/L	0.005	0.106	
hallium	mg/L	0.006	<0.006	
ïn	mg/L	0.002	<0.002	
ïtanium	mg/L	0.002	<0.002	
ungsten	mg/L	0.010	<0.010	
Jranium	mg/L	0.002	<0.002	
anadium	mg/L	0.002	<0.002	
linc	mg/L	0.005	0.017	
írconium	mg/L	0.004	<0.004	
6 Difference/ Ion Balance	%	NA	7.26	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7395659 Elevated RDL indicates the degree of sample dilution prior to the analysis for anions in order to keep analyte within the calibration range of the instrument and to reduce matrix interference.

Certified By:

Amanjot Bhela



Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 3000 33273

SAMPLING SITE:

AGAT WORK ORDER: 16T069988

ATTENTION TO: Jim Baxter

SAMPLED BY:

			Wate	er Ar	nalysi	S								
RPT Date: Feb 23, 2016		[UPLICATI	=		REFEREN	NCE MA	TERIAL	METHOD	BLANK		MAT	RIX SPI	KE
PARAMETER	Batch Samp	e Dup #1	Dup #2	RPD	Method Blank	Measured	Accer Lim		Recovery		ptable nits	Recovery		ptable nits
	Id					Value	Lower	Upper	,	Lower	Upper		Lower	Upper
Water Quality Assessment (mg/L))													
Electrical Conductivity	7397209	1320	1320	0.0%	< 2	98%	80%	120%	NA			NA		
рН	7397209	8.11	8.02	1.1%	NA	99%	90%	110%	NA			NA		
Total Dissolved Solids	7393504	552	562	1.8%	< 20	96%	80%	120%	NA			NA		
Alkalinity (as CaCO3)	7397209	336	337	0.3%	< 5	102%	80%	120%	NA			NA		
Bicarbonate (as CaCO3)	7397209	336	337	0.3%	< 5	NA			NA			NA		
Carbonate (as CaCO3)	7397209	<5	<5	NA	< 5	NA			NA			NA		
Hydroxide (as CaCO3)	7397209	<5	<5	NA	< 5	NA			NA			NA		
Fluoride	7395664 7395664	< 0.25	<0.25	NA	< 0.05	99%	90%	110%	93%	90%	110%	89%	80%	120%
Chloride	7395664 7395664	16.8	16.8	0.0%	< 0.10	105%	90%	110%	98%	90%	110%	96%	80%	120%
Nitrate as N	7395664 7395664	8.00	7.88	1.5%	< 0.05	98%	90%	110%	101%	90%	110%	113%	80%	120%
Nitrite as N	7395664 7395664	< 0.25	<0.25	NA	< 0.05	NA	90%	110%	98%	90%	110%	113%	80%	120%
Bromide	7395664 7395664		<0.25	NA	< 0.05	108%		110%	104%	90%	110%	112%	80%	120%
Sulphate	7395664 7395664		18.4	2.7%	< 0.10	104%		110%	95%	90%	110%	102%	80%	120%
Ortho Phosphate as P	7395664 7395664		<0.50	NA	< 0.10	95%		110%	90%	90%	110%	92%	80%	120%
Reactive Silica	7395659 7395659		6.92	1.6%	< 0.05	98%		110%	99%	90%	110%	89%	80%	120%
Ammonia as N	7205650 720565	0.10	0.10	0.00/	. 0. 02	0.49/	0.00/	1100/	069/	0.00/	1100/	050/	80%	120%
	7395659 7395659		0.10	0.0%	< 0.02	94%		110%	96%	90%	110%	85%		130%
Total Phosphorus Total Organic Carbon	7396488 7396282	<0.05	<0.05	NA	< 0.05 < 0.5	102% 96%		120%	95% 103%	90%	110%	102% 99%	70% 80%	120%
Colour	7396488	<0.5 <5	<0.5 <5	NA NA	< 0.5	90% 102%		110% 110%	NA	90%	110%	99% NA	00%	12070
Turbidity	7396488	<0.5	<0.5	NA	< 0.5	102 %		110%	NA			NA		
														4000/
Calcium	7395659 7395659		76.9	0.4%	< 0.05	105%		110%	104%	90%	110%	89%	70%	130%
Magnesium	7395659 7395659		21.6	1.9%	< 0.05	98%		110%	98%	90%	110%	86%	70%	130%
Sodium	7395659 7395659		5.64	0.7%	< 0.05	101%		110%	102%	90%	110%	95%	70%	130%
Potassium	7395659 7395659		1.02	2.0%	< 0.05	101%		110%	102%	90%	110%	106%	70%	130%
Antimony	7394156	< 0.003	< 0.003	NA	< 0.003	94%	90%	110%	92%	90%	110%	97%	70%	130%
Arsenic	7394156	< 0.003	< 0.003	NA	< 0.003	98%		110%	96%	90%	110%	114%	70%	130%
Barium	7394156	0.453	0.447	1.3%	< 0.002	96%	90%	110%	97%	90%	110%	92%	70%	130%
Beryllium	7394156	< 0.001	< 0.001	NA	< 0.001	91%		110%	97%	90%	110%	98%	70%	130%
Boron	7394156	0.040	0.039	NA	< 0.010	100%		110%	101%	90%	110%	106%	70%	130%
Cadmium	7394156	< 0.001	< 0.001	NA	< 0.001	94%	90%	110%	94%	90%	110%	99%	70%	130%
Chromium	7394156	0.009	0.009	NA	< 0.003	100%	90%	110%	101%	90%	110%	104%	70%	130%
Cobalt	7394156	< 0.001	< 0.001	NA	< 0.001	101%	90%	110%	102%	90%	110%	105%	70%	130%
Copper	7394156	< 0.003	< 0.003	NA	< 0.003	99%	90%	110%	101%	90%	110%	102%	70%	130%
Iron	7394156	7.79	7.51	3.7%	< 0.010	102%	90%	110%	101%	90%	110%	110%	70%	130%
Lead	7394156	< 0.002	< 0.002	NA	< 0.002	92%	90%	110%	91%	90%	110%	91%	70%	130%
Manganese	7394156	1.35	1.35	0.0%	< 0.002	97%	90%	110%	97%	90%	110%	80%	70%	130%
Mercury	7395659 7395659		<0.0001	NA	< 0.0001			110%	98%	90%	110%	99%		120%
Molybdenum	7394156	0.002	0.002	NA	< 0.002	94%		110%	95%		110%	101%		130%
Nickel	7394156	< 0.003	< 0.003	NA	< 0.003	106%		110%	106%		110%	108%	70%	130%

AGAT QUALITY ASSURANCE REPORT (V2)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

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Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 3000 33273

SAMPLING SITE:

AGAT WORK ORDER: 16T069988 ATTENTION TO: Jim Baxter

SAMPLED BY:

Water Analysis (Continued)

						`											
RPT Date: Feb 23, 2016			C	DUPLICATI	E		REFEREN	NCE MATERIAL METHOD BLANK SPIKE MATRIX SPIKE			KE						
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	nk Measured		Blank Measured		ptable nits	Recovery	Acceptable Limits		Recovery	1.10	ptable nits
		ld					Value	Lower	Upper		Lower	Upper		Lower	Upper		
Selenium	7394156		< 0.004	< 0.004	NA	< 0.004	102%	90%	110%	99%	90%	110%	119%	70%	130%		
Silver	7394156		< 0.002	< 0.002	NA	< 0.002	95%	90%	110%	105%	90%	110%	102%	70%	130%		
Strontium	7394156		0.496	0.488	1.6%	< 0.005	94%	90%	110%	96%	90%	110%	95%	70%	130%		
Thallium	7394156		< 0.006	< 0.006	NA	< 0.006	100%	90%	110%	100%	90%	110%	101%	70%	130%		
Tin	7394156		< 0.002	< 0.002	NA	< 0.002	97%	90%	110%	92%	90%	110%	98%	70%	130%		
Titanium	7394156		0.002	0.003	NA	< 0.002	97%	90%	110%	96%	90%	110%	104%	70%	130%		
Tungsten	7394156		< 0.010	< 0.010	NA	< 0.010	96%	90%	110%	90%	90%	110%	101%	70%	130%		
Uranium	7394156		< 0.002	< 0.002	NA	< 0.002	97%	90%	110%	91%	90%	110%	97%	70%	130%		
Vanadium	7394156		< 0.002	< 0.002	NA	< 0.002	91%	90%	110%	95%	90%	110%	101%	70%	130%		
Zinc	7394156		< 0.005	< 0.005	NA	< 0.005	97%	90%	110%	98%	90%	110%	101%	70%	130%		
Zirconium	7394156		< 0.004	< 0.004	NA	< 0.004	101%	90%	110%	97%	90%	110%	108%	70%	130%		

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By:

Amanjot Bhela

AGAT QUALITY ASSURANCE REPORT (V2)

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Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 3000 33273

AGAT WORK ORDER: 16T069988

ATTENTION TO: Jim Baxter

SAMPLING SITE:	SAMPLED BY:									
		_								
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE							
Water Analysis		014 4440 5								
Nitrate as N	INOR-93-6004	SM 4110 B								
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE							
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE							
Saturation pH		SM 2320 B	CALCULATION							
		SM 2330B	CALCULATION							
Total Hardness (as CaCO3)	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE							
Alkalinity (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE							
Bicarbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE							
Carbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE							
Hydroxide (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE							
Fluoride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Bromide	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Ortho Phosphate as P	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Reactive Silica	INOR-93-6047	AQ2 EPA-122A & SM 4500 SiO2 D	AQ2 DISCRETE ANALYSER							
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH3-F	LACHAT FIA							
Total Phosphorus	INOR-93-6057	QuikChem 10-115-01-3-A & SM 4500-P I	LACHAT FIA							
Total Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310	SHIMADZU CARBON ANALYZER							
Colour	INOR-93-6046	SM 2120 B	SPECTROPHOTOMETER							
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER							
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Aluminum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Iron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Manganese	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Mercury	MET-93-6100	EPA SW 846 7470 & 245.1	CVAAS							
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Strontium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
	MET-93-6103	EPA SW-846 6020A & 200.8								



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 3000 33273

AGAT WORK ORDER: 16T069988

ATTENTION TO: Jim Baxter

SAMPLING SITE:		SAMPLED BY:									
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE								
Tin	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Titanium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Tungsten	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
Zirconium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS								
% Difference/ Ion Balance		SM 1030 E	CALCULATION								

Samples Relinquished By (Print Name and Sign):	3	ていて	Sample Identification	nformati	Chain of Custody Report Information: Company: Contact: Address: Phone: Reports to be sent to: 1. Email: 2. Email:
k Mato	TCO INVAIS	Fib 19/245 10:56	Date Time Sampled Sampled	Pease note: If quidabloin numbor is not provided, client will be billed full prive for analysis On: Bill To Same: Yes	Record Record Barber Barber Societ
Date Time	33	- ~	# of Sample Containers Matrix	lir be billed full price for analysis. Bill To Same: Yes I No I	Control of the second of the
Samples Received By (Print Name and Sign): Samples Received By (Print Name and Sign):			Comments/ Special Instructions	Sample Matrix Legend B Biota GW Ground Water O Oil P Paint S Soil S Soil S Sediment SW Surface Water	Vater Chain of (Vater Chain of (tory Requi all applicable boxes) ion 153/04 ion 153/04 difuere One om arrk liture e check one) e cof Site Con
ed By (Print Kame and Sign): d By (Print Name and Sign):			Metal Hydrid Client	e Forming Metals Custom Metals	Ph: 905.71 Ph: 905.71
Plnk Copy - c			Cr ⁶⁺ Tota Nutrie NO ₃ Volatil	B-HWS CI CN CI CN DEC FOC NO ₂ /NO ₂ NO ₂ /NO ₂ CI CI IN Hg D H SAR Application Application nts: TP NH ₃ TKN Discation Application Application NO ₂ NO ₃ /NO ₂ E E VOC BTEX THM E Fractions 1 to 4 E	5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2 webearth.agatlabs.com ater intended for human consumption) o Regulatory Requirement Regulation 558 ccME prov. Water Quality objectives (PWQO) other Indicate of Analysis Yes XN0
Date Time Pag Date Time N°: Date Time N°:			PCBs Organo	phenols ochlorine Pesticides Aetals/Inorganics Use	Labo Work C Cooler Arrival Rush Rush
e of _		X	As W W	Antis	Business by Contract Business bays r notification for ra
01 1					1 Business Day vs Apply): vy Apply):

Page 9 of 9



CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Dwight Smikle

PROJECT: 300033273

AGAT WORK ORDER: 16T070836

WATER ANALYSIS REVIEWED BY: Mike Muneswar, BSc (Chem), Senior Inorganic Analyst

DATE REPORTED: Feb 24, 2016

PAGES (INCLUDING COVER): 9

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES		

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

Member of: Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA) Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA)

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Page 1 of 9

Results relate only to the items tested and to all the items tested All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request



AGAT WORK ORDER: 16T070836 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle

SAMPLED BY:

	Nitrate (Water)										
DATE RECEIVED: 2016-02-23	DATE RECEIVED: 2016-02-23 DATE REPORTED: 2016-02-24										
SAMPLE DESCRIPTION: TW8 - 10 min											
		SAM	PLE TYPE:	Water							
		DATE S	SAMPLED:	2/23/2016							
Parameter	Unit	G/S	RDL	7401689							
Nitrate as N	mg/L		0.25	7.93							

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7401689 Sample required dilution prior to analysis in order to keep the analyte within the calibration range of the instrument and/or to minimize any matrix interferences; the RDL was adjusted accordingly.

Certified By:



AGAT WORK ORDER: 16T070836 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle

SAMPLED BY:

Water Quality Assessment - Groundwater Sample DATE RECEIVED: 2016-02-23 DATE REPORTED: 2016-02-24 SAMPLE DESCRIPTION: TW8 SAMPLE TYPE: Water DATE SAMPLED: 2/23/2016 Unit G/S RDL 7401690 Parameter 2 Electrical Conductivity uS/cm 606 pН pH Units NA 8.02 Saturation pH 6.96 Langelier Index 1.06 Total Hardness (as CaCO3) mg/L 0.5 315 20 368 Total Dissolved Solids mg/L Alkalinity (as CaCO3) mg/L 5 254 Bicarbonate (as CaCO3) mg/L 5 254 Carbonate (as CaCO3) 5 <5 mg/L Hydroxide (as CaCO3) mg/L 5 <5 0.25 Fluoride mg/L < 0.25 Chloride 0.50 10.4 mg/L Nitrate as N 0.25 8.25 mg/L Nitrite as N 0.25 <0.25 mg/L Bromide mg/L 0.25 <0.25 Sulphate mg/L 0.50 49.1 Ortho Phosphate as P mg/L 0.50 < 0.50 Reactive Silica mg/L 0.05 7.60 0.02 Ammonia as N mg/L < 0.02 Total Phosphorus mg/L 0.05 < 0.05 0.5 Total Organic Carbon mg/L 0.6 TCU Colour 5 <5 Turbidity NTU 0.5 21.1 Calcium mg/L 0.05 85.6 Magnesium mg/L 0.05 24.7 Sodium 0.05 4.69 mg/L Potassium mg/L 0.05 1.30 Aluminum mg/L 0.004 < 0.004 0.003 < 0.003 Antimony mg/L Arsenic 0.003 < 0.003 mg/L

Certified By:

Mile Munemon



AGAT WORK ORDER: 16T070836 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle

SAMPLED BY:

Water Quality Assessment - Groundwater Sample DATE RECEIVED: 2016-02-23 **DATE REPORTED: 2016-02-24** SAMPLE DESCRIPTION: TW8 SAMPLE TYPE: Water DATE SAMPLED: 2/23/2016 RDL 7401690 Parameter Unit G/S Barium mg/L 0.002 0.110 Beryllium mg/L 0.001 < 0.001 Boron 0.010 mg/L 0.013 Cadmium mg/L 0.001 < 0.001 Chromium mg/L 0.003 < 0.003 Cobalt mg/L 0.001 < 0.001 Copper mg/L 0.003 < 0.003 Iron mg/L 0.010 < 0.010 0.002 < 0.002 Lead mg/L Manganese mg/L 0.002 0.007 Mercury mg/L 0.0001 < 0.0001 Molybdenum 0.002 < 0.002 mg/L Nickel 0.003 < 0.003 mg/L Selenium mg/L 0.004 < 0.004 Silver mg/L 0.002 < 0.002 Strontium mg/L 0.005 0.437 Thallium mg/L 0.006 < 0.006 Tin mg/L 0.002 < 0.002 0.002 Titanium mg/L < 0.002 Tungsten mg/L 0.010 < 0.010 Uranium mg/L 0.002 < 0.002 Vanadium mg/L 0.002 < 0.002 Zinc mg/L 0.005 0.016 Zirconium mg/L 0.004 < 0.004 % Difference/ Ion Balance % NA 3.27

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7401690 Sample required dilution prior to analysis for Anions in order to keep the analytes within the calibration range of the instrument and/or to minimize any matrix interferences; the RDLs were adjusted accordingly.

Certified By:

Mile Muneman



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Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

SAMPLING SITE:

AGAT WORK ORDER: 16T070836

ATTENTION TO: Dwight Smikle

SAMPLED BY:

				Wate	er Ar	alysi	S													
RPT Date: Feb 24, 2016	2016 DUPLICATE REFERENCE MATERIAL METHOD BLANK SPIKE				MATRIX SPI		KE													
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		Acceptable Limits		easured Limits		easured Limits		Recovery	Acceptable Limits		Recovery		ptable nits
		ld					Value	Lower	Upper	,	Lower	Upper		Lower	Upper					
Water Quality Assessment - Gro	undwater Sa	ample																		
Electrical Conductivity	7401323		<2	<2	NA	< 2	101%	80%	120%	NA			NA							
рН	7401323		5.51	5.16	6.6%	NA	100%	90%	110%	NA			NA							
Total Dissolved Solids	7398229		232	238	2.6%	< 20	96%	80%	120%	NA			NA							
Alkalinity (as CaCO3)	7401323		<5	<5	NA	< 5	96%	80%	120%	NA			NA							
Bicarbonate (as CaCO3)	7401323		<5	<5	NA	< 5	NA			NA			NA							
Carbonate (as CaCO3)	7401323		<5	<5	NA	< 5	NA			NA			NA							
Hydroxide (as CaCO3)	7401323		<5	<5	NA	< 5	NA			NA			NA							
Fluoride	7401689 7	401689	< 0.05	< 0.05	NA	< 0.05	94%	90%	110%	94%	90%	110%	99%	80%	120%					
Chloride	7401689 7	401689	12.7	12.3	3.2%	< 0.10	107%	90%	110%	98%	90%	110%	100%	80%	120%					
Nitrate as N	7401689 7	401689	7.93	7.70	2.9%	< 0.05	100%	90%	110%	106%	90%	110%	106%	80%	120%					
Nitrite as N	7401689 7	7401689	< 0.05	< 0.05	NA	< 0.05	NA	90%	110%	108%	90%	110%	113%	80%	120%					
Bromide	7401689 7		< 0.05	< 0.05	NA	< 0.05	110%	90%	110%	96%	90%	110%	107%	80%	120%					
Sulphate	7401689 7		159	156	1.9%	< 0.10	90%		110%	101%	90%	110%	96%	80%	120%					
Ortho Phosphate as P	7401689 7		< 0.10	< 0.10	NA	< 0.10	93%		110%	92%	90%	110%	91%	80%	120%					
Reactive Silica	7401690 7		7.60	7.55	0.7%	< 0.05	95%	90%	110%	97%	90%	110%	87%	80%	120%					
Ammonia as N	7399914		<0.02	<0.02	NA	< 0.02	95%	90%	110%	97%	90%	110%	96%	80%	120%					
Total Phosphorus	7401323		<0.02 <0.05	<0.02 <0.05	NA	< 0.02	95% 103%	90% 80%	120%	97% 100%	90% 90%	110%	90% 101%	80 <i>%</i> 70%	130%					
Total Organic Carbon	7401323	7401600	<0.05 0.6	<0.05 0.6	NA	< 0.05	103%	90%	120%	99%		110%	97%	70% 80%	120%					
Colour	7401690 7		< 5	<5	NA	< 5	102 %	90%	110%	NA	9078	11070	NA	00 /0	12070					
Turbidity	7401690 7		21.1	21.5	1.9%	< 0.5	101%		110%	NA			NA							
Coloium	7404000 7		05.0	05.0	0.5%	0.05	40.40/	000/	44.00/	4000/	000/	44.00/	4000/	700/	4000/					
Calcium	7401690 7		85.6	85.2	0.5%	< 0.05	104%	90%	110%	102%	90%	110%	100%	70%	130%					
Magnesium	7401690 7		24.7	24.5	0.8%	< 0.05	98%		110%	97%	90%	110%	100%	70%	130%					
Sodium	7401690 7		4.69	4.70	0.2%	< 0.05	100%	90%	110%	99%	90%	110%	101%	70%	130%					
Potassium	7401690 7		1.30	1.26	3.1%	< 0.05	100%	90%	110%	99%	90%	110%	105%	70%	130%					
Aluminum	7401690 7	401690	< 0.004	<0.004	NA	< 0.004	109%	90%	110%	108%	90%	110%	102%	70%	130%					
Antimony	7401690 7	401690	< 0.003	<0.003	NA	< 0.003	107%	90%	110%	97%	90%	110%	99%	70%	130%					
Arsenic	7401690 7	401690	< 0.003	<0.003	NA	< 0.003	101%	90%	110%	100%	90%	110%	93%	70%	130%					
Barium	7401690 7	401690	0.110	0.106	3.7%	< 0.002	102%	90%	110%	100%	90%	110%	107%	70%	130%					
Beryllium	7401690 7	401690	< 0.001	<0.001	NA	< 0.001	106%	90%	110%	107%	90%	110%	97%	70%	130%					
Boron	7401690 7	401690	0.013	0.013	NA	< 0.010	107%	90%	110%	101%	90%	110%	91%	70%	130%					
Cadmium	7401690 7	401690	< 0.001	<0.001	NA	< 0.001	103%	90%	110%	106%	90%	110%	97%	70%	130%					
Chromium	7401690 7	401690	< 0.003	<0.003	NA	< 0.003	103%	90%	110%	103%	90%	110%	99%	70%	130%					
Cobalt	7401690 7	401690	< 0.001	<0.001	NA	< 0.001	106%	90%	110%	104%	90%	110%	98%	70%	130%					
Copper	7401690 7	401690	< 0.003	<0.003	NA	< 0.003	104%	90%	110%	102%	90%	110%	86%	70%	130%					
Iron	7401690 7	401690	< 0.010	<0.010	NA	< 0.010	108%	90%	110%	103%	90%	110%	104%	70%	130%					
Lead	7401690 7	401690	< 0.002	<0.002	NA	< 0.002	103%	90%	110%	102%	90%	110%	93%	70%	130%					
Manganese	7401690 7		0.007	0.007	NA	< 0.002	103%		110%	103%		110%	103%		130%					
Mercury	7401690 7		<0.0001	<0.0001	NA	< 0.0001	101%		110%	103%		110%	104%		120%					
Molybdenum	7401690 7		< 0.002	<0.002	NA	< 0.002	101%		110%	96%		110%	108%		130%					
.,		2.300				. 5.002		2373		2370	, , ,									

AGAT QUALITY ASSURANCE REPORT (V1)

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Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

SAMPLING SITE:

AGAT WORK ORDER: 16T070836 ATTENTION TO: Dwight Smikle

SAMPLED BY:

Water Analysis (Continued)

					,	`										
RPT Date: Feb 24, 2016				UPLICATI	E		REFERENCE MATERIAL METHOD BLANK SPIKE MATRIX SP			RIX SPI	KE					
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Braint Interest		Blank Measured	Acceptable d Limits		Recovery	Acceptable Limits		Recovery	1 1 10	eptable mits
		ld					Value	Lower	Upper		Lower	Upper	,	Lower	Upper	
Nickel	7401690 7	7401690	< 0.003	<0.003	NA	< 0.003	106%	90%	110%	105%	90%	110%	94%	70%	130%	
Selenium	7401690 7	7401690	< 0.004	<0.004	NA	< 0.004	103%	90%	110%	102%	90%	110%	101%	70%	130%	
Silver	7401690 7	7401690	< 0.002	<0.002	NA	< 0.002	105%	90%	110%	108%	90%	110%	101%	70%	130%	
Strontium	7401690 7	7401690	0.437	0.428	2.1%	< 0.005	98%	90%	110%	99%	90%	110%	94%	70%	130%	
Thallium	7401690 7	7401690	< 0.006	<0.006	NA	< 0.006	104%	90%	110%	99%	90%	110%	94%	70%	130%	
Tin	7401690 7	7401690	< 0.002	<0.002	NA	< 0.002	110%	90%	110%	100%	90%	110%	106%	70%	130%	
Titanium	7401690 7	7401690	< 0.002	<0.002	NA	< 0.002	107%	90%	110%	99%	90%	110%	103%	70%	130%	
Tungsten	7401690 7	7401690	< 0.010	<0.010	NA	< 0.010	104%	90%	110%	96%	90%	110%	101%	70%	130%	
Uranium	7401690 7	7401690	< 0.002	<0.002	NA	< 0.002	103%	90%	110%	99%	90%	110%	104%	70%	130%	
Vanadium	7401690 7	7401690	< 0.002	<0.002	NA	< 0.002	102%	90%	110%	101%	90%	110%	103%	70%	130%	
Zinc	7401690 7	7401690	0.016	0.016	NA	< 0.005	103%	90%	110%	103%	90%	110%	83%	70%	130%	
Zirconium	7401690 7	7401690	< 0.004	<0.004	NA	< 0.004	96%	90%	110%	93%	90%	110%	104%	70%	130%	

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By:

Mile Munemon

AGAT QUALITY ASSURANCE REPORT (V1)

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Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

AGAT WORK ORDER: 16T070836 ATTENTION TO: Dwight Smikle

		SAMPLED BY:								
SAMPLING SITE:										
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE							
Water Analysis										
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE							
рН	INOR-93-6000	SM 4500-H+ B	PC TITRATE							
Saturation pH		SM 2320 B	CALCULATION							
Langelier Index		SM 2330B	CALCULATION							
Total Hardness (as CaCO3)	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE							
Alkalinity (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE							
Bicarbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE							
Carbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE							
Hydroxide (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE							
Fluoride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Bromide	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Ortho Phosphate as P	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Reactive Silica	INOR-93-6047	AQ2 EPA-122A & SM 4500 SiO2 D	AQ2 DISCRETE ANALYSER							
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH3-F	LACHAT FIA							
Total Phosphorus	INOR-93-6057	QuikChem 10-115-01-3-A & SM 4500-P I	LACHAT FIA							
Total Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310	SHIMADZU CARBON ANALYZER							
Colour	INOR-93-6046	SM 2120 B	SPECTROPHOTOMETER							
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER							
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Aluminum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Iron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Manganese	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Mercury	MET-93-6100	EPA SW 846 7470 & 245.1	CVAAS							
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Strontium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Thallium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

AGAT WORK ORDER: 16T070836 ATTENTION TO: Dwight Smikle

SAMPLING SITE:		SAMPLED BY:								
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE							
Tin	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Titanium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Tungsten	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Zirconium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
% Difference/ Ion Balance		SM 1030 E	CALCULATION							

Document (0: DN 75 1511.010	Samples Reinquished By (Print Name SCAN Qui, Un Samples Reinquished By (Print Name		Tus	TW8	Sample Identification	Invoice Information: Company: Contact: Address: Email:	AGAT Quote #:	Project Information: Project Site Location: Sampled By:	Phone: Reports to be sent to: 1. Email: 2. Email:	Report Information: Company: Contact Address:	Chain of C	
0	isted By (Print Name and Sign); (Qui, Un Support isted By (Print Name and Sign);			-10 min	ntification	ation:	Please note: If quota	Belfaunt	S19 823-49	ENSI HT	Custody R	2
			23 KBIL	23FG3 16	Date Sampled		PO: _PO:	3273	ters	SMIKLE	Record	
			14:42	12:52	Time Sampled		PO: ided, client will be t		Fax: braside.c		lf this is a Dri	
13	Date		6	-	# of Containers	Bill To Same: Ye	billed full price for a		Con		nking Water s	Lat
	Time 15:0 Time		6w	52	Sample Matrix	Ves 🕺 No 🗆	nalysis				ample, please	oorat
	oo Samples Received By IPrint Name and Sign Samples Received By (Print Name and Sign			- Contraction	Comments/ Special Instructions	 B Biota GW Ground Water O Oil P Paint S Soil SD Sediment SW Surface Water 	Sample Matrix Legend	Is this submission for a Record of Site Condition?		Regulatory Requirements: (Please check all applicable boxes) Regulation 153/04 Table Indicate One Indicate One	If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water	aboratories
	and Sign				Metal 9	and Inorganics Scan e Forming Metals		a on?	n Indicate One	nita	dy Form (potat	Ph
Pink Copy	Feb 23/16		Inter Annual International		Client (ORPs: Cr ⁶⁺ Total Nutrien No ₃ Volatili	Custom Metals B-HWS C C NO ₂ /NO ₂ IN Hg D H SAR nts: C TP C NH, C TKN NO ₂ NO ₂ /NO ₂ es: VOC BTEX C THM Fractions 1 to 4	(Check Applicable)	Report Guldeline on Certificate of Analysis Ves X No	e Dobjectives (PWQO) Objectives (PWQO) Other	No Regulatory Requirement Ise Regulation 558 Inv CCME	ble water intended for human consumption)	5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2 Ph: 905,712.5100 Fax: 905,712.5122 webearth.agattabs.com
- Client Yello	Date		3, 8 (3		ABNs PAHs	phenols	1.13 1.2	io Sis		-11		
Pink Copy - Client Yellow Copy - AGAT White Copy- AGAT	O for Time				PCBs Organo TCLP N Sewer	ochlorine Pesticides /letals/Inorganics Use		Please prov *TAT is exclusiv	Business Days	Custody Seal Intact: Notes: Turnaround Time Regular TAT	Arrival Temperatures:	Laboratory Use Only Work Order #: 167 (Cooler Quantity:
te Copy- AGAT Dute issued: Nivember 2, 2015				V	Mar M. Anno TI	rate DS Tous Inorganics Whats notice Total Pho DC UCUTY	spho	Please provide prior notification for rush TAT *TAT is exclusive of weekends and equilibry holidays	AT (Rush Surcharges Apply) 3 Business 2 Business 2 Business Days 2 Days 2 Days 2 Days	CITAT) Required:	2.6 2.1 3.3	953049

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CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Jim Baxter

PROJECT: Belfountain - 300033273

AGAT WORK ORDER: 16T071689

WATER ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

DATE REPORTED: Feb 26, 2016

PAGES (INCLUDING COVER): 4

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

<u>*NOTES</u> VERSION 1:Partial Report Issued Feb 26th 2016 at 1:20pm

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

Member of: Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA) Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Page 1 of 4

Results relate only to the items tested and to all the items tested

All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request



AGAT WORK ORDER: 16T071689 PROJECT: Belfountain - 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Jim Baxter

SAMPLED BY:

					Nitrate (Water)
DATE RECEIVED: 2016-02-25					DATE REPORTED: 2016-02-26
	S	AMPLE DES	CRIPTION:	TW10N	
		SAM	PLE TYPE:	Water	
		DATE S	SAMPLED:	2/25/2016	
Parameter	Unit	G/S	RDL	7408001	
Nitrate as N	mg/L		0.25	2.41	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7408001 Elevated RDL indicates the degree of sample dilution prior to the analysis in order to keep analyte within the calibration range of the instrument and to reduce matrix interference.

Certified By:



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOC	CIATES LTD	AGAT WORK ORDER: 16T071689						
PROJECT: Belfountain - 300033273		ATTENTION TO: Jim Baxter						
SAMPLING SITE:		SAMPLED BY:						
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE					
Water Analysis		•						
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH					

Samples Relinquished By (Print Name and Sign):	d Sampled Containers	nformation:	Project Information: Project: Bel Bucking 3200 33273 Site Location: Bel Bucking 3200 33273 Sampled By: Marga Value of the	$\begin{array}{c} \text{Company:} \textbf{R.J. (Surfs. a. f. 1455 c. a. d. S. lim f. J. Contact: Address: \begin{array}{c} \text{Address:} \textbf{Aga. Speedball Ave. west, unit J. a. \\ \text{Phone:} \\ \text{Phone:} \\ \text{Reports to be sent to:} \\ \text{1. Email:} \\ \begin{array}{c} \text{Sig. 9.2.5.4123} \text{Fax:} \\ \text{Sig. 9.2.5.4123} \text{Fax:} \\ \text{Sig. 9.2.5.4123} \text{Fax:} \\ \text{Sig. 9.2.5.4123} \text{Fax:} \\ \end{array}$	
Samples Received By (Print Name and Sign):		Comments/	Is this submission for a Report Guideline on Record of Site Condition? Certificate of Analysis	(Please check all applicable boxs) Regulation 153/04 Sewer Use Iable Indicate One Indicate One Sanitary Indicate One Storm Res/Park Storm Agriculture Storm Soil Texture (check One) Region Indicate One Other Fine Indicate One	SS35 Coopers Averue Mississauga, Oritario LABORATORIES Ph: 905,712,5100 Fax: 905,712,5122 Webearth.agatiabs.com If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption) Regulatory Requirements: ON Regulatory Requirement
Date Time Time Page Total Gate Ime Ne: T 0 2 1 6	AE PA CH PC OI TC	ME Fractions 1 to 4 Ns Hs lorophenols Bs ganochlorine Pesticides LP Metals/Inorganics wer Use $W_i frack S$ 1 w Q A	Analysis Please provide prior notification for rush TAT NO *TAT is exclusive of weekends and statutory holidays	Turnal Regula	Laboratory Use Only L4Z 1Y2 L4Z 1Y2 L4Z 1Y2 Work Order #: L4D T O T L6 & A Labs.com Cooler Quantity: Arrival Temperatures: S. S. A. A S.S. Custody Seal Intact: Over Seal Intact:

Page 4 of 4

Decument @. 0(+78.4915.010

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CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Jim Baxter

PROJECT: 300033273

AGAT WORK ORDER: 16T072180

WATER ANALYSIS REVIEWED BY: Anthony Dapaah, PhD (Chem), Inorganic Lab Manager

DATE REPORTED: Mar 01, 2016

PAGES (INCLUDING COVER): 9

VERSION*: 2

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

VERSION 2: Revised Report issued March 07th 2016. Reactive Silica Results corrected.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V2)

Member of: Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA) Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA) AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Page 1 of 9

Results relate only to the items tested and to all the items tested All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request



AGAT WORK ORDER: 16T072180 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Jim Baxter

SAMPLED BY:MV

					Nitrate (Water)
DATE RECEIVED: 2016-02-29					DATE REPORTED: 2016-03-01
	S	SAMPLE DES	CRIPTION:	TW9N	
		SAM	PLE TYPE:	Water	
		DATE S	SAMPLED:	2/26/2016	
Parameter	Unit	G/S	RDL	7410958	
Nitrate as N	mg/L		0.05	3.65	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard



Certified By:



AGAT WORK ORDER: 16T072180 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Jim Baxter

SAMPLED BY:MV

			Water C	uality Assessment (mg/L)
DATE RECEIVED: 2016-02-29	9			DATE REPORTED: 2016-03-01
Parameter	S. Unit	AMPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED: G / S RDL	TW9 Water 2/26/2016 7410959	
Electrical Conductivity	uS/cm	2 G73 KDL	610	
pH	pH Units	NA	8.02	
Saturation pH	P		6.94	
Langelier Index			1.08	
Total Hardness (as CaCO3)	mg/L	0.5	310	
Total Dissolved Solids	mg/L	20	332	
Alkalinity (as CaCO3)	mg/L	5	265	
Bicarbonate (as CaCO3)	mg/L	5	265	
Carbonate (as CaCO3)	mg/L	5	<5	
Hydroxide (as CaCO3)	mg/L	5	<5	
Fluoride	mg/L	0.05	<0.05	
Chloride	mg/L	0.10	9.37	
Nitrate as N	mg/L	0.05	3.26	
Nitrite as N	mg/L	0.05	<0.05	
Bromide	mg/L	0.05	<0.05	
Sulphate	mg/L	0.10	50.0	
Ortho Phosphate as P	mg/L	0.10	<0.10	
Reactive Silica	mg/L	0.05	8.72	
Ammonia as N	mg/L	0.02	<0.02	
Total Phosphorus	mg/L	0.05	<0.05	
Total Organic Carbon	mg/L	0.5	0.6	
Colour	TCU	5	<5	
Turbidity	NTU	0.5	10.4	
Calcium	mg/L	0.05	82.4	
Magnesium	mg/L	0.05	25.4	
Sodium	mg/L	0.05	3.99	
Potassium	mg/L	0.05	1.19	
Aluminum	mg/L	0.004	<0.004	
Antimony	mg/L	0.003	<0.003	
Arsenic	mg/L	0.003	<0.003	





AGAT WORK ORDER: 16T072180

____ PROJECT: 300033273

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

5835 COOPERS AVENUE

MISSISSAUGA, ONTARIO

ATTENTION TO: Jim Baxter

SAMPLED BY:MV

			Water Qua	lity Assessment (mg/L)
DATE RECEIVED: 2016-02-29				DATE REPORTED: 2016-03-01
	S	AMPLE DESCRIPTION:	TW9	
		SAMPLE TYPE:	Water	
		DATE SAMPLED:	2/26/2016	
Parameter	Unit	G/S RDL	7410959	
Barium	mg/L	0.002	0.070	
Beryllium	mg/L	0.001	<0.001	
Boron	mg/L	0.010	0.014	
Cadmium	mg/L	0.001	<0.001	
Chromium	mg/L	0.003	0.005	
Cobalt	mg/L	0.001	<0.001	
Copper	mg/L	0.003	<0.003	
on	mg/L	0.010	< 0.010	
ead	mg/L	0.002	<0.002	
langanese	mg/L	0.002	<0.002	
/lercury	mg/L	0.0001	<0.0001	
lolybdenum	mg/L	0.002	<0.002	
lickel	mg/L	0.003	<0.003	
Selenium	mg/L	0.004	<0.004	
Silver	mg/L	0.002	<0.002	
Strontium	mg/L	0.005	0.320	
hallium	mg/L	0.006	<0.006	
ĩn	mg/L	0.002	<0.002	
ïtanium	mg/L	0.002	<0.002	
ungsten	mg/L	0.010	<0.010	
Iranium	mg/L	0.002	<0.002	
anadium	mg/L	0.002	<0.002	
linc	mg/L	0.005	0.022	
lirconium	mg/L	0.004	<0.004	
% Difference/ Ion Balance	%	NA	3.26	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7410959

Revised March 04, 2016.

Revision: This report replaces the Certificate of Analysis issued on March 01, 2016. The Certificate of analysis has been updated to correct the erroneous Reactive Silica value reported. The discrepancy was due to sampling error during the analysis.



Certified By:



Page 5 of 9

Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

SAMPLING SITE:

AGAT WORK ORDER: 16T072180

ATTENTION TO: Jim Baxter

SAMPLED BY:MV

				Wate	er Ar	alysi	is								
RPT Date: Mar 01, 2016		DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE			
		0 mm la				Method			ptable			ptable			ptable
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Blank	Measured Value	Lir	nits Upper	Recovery	Lin	nits Upper	Recovery	Lir	nits Upper
Water Quality Assessment (mg/L)														
Electrical Conductivity	7410959 7	410959	610	611	0.2%	< 2	102%	80%	120%	NA			NA		
рН	7410959 7	7410959	8.02	8.01	0.1%	NA	99%	90%	110%	NA			NA		
Total Dissolved Solids	7410971		436	430	1.4%	< 20	96%	80%	120%	NA			NA		
Alkalinity (as CaCO3)	7410959 7	7410959	265	263	0.8%	< 5	102%	80%	120%	NA			NA		
Bicarbonate (as CaCO3)	7410959 7	410959	265	263	0.8%	< 5	NA			NA			NA		
Carbonate (as CaCO3)	7410959 7	7410959	<5	<5	NA	< 5	NA			NA			NA		
Hydroxide (as CaCO3)	7410959 7	7410959	<5	<5	NA	< 5	NA			NA			NA		
Fluoride	7411422		<0.5	<0.5	NA	< 0.05	96%	90%	110%	95%	90%	110%	89%	80%	120%
Chloride	7411422		247	248	0.4%	< 0.10	105%	90%	110%	109%	90%	110%	99%	80%	120%
Nitrate as N	7411422		1.2	1.1	8.7%	< 0.05	101%	90%	110%	110%	90%	110%	114%	80%	120%
Nitrite as N	7411422		<0.5	<0.5	NA	< 0.05	NA	90%	110%	109%	90%	110%	112%	80%	120%
Bromide	7411422		<0.5	<0.5	NA	< 0.05	108%	90%	110%	109%	90%	110%	109%	80%	120%
Sulphate	7411422		162	162	0.0%	< 0.10	101%	90%	110%	108%	90%	110%	105%	80%	120%
Ortho Phosphate as P	7411422		<1.0	<1.0	NA	< 0.10	92%	90%	110%	98%	90%	110%	88%	80%	120%
Reactive Silica	7402270		1.97	2.00	1.5%	< 0.05	98%	90%	110%	99%	90%	110%	93%	80%	120%
Ammonia as N	7408819		4.81	4.80	0.2%	< 0.02	100%	90%	110%	103%	90%	110%	96%	80%	120%
Total Phosphorus	7410959 7	7410959	<0.05	<0.05	NA	< 0.05	102%	80%	120%	103%	90%	110%	102%	70%	130%
Total Organic Carbon	7410959 7	7410959	0.6	0.5	NA	< 0.5	98%	90%	110%	98%	90%	110%	94%	80%	120%
Colour	7410959 7	7410959	<5	<5	NA	< 5	100%	90%	110%	NA			NA		
Turbidity	7410852		948	1020	7.3%	< 0.5	101%	90%	110%	NA			NA		
Calcium	7410959 7	410959	82.4	82.5	0.1%	< 0.05	105%	90%	110%	106%	90%	110%	98%	70%	130%
Magnesium	7410959 7	410959	25.4	25.5	0.4%	< 0.05	98%	90%	110%	100%	90%	110%	97%	70%	130%
Sodium	7410959 7	410959	3.99	3.97	0.5%	< 0.05	100%	90%	110%	102%	90%	110%	99%	70%	130%
Potassium	7410959 7	410959	1.19	1.17	1.7%	< 0.05	101%	90%	110%	103%	90%	110%	101%	70%	130%
Aluminum	7410959 7	410959	< 0.004	< 0.004	NA	< 0.004	102%	90%	110%	105%	90%	110%	117%	70%	130%
Antimony	7410959 7	410959	< 0.003	< 0.003	NA	< 0.003	98%	90%	110%	96%	90%	110%	101%	70%	130%
Arsenic	7410959 7	410959	< 0.003	< 0.003	NA	< 0.003	102%	90%	110%	98%	90%	110%	107%	70%	130%
Barium	7410959 7	410959	0.070	0.070	0.0%	< 0.002	99%	90%	110%	99%	90%	110%	110%	70%	130%
Beryllium	7410959 7	410959	< 0.001	< 0.001	NA	< 0.001	94%	90%	110%	96%	90%	110%	98%	70%	130%
Boron	7410959 7	410959	0.014	0.012	NA	< 0.010	107%	90%	110%	109%	90%	110%	111%	70%	130%
Cadmium	7410959 7	410959	< 0.001	< 0.001	NA	< 0.001	100%	90%	110%	99%	90%	110%	119%	70%	130%
Chromium	7410959 7	7410959	0.005	0.003	NA	< 0.003	100%	90%	110%	104%	90%	110%	109%	70%	130%
Cobalt	7410959 7	410959	< 0.001	< 0.001	NA	< 0.001	100%	90%	110%	101%	90%	110%	108%	70%	130%
Copper	7410959 7	410959	< 0.003	< 0.003	NA	< 0.003	99%	90%	110%	102%	90%	110%	109%	70%	130%
Lead	7410959 7	410959	< 0.002	< 0.002	NA	< 0.002	98%	90%	110%	94%	90%	110%	104%	70%	130%
Manganese	7410959 7	7410959	< 0.002	< 0.002	NA	< 0.002	98%	90%	110%	98%	90%	110%	101%	70%	130%
Mercury	7410971		<0.0001	<0.0001	NA	< 0.0001	100%	90%	110%	102%	90%	110%	102%	80%	120%
Molybdenum	7410959 7	410959	< 0.002	< 0.002	NA	< 0.002	101%	90%	110%	99%	90%	110%	108%	70%	130%
Nickel	7410959 7	410959	< 0.003	< 0.003	NA	< 0.003	103%	90%	110%	105%	90%	110%	111%	70%	130%

AGAT QUALITY ASSURANCE REPORT (V2)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.



Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

SAMPLING SITE:

AGAT WORK ORDER: 16T072180 ATTENTION TO: Jim Baxter

SAMPLED BY:MV

Water Analysis (Continued)

						`		,							
RPT Date: Mar 01, 2016				UPLICATI	E		REFEREN	ICE MA	TERIAL	METHOD BLANK SPIKE			MATRIX SPIKE		KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured Value		ptable nits	Recovery	Lin	ptable nits	Recovery	Lin	ptable nits
		Ia					value	Lower	Upper		Lower	Upper		Lower	Upper
Selenium	7410959	7410959	< 0.004	< 0.004	NA	< 0.004	99%	90%	110%	99%	90%	110%	111%	70%	130%
Silver	7410959	7410959	< 0.002	< 0.002	NA	< 0.002	102%	90%	110%	107%	90%	110%	120%	70%	130%
Strontium	7410959	7410959	0.320	0.307	4.1%	< 0.005	100%	90%	110%	98%	90%	110%	109%	70%	130%
Thallium	7410959	7410959	< 0.006	< 0.006	NA	< 0.006	104%	90%	110%	102%	90%	110%	115%	70%	130%
Tin	7410959	7410959	< 0.002	< 0.002	NA	< 0.002	98%	90%	110%	97%	90%	110%	101%	70%	130%
Titanium	7410959	7410959	< 0.002	< 0.002	NA	< 0.002	102%	90%	110%	97%	90%	110%	105%	70%	130%
Tungsten	7410959	7410959	< 0.010	< 0.010	NA	< 0.010	95%	90%	110%	95%	90%	110%	94%	70%	130%
Uranium	7410959	7410959	< 0.002	< 0.002	NA	< 0.002	100%	90%	110%	95%	90%	110%	106%	70%	130%
Vanadium	7410959	7410959	< 0.002	< 0.002	NA	< 0.002	96%	90%	110%	95%	90%	110%	103%	70%	130%
Zinc	7410959	7410959	0.022	0.021	NA	< 0.005	100%	90%	110%	103%	90%	110%	112%	70%	130%
Zirconium	7410959	7410959	< 0.004	< 0.004	NA	< 0.004	93%	90%	110%	91%	90%	110%	93%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.





AGAT QUALITY ASSURANCE REPORT (V2)

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Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

AGAT WORK ORDER: 16T072180 ATTENTION TO: Jim Baxter

FROJECT. 300033273		ATTENTION TO: JIII Baxter							
SAMPLING SITE:		SAMPLED BY:MV							
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE						
Water Analysis									
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH						
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE						
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE						
Saturation pH		SM 2320 B	CALCULATION						
Langelier Index		SM 2330B	CALCULATION						
Total Hardness (as CaCO3)	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES						
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE						
Alkalinity (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE						
Bicarbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE						
Carbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE						
Hydroxide (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE						
Fluoride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH						
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH						
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH						
Bromide	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH						
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH						
Ortho Phosphate as P	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH						
Reactive Silica	INOR-93-6047	AQ2 EPA-122A & SM 4500 SiO2 D	AQ2 DISCRETE ANALYSER						
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH3-F	LACHAT FIA						
Total Phosphorus	INOR-93-6057	QuikChem 10-115-01-3-A & SM 4500-P I	LACHAT FIA						
Total Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310	SHIMADZU CARBON ANALYZER						
Colour	INOR-93-6046	SM 2120 B	SPECTROPHOTOMETER						
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER						
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES						
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES						
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES						
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES						
Aluminum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Iron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Manganese	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Mercury	MET-93-6100	EPA SW 846 7470 & 245.1	CVAAS						
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Strontium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Thallium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

AGAT WORK ORDER: 16T072180 ATTENTION TO: Jim Baxter

SAMPLING SITE:		SAMPLED BY:MV								
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE							
Tin	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Titanium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Tungsten	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Zirconium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
% Difference/ Ion Balance		SM 1030 E	CALCULATION							

Samples reinquisited by (minit name and Sep)).	Samples Relinquished By (Print Name and Sign): il Martt Ulit Krist	TW9	Sample Identification	AGAT Quote #: Prease note #: Invoice Information: Company: Contact: Address: Email:	nformation:
5	- CI/W		Date Time Sampled Sampled	PO:	
	Date Time	6	# of Sample Containers Matrix	il be billed full price for analysis Bill To Same: Yes No	Vinking Water sample, please use Drinking Water sample, please use Drinking V Control of the line of
	Samples Received By (Pfett Namo		Comments/ Special Instructions	B Biota GW Ground Water 0 Oil P Paint SD Sediment SW Surface Water	Arter Chain of Arter Chain 153/04 Inture Park Intur
C	ed By (Print Name and Sign):	rgible training	Metal Hydrid Client ORPs: □ Cr ⁶⁺	e Forming Metals	State 5 Mississan Mississan Ph: 905,712.5100 wet Custody Form (potable water intended) Image: Custody Form (potable water intended) Custody Form (potable water intended) Image: Custody Form (potable water intended) Sanitary Image: Custody Form (potable water intended) Region Image: Custody Form (potable water intended) Indition? Certifican No Yes
Pink Copy - Client Yell	A Date Date		□ NO ₃ Volati CCME ABNs PAHs	B-HWS CI CN B EC FOC NO_3/NO_2 FOC IN Hg DH SAR nts: TP NH, TKN NO_2 NO_3/NO_2 Foc Foc else: VOC BTEX THM Fractions 1 to 4 Foc Foc Foc	335 Couperrs Avenue 24, Onterin 142 1Y2 Fax: 905,712,5422 pearth.agaitabs.com for human consumption) tory Requirement egulation 558 CME CME CME CME CME CME CME CME CME CME
Pink Copy - Client I Yellow Copy - AGAT I White Copy - AGAT community Advantage 2	Transaction Page 1 of 1	X	PCBs Organ TCLP Sewer	ochlorine Pesticides Vetals/Inorganics	Laboratory Use Only Work Order #: Image: Table of the sum of th

Page 9 of 9



CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Jim Baxter

PROJECT: 300033273

AGAT WORK ORDER: 16T072717

WATER ANALYSIS REVIEWED BY: Anthony Dapaah, PhD (Chem), Inorganic Lab Manager

DATE REPORTED: Mar 01, 2016

PAGES (INCLUDING COVER): 9

VERSION*: 2

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

<u>*NOTES</u> VERSION 2:Revised Report: Reactive Silica results corrected.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V2)

Member of: Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA) Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA) AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Page 1 of 9

Results relate only to the items tested and to all the items tested

All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request



AGAT WORK ORDER: 16T072717 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Jim Baxter

SAMPLED BY:

					Nitrate (Water)			
DATE RECEIVED: 2016-02-29 DATE REPORTED: 2016-03-01								
	SAMPLE DESCRIPTION:							
		SAM	PLE TYPE:	Water				
		DATES	SAMPLED:	2/29/2016				
Parameter	Unit	G/S	RDL	7413121				
Nitrate as N	mg/L		0.10	4.61				

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7413121 Elevated RDL indicates the degree of sample dilution prior to the analysis in order to keep analyte within the calibration range of the instrument and to reduce matrix interference.



Certified By:



AGAT WORK ORDER: 16T072717 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Jim Baxter

SAMPLED BY:

			Wa	ter Quality Assessment
DATE RECEIVED: 2016-02-29				DATE REPORTED: 2016-03-01
_		AMPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED:	TW11N Water 2/29/2016	
Parameter	Unit	G/S RDL	7413129	
Electrical Conductivity	uS/cm	2	607	
pH	pH Units	NA	8.00	
Saturation pH			6.95	
Langelier Index		0.5	1.05	
Total Hardness (as CaCO3)	mg/L	0.5	303	
Total Dissolved Solids	mg/L	20	326	
Alkalinity (as CaCO3)	mg/L	5	267	
Bicarbonate (as CaCO3)	mg/L	5	267	
Carbonate (as CaCO3)	mg/L	5	<5	
Hydroxide (as CaCO3)	mg/L	5	<5	
Fluoride	mg/L	0.10	<0.10	
Chloride	mg/L	0.20	12.8	
Nitrate as N	mg/L	0.10	4.58	
Nitrite as N	mg/L	0.10	<0.10	
Bromide	mg/L	0.10	<0.10	
Sulphate	mg/L	0.20	21.3	
Ortho Phosphate as P	mg/L	0.20	<0.20	
Reactive Silica	mg/L	0.10	8.05	
Ammonia as N	mg/L	0.02	<0.02	
Total Phosphorus	mg/L	0.05	<0.05	
Total Organic Carbon	mg/L	0.5	0.7	
Colour	TCU	5	<5	
Turbidity	NTU	0.5	2.9	
Calcium	mg/L	0.05	81.7	
Magnesium	mg/L	0.05	24.0	
Sodium	mg/L	0.05	5.39	
Potassium	mg/L	0.05	1.01	
Aluminum	mg/L	0.004	<0.004	
Antimony	mg/L	0.003	<0.003	
Arsenic	mg/L	0.003	<0.003	





AGAT WORK ORDER: 16T072717 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Jim Baxter

SAMPLED BY:

			Water	Quality Assessment
DATE RECEIVED: 2016-02-29	I			DATE REPORTED: 2016-03-01
	S	AMPLE DESCRIPTION:	TW11N	
		SAMPLE TYPE:	Water	
		DATE SAMPLED:	2/29/2016	
Parameter	Unit	G/S RDL	7413129	
Barium	mg/L	0.002	0.060	
Beryllium	mg/L	0.001	<0.001	
Boron	mg/L	0.010	<0.010	
Cadmium	mg/L	0.001	<0.001	
Chromium	mg/L	0.003	< 0.003	
Cobalt	mg/L	0.001	<0.001	
Copper	mg/L	0.003	< 0.003	
Iron	mg/L	0.010	< 0.010	
Lead	mg/L	0.002	<0.002	
Manganese	mg/L	0.002	<0.002	
Mercury	mg/L	0.0001	<0.0001	
Molybdenum	mg/L	0.002	<0.002	
Nickel	mg/L	0.003	< 0.003	
Selenium	mg/L	0.004	<0.004	
Silver	mg/L	0.002	<0.002	
Strontium	mg/L	0.005	0.132	
Thallium	mg/L	0.006	<0.006	
Tin	mg/L	0.002	<0.002	
Titanium	mg/L	0.002	<0.002	
Tungsten	mg/L	0.010	<0.010	
Uranium	mg/L	0.002	<0.002	
Vanadium	mg/L	0.002	<0.002	
Zinc	mg/L	0.005	0.013	
Zirconium	mg/L	0.004	<0.004	
% Difference/ Ion Balance	%	NA	1.24	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Elevated RDL indicates the degree of sample dilution prior to the analysis in order to keep analyte within the calibration range of the instrument and to reduce matrix interference. Revised March 04, 2016.

Revision: This report replaces the Certificate of Analysis issued on March 01, 2016. The Certificate of analysis has been updated to correct the erroneous Reactive Silica value reported. The discrepancy was due to sampling error during the analysis.



Certified By:

7413129



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Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

SAMPLING SITE:

AGAT WORK ORDER: 16T072717

ATTENTION TO: Jim Baxter

SAMPLED BY:

				Wate	er An	alysi	S								
RPT Date: Mar 01, 2016			C	UPLICATE	Ξ		REFEREN	ICE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery		ptable nits	Recovery		ptable nits
		ld					Value	Lower	Upper		Lower	Upper		Lower	Upper
Water Quality Assessment															
Electrical Conductivity	7412084		754	750	0.5%	< 2	102%	80%	120%	NA			NA		
рН	7412084		7.74	7.79	0.6%	NA	100%	90%	110%	NA			NA		
Total Dissolved Solids	7413129 7	7413129	326	324	0.6%	< 20	96%	80%	120%	NA			NA		
Alkalinity (as CaCO3)	7412084		103	103	0.0%	< 5	100%	80%	120%	NA			NA		
Bicarbonate (as CaCO3)	7412084		103	103	0.0%	< 5	NA			NA			NA		
Carbonate (as CaCO3)	7412084		<5	<5	NA	< 5	NA			NA			NA		
Hydroxide (as CaCO3)	7412084		<5	<5	NA	< 5	NA			NA			NA		
Fluoride	7413121 7	7413121	<0.10	<0.10	NA	< 0.05	106%	90%	110%	100%	90%	110%	104%	80%	120%
Chloride	7413121 7	7413121	12.9	13.1	1.5%	< 0.10	102%	90%	110%	107%	90%	110%	102%	80%	120%
Nitrate as N	7413121 7	7413121	4.61	4.67	1.3%	< 0.05	93%	90%	110%	104%	90%	110%	89%	80%	120%
Nitrite as N	7413121 7	7413121	<0.10	<0.10	NA	< 0.05	NA	90%	110%	107%	90%	110%	101%	80%	120%
Bromide	7413121 7		<0.10	<0.10	NA	< 0.05	102%	90%	110%	109%	90%	110%	100%	80%	120%
Sulphate	7413121 7		21.9	22.2	1.4%	< 0.10	94%		110%	106%	90%	110%	94%	80%	120%
Ortho Phosphate as P	7413121 7		<0.20	<0.20	NA	< 0.10	93%		110%	100%	90%	110%	100%	80%	120%
Reactive Silica	7402270		1.97	2.00	1.5%	< 0.05	98%	90%	110%	99%	90%	110%	93%	80%	120%
Ammonia as N	7413129 7	7413129	<0.02	<0.02	NA	< 0.02	92%	90%	110%	101%	90%	110%	89%	80%	120%
Total Phosphorus	7410959		<0.05	<0.05	NA	< 0.05	102%	80%	120%	103%	90%	110%	102%	70%	130%
Total Organic Carbon	7413129 7	7413129	0.7	0.7	NA	< 0.5	98%	90%	110%	98%		110%	102%	80%	120%
Colour	7413129 7		<5	<5	NA	< 5	100%	90%	110%	NA	0070		NA	0070	
Turbidity	7413129 7		2.9	3.0	3.4%	< 0.5	101%		110%	NA			NA		
Calcium	7413129 7	7413129	81.7	82.2	0.6%	< 0.05	103%	90%	110%	103%	90%	110%	101%	70%	130%
Magnesium	7413129 7		24.0	24.0	0.0%	< 0.05	98%		110%	97%	90%	110%	100%	70%	130%
Sodium	7413129 7		5.39	5.28	2.1%	< 0.05	101%	90%	110%	100%	90%	110%	100%	70%	130%
Potassium	7413129 7		1.01	1.01	0.0%	< 0.05	100%	90%	110%	100%	90%	110%	100%	70%	130%
Aluminum	7413129 7		< 0.004	< 0.004	NA	< 0.004	100%		110%	101%		110%	103%	70%	130%
Antimony	7413129 7	7413129	< 0.003	< 0.003	NA	< 0.003	95%	90%	110%	95%	90%	110%	96%	70%	130%
Arsenic	7413129 7		< 0.003	< 0.003	NA	< 0.003	99%	90%	110%	97%	90%	110%	108%	70%	130%
Barium	7413129 7		0.060	0.058	3.4%	< 0.002	100%	90%	110%	103%	90%	110%	101%	70%	130%
Beryllium	7413129 7		< 0.001	< 0.001	NA	< 0.001	104%	90%	110%	105%	90%	110%	112%	70%	130%
Boron	7413129 7		< 0.010	< 0.010	NA	< 0.010	101%		110%	101%		110%	109%	70%	130%
Cadmium	7413129 7	7413129	< 0.001	< 0.001	NA	< 0.001	97%	90%	110%	93%	90%	110%	110%	70%	130%
Chromium	7413129 7		< 0.003	< 0.003	NA	< 0.003	100%		110%	96%		110%	101%		130%
Cobalt	7413129 7		< 0.001	< 0.001	NA	< 0.001	96%		110%	97%		110%	98%		130%
Copper	7413129 7		< 0.003	< 0.003	NA	< 0.003	99%		110%	99%		110%	98%		130%
Lead	7413129 7		< 0.002	< 0.002	NA	< 0.002	99%		110%	97%		110%	96%		130%
Manganese	7413129 7	7413129	< 0.002	< 0.002	NA	< 0.002	100%	90%	110%	97%	90%	110%	98%	70%	130%
Mercury	7413129 7		< 0.0001	< 0.0001	NA	< 0.0001	100%		110%	103%		110%	100%		120%
Molybdenum	7413129 7		< 0.002	< 0.002	NA	< 0.002	96%		110%	91%		110%	98%		130%
Nickel	7413129 7			< 0.002	NA	< 0.002	98%		110%	99%		110%	99%		130%
						. 0.000	0070	0070		0070	0070		0070	. 570	

AGAT QUALITY ASSURANCE REPORT (V2)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.



Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

SAMPLING SITE:

AGAT WORK ORDER: 16T072717

ATTENTION TO: Jim Baxter

SAMPLED BY:

RPT Date: Mar 01, 2016			DUPLICATE			REFERENCE MATERIAL		METHOD BLANK SPIKE			MATRIX SPIKE				
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured Value		ptable nits	Recovery	Acceptable Limits		Recovery	Acceptable Limits	
		Id						Lower	Upper	-	Lower	Upper		Lower	Upper
Selenium	7413129	7413129	< 0.004	< 0.004	NA	< 0.004	97%	90%	110%	98%	90%	110%	111%	70%	130%
Silver	7413129	7413129	< 0.002	< 0.002	NA	< 0.002	99%	90%	110%	104%	90%	110%	111%	70%	130%
Strontium	7413129	7413129	0.132	0.130	1.5%	< 0.005	99%	90%	110%	96%	90%	110%	100%	70%	130%
Thallium	7413129	7413129	< 0.006	< 0.006	NA	< 0.006	103%	90%	110%	101%	90%	110%	100%	70%	130%
Tin	7413129	7413129	< 0.002	< 0.002	NA	< 0.002	100%	90%	110%	97%	90%	110%	95%	70%	130%
Titanium	7413129	7413129	< 0.002	< 0.002	NA	< 0.002	97%	90%	110%	93%	90%	110%	95%	70%	130%
Tungsten	7413129	7413129	< 0.010	< 0.010	NA	< 0.010	96%	90%	110%	92%	90%	110%	96%	70%	130%
Uranium	7413129	7413129	< 0.002	< 0.002	NA	< 0.002	99%	90%	110%	95%	90%	110%	92%	70%	130%
Vanadium	7413129	7413129	< 0.002	< 0.002	NA	< 0.002	93%	90%	110%	93%	90%	110%	94%	70%	130%
Zinc	7413129	7413129	0.013	0.012	NA	< 0.005	99%	90%	110%	99%	90%	110%	99%	70%	130%
Zirconium	7413129	7413129	< 0.004	< 0.004	NA	< 0.004	98%	90%	110%	94%	90%	110%	91%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.





AGAT QUALITY ASSURANCE REPORT (V2)

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Page 6 of 9



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

AGAT WORK ORDER: 16T072717

ATTENTION TO: Jim Baxter

SAMPLING SITE:		SAMPLED BY:							
	104700D								
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE						
Water Analysis									
Nitrate as N	INOR-93-6004	SM 4110 B							
Electrical Conductivity	INOR-93-6000	SM 2510 B							
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE						
Saturation pH		SM 2320 B	CALCULATION						
Langelier Index		SM 2330B	CALCULATION						
Total Hardness (as CaCO3)	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES						
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE						
Alkalinity (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE						
Bicarbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE						
Carbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE						
Hydroxide (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE						
Fluoride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH						
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH						
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH						
Bromide	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH						
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH						
Ortho Phosphate as P	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH						
Reactive Silica	INOR-93-6047	AQ2 EPA-122A & SM 4500 SiO2 D	AQ2 DISCRETE ANALYSER						
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH3-F	LACHAT FIA						
Total Phosphorus	INOR-93-6057	QuikChem 10-115-01-3-A & SM 4500-P I	LACHAT FIA						
Total Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310	SHIMADZU CARBON ANALYZER						
Colour	INOR-93-6046	SM 2120 B	SPECTROPHOTOMETER						
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER						
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES						
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES						
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES						
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES						
Aluminum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Iron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Manganese	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Mercury	MET-93-6100	EPA SW 846 7470 & 245.1	CVAAS						
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Strontium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

AGAT WORK ORDER: 16T072717

ATTENTION TO: Jim Baxter

SAMPLING SITE:		SAMPLED BY:							
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE						
Tin	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Titanium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Tungsten	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Zirconium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
% Difference/ Ion Balance		SM 1030 E	CALCULATION						

Samples Reinquished By Print Name and Sign: Way H Van LC (18 Jac) Samples Reinquished By (Print Name and Sign): Decument ID: 20-76-1511.009	TWIN	AGAT Quote #: Please note: / Invoice Information: Company: Contact: Address: Email: Sample Identification	Chain of Custody Record Report Information: Company: Contact: Transformation: Report Information: Transformation: Transformation: Transformation: Transformation: Transformation: Transformation:
Math	Fzb. 29, 201 / Zeb. 29, 201 /	PO: Please note: If guotation number is not provided, client will be billed full price for analysis ON: Bill To Same: Yes Bill To Same: Yes Time # of Sampled Sampled Containers Ma	E D. P. P. C. ZAN
	11:00	ed, client will be (Bill 1 Time Sampled	Fax:
Data TEb.J.	6	Bill To Same: Y Bill To Same: Y	a Drinking Water
7, 2016 Time	6w	vyes No Sample	ater sample, please use Drinking 1 ater sample, please use Drinking 1 ater sample, please use Drinking 1 Please check Please check Comparison Soil Texture Coars Fine Soil Texture Coars Coars
Samples Repeived By Print Name and Service State of the Service Name and Service Service Service Name and Service		Special Instructions Sediment Surface Water Metals and Inorganics Metal Scan Hydride Forming Metals Client Custom Metals Client Custom Metals ORPs: □B-HWS □ Cr □ CN □ Cr ^{e+} □ EC □ FOC □ N0 ₂ /N0 ₂ □ Total N □ Hg □ pH □ SAR	Ater Chain of Custody Form (portable wate tory Requirements: No all applicable boxes) ion 153/04 of stree Condition?
Pink Copy - Client		ORPs: LIBHWS LICh Crest FOC NO_XNO_2 I Total N Hg PH SAR A Nutrients: TP NH, ITKN D D No_a NO_2 NO_4/NO_2 D D Volatilies: V oc BTEX THM E CCME Fractions 1 to 4 A ABNs PAHs S S S	5835 Coopers Avenue Mississauga, Ontario L42 1Y2 5.712.5120 Fax: 905.712.5122 webearth.agatlabs.com ater intended for human consumption) ater intended for human consumption) I Regulatory Requirement Regulatory Requirement Objectives (PWQO) Objectives (PWQO) Indicate of Analysis Ves X No
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		Chlorophenols PCBs Organochlorine Pesticides TCLP Metals/Inorganics Sewer Use Mikratus MWQA	Laboratory Use Only Work Order #: I I I I I I I I I I I I I I I I I I I

Page 9 of 9



CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Dwight Smikle

PROJECT: 300033273

AGAT WORK ORDER: 16T101841

WATER ANALYSIS REVIEWED BY: Mike Muneswar, BSc (Chem), Senior Inorganic Analyst

DATE REPORTED: Jun 17, 2016

PAGES (INCLUDING COVER): 8

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

<u>*NOTES</u>		

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

Member of: Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA) Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA)

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Page 1 of 8

Results relate only to the items tested and to all the items tested All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request



AGAT WORK ORDER: 16T101841 PROJECT: 300033273

5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle

SAMPLED BY:

		Water	Quality As	ssessment	- Groundwa	ter Sample	S		
DATE RECEIVED: 2016-06-06	3						I	DATE REPORTED:	2016-06-08
Parameter	Si	AMPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED: G / S RDL	TW2 Water 6/2/2016 7607710	TW6 Water 6/2/2016 7607713	TW5 Water 6/2/2016 7607719	TW8 Water 6/2/2016 7607726	TW9 Water 6/2/2016 7607733	TW11 Water 6/2/2016 7607739	
Electrical Conductivity	uS/cm	2	526	585	606	627	601	572	
pH	pH Units	NA	8.03	8.07	8.10	8.17	8.10	8.08	
Saturation pH			6.97	6.96	6.99	6.95	6.95	6.95	
Langelier Index			1.06	1.11	1.11	1.22	1.15	1.13	
Total Hardness (as CaCO3)	mg/L	0.5	276	303	298	324	314	289	
Total Dissolved Solids	mg/L	20	290	326	326	358	334	300	
Alkalinity (as CaCO3)	mg/L	5	264	261	251	251	257	262	
Bicarbonate (as CaCO3)	mg/L	5	264	261	251	251	257	262	
Carbonate (as CaCO3)	mg/L	5	<5	<5	<5	<5	<5	<5	
Hydroxide (as CaCO3)	mg/L	5	<5	<5	<5	<5	<5	<5	
Fluoride	mg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Chloride	mg/L	0.20	5.59	15.2	24.3	11.0	9.32	18.4	
Nitrate as N	mg/L	0.10	1.18	6.32	6.72	5.35	2.99	3.00	
Nitrite as N	mg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Bromide	mg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Sulphate	mg/L	0.20	19.0	16.4	16.8	58.0	50.5	17.3	
Ortho Phosphate as P	mg/L	0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
Reactive Silica	mg/L	0.05	9.90	7.14	7.49	7.75	8.60	7.67	
Ammonia as N	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Total Phosphorus	mg/L	0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.05	
Total Organic Carbon	mg/L	0.5	0.7	0.5	<0.5	0.7	0.6	1.1	
Colour	TCU	5	<5	<5	<5	<5	<5	<5	
Turbidity	NTU	0.5	6.4	3.7	2.5	53.6	3.5	10.2	
Calcium	mg/L	0.05	73.3	83.2	81.5	88.3	82.5	78.3	
Magnesium	mg/L	0.05	22.6	23.1	23.0	25.1	26.2	22.8	
Sodium	mg/L	0.05	2.65	5.15	9.66	4.72	3.91	7.26	
Potassium	mg/L	0.05	1.03	0.89	0.91	1.34	0.98	0.99	
Aluminum	mg/L	0.004	0.006	0.009	0.006	0.011	< 0.004	<0.004	
Antimony	mg/L	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	
Arsenic	mg/L	0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	<0.003	

Certified By:

Minte Muneman



AGAT WORK ORDER: 16T101841 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle

SAMPLED BY:

		Water	Quality As	ssessment	 Groundwa 	ter Samples	S		
DATE RECEIVED: 2016-06-06	3							DATE REPORTED:	2016-06-08
	S	AMPLE DESCRIPTION:	TW2	TW6	TW5	TW8	TW9	TW11	
		SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	
		DATE SAMPLED:	6/2/2016	6/2/2016	6/2/2016	6/2/2016	6/2/2016	6/2/2016	
Parameter	Unit	G/S RDL	7607710	7607713	7607719	7607726	7607733	7607739	
Barium	mg/L	0.002	0.063	0.101	0.112	0.087	0.069	0.056	
Beryllium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Boron	mg/L	0.010	0.012	0.012	0.011	0.025	0.013	0.010	
Cadmium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Chromium	mg/L	0.003	<0.003	<0.003	<0.003	< 0.003	<0.003	<0.003	
Cobalt	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Copper	mg/L	0.003	<0.003	<0.003	<0.003	< 0.003	< 0.003	<0.003	
ron	mg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Lead	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Manganese	mg/L	0.002	0.004	<0.002	<0.002	0.005	<0.002	<0.002	
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Molybdenum	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Nickel	mg/L	0.003	<0.003	< 0.003	< 0.003	< 0.003	< 0.003	<0.003	
Selenium	mg/L	0.004	<0.004	< 0.004	< 0.004	< 0.004	< 0.004	<0.004	
Silver	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Strontium	mg/L	0.005	0.122	0.132	0.153	1.42	0.296	0.123	
Thallium	mg/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	
Tin	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Titanium	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Fungsten	mg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Jranium	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
/anadium	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Zinc	mg/L	0.005	0.010	0.035	0.026	0.023	0.031	0.024	
Zirconium	mg/L	0.004	< 0.004	<0.004	<0.004	< 0.004	<0.004	<0.004	
% Difference/ Ion Balance	%	NA	2.23	1.11	1.02	1.52	1.52	1.67	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7607710-7607739 Samples required dilution prior to analysis for Anions due to the presence of non-target lons; the RDLs were adjusted to reflect the dilution.

Mile Muneman



Page 4 of 8

Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

SAMPLING SITE:

AGAT WORK ORDER: 16T101841

ATTENTION TO: Dwight Smikle

SAMPLED BY:

				Wate	er An	alysi	S								
RPT Date:			C	UPLICATE	=		REFEREN	ICE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured Value		ptable nits	Recovery		ptable nits	Recovery		ptable nits
		lu					value	Lower	Upper	-	Lower	Upper		Lower	Upper
Water Quality Assessment - Grou	undwater Sa	amples													
Electrical Conductivity	7607726 7	7607726	627	630	0.5%	< 2	100%	80%	120%	NA			NA		
рН	7607726 7	7607726	8.17	8.11	0.7%	NA	100%	90%	110%	NA			NA		
Total Dissolved Solids	7606122		858	906	5.4%	< 20	114%	80%	120%	NA			NA		
Alkalinity (as CaCO3)	7607726 7	7607726	251	262	4.3%	< 5	102%	80%	120%	NA			NA		
Bicarbonate (as CaCO3)	7607726 7	7607726	251	262	4.3%	< 5	NA			NA			NA		
Carbonate (as CaCO3)	7607726 7	7607726	< 5	<5	NA	< 5	NA			NA			NA		
Hydroxide (as CaCO3)	7607726 7		< 5	<5	NA	< 5	NA			NA			NA		
Fluoride	7607427		<0.10	<0.10	NA	< 0.05	98%	90%	110%	97%	90%	110%	94%	80%	120%
Chloride	7607427		122	117	4.2%	< 0.10	91%	90%	110%	108%	90%	110%	NA	80%	120%
Nitrate as N	7607427		0.73	0.73	0.0%	< 0.05	92%	90%	110%	90%		110%	95%	80%	120%
Nitrite as N	7607427		<0.10	<0.10	NA	< 0.05	NA	90%	110%	96%	90%	110%	85%	80%	120%
Bromide	7607427		<0.10	<0.10	NA	< 0.05	104%	90%	110%	104%	90%	110%	102%	80%	120%
Sulphate	7607427		28.2	28.2	0.0%	< 0.00	104 %	90%	110%	104 %	90%	110%	102 %	80%	120%
Ortho Phosphate as P	7607427		<0.20	<0.20	0.078 NA	< 0.10	103%	90%	110%	106%	90%	110%	116%	80%	120%
Ammonia as N	7605143		<0.20	<0.20	NA	< 0.10	90%	90%	110%	97%	90%	110%	95%	80%	120%
	7003143		<0.02	<0.0Z	INA.	< 0.02	5078	90 /6	11076	51 /6	90 /8	11076	9378	00 /8	12070
Total Phosphorus	7602935		0.44	0.43	2.3%	< 0.05	101%	80%	120%	95%	90%	110%	101%	70%	130%
Total Organic Carbon	7603116		2.7	2.6	3.8%	< 0.5	98%	90%	110%	92%	90%	110%	97%	80%	120%
Colour	7595900		60	63	4.9%	< 5	101%	90%	110%	NA			NA		
Turbidity	7606359		<0.5	<0.5	NA	< 0.5	103%	90%	110%	NA			NA		
Calcium	7607710 7	7607710	73.3	74.7	1.9%	< 0.05	102%	90%	110%	101%	90%	110%	97%	70%	130%
Magnesium	7607710 7	7607710	22.6	23.0	1.8%	< 0.05	99%	90%	110%	97%	90%	110%	98%	70%	130%
Sodium	7607710 7	7607710	2.65	2.63	0.8%	< 0.05	96%	90%	110%	97%	90%	110%	94%	70%	130%
Potassium	7607710 7	7607710	1.03	1.02	1.0%	< 0.05	93%	90%	110%	94%	90%	110%	92%	70%	130%
Aluminum	7607710 7	7607710	0.006	0.009	NA	< 0.004	104%	90%	110%	98%	90%	110%	105%	70%	130%
Antimony	7607710 7	7607710	< 0.003	<0.003	NA	< 0.003	99%	90%	110%	93%	90%	110%	102%	70%	130%
Arsenic	7607710 7	7607710	< 0.003	<0.003	NA	< 0.003	104%	90%	110%	99%	90%	110%	107%	70%	130%
Barium	7607710 7		0.063	0.062	1.6%	< 0.002	103%	90%	110%	99%	90%	110%	105%	70%	130%
Beryllium	7607710 7		< 0.001	< 0.001	NA	< 0.001	106%	90%	110%	100%	90%	110%	111%	70%	130%
Boron	7607710 7		0.012	0.011	NA	< 0.010	110%	90%	110%	103%	90%	110%	110%	70%	130%
Cadmium	7607710 7		< 0.001	<0.001	NA	< 0.001	100%	90%	110%	99%	90%	110%	118%	70%	130%
Chromium	7607710 7	7607710	~ 0 003	<0.003	NA	< 0.003	104%	00%	110%	98%	Q0%	110%	105%	70%	130%
Cobalt	7607710 7		< 0.003	<0.003		< 0.003	104%		110%	90% 99%		110%	105%		130%
					NA										130%
Copper Iron	7607710 7			<0.003 <0.010	NA NA	< 0.003 < 0.010	104% 104%		110% 110%	99% 91%		110% 110%	105% 94%		130%
Lead	7607710 7			<0.002	NA	< 0.002	99%		110%	91% 94%		110%	94 % 98%		130%
				-0.00L		- 0.002	0070	0070		0.70	23/0		0070	. 575	,
Manganese	7607710 7		0.004	0.004	NA	< 0.002	104%		110%	99%		110%	108%		130%
Mercury	7607710 7	7607710	<0.0001	<0.0001	NA	< 0.0001			110%	98%		110%	101%		120%
Molybdenum	7607710 7			<0.002	NA	< 0.002	101%		110%	94%		110%	105%		130%
Nickel	7607710 7	7607710	< 0.003	<0.003	NA	< 0.003	106%	90%	110%	101%	90%	110%	107%	70%	130%

AGAT QUALITY ASSURANCE REPORT (V1)

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Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

SAMPLING SITE:

AGAT WORK ORDER: 16T101841 ATTENTION TO: Dwight Smikle

SAMPLED BY:

Water Analysis (Continued)	
----------------------------	--

RPT Date:			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery	Lin	otable hits	Recovery	1.10	ptable nits
		ld					Value	Lower	Upper			Upper		Lower	Upper
Selenium	7607710 7	7607710	< 0.004	<0.004	NA	< 0.004	102%	90%	110%	97%	90%	110%	110%	70%	130%
Silver	7607710 7	7607710	< 0.002	<0.002	NA	< 0.002	104%	90%	110%	109%	90%	110%	120%	70%	130%
Strontium	7607710 7	7607710	0.122	0.121	0.8%	< 0.005	105%	90%	110%	97%	90%	110%	106%	70%	130%
Thallium	7607710 7	7607710	< 0.006	<0.006	NA	< 0.006	106%	90%	110%	106%	90%	110%	109%	70%	130%
Tin	7607710 7	7607710	< 0.002	<0.002	NA	< 0.002	101%	90%	110%	97%	90%	110%	105%	70%	130%
Titanium	7607710 7	7607710	< 0.002	<0.002	NA	< 0.002	106%	90%	110%	95%	90%	110%	102%	70%	130%
Tungsten	7607710 7	7607710	< 0.010	<0.010	NA	< 0.010	106%	90%	110%	100%	90%	110%	100%	70%	130%
Uranium	7607710 7	7607710	< 0.002	<0.002	NA	< 0.002	106%	90%	110%	92%	90%	110%	98%	70%	130%
Vanadium	7607710 7	7607710	< 0.002	<0.002	NA	< 0.002	100%	90%	110%	95%	90%	110%	101%	70%	130%
Zinc	7607710 7	7607710	0.010	0.010	NA	< 0.005	101%	90%	110%	96%	90%	110%	102%	70%	130%
Zirconium	7607710 7	7607710	< 0.004	<0.004	NA	< 0.004	102%	90%	110%	95%	90%	110%	94%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By:

Mile Munemon

AGAT QUALITY ASSURANCE REPORT (V1)

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Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

AGAT WORK ORDER: 16T101841 ATTENTION TO: Dwight Smikle

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
рН	INOR-93-6000	SM 4500-H+ B	PC TITRATE
Saturation pH		SM 2320 B	CALCULATION
Langelier Index		SM 2330B	CALCULATION
Total Hardness (as CaCO3)	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE
Alkalinity (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Bicarbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Carbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Hydroxide (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Fluoride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Bromide	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Ortho Phosphate as P	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Reactive Silica	INOR-93-6047	AQ2 EPA-122A & SM 4500 SiO2 D	AQ2 DISCRETE ANALYSER
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH3-F	LACHAT FIA
Total Phosphorus	INOR-93-6057	QuikChem 10-115-01-3-A & SM 4500-P I	LACHAT FIA
Total Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310	SHIMADZU CARBON ANALYZER
Colour	INOR-93-6046	SM 2120 B	SPECTROPHOTOMETER
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Aluminum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Iron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Manganese	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Mercury	MET-93-6100	EPA SW 846 7470 & 245.1	CVAAS
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Strontium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Thallium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
mandin	WIL 1-35-0105	LI A GW-040 0020A & 200.0	



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

AGAT WORK ORDER: 16T101841

ATTENTION TO: Dwight Smikle

SAMPLING SITE:		SAMPLED BY:							
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE						
Tin	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Titanium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Tungsten	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
Zirconium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS						
% Difference/ Ion Balance		SM 1030 E	CALCULATION						

Samples Relinquished By (Print Name and Sign): May The Very Very Very Samples Relinquished By (Print Name and Sign): Samples Relinquished By (Print Name and Sign):	Sample Identification $T \mathcal{W} \mathcal{X}$ $T \mathcal{W} \mathcal{X}$ $T \mathcal{W} \mathcal{S}$ $T \mathcal{W} \mathcal{S}$	t: Please note:	Chain of Custody Record Report Information: Contact: Adress: Phone: Reports to be sent to: 1. Email: 2 mail: Mail: <tr td=""></tr>
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CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Jim Baxter

PROJECT: 300033273

AGAT WORK ORDER: 16W073428

WATER ANALYSIS REVIEWED BY: Mike Muneswar, BSc (Chem), Senior Inorganic Analyst

DATE REPORTED: Mar 03, 2016

PAGES (INCLUDING COVER): 9

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES		

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

Member of: Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA) Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA)

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Results relate only to the items tested and to all the items tested All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request



AGAT WORK ORDER: 16W073428 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Jim Baxter

SAMPLED BY:

					Nitrate (Water)
DATE RECEIVED: 2016-03-02					DATE REPORTED: 2016-03-03
	S	AMPLE DES	CRIPTION:	TW12N	
		SAM	PLE TYPE:	Water	
		DATE	SAMPLED:	3/1/2016	
Parameter	Unit	G/S	RDL	7417866	
Nitrate as N	mg/L		0.25	<0.25	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7417866 Sample required dilution prior to analysis for Nitrate due to the presence of non-target Anions; the RDL was adjusted accordingly.

Certified By:



AGAT WORK ORDER: 16W073428 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Jim Baxter

SAMPLED BY:

			Wat	er Quality Assessment
DATE RECEIVED: 2016-03-02				DATE REPORTED: 2016-03-03
		AMPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED:	TW12 Water 3/1/2016	
Parameter	Unit	G/S RDL	7417874	
Electrical Conductivity	uS/cm	2	1740	
pH	pH Units	NA	7.92	
Saturation pH			6.60	
Langelier Index			1.32	
Total Hardness (as CaCO3)	mg/L	0.5	1010	
Total Dissolved Solids	mg/L	20	1480	
Alkalinity (as CaCO3)	mg/L	5	195	
Bicarbonate (as CaCO3)	mg/L	5	195	
Carbonate (as CaCO3)	mg/L	5	<5	
Hydroxide (as CaCO3)	mg/L	5	<5	
Fluoride	mg/L	0.25	<0.25	
Chloride	mg/L	0.50	2.30	
Nitrate as N	mg/L	0.25	<0.25	
Nitrite as N	mg/L	0.25	<0.25	
Bromide	mg/L	0.25	<0.25	
Sulphate	mg/L	2.0	875	
Ortho Phosphate as P	mg/L	0.50	<0.50	
Reactive Silica	mg/L	0.05	14.2	
Ammonia as N	mg/L	0.02	0.08	
Total Phosphorus	mg/L	0.05	<0.05	
Total Organic Carbon	mg/L	0.5	<0.5	
Colour	TCU	5	<5	
Turbidity	NTU	0.5	5.0	
Calcium	mg/L	0.10	320	
Magnesium	mg/L	0.10	51.6	
Sodium	mg/L	0.10	7.51	
Potassium	mg/L	0.10	1.91	
Aluminum	mg/L	0.004	< 0.004	
Antimony	mg/L	0.003	< 0.003	
Arsenic	mg/L	0.003	0.013	

Certified By:

Mile Muneman



AGAT WORK ORDER: 16W073428 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Jim Baxter

SAMPLED BY:

			Water	Quality Assessment
DATE RECEIVED: 2016-03-02				DATE REPORTED: 2016-03-03
	S	AMPLE DESCRIPTION:	TW12	
		SAMPLE TYPE:	Water	
		DATE SAMPLED:	3/1/2016	
Parameter	Unit	G/S RDL	7417874	
Barium	mg/L	0.002	0.005	
Beryllium	mg/L	0.001	<0.001	
Boron	mg/L	0.010	0.055	
Cadmium	mg/L	0.001	<0.001	
Chromium	mg/L	0.003	<0.003	
Cobalt	mg/L	0.001	<0.001	
Copper	mg/L	0.003	<0.003	
ron	mg/L	0.010	0.401	
Lead	mg/L	0.002	<0.002	
Manganese	mg/L	0.002	0.026	
Mercury	mg/L	0.0001	<0.0001	
Molybdenum	mg/L	0.002	0.004	
Nickel	mg/L	0.003	<0.003	
Selenium	mg/L	0.004	<0.004	
Silver	mg/L	0.002	<0.002	
Strontium	mg/L	0.005	3.52	
Thallium	mg/L	0.006	<0.006	
Tin	mg/L	0.002	<0.002	
Titanium	mg/L	0.002	0.012	
Tungsten	mg/L	0.010	<0.010	
Uranium	mg/L	0.002	<0.002	
Vanadium	mg/L	0.002	<0.002	
Zinc	mg/L	0.005	0.036	
Zirconium	mg/L	0.004	<0.004	
% Difference/ Ion Balance	%	NA	3.66	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7417874 Sample required dilution prior to analysis for Anions & Cations in order to keep the analytes within the calibration range of the instruments and/or to minimize any matrix interferences; the RDLs were adjusted accordingly.

Certified By:

Mile Muneaven



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Quality Assurance

Water Analysia

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

SAMPLING SITE:

AGAT WORK ORDER: 16W073428

ATTENTION TO: Jim Baxter

SAMPLED BY:

			Wate	er Ar	nalysi	S								
RPT Date: Mar 03, 2016		0	UPLICATE	Ξ		REFEREN	NCE MA	TERIAL	METHOD	BLAN	(SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch Sample	Dup #1	Dup #2	RPD	Method Blank	Measured Value		ptable nits	Recovery	1 1 10	eptable nits	Recovery	1 1 1 1	ptable nits
						Value	Lower	Upper		Lower	Upper		Lower	Upper
Water Quality Assessment														
Electrical Conductivity	7415208	751	751	0.0%	< 2	102%	80%	120%	NA			NA		
рН	7415208	7.85	7.87	0.3%	NA	100%	90%	110%	NA			NA		
Total Dissolved Solids	7417874 7417874	1480	1270	15.3%	< 20	98%	80%	120%	NA			NA		
Alkalinity (as CaCO3)	7415208	102	104	1.9%	< 5	101%	80%	120%	NA			NA		
Bicarbonate (as CaCO3)	7415208	102	104	1.9%	< 5	NA			NA			NA		
Carbonate (as CaCO3)	7415208	<5	<5	NA	< 5	NA			NA			NA		
Hydroxide (as CaCO3)	7415208	<5	<5	NA	< 5	NA			NA			NA		
Fluoride	7411105	<0.5	<0.5	NA	< 0.05	107%	90%	110%	109%	90%	110%	99%	80%	120%
Chloride	7411105	171	172	0.6%	< 0.10	102%	90%	110%	107%	90%	110%	95%	80%	120%
Nitrate as N	7411105	<0.5	<0.5	NA	< 0.05	93%	90%	110%	102%	90%	110%	105%	80%	120%
Nitrite as N	7411105	<0.5	<0.5	NA	< 0.05	NA	90%	110%	94%	90%	110%	90%	80%	120%
Bromide	7411105	<0.5	<0.5	NA	< 0.05	109%	90%	110%	104%	90%	110%	89%	80%	120%
Sulphate	7411105	<1.0	<1.0	NA	< 0.10	96%	90%	110%	100%	90%	110%	95%	80%	120%
Ortho Phosphate as P	7411105	<1.0	<1.0	NA	< 0.10	93%	90%	110%	101%	90%	110%	94%	80%	120%
Reactive Silica	7402270	1.97	2.00	1.5%	< 0.05	98%	90%	110%	101%	90%	110%	93%	80%	120%
Ammonia as N	7417865	0.06	0.06	NA	< 0.02	103%	90%	110%	102%	90%	110%	94%	80%	120%
Total Phosphorus	7417874 7417874	< 0.05	< 0.05	NA	< 0.05	103%		120%	98%	90%	110%	101%	70%	130%
Total Organic Carbon	7417874 7417874	< 0.5	< 0.5	NA	< 0.5	96%		110%	92%		110%	99%	80%	120%
Colour	7417874 7417874	< 5	<5	NA	< 5	100%		110%	NA			NA		
Turbidity	7417874 7417874	5.0	4.8	4.1%	< 0.5	104%	90%	110%	NA			NA		
Calcium	7413138	17.0	16.7	1.8%	< 0.05	103%	90%	110%	105%	90%	110%	100%	70%	130%
Magnesium	7413138	3.77	3.75	0.5%	< 0.05	97%		110%	99%	90%	110%	100%	70%	130%
Sodium	7413138	80.8	81.6	1.0%	< 0.05	101%		110%	98%	90%		97%	70%	130%
Potassium	7413138	0.79	0.79	0.0%	< 0.05	99%		110%	98%	90%	110%	97%	70%	130%
Aluminum	7417874 7417874	< 0.004	<0.004	NA	< 0.004	102%	90%	110%	110%	90%	110%	101%	70%	130%
Antimony	7417874 7417874	< 0.003	<0.003	NA	< 0.003	102%	90%	110%	98%	90%	110%	96%	70%	130%
Arsenic	7417874 7417874	0.013	0.013	NA	< 0.003	106%		110%	103%			107%	70%	130%
Barium	7417874 7417874	0.005	0.005	NA	< 0.002	99%	90%	110%	99%	90%	110%	94%	70%	130%
Beryllium	7417874 7417874	< 0.001	< 0.001	NA	< 0.001	103%		110%	106%	90%	110%	106%	70%	130%
Boron	7417874 7417874	0.055	0.058	5.3%	< 0.010	108%		110%	104%	90%		101%	70%	130%
Cadmium	7417874 7417874	< 0.001	<0.001	NA	< 0.001	102%	90%	110%	100%	90%	110%	103%	70%	130%
Chromium	7417874 7417874		< 0.003	NA	< 0.003	102 %		110%	102%		110%	97%		130%
Cobalt	7417874 7417874	< 0.003	<0.003	NA	< 0.003	107%		110%	102%		110%	98%		130%
Copper	7417874 7417874		< 0.003	NA	< 0.003	107 %		110%	102 %		110%	96%		130%
Iron	7417874 7417874	0.401	0.400	0.2%	< 0.000	102%		110%	102%		110%	87%		130%
Lead	7417874 7417874	< 0.002	<0.002	NA	< 0.002	100%	90%	110%	97%	Q0%	110%	90%	70%	130%
Manganese	7417874 7417874	< 0.002 0.026	<0.002 0.025	3.9%	< 0.002	110%		110%	97% 103%		110%	90% 101%		130%
Mercury	7417874 7417874		<0.025	3.9% NA	< 0.002			110%	103%		110%	93%		120%
Molybdenum	7417874 7417874	<0.0001 0.004	0.004	NA	< 0.0001	99% 100%		110%	93%		110%	93% 91%		130%
	1411014	0.004	0.004		< 0.00Z	10070	5070	11070	5576	5070	11070	0170	1070	10070

AGAT QUALITY ASSURANCE REPORT (V1)

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Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

SAMPLING SITE:

AGAT WORK ORDER: 16W073428

ATTENTION TO: Jim Baxter

SAMPLED BY:

RPT Date: Mar 03, 2016				UPLICATI	Ξ		REFEREN	ICE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured	Acceptable d Limits		Recovery	Acce Lin		Recovery	Lie	ptable nits
		ld					Value	Lower	Upper	,		Upper			Upper
Nickel	7417874 7	7417874	< 0.003	<0.003	NA	< 0.003	105%	90%	110%	100%	90%	110%	95%	70%	130%
Selenium	7417874 7	7417874	< 0.004	<0.004	NA	< 0.004	104%	90%	110%	102%	90%	110%	112%	70%	130%
Silver	7417874 7	7417874	< 0.002	<0.002	NA	< 0.002	104%	90%	110%	108%	90%	110%	110%	70%	130%
Strontium	7417874 7	7417874	3.52	3.55	0.8%	< 0.005	99%	90%	110%	97%	90%	110%	85%	70%	130%
Thallium	7417874 7	7417874	< 0.006	<0.006	NA	< 0.006	107%	90%	110%	106%	90%	110%	100%	70%	130%
Tin	7417874 7	7417874	< 0.002	<0.002	NA	< 0.002	99%	90%	110%	99%	90%	110%	95%	70%	130%
Titanium	7417874 7	7417874	0.012	0.012	0.0%	< 0.002	106%	90%	110%	103%	90%	110%	96%	70%	130%
Tungsten	7417874 7	7417874	< 0.010	<0.010	NA	< 0.010	93%	90%	110%	91%	90%	110%	91%	70%	130%
Uranium	7417874 7	7417874	< 0.002	<0.002	NA	< 0.002	103%	90%	110%	97%	90%	110%	92%	70%	130%
Vanadium	7417874 7	7417874	< 0.002	<0.002	NA	< 0.002	107%	90%	110%	103%	90%	110%	97%	70%	130%
Zinc	7417874 7	7417874	0.036	0.036	0.0%	< 0.005	105%	90%	110%	104%	90%	110%	110%	70%	130%
Zirconium	7417874 7	7417874	< 0.004	<0.004	NA	< 0.004	98%	90%	110%	94%	90%	110%	91%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By:

Male Muneman

AGAT QUALITY ASSURANCE REPORT (V1)

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Page 6 of 9



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

AGAT WORK ORDER: 16W073428

ATTENTION TO: Jim Baxter

		ATTENTION TO: C	Jan Baxon
SAMPLING SITE:	1	SAMPLED BY:	I
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis		·	1
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
рН	INOR-93-6000	SM 4500-H+ B	PC TITRATE
Saturation pH		SM 2320 B	CALCULATION
Langelier Index		SM 2330B	CALCULATION
Total Hardness (as CaCO3)	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE
Alkalinity (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Bicarbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Carbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Hydroxide (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Fluoride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Bromide	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Ortho Phosphate as P	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Reactive Silica	INOR-93-6047	AQ2 EPA-122A & SM 4500 SiO2 D	AQ2 DISCRETE ANALYSER
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH3-F	LACHAT FIA
Total Phosphorus	INOR-93-6057	QuikChem 10-115-01-3-A & SM 4500-P I	LACHAT FIA
Total Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310	SHIMADZU CARBON ANALYZER
Colour	INOR-93-6046	SM 2120 B	SPECTROPHOTOMETER
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Aluminum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Iron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Manganese	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Mercury	MET-93-6100	EPA SW 846 7470 & 245.1	CVAAS
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
		EPA SW-846 6020A & 200.8	ICP-MS
Strontium	MET-93-6103		



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

AGAT WORK ORDER: 16W073428

ATTENTION TO: Jim Baxter

SAMPLING SITE:		SAMPLED BY:								
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE							
Tin	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Titanium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Tungsten	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Zirconium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
% Difference/ Ion Balance		SM 1030 E	CALCULATION							

Sumples Relinquished By (Print Name and Sign): Date Time March 2,	TWIZIU Maribinis 12:10 1 6W	Sample Identification Date Time # of Sample Sampled Sampled Sampled Containers Matrix	nformati	Project Information: Project: 3000 37277 Site Location: 3000 37277 Sampled By: Mark Value/action	Chain of Custody Record Irthis a brinking Water sample, please use brinking Company: Contact: Address: Phone: Temail: The basent to: The bas
Samplets Received By (Print Name and Sign) Samples Received By Print Name and Sign) Samples Received By Print Name and Sign) Prink Copy - Cliem		Metal 3 Hydridd Client 0 ORPs: Cr ⁶⁺ Total Nutrieu NO ₃ Volatil	e Forming Metals Custom Metals	Is this submission for a Report Guideline on Record of Site Condition? Certificate of Analysis □ Yes If No □ Yes If No	Fax:
Dots Time I S An Page of Uare 1 7 1 5 7 Page of Uare 1 1 9 1 5 7 Page of 1 Uare 1 1 1 9 2 N° T 0 1 3 1 4 Pink Copy - Client I Vellow Copy - AGAT White Copy- AGAT Town United and B 2015		PCBs Organo TCLP N Sewer		Please provide prior notification for rush TAT *TAT is exclusive of weekends and statutory holidays	Labor Work D Cooler Arrival Turna Regula Rush T

Page 9 of 9



CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Jim Baxter

PROJECT: 320033273

AGAT WORK ORDER: 16W074674

WATER ANALYSIS REVIEWED BY: Parvathi Malemath, Data Reviewer

DATE REPORTED: Mar 09, 2016

PAGES (INCLUDING COVER): 5

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES	

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

Member of: Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA) Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA)

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Page 1 of 5

Results relate only to the items tested and to all the items tested All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request



AGAT WORK ORDER: 16W074674 PROJECT: 320033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Jim Baxter

SAMPLED BY:MV

					Nitrate (V	Vater)	
DATE RECEIVED: 2016-03-08							DATE REPORTED: 2016-03-09
		SAMPLE DES	CRIPTION:	TW4	TW11	TW8	
		SAM	PLE TYPE:	Water	Water	Water	
		DATES	SAMPLED:	3/7/2016	3/7/2016	3/7/2016	
Parameter	Unit	G / S	RDL	7426607	7426610	7426611	
Nitrate as N	mg/L		0.05	2.97	5.03	7.76	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard



Certified By:



Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 320033273

SAMPLING SITE:

AGAT WORK ORDER: 16W074674

ATTENTION TO: Jim Baxter

SAMPLED BY:MV

				Wate	ər An	alys	is								
RPT Date: Mar 09, 2016			C	UPLICAT	E		REFEREN	ICE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Lin	ptable nits
		iù					value	Lower	Upper		Lower	Upper		Lower	Upper
Nitrate (Water) Nitrate as N	7427214		3.61	3.59	0.6%	< 0.05	104%	90%	110%	109%	90%	110%	101%	80%	120%





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Page 3 of 5



Method Summary

Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH						
Water Analysis	·								
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE						
SAMPLING SITE:		SAMPLED BY:MV							
PROJECT: 320033273		ATTENTION TO: Jim Baxter							
CLIENT NAME: R.J. BURNSIDE & ASSOC	CIATES LTD	AGAT WORK ORDER: 16W074674							

M. Kell X Me	Samples Reinquished By (Print Name and Sign) Samples Reinquished By (Print Name and Sign)		Tw ?	TWI	TWY	Sample Identification	Invoice Information: Company: Contact: Address: Email:	AGAT Quote #: Please note: It	Site Location: <u>Buffer</u> Sampled By: <u>Mutt</u>	Project Information:	be sent to:	Report Information:	Chain of Custody Record	
Styles	plan	*	1	11	March. 7.	Date Sampled		PC: Please note: If quotation number is not provided, client will be billed full price for analysis	the leviete	27.75	a out	Buins a	Record	6
16/03/08						Time Sampled		PO: vided, client will be b			Fax:	at t	If this is a Drii	
6/3/2	March Brilb			-		# of S Containers	Bill To Same: Yes	illed full price for ana			h.com	Associates	nking Water san	Lab
2/2	Time		5	GW	60	Sample Matrix		lysis.			A hit 20	: Latel	nple, please us	aboratories
2 ST. March	Samples received by (Print N					Comments/ Special Instructions	 GW Ground Water O Oil P Paint Soil Sediment SW Surface Water 	Sa	TYes PNO	Is this submission for a Record of Site Condition?		Regulatory Requirements: (Please check all applicable boxes) Regulation 153/04	If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable	AG ries
uni	A CLASS OF					Metal	s and Inorganics Scan e Forming Metals		0	or a Ition?	Sanitary		stody Form (potabl	Print
A Pinkoopy-Chie	The hope is		2.1.			ORPs: Cr ⁶⁺ Tota Nutrie No ₃ Volati	Custom Metals B-HWS CI: CN: EC FOC NO ₂ /NO IN Hg pH SAR nts: TP NH, TKN NO ₂ NO ₂ /NO ₂ les: VOC BTEX TH Fractions 1 to 4	ck Applicab	Ves Jano	Report Guideline on Certificate of Analysis		No Regulatory Requirement	le water intended for human consumption)	5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2 Ph: 905.712.5100 Fax: 905.712.5122 webearth.agattabs.com
Prink Copy - Chemit Valley Copy - AGAT - Lynning Copy - AGAT	a 3/8 J. JANN		×	×		PCBs Organ TCLP I Sewer	phenols ochlorine Pesticides Metals/Inorganics Use Matt		*TAT is exclusive of wee	OR Date Required (Ru	Turnaround Time (TAT) Required: Regular TAT Rush TAT medianeter of the summer of the	nt Custody Seal Intact) Arrival Temperatures:	Laboratory Use Only Work Order #:
AGAT Date Instance April 2015	Page of								Prease provide prior notification for rush IAI *TAT is exclusive of weekends and statutory holidays	OR Date Required (Rush Surcharges May Apply):	2 Business Days	es 🔤 No 🔤 N/A	1.2 2.2 D.9	hLahLa

Page 5 of 5



CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Jim Baxter

PROJECT: 300033273

AGAT WORK ORDER: 16W074853

WATER ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

DATE REPORTED: Mar 10, 2016

PAGES (INCLUDING COVER): 5

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES	

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

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Page 1 of 5

Results relate only to the items tested and to all the items tested

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AGAT WORK ORDER: 16W074853 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Jim Baxter

SAMPLED BY:

					Nitrate (V	/ater)					
DATE RECEIVED: 2016-03-09								D	ATE REPORT	ED: 2016-03-10	
		SAMPLE DES	CRIPTION:	TW5	TW7	TW9		TW3		TW2	
		SAM	PLE TYPE:	Water	Water	Water		Water		Water	
		DATES	SAMPLED:	3/8/2016	3/8/2016	3/8/2016		3/8/2016		3/8/2016	
Parameter	Unit	G/S	RDL	7430208	7430212	7430214	RDL	7430216	RDL	7430218	
Nitrate as N	mg/L		0.05	7.80	7.27	3.41	0.25	0.54	0.05	0.58	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

7430216 Elevated RDL indicates the degree of sample dilution prior to the analysis in order to keep analyte within the calibration range of the instrument and to reduce matrix interference.

Certified By:



Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

SAMPLING SITE:

AGAT WORK ORDER: 16W074853

ATTENTION TO: Jim Baxter

SAMPLED BY:

				Wate	er Ar	nalys	is								
RPT Date: Mar 10, 2016			0	UPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recoverv	Lir	ptable nits	Recoverv	Lin	eptable nits
		ld					Value	Lower	Upper		Lower	Upper		Lower	Upper
Nitrate (Water) Nitrate as N	7430216	7430216	0.54	0.56	3.6%	< 0.05	108%	90%	110%	108%	90%	110%	110%	80%	120%

Certified By:

Amanjot Bhela

AGAT QUALITY ASSURANCE REPORT (V1)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Page 3 of 5



Method Summary

Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Water Analysis	-		
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
SAMPLING SITE:		SAMPLED BY:	
PROJECT: 300033273		ATTENTION TO: J	im Baxter
CLIENT NAME: R.J. BURNSIDE & ASSOC	IATES LTD	AGAT WORK ORE	DER: 16W074853

Chain of Custody Record Trans none return return your on a strange return return your on a strange return return your return r
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Page 5 of 5



CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Dwight Smikle

PROJECT: Belfountain

AGAT WORK ORDER: 16W082447

WATER ANALYSIS REVIEWED BY: Sofka Pehlyova, Senior Analyst

DATE REPORTED: Apr 06, 2016

PAGES (INCLUDING COVER): 5

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES	

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

Member of: Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA) Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA)

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Page 1 of 5

Results relate only to the items tested and to all the items tested

All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request



AGAT WORK ORDER: 16W082447 PROJECT: Belfountain 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle

SAMPLED BY:

					Nitrate (W	/ater)		
DATE RECEIVED: 2016-04-05								DATE REPORTED: 2016-04-05
		SAMPLE DES	CRIPTION:	TW11-1 hr	TW11-26 hr	TW6-1 hr	TW6-26 hr	
		SAM	PLE TYPE:	Water	Water	Water	Water	
		DATES	SAMPLED:	3/30/2016	3/31/2016	4/1/2016	4/2/2016	
Parameter	Unit	G/S	RDL	7471112	7471114	7471115	7471117	
Nitrate as N	mg/L		0.05	3.46	3.37	7.89	8.23	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

Sofrea Pehlyora



Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: Belfountain

SAMPLING SITE:

AGAT WORK ORDER: 16W082447

ATTENTION TO: Dwight Smikle

SAMPLED BY:

				Wat	er An	alysi	is								
RPT Date:			C	UPLICAT	E		REFEREN	ICE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		otable nits	Recovery	Lir	ptable nits	Recovery	Lin	eptable mits
		ld					Value	Lower	Upper		Lower	Upper		Lower	Upper
Nitrate (Water) Nitrate as N	7469191		1.99	1.92	3.6%	< 0.05	99%	90%	110%	108%	90%	110%	106%	80%	120%

Certified By:

Sofrea Pehlyora

AGAT QUALITY ASSURANCE REPORT (V1)

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Page 3 of 5



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOC	IATES LTD	AGAT WORK ORE	DER: 16W082447
PROJECT: Belfountain		ATTENTION TO: D	Dwight Smikle
SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH

Samples Relinguished By (Print Name and Sign):	Samples Rellnquished By (Print Name and Sign):	Samples Relinquisted By (Print Mathe and Sign)	24 HR RUSH TAT REQUESTED		TW6-26 1	TW6 - 1 hr	TW11 - 26 hr	TW11 - 1 hr	Sample Identification	Emailt	Address:	Contact:	Company:	Invoice Information:	AGAT Quote #: Pleas	÷ ·	xation:	Project Information: Project: Belfountain		2. Email: Sean.Q	Reports to be sent to: Dwight 1. Email:	Phone: 519 823 4995	Geulph, ON		t Informa	Chain of Custody			
nd Sign):	nd Si≰n):		JESTED						on					Π	PO:Prease note: If quotation number is not provided, client will be billed full price for analysis	Sean Quinlan	3273	Intain		Sean.Quinlan@rjburnside.com	Dwight.Smikle@rjburnside.com	3 4995	I, ON	292 Speedvale Ave West	de			3	
		$\left[\right]$			2 Apr 16	1 Apr 16	31 Mar 16	30 Mar 16	Date Sampled						number is not pro					mside.com	umside.com			West		Record	5		
					14:50	12:00	13:00	12:30	Time Sampled					Bill	PO: vided, client will be							Fax:				If this is a Dri			
Lano	Date	Date 4 April 16				1	1	1	# of Containers				ľ	Bill To Same: Ye	billed full price for											nking Water s			
					GW	GW	GW	GW	Sample Matrix					Yes 🔄 No 🗆	analysis											ample, please	JOIAL		
Setti signatur i serena set	Samulas Bacslund								Comments/ Special Instructions	SW Surface Water				B Biota GW Ground Water	Sample Matrix		□ Yes	Record of Site Condition?	le this submission for a		Soil Texture (Check One)	Agriculture	Indicate One	Table	Regulatory Requirements: (Please check all applicable boxes)	If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption)	duoratories		
		Samples Received By (Print Name and Sign):			Ż		Z	Z	s Y/N	Field F		ed - N Please					4 No	Sondition?	tion for a		RegionIndicate One	Storm	Sanitary		-	of Custody Form (pot		R	
		i tal					2		-	s and In Scan	orga	anics						Сел	Re		One		Ţ	JSE		able water int		Miss	
		S							Clien	de Form t Custom	n Me	etals					□ Yes	tificate (port Gui		Other	Prov.			gulatory	ended for hu	webear	5835 sissauga, C	
		8							Cr ⁶	: D B-HV D EC BIN D ents: D NO ₂	□F Hg TP	FOC D D pH		₃/NO₂ SAR	(Check Applicable)		I4 NO	Certificate of Analysis	Report Guideline on	Indicate One	·	Prov. Water Quality Objectives (PWQO)			No Regulatory Requirement	ıman consumptio	webearth.agatlabs.com	5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2 Mississauga, Ontario L4Z 1Y2	
	16/5	Date Uate							-	lles: 🗆 E Fractic		_		⊐тнм	1								_		1	ē	13	N N 0	
-	4	104							ABNs	_							*7/	Ť	0	2		Rush TAT (Rush Surcharges Apply)	Regular TAT	Turnaro	Notes: 00 1	Arrival lemperatures:	Cooler Quantity:	Work Order #: 160	•
31 - ² 81	Time								Chlo	ropheno	ls						AT is exc	Please	R Date	-	3 Business Days	(Ruah S	TAT	und 1	y Seal Inta	nperatu	antity:	"#	
1		30				+	1		-	nochlori	ne P	Pestic	ides				clusive	; provio	Requir	7	⁶⁶	urcharge		lime	- 19	res:	1	16 Jse	
2) N	-	2							-	Metals,	/Inor	rgani	cs				of we	le pric	ed (Ru	Ì		s Apply)		(TA	Yes		נ	Enil	
	Page									er Use trate							ekends	ir notifi	inc usr	2	2 Business Days	-	to 7 E	T) Re	8	5		S	
		-							INI								*TAT is exclusive of weekends and statutory holidays	Please provide prior notification for rush TAT	OR Date Required (Rush Surcharges May Apply).		ness 4 1 Business Day		☐ 5 to 7 Business Days	Turnaround Time (TAT) Required:				6 MOSSAH7	
							1	ļ																			Page 5	of 5	



CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Dwight Smikle

PROJECT: 300033273

AGAT WORK ORDER: 16W138240

WATER ANALYSIS REVIEWED BY: Sofka Pehlyova, Senior Analyst

DATE REPORTED: Sep 26, 2016

PAGES (INCLUDING COVER): 12

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES	

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

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Page 1 of 12

Results relate only to the items tested and to all the items tested



AGAT WORK ORDER: 16W138240 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle

SAMPLED BY:

			Wate	er Quality /	Assessment					
DATE RECEIVED: 2016-09-16							[DATE REPORTE	D: 2016-09-26	;
Parameter	S, Unit	AMPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED: G / S RDL	TW5 Water 9/15/2016 7853172	RDL	TW2 Water 9/15/2016 7853176	RDL	TW7 Water 9/15/2016 7853182	TW8 Water 9/15/2016 7853189	RDL	TW9 Water 9/15/2016 7853195
Electrical Conductivity	uS/cm	2	667	2	575	2	606	598	2	594
рН	pH Units	NA	8.08	NA	8.17	NA	8.14	8.08	NA	8.15
Saturation pH			7.04		6.96		7.01	7.01		7.00
Langelier Index			1.04		1.21		1.13	1.07		1.15
Total Hardness (as CaCO3)	mg/L	0.5	280	0.5	294	0.5	284	296	0.5	289
Total Dissolved Solids	mg/L	20	358	20	308	20	334	364	20	332
Alkalinity (as CaCO3)	mg/L	5	237	5	271	5	247	238	5	249
Bicarbonate (as CaCO3)	mg/L	5	237	5	271	5	247	238	5	249
Carbonate (as CaCO3)	mg/L	5	<5	5	<5	5	<5	<5	5	<5
Hydroxide (as CaCO3)	mg/L	5	<5	5	<5	5	<5	<5	5	<5
Fluoride	mg/L	0.10	<0.10	0.05	<0.05	0.10	<0.10	<0.10	0.05	<0.05
Chloride	mg/L	0.20	41.2	0.10	5.96	0.20	17.4	9.46	0.10	9.76
Nitrate as N	mg/L	0.10	7.18	0.05	0.82	0.10	6.97	7.85	0.05	2.17
Nitrite as N	mg/L	0.10	<0.10	0.05	<0.05	0.10	<0.10	<0.10	0.05	<0.05
Bromide	mg/L	0.10	<0.10	0.05	<0.05	0.10	<0.10	<0.10	0.05	<0.05
Sulphate	mg/L	0.20	20.1	0.10	25.6	0.20	18.5	43.5	0.10	45.3
Ortho Phosphate as P	mg/L	0.20	<0.20	0.10	<0.10	0.20	<0.20	<0.20	0.10	<0.10
Reactive Silica	mg/L	0.05	7.43	0.05	11.8	0.05	7.12	7.49	0.05	8.77
Ammonia as N	mg/L	0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.02	0.02	<0.02
Total Phosphorus	mg/L	0.05	<0.05	0.05	0.05	0.05	<0.05	0.06	0.05	<0.05
Total Organic Carbon	mg/L	0.5	0.6	0.5	1.1	0.5	1.0	1.5	0.5	0.9
Colour	TCU	5	<5	5	<5	5	<5	<5	5	<5
Turbidity	NTU	0.5	1.7	0.5	110	0.5	4.8	113	0.5	2.4
Calcium	mg/L	0.05	76.6	0.05	77.6	0.05	77.5	80.6	0.05	76.2
Magnesium	mg/L	0.05	21.6	0.05	24.3	0.05	21.9	22.9	0.05	23.9
Sodium	mg/L	0.05	16.0	0.05	3.10	0.05	6.44	3.22	0.05	4.03
Potassium	mg/L	0.05	0.90	0.05	1.12	0.05	0.87	1.17	0.05	0.89
Aluminum	mg/L	0.004	0.010	0.004	0.014	0.004	0.012	0.011	0.004	0.010
Antimony	mg/L	0.003	<0.003	0.003	<0.003	0.003	<0.003	<0.003	0.003	< 0.003
Arsenic	mg/L	0.003	< 0.003	0.003	<0.003	0.003	< 0.003	0.003	0.003	< 0.003

Certified By:

Sofrea Pehlyora



AGAT WORK ORDER: 16W138240 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle

SAMPLED BY:

			Wat	er Quality A	Assessment					
DATE RECEIVED: 2016-09-16							[DATE REPORTE	D: 2016-09-26	;
Parameter	Unit	SAMPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED: G / S RDL	TW5 Water 9/15/2016 7853172	RDL	TW2 Water 9/15/2016 7853176	RDL	TW7 Water 9/15/2016 7853182	TW8 Water 9/15/2016 7853189	RDL	TW9 Water 9/15/2016 7853195
Barium	mg/L	0.002	0.112	0.002	0.092	0.002	0.099	0.085	0.002	0.074
Beryllium	mg/L	0.002	<0.001	0.002	< 0.001	0.002	<0.001	<0.001	0.002	<0.001
Boron	mg/L	0.010	<0.010	0.010	<0.010	0.010	<0.010	0.022	0.010	0.010
Cadmium	mg/L	0.001	<0.001	0.001	<0.001	0.001	<0.001	<0.001	0.001	<0.001
Chromium	mg/L	0.003	<0.003	0.003	<0.003	0.003	< 0.003	< 0.003	0.003	<0.003
Cobalt	mg/L	0.001	<0.001	0.001	<0.001	0.001	<0.001	<0.001	0.001	<0.001
Copper	mg/L	0.003	< 0.003	0.003	<0.003	0.003	< 0.003	< 0.003	0.003	< 0.003
Iron	mg/L	0.010	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	<0.010
Lead	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002	0.002	<0.002
Manganese	mg/L	0.002	<0.002	0.002	0.003	0.002	<0.002	0.005	0.002	<0.002
Mercury	mg/L	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	<0.0001	0.0001	<0.0001
Molybdenum	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002	0.002	<0.002
Nickel	mg/L	0.003	< 0.003	0.003	<0.003	0.003	< 0.003	< 0.003	0.003	<0.003
Selenium	mg/L	0.004	<0.004	0.004	<0.004	0.004	< 0.004	< 0.004	0.004	< 0.004
Silver	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002	0.002	< 0.002
Strontium	mg/L	0.005	0.155	0.005	0.134	0.005	0.124	1.66	0.005	0.279
Thallium	mg/L	0.006	<0.006	0.006	<0.006	0.006	<0.006	<0.006	0.006	<0.006
Tin	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002	0.002	<0.002
Titanium	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002	0.002	<0.002
Tungsten	mg/L	0.010	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	<0.010
Uranium	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002	0.002	<0.002
Vanadium	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002	0.002	<0.002
Zinc	mg/L	0.005	0.016	0.005	0.009	0.005	0.020	0.024	0.005	0.028
Zirconium	mg/L	0.004	<0.004	0.004	<0.004	0.004	<0.004	<0.004	0.004	<0.004
% Difference/ Ion Balance	%	NA	3.91	NA	1.18	NA	2.78	3.31	NA	3.13

Certified By:

Sofrea Pehlyora



AGAT WORK ORDER: 16W138240 PROJECT: 300033273

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

ATTENTION TO: Dwight Smikle

SAMPLED BY:

Water Quality Assessment									
DATE RECEIVED: 2016-09-16				DATE REPORTED: 2016-09-26					
Parameter	S/ Unit	AMPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED: G / S RDL	TW11 Water 9/15/2016 7853203						
Electrical Conductivity	uS/cm	2	589						
pH	pH Units	NA	8.20						
Saturation pH	1		6.99						
Langelier Index			1.21						
Total Hardness (as CaCO3)	mg/L	0.5	286						
Total Dissolved Solids	mg/L	20	314						
Alkalinity (as CaCO3)	mg/L	5	258						
Bicarbonate (as CaCO3)	mg/L	5	258						
Carbonate (as CaCO3)	mg/L	5	<5						
Hydroxide (as CaCO3)	mg/L	5	<5						
Fluoride	mg/L	0.05	<0.05						
Chloride	mg/L	0.10	12.7						
Nitrate as N	mg/L	0.05	4.08						
Nitrite as N	mg/L	0.05	<0.05						
Bromide	mg/L	0.05	<0.05						
Sulphate	mg/L	0.10	21.3						
Ortho Phosphate as P	mg/L	0.10	<0.10						
Reactive Silica	mg/L	0.05	7.88						
Ammonia as N	mg/L	0.02	<0.02						
Total Phosphorus	mg/L	0.05	<0.05						
Total Organic Carbon	mg/L	0.5	0.8						
Colour	TCU	5	<5						
Turbidity	NTU	0.5	4.9						
Calcium	mg/L	0.05	77.5						
Magnesium	mg/L	0.05	22.4						
Sodium	mg/L	0.05	5.49						
Potassium	mg/L	0.05	0.97						
Aluminum	mg/L	0.004	0.013						
Antimony	mg/L	0.003	<0.003						
Arsenic	mg/L	0.003	<0.003						

Certified By:

Sofrea Pehlyora



AGAT WORK ORDER: 16W138240 PROJECT: 300033273

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

ATTENTION TO: Dwight Smikle

SAMPLED BY:

			Water (uality Assessment
DATE RECEIVED: 2016-09-16				DATE REPORTED: 2016-09-26
	S	AMPLE DESCRIPTION:	TW11	
		SAMPLE TYPE:	Water	
		DATE SAMPLED:	9/15/2016	
Parameter	Unit	G/S RDL	7853203	
Barium	mg/L	0.002	0.059	
Beryllium	mg/L	0.001	<0.001	
Boron	mg/L	0.010	<0.010	
Cadmium	mg/L	0.001	<0.001	
Chromium	mg/L	0.003	<0.003	
Cobalt	mg/L	0.001	<0.001	
Copper	mg/L	0.003	<0.003	
ron	mg/L	0.010	<0.010	
ead	mg/L	0.002	<0.002	
Manganese	mg/L	0.002	<0.002	
Mercury	mg/L	0.0001	<0.0001	
Nolybdenum	mg/L	0.002	<0.002	
Nickel	mg/L	0.003	<0.003	
Selenium	mg/L	0.004	<0.004	
Silver	mg/L	0.002	<0.002	
Strontium	mg/L	0.005	0.128	
Thallium	mg/L	0.006	<0.006	
Гin	mg/L	0.002	<0.002	
Titanium	mg/L	0.002	<0.002	
Fungsten	mg/L	0.010	<0.010	
Jranium	mg/L	0.002	<0.002	
/anadium	mg/L	0.002	<0.002	
Zinc	mg/L	0.005	0.016	
Zirconium	mg/L	0.004	<0.004	
% Difference/ Ion Balance	%	NA	2.28	

Certified By:

Sofrea Pehlyora



AGAT WORK ORDER: 16W138240 PROJECT: 300033273

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle

SAMPLED BY:

Water Quality Assessment DATE RECEIVED: 2016-09-16 **DATE REPORTED: 2016-09-26** Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard 7853172 Elevated RDLs for Anions indicate the degree of sample dilutions prior to analyses to keep analytes within the calibration range, reduce matrix interference and/or to avoid contaminating the instrument. Turbidity Analysis: Hold time of 48 hours for this parameter was exceeded. Samples were received and analyzed past hold time. Review data with discretion.

7853182 Elevated RDLs for Anions indicate the degree of sample dilutions prior to analyses to keep analytes within the calibration range, reduce matrix interference and/or to avoid contaminating the instrument.

Turbidity Analysis: Hold time of 48 hours for this parameter was exceeded. Samples were received and analyzed past hold time. Review data with discretion.

Certified By:

Sofie Pehlyora

5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com



Quality Assurance

Water Analysia

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

SAMPLING SITE:

AGAT WORK ORDER: 16W138240

ATTENTION TO: Dwight Smikle

SAMPLED BY:

			Wate	er Ar	nalysi	S								
RPT Date: Sep 26, 2016		0	UPLICATE	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch Sample	Dup #1	Dup #2	RPD	Method Blank	Measured Value		otable nits	Recovery		ptable nits	Recovery	1 1 1 1	ptable nits
						Value	Lower	Upper		Lower	Upper		Lower	Upper
Water Quality Assessment														
Electrical Conductivity	7854077	1770	1760	0.6%	< 2	97%	80%	120%	NA			NA		
рН	7854077	7.24	7.16	1.1%	NA	99%	90%	110%	NA			NA		
Total Dissolved Solids	7853217	364	360	1.1%	< 20	96%	80%	120%	NA			NA		
Alkalinity (as CaCO3)	7854077	777	784	0.9%	< 5	95%	80%	120%	NA			NA		
Bicarbonate (as CaCO3)	7854077	777	784	0.9%	< 5	NA			NA			NA		
Carbonate (as CaCO3)	7854077	<5	<5	NA	< 5	NA			NA			NA		
Hydroxide (as CaCO3)	7854077	<5	<5	NA	< 5	NA			NA			NA		
Fluoride	7857463	<0.25	<0.25	NA	< 0.05	95%	90%	110%	97%	90%	110%	99%	80%	120%
Chloride	7857463	129	129	0.0%	< 0.10	95%	90%	110%	103%	90%	110%	102%	80%	120%
Nitrate as N	7857463	14.6	14.7	0.7%	< 0.05	93%	90%	110%	103%	90%	110%	110%	80%	120%
Nitrite as N	7857463	<0.25	<0.25	NA	< 0.05	NA	90%	110%	90%	90%	110%	93%	80%	120%
Bromide	7857463	<0.25	<0.25	NA	< 0.05	106%	90%	110%	103%	90%	110%	107%	80%	120%
Sulphate	7857463	35.4	35.4	0.0%	< 0.10	98%	90%	110%	100%	90%	110%	103%	80%	120%
Ortho Phosphate as P	7857463	<0.50	<0.50	NA	< 0.10	104%	90%	110%	96%	90%	110%	102%	80%	120%
Reactive Silica	7848788	18.3	18.3	0.0%	< 0.05	100%	90%	110%	102%	90%	110%	100%	80%	120%
Ammonia as N	7853203 7853203	<0.02	<0.02	NA	< 0.02	110%	90%	110%	101%	90%	110%	98%	80%	120%
Total Phosphorus	7853203 7853203	<0.05	<0.05	NA	< 0.05	99%	80%	120%	100%	90%	110%	98%	70%	130%
Total Organic Carbon	7853182 7853182	1.0	0.8	NA	< 0.5	100%	90%	110%	103%	90%	110%	98%	80%	120%
Colour	7853217	<5	<5	NA	< 5	100%		110%	NA			NA		
Turbidity	7853172 7853172	1.7	1.5	NA	< 0.5	104%	90%	110%	NA			NA		
Calcium	7853398	49.8	53.8	7.7%	< 0.05	100%	90%	110%	97%	90%	110%	99%	70%	130%
Magnesium	7853398	8.04	8.68	7.7%	< 0.05	98%	90%	110%	95%	90%	110%	96%	70%	130%
Sodium	7853398	7.45	8.07	8.0%	< 0.05	94%		110%	92%		110%	95%	70%	130%
Potassium	7853398	3.17	3.42	7.6%	< 0.05	99%		110%	96%	90%	110%	97%	70%	130%
Aluminum	7853172 7853172	0.010	0.010	NA	< 0.004	101%		110%	102%	90%	110%	97%	70%	130%
Antimony	7853172 7853172	<0.003	<0.003	NA	< 0.003	98%	90%	110%	91%	90%	110%	92%	70%	130%
Arsenic	7853172 7853172	< 0.003	< 0.003	NA	< 0.003	104%		110%	99%	90%	110%	100%	70%	130%
Barium	7853172 7853172	0.112	0.110	1.8%	< 0.002	105%		110%	100%	90%	110%	98%	70%	130%
Beryllium	7853172 7853172	<0.001	< 0.001	NA	< 0.001	99%		110%	100%	90%	110%	112%	70%	130%
Boron	7853172 7853172	<0.010	<0.010	NA	< 0.010	98%		110%	97%		110%	97%	70%	130%
Cadmium	7853172 7853172	<0.001	<0.001	NA	< 0.001	100%	90%	110%	97%	90%	110%	95%	70%	130%
Chromium	7853172 7853172	< 0.003	< 0.003	NA	< 0.003	102%		110%	101%		110%	101%		130%
Cobalt	7853172 7853172	<0.000	<0.000	NA	< 0.001	102%		110%	98%		110%	98%		130%
Copper	7853172 7853172	< 0.003	< 0.003	NA	< 0.003	105%		110%	104%		110%	102%		130%
Iron	7853172 7853172		<0.010	NA	< 0.010	107%		110%	97%		110%	94%		130%
Lead	7853172 7853172	<0.002	<0.002	NA	< 0.002	100%	90%	110%	96%	90%	110%	95%	70%	130%
Manganese	7853172 7853172	<0.002	< 0.002	NA	< 0.002	105%		110%	99%		110%	101%	70%	130%
Mercury	7853172 7853172		<0.0001	NA	< 0.0001			110%	101%		110%	103%		120%
Molybdenum	7853172 7853172		<0.002	NA	< 0.002	98%		110%	94%		110%	98%		130%
	1000112 1000112	-0.00Z	-0.00Z		- 0.00Z	0070	0070	11070	0 770	0070	11070	0070	. 0 /0	10070

AGAT QUALITY ASSURANCE REPORT (V1)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

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Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

SAMPLING SITE:

AGAT WORK ORDER: 16W138240

ATTENTION TO: Dwight Smikle SAMPLED BY:

Water Analysis (Continued)

						`									
RPT Date: Sep 26, 2016			C	DUPLICATE			REFEREN	NCE MATERIAL METHOD BLANK SPIKE MATRIX					RIX SPI	RIX SPIKE	
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery	1.10	ptable nits	Recovery	1 1 10	eptable mits
		ld					Value	Lower Upper			Lower	Upper		Lower	Upper
Nickel	7853172 7	853172	<0.003	<0.003	NA	< 0.003	103%	90%	110%	100%	90%	110%	98%	70%	130%
Selenium	7853172 7	853172	<0.004	<0.004	NA	< 0.004	96%	90%	110%	96%	90%	110%	100%	70%	130%
Silver	7853172 7	853172	<0.002	<0.002	NA	< 0.002	102%	90%	110%	104%	90%	110%	107%	70%	130%
Strontium	7853172 7	853172	0.155	0.153	1.3%	< 0.005	105%	90%	110%	97%	90%	110%	98%	70%	130%
Thallium	7853172 7	853172	<0.006	<0.006	NA	< 0.006	105%	90%	110%	104%	90%	110%	101%	70%	130%
Tin	7853172 7	853172	<0.002	<0.002	NA	< 0.002	95%	90%	110%	97%	90%	110%	97%	70%	130%
Titanium	7853172 7	853172	<0.002	<0.002	NA	< 0.002	97%	90%	110%	94%	90%	110%	94%	70%	130%
Tungsten	7853172 7	853172	<0.010	<0.010	NA	< 0.010	98%	90%	110%	101%	90%	110%	100%	70%	130%
Uranium	7853172 7	853172	<0.002	<0.002	NA	< 0.002	100%	90%	110%	99%	90%	110%	97%	70%	130%
Vanadium	7853172 7	853172	<0.002	< 0.002	NA	< 0.002	96%	90%	110%	94%	90%	110%	95%	70%	130%
Zinc	7853172 7	853172	0.016	0.016	NA	< 0.005	104%	90%	110%	102%	90%	110%	103%	70%	130%
Zirconium	7853172 7	853172	<0.004	<0.004	NA	< 0.004	96%	90%	110%	89%	90%	110%	86%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

QA Qualifier for Zirconium : In a multi-element scan up to 10% of analytes may exceed the quoted limits for lab control standards and matrix spike by up to 10% absolute and the spike is deemed acceptable.

Certified By:

Sofiéa Pehlyora

AGAT QUALITY ASSURANCE REPORT (V1)

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QA Violation

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

AGAT WORK ORDER: 16W138240 ATTENTION TO: Dwight Smikle

RPT Date: Sep 26, 2016	REFERENCE MATERIAL			METHOD	BLANK	SPIKE	MATRIX SPIKE				
PARAMETER	Sample Id	Sample Description	Measured		ptable nits	Recovery	Acceptable Limits		Recovery	Lin	eptable mits
			Value	Lower	Upper		Lower	Upper	,	Lower	Upper
Water Quality Assessment											
Zirconium	7853172	TW5	96%	90%	110%	89%	90%	110%	86%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

QA Qualifier for Zirconium : In a multi-element scan up to 10% of analytes may exceed the quoted limits for lab control standards and matrix spike by up to 10% absolute and the spike is deemed acceptable.

AGAT QUALITY ASSURANCE REPORT (V1)

Page 9 of 12

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

AGAT WORK ORDER: 16W138240 ATTENTION TO: Dwight Smikle

SAMPLING SITE:		SAMPLED BY:								
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE							
Water Analysis										
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE							
рН	INOR-93-6000	SM 4500-H+ B	PC TITRATE							
Saturation pH		SM 2320 B	CALCULATION							
Langelier Index		SM 2330B	CALCULATION							
Total Hardness (as CaCO3)	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE							
Alkalinity (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE							
Bicarbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE							
Carbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE							
Hydroxide (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE							
Fluoride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Bromide	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Ortho Phosphate as P	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Reactive Silica	INOR-93-6047	AQ2 EPA-122A & SM 4500 SiO2 D	AQ2 DISCRETE ANALYSER							
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH3-F	LACHAT FIA							
Total Phosphorus	INOR-93-6057	QuikChem 10-115-01-3-A & SM 4500-P I	LACHAT FIA							
Total Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310	SHIMADZU CARBON ANALYZER							
Colour	INOR-93-6046	SM 2120 B	SPECTROPHOTOMETER							
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER							
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Aluminum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Iron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Manganese	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Mercury	MET-93-6100	EPA SW 846 7470 & 245.1	CVAAS							
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Strontium	MET-93-6103 MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS ICP-MS							
Thallium	WIL 1-93-0103	EPA SW-846 6020A & 200.8								



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

AGAT WORK ORDER: 16W138240

ATTENTION TO: Dwight Smikle

SAMPLING SITE:		SAMPLED BY:								
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE							
Tin	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Titanium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Tungsten	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Zirconium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
% Difference/ Ion Balance		SM 1030 E	CALCULATION							

Samples Refinquisited By (Print Name and Sign): Date Time: Squaptes Recorded By (Print)	If Valer 2 Le Bate 15,26 Time Services Recent Second Case Time Services Recent Control Time Services Recent	Twill C Winds C C	N N P	TWS / 10:00 Field Filter	Heren Bo	130 6 GW / 1/2.	Sample Identification Data Time # of Sample Comments/ Sampled Sampled Sampled Containers Matrix Special Instructions	Prosee note: If quotation number is not provided, client will be balled full price for analysis Si Information: Bill To Same: Yes No Bill To Same: Yes No Image: Signal provided for provided for price for analysis Si	Project Information: Project If the submission for a Project: If the submission for a Site Location: If the submission for a Sampled By: Volt U Star. Q	- Bunsid + Assailles U.M. Speedvall Ave. West elph DNT - 823-4985 mm 0.5m; hele 3 r j burnside. Can	Chain of Custody Record If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption) Report Information	AGGAT Laboratories
Name and Soft Sop (17/16) Diff 4.D co. Trine No: T 0.3.4.6.9.5 - Pink Copy - Client I Yellow Copy - AGAT I White Copy- AGAT Date issued feet 13. 2016	ind By (Prim, Name and Sign) Munch and Construction on the State of th			A X			Metal Hydric Client ORPs: Crf* Tota Nutrie No ₃ Volatil CCME ABNS PAHS Chlorc PCBS Organ	(Please Circle) is and Inorganics I Scan de Forming Metals c Custom Metals c Custom Metals c EC = Foc = No_/NO_2 al N = Hg = pH = SAR ents: = TP = NH_3 = TKN j = No_2 = No_/NO_2 itles: = Voc = BTEX = THM E Fractions 1 to 4 ophenols mochlorine Pesticides Metals/Inorganics	for a Report Guideline on OR Date Required (Rush Surcharges May Apply): Ittion? Certificate of Analysis Please provide prior notification for rush TAT VO Ves NO *TAT is exclusive of weekends and statutory holidays	er Use Regulation 558 rurnaround Time (TAT) Required: Regular TAT Dibjectives (PWQO) Other Indiaate One Indiaate One Indiaate One Notes: OO Notes: OO	ements: RXG Regulatory Requirement Custody Seal Infact: Type The Provide Seal Provi	S835 Coopers Avenue Laboratory Use Only Mississauga, Ontario L4Z 1Y2 Work Order #: 1001 38240 Ph: 905.712.5100 Fax: 905.712.5122 Work Order #: 1001 38240 webearth.agatlabs.com Cooler Quantity:

Page 12 of 12



CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Matt Valeriote

PROJECT: 300033273

AGAT WORK ORDER: 16W170996

WATER ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

DATE REPORTED: Dec 15, 2016

PAGES (INCLUDING COVER): 5

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES	

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

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Page 1 of 5

Results relate only to the items tested and to all the items tested All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request



AGAT WORK ORDER: 16W170996 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Matt Valeriote

SAMPLED BY:

Nitrate (Water)										
DATE RECEIVED: 2016-12-15 DATE REPORTED: 2016-12-15										
		SAMPLE DES	CRIPTION:	TW2	TW7	TW9	TW5	TW8	TW11	
		SAM	PLE TYPE:	Water	Water	Water	Water	Water	Water	
		DATES	SAMPLED:	2016-12-13	2016-12-13	2016-12-13	2016-12-13	2016-12-13	2016-12-13	
Parameter	Unit	G / S	RDL	8091589	8091592	8091593	8091594	8091595	8091596	
Nitrate as N	mg/L		0.05	0.67	5.96	1.51	6.34	7.41	3.58	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

Amanjot Bhela



Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

AGAT WORK ORDER: 16W170996

ATTENTION TO: Matt Valeriote

SAMPLED BY:

SAMPLING SITE:

Water Analysis

				vvar		iuly 5	10								
RPT Date: Dec 15, 2016			C	UPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	(SPIKE	MAT	RIX SPI	IKE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery	Lir	ptable nits	Recovery	Lin	eptable mits
		ld					Value	Lower	Upper		Lower	Upper		Lower	Upper
Nitrate (Water)															
Nitrate as N	8086759		<0.05	< 0.05	NA	< 0.05	93%	90%	110%	99%	90%	110%	97%	80%	120%

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By:

Amanjot Bhela

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AGAT QUALITY ASSURANCE REPORT (V1)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOC	IATES LTD	AGAT WORK ORDER: 16W170996							
PROJECT: 300033273		ATTENTION TO: Matt Valeriote							
SAMPLING SITE:		SAMPLED BY:							
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE						
Water Analysis									
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH						

Standard Stand		F La	abora	ator	ies ^{15m}	Ph: 90	5.712.51	5835 Coop auga, Ontari 00 Fax: 905 vebearth.ag	o L4Z 1Y . 712.512	2 2	Wol	oler Qua	r #:	16			109	1946 b.2	
Report Information:	If this is a	a Drinking Wate	er sample, ple	R	rInking Water Chain of Custody Form (; egulatory Requirements:						-	val Terr stody Se			((0	< 9 No	15	7 □N/A
Company: BURNSIDE Contact: Matt Vale Address: 292 Spee Ua.t 20 B23-4995	Guelp Fax:	Are u	vest		ease check all applicable boxes) Regulation 153/04 Sewe Table Indicate One Ind/Com San Res/Park Stor Agriculture Stor	itary]Regulation]CCME]Prov. Water	Quality		Tur Reg	narou Jular 1 h TAT	TAT		5		quired: usiness Da		
Reports to be sent to: 1. Email: 2. Email:		ournsid	e, cor	So	Dil Texture (Check One) Region	ite One	- E	Objectives Other Indicate			[Day			Di D		ess Charges Ma	Next Bu Day ay Apply):	isiness
Project Information: Project: Site Location: Sampled By: Mathematical Mathematica	3				Is this submission for a Record of Site Condition?		and sent the second second	t Guidelin ate of An S			F	*TAT	is exc	lusive	of wee	kends a		rush TAT tory holiday ur AGAT CF	
AGAT Quote #: Please note: if quotation number is Invoice Information: Company: Contact: Address: Email:		ill be billed full price Bill To Same:	_	В	W Ground Water Oil Paint Soil D Sediment	Field Filtered - Metals, Hg, CrVI	Metals and Inorganics	DHydride Metals	Full Metals Scan Regulation/Custom Metals	Nutrients: DTP DNH ₃ DTKN No ₃ DNO ₃ DNO ₃ +NO ₂	S: OVOC DBTEX OTHM	CCME Fractions 1 to 4 ABNs] Total D Aroclors	Organochlorine Pesticides TCLP:□M&I □VOCs □ABNs □B(a)P □PCBs				
Sample Identification	Date Sampled	Time Sampled	Containers	Sample Matrix	Comments/ Special Instructions	Y/N		ORPs: ORPs: ORPs: ORPs:	Full Me Regulat	Nutrien	Volatiles:	CCME F	PAHs	PCBs: D Total	Organochlo TCLP: D M&I	Sewer			1
TWZ	13 DECK		51	GW		-		-		V			-						
TW7		9:38											-		_	+ +			
TW9		9:08											+						
TWS		10:40		-		-	-						1						
TWS	1	10:58		1	1	147 m.M				V	1		-						
	0	10.50	Con .	p							-		1						
															12				
Samples Relinquinted By (Print Nume and Sign):	HA	1200	14,246 1	CON	Samples Received By (Print Name and Sign):	_			D	010		C		-					
Samples Relinquished By (Print Name and Sign):	20	Date	19,40 Time	5,00	Samules Received By (Angentume and Sign):	5			D	nte /	Pecl	Time	s.a	2pm	-	Page	. 1	of 1	
Samples Relinquished By (Print Name and Sign):		Date	Time		Samples Received By (Print Name and Shin):				Da	te /1	2/1	Time	52	C		Fage		070	
															Nº:		142	3/6	
Cocument ID- DIV 78-1511 013								Pink	Copy - Cli	ent I Y	ellow (Сору - А	GAT I	White	е Сору-	AGAT		d September 3 age 5 of 5	



CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Dwight Smikle

PROJECT: 300033273

AGAT WORK ORDER: 17T211486

WATER ANALYSIS REVIEWED BY: Sofka Pehlyova, Senior Analyst

DATE REPORTED: May 05, 2017

PAGES (INCLUDING COVER): 6

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

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Results relate only to the items tested and to all the items tested All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request



AGAT WORK ORDER: 17T211486 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle

SAMPLED BY:

				N	litrate/Nitrite	e (Water)					
DATE RECEIVED: 2017-05-03								D	ATE REPOR	TED: 2017-05-05	
		SAMPLE DES	CRIPTION:	TW1	TW2	TW3	TW4	TW5		TW6	
		SAM	PLE TYPE:	Water	Water	Water	Water	Water		Water	
		DATES	SAMPLED:	2017-05-02	2017-05-02	2017-05-02	2017-05-02	2017-05-02		2017-05-02	
Parameter	Unit	G/S	RDL	8358383	8358385	8358386	8358387	8358388	RDL	8358389	
litrate as N	mg/L		0.05	<0.05	1.90	0.58	3.22	7.99	0.10	9.08	
itrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.10	<0.10	
		SAMPLE DES	CRIPTION:	TW7	TW8	TW9	TW10	TW11		TW12	
		SAM	PLE TYPE:	Water	Water	Water	Water	Water		Water	
		DATES	SAMPLED:	2017-05-02	2017-05-02	2017-05-02	2017-05-02	2017-05-02		2017-05-02	
Parameter	Unit	G / S	RDL	8358390	8358391	8358392	8358393	8358394	RDL	8358397	
litrate as N	mg/L		0.05	6.87	5.15	3.02	0.85	3.00	0.10	<0.10	
litrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.10	<0.10	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8358389 Elevated RDLs indicate the degree of sample dilutions prior to analyses to keep analytes within the calibration range, reduce matrix interference and to avoid contaminating the instrument. 8358397 Elevated RDLs indicate the degree of sample dilutions prior to analyses to keep analytes within the calibration range, reduce matrix interference and to avoid contaminating the instrument.

Certified By:

Sofiéa Pehlyora



Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

AGAT WORK ORDER: 17T211486

ATTENTION TO: Dwight Smikle

SAMPLED BY:

SAMPLING SITE:

Water Analysis

						,, , ,	-								
RPT Date: May 05, 2017			C	UPLICAT	E		REFEREN	ICE MAT	ERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured	Accep Lim		Recovery	Lir	ptable nits	Recovery	Lie	ptable nits
		ld					Value	Lower	Upper		Lower	Upper		Lower	Upper
Nitrate/Nitrite (Water)															
Nitrate as N Nitrite as N	8358389 8 8358389 8		9.08 <0.10	9.02 <0.10	0.7% NA	< 0.05 < 0.05	102% NA		110% 110%	107% 103%	90% 90%	110% 110%	114% 102%	80% 80%	120% 120%

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By:

Sofiéa Pehlyora

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AGAT QUALITY ASSURANCE REPORT (V1)

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Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD AGAT WORK ORDER: 17T211486 PROJECT: 300033273 ATTENTION TO: Dwight Smikle SAMPLING SITE: SAMPLED BY: PARAMETER AGAT S.O.P LITERATURE REFERENCE ANALYTICAL TECHNIQUE Water Analysis SM 4110 B Nitrate as N INOR-93-6004 ION CHROMATOGRAPH Nitrite as N INOR-93-6004 SM 4110 B ION CHROMATOGRAPH

Chain of Custody Record If this is a Drinking Water sample, please u	5835 Coopers Avenue Mississauga, Ontario L4Z 1Y2 Ph: 905.712.5100 Fax: 905.712.5122 webearth.agatlabs.com ase Drinking Water Chain of Custody Form (potable water consumed by humans)
Report Information: Company: R5 Burnside + Associates Utt	Regulatory Requirements: No Regulatory Requirement (Pirease check all applicable bases)
Contact: Address: Dwight Smikle 292 Speedbale Ave, W, Unit +20 Guelph ON, NIH ICY Phone: Reports to be sent to: 1. Email: 2. Email: Project Information:	Regulation 153/04 Sewer Use Regulation 558 Table Sanitary CCME Ind/com Storm Prov. Water Quality Agriculture Objectives (PWQO) Soll Texture (check one) Indicate One Fine MISA Is this submission for a Report Guideline on
Project: Betforman 3000 33273 Site Location: Belfoundain on Sampled By: Mut Valeriota	Record of Site Condition? Certificate of Analysis Please provide prior notification for rush TAT Yes No Yes No Yes No Yes No
AGAT Quote #: PO: Please nole: If quotation number is not provided, client will be billed full price for analysis. Invoice Information: Bill To Same: Yes No I Company: Contact: Address: Email:	Same of the second of the s
Sample Identification Date Time # of Sam Sampled Sampled Sampled Sampled Mat	turix Sbecial Instructions ABNS ABNS ABNS ABNS ABNS ABNS ABNS ABNS
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Subjects France A A A A Subjects Foregoing A A A A Subjects Foregoing Baty Time A A Subjects Foregoing Baty Time Page of
Samples Relinquished By (Print Name and Sign): Date Time	Samples Received By (Print Name and Sign): Date Time N°: T 0.510.85

Page 5 of 6

Chain of Custody Recor				_	ries Drinking Water Chain of Custody Form (_	5.712	sissau 2.5100 wel	335 Coope ga, Ontario Fax: 905, bearth.aga d by humans	o L4Z .712.5 Itlabs.	1Y2 1 22		Work Cool	c Orde er Qu	tory er #: antity: nperat			nly	22	K=	314	1.5
Report Information: Company: Iso Burnside Contact: Dwight 5 Address: 292 Specified Address: 292 Specified Contact: Duight 9 Phone: Guilph 04/- Reports to be sent to: 1. Email: 1. Email: Duight - Smill 2. Email: Project Information: Project: Site Location: Site Location: Suffauriation Sampled By: Must Valen	Fax: kled(jbarn	si le .	an s	Regulatory Requirements: Please check all applicable boxes: Please check all applicable boxes: Regulation 153/04 Table	r Use tary	Re Cert	PP CC CC CC CC CC CC CC CC CC CC CC CC C	egulation CME rov. Water bijectives (ther Indicate (Buildelin te of An	558 Qualit PWQC	(y))		Note Turn Regu Rush	aro laro lar TAT Da Of *7A	TAT (Rush S Busine ys R Date Pleas T is ex	Tim Surchan ess Requ e pro	ne (1] 5 to pply) 2 E Day (Rush prior i weeks	Red o 7 Bu Busine ys n Surc notific ends	N Puired usiness D ess harges ration for and statu ontact yo	Pays Day Tay Apply Trush TA Itory hol	T lidays
AGAT Quote #: AGAT Quote #: Please note: If quotation number i Invoice Information: Company: Contact: Address: Email:	PO:	Bill To Same:			Sample Matrix Legend B Biota GW Ground Water O Oil P Paint S Soil SD Sediment SW Surface Water	Field Filtered - Metals, Hg, CrVI	Metals and Inorganics	□ All Metals □ 153 Metals (excl. Hydrides) □ Hydrides) □ Hydrides Metals □ 153 Metals (Incl. Hydrides)	DB-HWS DCI DCN- DEC DFOC DHg JSAR	Full Metals Scan	Regulation/Custom Metals	VO2 DNO3+NO2		CUME Fractions 1 to 4		PCBs: Total Aroclors	Organochlorine Pesticides	TCLP: CI M&I COCS CI ABNS CI B(a)P CIPCBS	Sewer Use	had Mishik		
Sample Identification	Date Sampled May 2, 2017	Time Sampled	# of Containers	Sample Matrix	Special Instructions	×/Ø	Metal			Full N	Regul	E NO	Volatiles:	APNe	PAHS	PCBs	Organ	LCLP:	Sewe	NX		
Samples Relinguasted by IPont Name and Sign! Must Us len.ote Manufactor Samples Relinguistics by IPont Name and Sign? Samples Relinguistics by IPont Name and Sign? Samples Relinguistics by IPont Name and Sign? 2	0	Date Date Date		16: 3		2		5-	20) 71	105	Date	2		Time	2.;	15			Page	2	of _ Z	

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Pink Copy - Client | Yellow Copy - AGAT | White Copy- AGAT Page 6 of 6



CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Dwight Smikle

PROJECT: 300033273

AGAT WORK ORDER: 17W195195

WATER ANALYSIS REVIEWED BY: Mike Muneswar, BSc (Chem), Senior Inorganic Analyst

DATE REPORTED: Mar 22, 2017

PAGES (INCLUDING COVER): 11

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

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Results relate only to the items tested and to all the items tested



AGAT WORK ORDER: 17W195195 PROJECT: 300033273

5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle

SAMPLED BY:

		Water	Quality As	sessment	- Groundwat	er Sample	es			
DATE RECEIVED: 2017-03-10							D/	ATE REPORT	FED: 2017-03-22	
Duranta		AMPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED:	TW1 Water 2017-03-10		TW2 Water 2017-03-10		TW3 Water 2017-03-10		TW4 Water 2017-03-10	TW5 Water 2017-03-10
Parameter	Unit	G/S RDL 2	8244996	RDL	8244997	RDL	8245003	RDL	8245009	8245015
Electrical Conductivity	uS/cm	_	705	2	392	2	802	2	558	604
pH	pH Units	NA	8.14	NA	8.02	NA	8.14	NA	8.10	8.12
Saturation pH			6.89		7.36		6.83		6.99	7.00
Langelier Index	4	0.5	1.25	0.5	0.66		1.31	0 F	1.11	1.12
Total Hardness (as CaCO3)	mg/L	0.5	361	0.5	181	0.5	433	0.5	275	288
Total Dissolved Solids	mg/L	20	396	20	198	20	484	20	284	306
Alkalinity (as CaCO3)	mg/L	5	256	5	163	5	248	5	250	249
Bicarbonate (as CaCO3)	mg/L	5	256	5	163	5	248	5	250	249
Carbonate (as CaCO3)	mg/L	5	<5	5	<5	5	<5	5	<5	<5
Hydroxide (as CaCO3)	mg/L	5	<5	5	<5	5	<5	5	<5	<5
Fluoride	mg/L	0.05	0.19	0.05	<0.05	0.05	0.10	0.05	<0.05	<0.05
Chloride	mg/L	0.10	14.3	0.10	16.7	0.10	3.41	0.10	12.6	20.2
Nitrate as N	mg/L	0.05	<0.05	0.05	1.16	0.05	0.62	0.05	3.43	6.76
Nitrite as N	mg/L	0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05
Bromide	mg/L	0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05
Sulphate	mg/L	0.50	105	0.10	13.8	0.50	193	0.10	18.9	14.1
Ortho Phosphate as P	mg/L	0.10	<0.10	0.10	<0.10	0.10	<0.10	0.10	<0.10	<0.10
Reactive Silica	mg/L	0.05	12.7	0.05	3.65	0.05	10.7	0.05	7.28	7.03
Ammonia as N	mg/L	0.02	<0.02	0.02	0.04	0.02	0.14	0.02	<0.02	<0.02
Total Phosphorus	mg/L	0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	<0.05	<0.05
Total Organic Carbon	mg/L	0.5	1.3	0.5	2.4	0.5	0.7	0.5	1.2	0.7
Colour	TCU	5	<5	5	<5	5	<5	5	<5	<5
Turbidity	NTU	0.5	135	0.5	3.3	0.5	15.3	0.5	0.6	1.9
Calcium	mg/L	0.05	97.9	0.05	48.8	0.05	122	0.05	74.1	79.3
Magnesium	mg/L	0.05	28.4	0.05	14.4	0.05	31.1	0.05	21.8	21.9
Sodium	mg/L	0.05	5.27	0.05	6.39	0.05	3.42	0.05	5.36	8.93
Potassium	mg/L	0.05	1.18	0.05	1.26	0.05	1.28	0.05	1.01	0.91
Aluminum	mg/L	0.004	0.006	0.004	0.017	0.004	0.008	0.004	0.011	0.013
Antimony	mg/L	0.003	< 0.003	0.003	< 0.003	0.003	< 0.003	0.003	< 0.003	< 0.003
Arsenic	mg/L	0.003	0.006	0.003	<0.003	0.003	<0.003	0.003	<0.003	< 0.003

Certified By:

Mile Muneman



AGAT WORK ORDER: 17W195195 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle

SAMPLED BY:

		Wate	r Quality As	sessment	- Groundwat	ter Sample	es			
DATE RECEIVED: 2017-03-10							D	ATE REPORT	FED: 2017-03-22	
	5	SAMPLE DESCRIPTION:	TW1		TW2		TW3		TW4	TW5
		SAMPLE TYPE:	Water		Water		Water		Water	Water
		DATE SAMPLED:	2017-03-10		2017-03-10		2017-03-10		2017-03-10	2017-03-10
Parameter	Unit	G/S RDL	8244996	RDL	8244997	RDL	8245003	RDL	8245009	8245015
Barium	mg/L	0.002	0.073	0.002	0.030	0.002	0.045	0.002	0.053	0.110
Beryllium	mg/L	0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001	<0.001
Boron	mg/L	0.010	0.016	0.010	<0.010	0.010	0.020	0.010	<0.010	<0.010
Cadmium	mg/L	0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001	<0.001
Chromium	mg/L	0.003	<0.003	0.003	< 0.003	0.003	< 0.003	0.003	<0.003	< 0.003
Cobalt	mg/L	0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001	<0.001
Copper	mg/L	0.003	<0.003	0.003	<0.003	0.003	<0.003	0.003	<0.003	< 0.003
Iron	mg/L	0.010	0.167	0.010	<0.010	0.010	0.032	0.010	<0.010	<0.010
Lead	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002
Manganese	mg/L	0.002	0.019	0.002	<0.002	0.002	0.005	0.002	<0.002	<0.002
Mercury	mg/L	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	<0.0001
Molybdenum	mg/L	0.002	<0.002	0.002	<0.002	0.002	0.002	0.002	<0.002	<0.002
Nickel	mg/L	0.003	<0.003	0.003	< 0.003	0.003	< 0.003	0.003	<0.003	< 0.003
Selenium	mg/L	0.004	<0.004	0.004	< 0.004	0.004	< 0.004	0.004	< 0.004	< 0.004
Silver	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002
Strontium	mg/L	0.005	0.588	0.005	0.078	0.005	0.916	0.005	0.121	0.162
Thallium	mg/L	0.006	<0.006	0.006	< 0.006	0.006	< 0.006	0.006	<0.006	<0.006
Tin	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002
Titanium	mg/L	0.002	<0.002	0.002	<0.002	0.002	0.003	0.002	<0.002	<0.002
Tungsten	mg/L	0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	<0.010	<0.010
Uranium	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002
Vanadium	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002
Zinc	mg/L	0.005	0.034	0.005	0.011	0.005	0.032	0.005	0.013	0.024
Zirconium	mg/L	0.004	<0.004	0.004	<0.004	0.004	< 0.004	0.004	< 0.004	<0.004
% Difference/ Ion Balance	%	NA	1.56	NA	2.09	NA	1.57	NA	2.07	1.24

Certified By:

Mile Muneaven



AGAT WORK ORDER: 17W195195 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle

SAMPLED BY:

		Water	Quality As	ssessment	- Groundwa	ter Sample	S			
DATE RECEIVED: 2017-03-10							[DATE REPORTE	D: 2017-03-22	2
Parameter	SUnit	GAMPLE DESCRIPTION: SAMPLE TYPE: DATE SAMPLED: G / S RDL	TW6 Water 2017-03-10 8245021	TW7 Water 2017-03-10 8245027	TW8 Water 2017-03-10 8245033	TW9 Water 2017-03-10 8245039	TW10 Water 2017-03-10 8245045	TW11 Water 2017-03-10 8245052	RDL	TW12 Water 2017-03-10 8245058
Electrical Conductivity	uS/cm	2	612	592	604	620	430	568	2	1730
pН	pH Units	NA	8.10	8.11	8.12	8.10	8.06	8.16	NA	7.95
Saturation pH			7.01	6.98	6.98	6.90	7.26	6.99		6.61
Langelier Index			1.09	1.13	1.14	1.20	0.80	1.17		1.34
Total Hardness (as CaCO3)	mg/L	0.5	288	291	301	310	202	278	0.5	1020
Total Dissolved Solids	mg/L	20	308	306	312	326	216	286	20	1400
Alkalinity (as CaCO3)	mg/L	5	245	260	251	294	182	249	5	192
Bicarbonate (as CaCO3)	mg/L	5	245	260	251	294	182	249	5	192
Carbonate (as CaCO3)	mg/L	5	<5	<5	<5	<5	<5	<5	5	<5
Hydroxide (as CaCO3)	mg/L	5	<5	<5	<5	<5	<5	<5	5	<5
Fluoride	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.25	<0.25
Chloride	mg/L	0.10	21.8	12.5	9.54	8.84	14.4	13.9	0.50	2.11
Nitrate as N	mg/L	0.05	8.52	5.77	6.68	2.68	1.68	3.94	0.25	<0.25
Nitrite as N	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.25	<0.25
Bromide	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.25	<0.25
Sulphate	mg/L	0.10	13.5	14.4	31.1	50.1	14.3	19.1	1.0	896
Ortho Phosphate as P	mg/L	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.50	<0.50
Reactive Silica	mg/L	0.05	7.01	6.72	7.18	8.42	4.56	7.19	0.05	13.1
Ammonia as N	mg/L	0.02	<0.02	0.03	0.15	0.09	0.03	<0.02	0.02	<0.02
Total Phosphorus	mg/L	0.05	<0.05	<0.05	0.08	<0.05	0.06	<0.05	0.05	<0.05
Total Organic Carbon	mg/L	0.5	0.7	0.6	1.1	0.8	2.1	1.6	0.5	0.6
Colour	TCU	5	<5	<5	<5	<5	<5	<5	5	<5
Turbidity	NTU	0.5	<0.5	1.8	113	2.0	64.8	7.4	0.5	8.6
Calcium	mg/L	0.05	79.9	80.0	81.6	81.5	54.3	75.0	0.10	318
Magnesium	mg/L	0.05	21.6	22.2	23.6	25.8	16.2	22.0	0.10	54.3
Sodium	mg/L	0.05	8.87	4.86	3.67	4.17	5.76	5.82	0.10	8.43
Potassium	mg/L	0.05	0.86	0.92	1.12	0.99	1.21	0.98	0.10	1.95
Aluminum	mg/L	0.004	0.006	0.009	< 0.004	0.009	0.014	0.011	0.004	0.008
Antimony	mg/L	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	<0.003
Arsenic	mg/L	0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.003	0.013

Certified By:

Mile Muneman



AGAT WORK ORDER: 17W195195 PROJECT: 300033273 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Dwight Smikle

SAMPLED BY:

		Water	Quality As	ssessment	- Groundwa	ater Sample	S			
DATE RECEIVED: 2017-03-10							[DATE REPORTE	D: 2017-03-22	2
		SAMPLE DESCRIPTION:	TW6	TW7	TW8	TW9	TW10	TW11		TW12
		SAMPLE TYPE:	Water	Water	Water	Water	Water	Water		Water
		DATE SAMPLED:	2017-03-10	2017-03-10	2017-03-10	2017-03-10	2017-03-10	2017-03-10		2017-03-10
Parameter	Unit	G/S RDL	8245021	8245027	8245033	8245039	8245045	8245052	RDL	8245058
Barium	mg/L	0.002	0.105	0.109	0.099	0.074	0.036	0.061	0.002	0.012
Beryllium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001
Boron	mg/L	0.010	<0.010	0.010	0.011	0.012	<0.010	0.010	0.010	0.058
Cadmium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001
Chromium	mg/L	0.003	< 0.003	< 0.003	<0.003	<0.003	<0.003	<0.003	0.003	<0.003
Cobalt	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001
Copper	mg/L	0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	<0.003	0.003	< 0.003
Iron	mg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.665
Lead	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002
Manganese	mg/L	0.002	<0.002	<0.002	0.002	<0.002	0.009	<0.002	0.002	0.030
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001
Molybdenum	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.005
Nickel	mg/L	0.003	< 0.003	<0.003	<0.003	< 0.003	<0.003	<0.003	0.003	<0.003
Selenium	mg/L	0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	0.004	<0.004
Silver	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002
Strontium	mg/L	0.005	0.156	0.136	0.545	0.339	0.083	0.129	0.005	3.86
Thallium	mg/L	0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.006	<0.006
Tin	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	< 0.002
Titanium	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.013
Tungsten	mg/L	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010
Uranium	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002
Vanadium	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002
Zinc	mg/L	0.005	0.017	0.029	0.017	0.037	0.016	0.015	0.005	0.046
Zirconium	mg/L	0.004	< 0.004	< 0.004	< 0.004	<0.004	< 0.004	< 0.004	0.004	< 0.004
% Difference/ Ion Balance	%	NA	1.84	1.69	1.59	6.98	1.56	1.85	NA	4.11

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8244996-8245058 Elevated RDLs indicate the degree of sample dilutions prior to analysis in order to keep the analytes within the calibration range of the instruments and to reduce matrix interferences.

Certified By:

Mile Munemen



Page 6 of 11

Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

SAMPLING SITE:

AGAT WORK ORDER: 17W195195

ATTENTION TO: Dwight Smikle

SAMPLED BY:

PARAMETER Batch Sample Id Dup #1 Dup #2 RPD Method Blank Acceptable Lumits Acceptable Lumits Acceptable Lumits Acceptable Lumits Acceptable Lumits Acceptable Lumits Acceptable Lower Acceptable Lumits Acceptable Lower Acceptable Lumits Acceptable Lower Acceptable Lumits Acceptable Lower Acceptable Lumits Acceptable Lower Acceptable Lower Acceptable Lumits Acceptable Lower Acceptable Lower Acceptable Lower Acceptable Lumits Acceptable Lower Acceptable Lower Acceptable Lumits Acceptable Lower Acceptable Lumits Acceptable Lower Acceptable Lumits Acceptable Lower Acceptable Lumits Acceptable Lower Acceptable Lumits Acceptable Lower Acceptable Lumits Acceptable Lumits Acceptable Lower Acceptable Lumits Acceptabl	RIX SPIKE Acceptabl Limits Lower Upp	MAT															
PARAMETER Batch Sample Id Dup #1 Dup #2 RPD Blank Measured Value Limits Lower Recovery Limits Lower Recovery Limits Lower Recovery Limits Recovery <th limits<="" th=""> Recover <th limit<="" th=""><th>Limits</th><th></th><th>SPIKE</th><th>BLANK</th><th>METHOD</th><th>TERIAL</th><th>ICE MA</th><th>REFEREN</th><th></th><th></th><th>UPLICATE</th><th>C</th><th></th><th></th><th>RPT Date: Mar 22, 2017</th></th></th>	Recover <th limit<="" th=""><th>Limits</th><th></th><th>SPIKE</th><th>BLANK</th><th>METHOD</th><th>TERIAL</th><th>ICE MA</th><th>REFEREN</th><th></th><th></th><th>UPLICATE</th><th>C</th><th></th><th></th><th>RPT Date: Mar 22, 2017</th></th>	<th>Limits</th> <th></th> <th>SPIKE</th> <th>BLANK</th> <th>METHOD</th> <th>TERIAL</th> <th>ICE MA</th> <th>REFEREN</th> <th></th> <th></th> <th>UPLICATE</th> <th>C</th> <th></th> <th></th> <th>RPT Date: Mar 22, 2017</th>	Limits		SPIKE	BLANK	METHOD	TERIAL	ICE MA	REFEREN			UPLICATE	C			RPT Date: Mar 22, 2017
Id Id<	Lower Upp	Recoverv			Recovery					RPD	Dup #2	Dup #1		Batch	PARAMETER		
Electrical Conductivity 8241738 1620 1610 0.6% < 2 103% 80% 120% NA NA pH 8241738 7.91 7.92 0.1% NA 99% 90% 110% NA NA Total Dissolved Solids 8248350 754 800 5.9% < 20 96% 80% 120% NA NA Alkalinity (as CaCO3) 8241738 104 104 0.0% < 5 107% 80% 120% NA NA Bicarbonate (as CaCO3) 8241738 104 104 0.0% < 5 NA NA NA Hydroxide (as CaCO3) 8241738 < 5 < 5 NA < 5 NA NA NA Fluoride 8245009 8245009 < 0.05 < 0.05 NA < 5 NA NA NA Fluoride 8245009 8245009 12.6 13.1 3.9% < 0.10 94% 90% 110% 90% 110% 99% 90% 110% 99% 90% 110% 99% <td< th=""><th></th><th></th><th>Upper</th><th>Lower</th><th></th><th>Upper</th><th>Lower</th><th>value</th><th></th><th></th><th></th><th></th><th>Id</th><th></th><th></th></td<>			Upper	Lower		Upper	Lower	value					Id				
pH 8241738 7.91 7.92 0.1% NA 99% 90% 110% NA NA Total Dissolved Solids 8248350 754 800 5.9% <20													Samples	ndwater S	Water Quality Assessment - Grou		
Total Dissolved Solids 8248350 754 800 5.9% < 20 96% 80% 120% NA NA Alkalinity (as CaCO3) 8241738 104 104 0.0% < 5		NA			NA	120%	80%	103%	< 2	0.6%	1610	1620		8241738	Electrical Conductivity		
Alkalinity (as CaCO3) 8241738 104 104 0.0% < 5		NA			NA	110%	90%	99%	NA	0.1%	7.92	7.91		8241738	рН		
Bicarbonate (as CaCO3) 8241738 104 104 0.0% < 5 NA NA NA Carbonate (as CaCO3) 8241738 <5		NA			NA	120%	80%	96%	< 20	5.9%	800	754		8248350	Total Dissolved Solids		
Carbonate (as CaCO3) 8241738 <5 <5 NA <5 NA <5 NA NA NA Hydroxide (as CaCO3) 8241738 <5		NA			NA	120%	80%	107%	< 5	0.0%	104	104		8241738	Alkalinity (as CaCO3)		
Hydroxide (as CaCO3) 8241738 <5 <5 NA <5 NA <5 NA < 5 NA < 0.05 98% 90% 110% 104% 90% 110% 105% 105% 105% 105% 105% 105% 100% 110% 90% 110% 80% 90% 110%		NA			NA			NA	< 5	0.0%	104	104		8241738	Bicarbonate (as CaCO3)		
Fluoride 8245009 8245009 <0.05 <0.05 NA <0.05 98% 90% 110% 104% 90% 110% 105% Chloride 8245009 8245009 12.6 13.1 3.9% <0.10 94% 90% 110% 104% 90% 110% <		NA			NA			NA	< 5	NA	<5	<5		8241738	Carbonate (as CaCO3)		
Chloride 8245009 8245009 12.6 13.1 3.9% < 0.10 94% 90% 110% 104% 90% 110% 99% Nitrate as N 8245009 8245009 3.43 3.50 2.0% < 0.05		NA			NA			NA	< 5	NA	<5	<5		8241738	Hydroxide (as CaCO3)		
Nitrate as N 8245009 8245009 3.43 3.50 2.0% < 0.05 95% 90% 110% 92% 90% 110% 98% Nitrite as N 8245009 8245009 < 0.05	80% 120	105%	110%	90%	104%	110%	90%	98%	< 0.05	NA	<0.05	< 0.05	8245009	8245009	Fluoride		
Nitrite as N82450098245009< 0.05<0.05<0.05NA<0.05NA90%110%96%90%110%89%Bromide82450098245009<0.05	80% 120	99%	110%	90%	104%	110%	90%	94%	< 0.10	3.9%	13.1	12.6	8245009	8245009	Chloride		
Bromide 8245009 8245009 <0.05 <0.05 NA <0.05 109% 90% 110% 90% 110% 100% Sulphate 8245009 8245009 18.9 19.1 1.1% <0.10	80% 120	98%	110%	90%	92%	110%	90%	95%	< 0.05	2.0%	3.50	3.43	8245009	8245009	Nitrate as N		
Bromide 8245009 8245009 <0.05 <0.05 NA <0.05 109% 90% 110% 98% 90% 110% 100% Sulphate 8245009 8245009 18.9 19.1 1.1% <0.10	80% 120	89%	110%	90%	96%	110%	90%	NA	< 0.05	NA	<0.05	< 0.05	8245009	8245009	Nitrite as N		
Sulphate 8245009 8245009 18.9 19.1 1.1% < 0.10 93% 90% 110% 97% 90% 110% 101% Ortho Phosphate as P 8245009 8245009 < 0.10	80% 120				98%			109%		NA					Bromide		
Ortho Phosphate as P 8245009 8245009 < 0.10 NA < 0.10 103% 90% 110% 107% 90% 110% 98% Reactive Silica 8244996 8244996 12.7 12.7 0.0% < 0.05	80% 120												8245009	8245009	Sulphate		
Reactive Silica 8244996 8244996 12.7 12.7 0.0% < 0.05 96% 90% 110% 98% 90% 110% 82%	80% 120														•		
	80% 120	82%	110%	90%	98%	110%	90%			0.0%	12.7	12.7	8244996	8244996	·		
Annuona as n 8249575 < 0.02 < 0.02 NA < 0.02 97% 90% 110% 91% 90% 110% 84%	80% 120	84%	110%	90%	91%	110%	90%	97%	< 0.02	NA	<0.02	<0.02		8249575	Ammonia as N		
Total Phosphorus 8243025 0.06 0.06 NA < 0.05 98% 80% 120% 97% 90% 110% 98%	70% 130																
Total Organic Carbon 8244996 8244996 1.3 1.4 NA < 0.5 109% 90% 110% NA 90% 110% 105%	80% 120												8244996		•		
Colour 8244996 8244996 < 5 < 5 NA < 5 106% 90% 110% NA NA															•		
Turbidity 8244996 8244996 135 135 0.0% < 0.5 101% 90% 110% NA NA		NA			NA	110%	90%	101%	< 0.5	0.0%		135	8244996	8244996	Turbidity		
Calcium 8244996 8244996 97.9 98.4 0.5% < 0.05 103% 90% 110% 102% 90% 110% 96%	70% 130	96%	110%	90%	102%	110%	90%	103%	< 0.05	0.5%	98.4	97.9	8244996	8244996	Calcium		
Magnesium 8244996 8244996 28.4 28.1 1.1% < 0.05 100% 90% 110% 90% 110% 97%	70% 130																
Sodium 8244996 8244996 5.27 5.22 1.0% < 0.05 99% 90% 110% 99% 90% 110% 99%	70% 130														-		
Potassium 8244996 8244996 1.18 1.14 3.4% < 0.05 99% 90% 110% 99% 90% 110% 99%	70% 130																
Aluminum 8244996 8244996 0.006 0.006 NA < 0.004 99% 90% 110% 110% 90% 110% 109%	70% 130							99%							Aluminum		
Antimony 8244996 8244996 < 0.003 < 0.003 NA < 0.003 97% 90% 110% 105% 90% 110% 106%	70% 130	106%	110%	90%	105%	110%	90%	97%	< 0.003	NA	<0.003	< 0.003	8244996	8244996	Antimony		
Arsenic 8244996 8244996 0.006 0.006 NA < 0.003 103% 90% 110% 102% 90% 110% 107%	70% 130																
Barium 8244996 8244996 0.073 0.072 1.4% < 0.002 100% 90% 110% 102% 90% 110% 99%	70% 130																
Beryllium 8244996 8244996 < 0.001 < 0.001 NA < 0.001 103% 90% 110% 109% 90% 110% 108%	70% 130														Beryllium		
	70% 130	103%	110%	90%	108%	110%	90%	100%	< 0.010			0.016	8244996	8244996			
Cadmium 8244996 8244996 < 0.001 < 0.001 NA < 0.001 98% 90% 110% 106% 90% 110% 117%	70% 130	117%	110%	90%	106%	110%	90%	98%	< 0.001	NA	<0.001	< 0.001	8244996	8244996	Cadmium		
	70% 130																
	70% 130																
	70% 130																
Iron 8244996 8244996 0.167 0.145 14.1% < 0.010 106% 90% 110% 105% 90% 110% 98%	70% 130																
Lead 8244996 8244996 < 0.002 < 0.002 NA < 0.002 100% 90% 110% 107% 90% 110% 103%	70% 130	103%	110%	90%	107%	110%	90%	100%	< 0.002	NA	<0.002	< 0.002	8244996	8244996	Lead		
	70% 130																
Mangalised Optimized Optimized <thoptimized< th=""> <thoptized< th=""> <thop< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>•</td></thop<></thoptized<></thoptimized<>															•		
Molybdenum 8244996 8244996 < 0.002 < 0.002 NA < 0.002 100% 90% 110% 102% 90% 110% 104%	80% 120																

AGAT QUALITY ASSURANCE REPORT (V1)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.



Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

SAMPLING SITE:

AGAT WORK ORDER: 17W195195 ATTENTION TO: Dwight Smikle

SAMPLED BY:

Water Analysis (Continued)

						`		,							
RPT Date: Mar 22, 2017				UPLICATE	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery	Lie	ptable nits	Recovery	1 1 1 1	ptable nits
		ld					Value	Lower	Upper	,	Lower	Upper		Lower	Upper
Nickel	8244996 8	3244996	< 0.003	<0.003	NA	< 0.003	103%	90%	110%	109%	90%	110%	107%	70%	130%
Selenium	8244996 8	3244996	< 0.004	<0.004	NA	< 0.004	100%	90%	110%	102%	90%	110%	110%	70%	130%
Silver	8244996 8	3244996	< 0.002	<0.002	NA	< 0.002	97%	90%	110%	108%	90%	110%	113%	70%	130%
Strontium	8244996 8	3244996	0.588	0.560	4.9%	< 0.005	106%	90%	110%	108%	90%	110%	112%	70%	130%
Thallium	8244996 8	3244996	< 0.006	<0.006	NA	< 0.006	104%	90%	110%	110%	90%	110%	108%	70%	130%
Tin	8244996 8	3244996	< 0.002	<0.002	NA	< 0.002	97%	90%	110%	102%	90%	110%	104%	70%	130%
Titanium	8244996 8	3244996	< 0.002	<0.002	NA	< 0.002	96%	90%	110%	100%	90%	110%	102%	70%	130%
Tungsten	8244996 8	3244996	< 0.010	<0.010	NA	< 0.010	94%	90%	110%	100%	90%	110%	98%	70%	130%
Uranium	8244996 8	3244996	< 0.002	<0.002	NA	< 0.002	104%	90%	110%	108%	90%	110%	106%	70%	130%
Vanadium	8244996 8	3244996	< 0.002	<0.002	NA	< 0.002	94%	90%	110%	102%	90%	110%	104%	70%	130%
Zinc	8244996 8	3244996	0.034	0.031	9.2%	< 0.005	102%	90%	110%	108%	90%	110%	110%	70%	130%
Zirconium	8244996 8	3244996	< 0.004	<0.004	NA	< 0.004	96%	90%	110%	96%	90%	110%	95%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By:

Mile Munemon

AGAT QUALITY ASSURANCE REPORT (V1)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Page 7 of 11



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

AGAT WORK ORDER: 17W195195 ATTENTION TO: Dwight Smikle

SAMPLING SITE:		SAMPLED BY:	1
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
рН	INOR-93-6000	SM 4500-H+ B	PC TITRATE
Saturation pH		SM 2320 B	CALCULATION
Langelier Index		SM 2330B	CALCULATION
Total Hardness (as CaCO3)	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE
Alkalinity (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Bicarbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Carbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Hydroxide (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Fluoride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Bromide	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Ortho Phosphate as P	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Reactive Silica	INOR-93-6047	SmartChem Method SIL-001-A & SM 4500 Si-F 18 &19th	DISCRETE ANALYZER
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH3-F	LACHAT FIA
Total Phosphorus	INOR-93-6057	QuikChem 10-115-01-3-A & SM 4500-P I	LACHAT FIA
Total Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310	SHIMADZU CARBON ANALYZER
Colour	INOR-93-6046	SM 2120 B	SPECTROPHOTOMETER
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Aluminum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Iron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Manganese	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Mercury	MET-93-6100	EPA SW 846 7470 & 245.1	CVAAS
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Strontium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Thallium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: 300033273

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ATTENTION TO: Dwight Smikle

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Tin	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Titanium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Tungsten	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zirconium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
% Difference/ Ion Balance		SM 1030 E	CALCULATION

Chain of Custody Recor					Short Holding Tin	_			_	_	*	Wo	oler Qu	r #:	1-		210	1519	
Report Information: PT Company: Divight Smith Contact: Divight Smith Address: 292 Phone: 292 Reports to be sent to: 1. Email: 2. Email: Matt. Valuer: Project Information: Project: Site Location: Belfour tail Sampled By: Matt. Valuer	l R Price	Regulatory Requirements: No Regulatory Requirement Please check all applicable bases Sewer Use Regulation 153/04 Sewer Use Tableindicate One Sanitary Ind/Com Sanitary Agriculture Storm Soil Texture (check One) Region							Arrival Temperatures: G / S / 4 Custody Seal Intact: Notes: Turnaround Time (TAT) Required: Regular TAT Begular TAT A 5 to 7 Business Days Rush TAT (Rush Surcharges Apply) 3 Business Days Case provide prior notification for rush TAT * TAT is exclusive of weekends and statutory holidays For 'Same Day' analysis, please contact your AGAT CPM										
AGAT Quote #: Please note: If quotation number I Invoice Information: Company: Contact: Address: Email:	PO: is not provided, client v	will be billed full price Bill To Same:		В	W Ground Water Oil Paint Soil D Sediment W Surface Water	Field Filtered Metal Hig Civi	xcl. Hydrides)	Č	00 Hg 00	Full Metals Scan Regulation/Custom Metals	Nutrients: D TP D NH D TKN D NO ₃ D NO ₃ + NO ₃	C THM	Fractions 1 to 4		: Total Aroclors		TCLP: [] M&I [] VOCs [] ABNS [] B(a)P [] PCBS	A	
Sample Identification TW TW 2 TW 3 TW 4 TW 5 TW 5 TW 6 TW 7 TW 8 TW 8 TW 9 TW 10 TW 10	Sampled	Sampled 8:25 10:00 9:35 12:25 12:00 11:30 12:56 11:05 10:30 13:18	Containers	Matrix GW	Special Instructions Field Field Mfalst Mullingt		Met					Vola	CCME	PAHS	PCB		TCLF	The second secon	
Samplins Relinquished By (Print Name and Sign):	100		Time		Samples Received By (Print Name and Sign): Samples Received By (Print Name and Sign): Samples Received By (Print Name and Sign):	il a	syk	2	Pink Cc	0		5/1		1	58	Nº:	Т	0474	of 459

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Page 10 of 11

			F La	abora	itor	ries Short Holding	Ti	Miss 122.1	issaug 5100	35 Coop (a. Ontari Fax: 905 earth.ag	o L4Z .712.5	1¥2 122		Wor	bora k Orde Ier Qua	r #:					6.5		
	ation: RJ Bu					Drinking Water Chain or Custody Ferm (p Regulatory Requirements: (Please check all applicable boxes)		_	_	_	_	_	t		val Ten tody Se es:				7 .(]Yes	ľ		1	
Contact: Address: Phone: <i>Reports to be sent to:</i> 1. Email: 2. Email: Project Inform Project:	dwight. Smi dwight. Smi 292 Speedu unit #20, 9 dwight. Smi Matt. Valeri ation: Belfountain #	kle ? (jburn	Side C		Is this submission for a Record of Site Condition?	ary 1	Rep Certifi	Pr OI OI	ov. Wate bjectives ther Indicate	Qualit (PWQC One IE ON alysis)) S		Reg	ular 1 h TAT J 3 B Day OR	(Rush S Usine /s Date Pleas	Surchar ess e Requ e pro	ges App iired (5 to 2 Bu Days Rush	7 Bus usines s Surch otifica	uired: siness D: ss [arges M ntion for nd statu	Ne Da Da Iay App <i>rush T</i>	oly): AT
Site Location: Sampled By:	Belfountain # Belfourtain Matt Value	is hi	. p.			Yes X No		A	Yes		No)		F					, pleas		ntact yo		
AGAT Quote #: Invoice Inform Company: Contact: Address: Email:	Please note: If quotation number is		III be billed full price Bill To Same:			Sample Matrix Legend B Biota GW Ground Water O Oil P Paint S Soil SD Sediment SW Surface Water	Field Filtered - Vetals, kg. CrVI		00	E BHWS DOI DON DEC DFOC DHg DSAR	Full Metals Scan	Regulation/Custom Metals			CCME Fractions 1 to 4 ABNs		PCBs: Total Aroclors	Organochlorine Pesticides	TCLP: DM&I DVOCS DABNS DB(a)P DPCBS	Jse	XX		
Sample	e Identification	Date Sampled	Time Sampled		Sample Matrix		Ø N	Metals	L All Me	ORPs: Cr ⁶⁺	Full Me	Regular	°on 🗆	Volatiles:	ABNS ABNS	PAHs	PCBs: [Organo	TCLP:	Sewer Use	3		
The	2	March 10, doit	9:00	6	GIJ	KField Filterul Mencury + Metals*	2													7	×		
Samples Relinquished By (Pri Math Vick Samples Relinquished By (Pri	t Name and Sign):	to	Date Ma	of7 Time		Samples Received By (Print Name and Sign): Samples Bicarved By (Print Name and Sign);	anj	i Su	is l	1	1_1	Date 20 Date	71	lor	Time 103	7 3	Sp l	2	P	Page _	2	of	2
Samples Relinquished By (Pri			Date	Time		Samples Received By (Print Name and Sign):					Copy - I	Date	1	1	Time	0.47		Nº	_	0	47	45	0 0

1.0

1.00

Appendix H

MOECC Well Records Search

Well ID	Zone	Easting	Northing	First Use	Second Use	Final Status
4908977	17	579679	4849026			Abandoned-Other
7226686	17	579410	4849408			Abandoned-Other
7226687	17	579458	4849364			Abandoned-Other
7227270	17	579267	4849590			Abandoned-Other
7244358	17	579305	4849431			Abandoned-Other
4900935	17	580130	4849589	Not Used		Abandoned-Supply
4901017	17	579561	4849643			Abandoned-Supply
4902928	17	580334	4849763			Abandoned-Supply
4902973	17	580414	4849923			Abandoned-Supply
7104809	17	579297	4849532	Domestic		Abandoned-Supply
7109610	17	579143	4848750	Not Used		Abandoned-Supply
7225052	17	579813	4848777	Monitoring and Test Hole		Monitoring and Test Hole
4906840	17	579466	4848761	Not Used		Observation Wells
4906842	17	579567	4848299	Not Used		Observation Wells
4906845	17	579466	4848759	Not Used		Observation Wells
4906846	17	579180	4849396	Not Used		Observation Wells
4906847	17	579567	4848301	Not Used		Observation Wells
4906848	17	579584	4848324	Not Used		Observation Wells
7225053	17	579814	4848771	Monitoring		Observation Wells
6712134	17	578800	4848946	Not Used		Test Hole
7140490	17	579080	4848673	Test Hole		Test Hole
7225054	17	579491	4848283	Test Hole		Test Hole
7225055	17	579995	4849204	Test Hole		Test Hole
7225056	17	579614	4848788	Test Hole		Test Hole
7225057	17	580008	4849203	Test Hole		Test Hole
7226632	17	579631	4849072	Test Hole		Test Hole
4906841	17	579469	4848760	Not Used		Unfinished
4900936	17	580155	4849605	Domestic		Water Supply
4900937	17	580329	4849762	Domestic		Water Supply
4900938	17	580347	4849883	Domestic		Water Supply
4901005	17	580366	4849130	Domestic		Water Supply
4901006	17	579779	4849344	Livestock	Domestic	Water Supply
4901007	17	579352	4849464	Domestic		Water Supply
4901008	17	579460	4849367	Domestic		Water Supply
4901009	17	578984	4848882	Public		Water Supply
4901010	17	579304	4849391	Domestic		Water Supply

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4901011	17	579622	4849394	Domestic		Water Supply
4901012	17	579011	4849211	Domestic		Water Supply
4901016	17	579285	4849524	Domestic		Water Supply
4901018	17	579581	4849479	Domestic		Water Supply
4901020	17	579076	4849263	Domestic		Water Supply
4901021	17	578822	4848994	Domestic		Water Supply
4901022	17	579329	4849559	Domestic		Water Supply
4901023	17	578871	4849235	Domestic		Water Supply
4901025	17	579347	4849667	Domestic		Water Supply
4901048	17	578747	4848905	Domestic		Water Supply
4902929	17	580334	4849753	Domestic		Water Supply
4902940	17	580524	4849773	Domestic		Water Supply
4902941	17	580524	4849793	Domestic		Water Supply
4902947	17	580364	4849723	Domestic		Water Supply
4902948	17	580234	4849683	Domestic		Water Supply
4903143	17	579089	4849323	Domestic		Water Supply
4903144	17	579139	4849533	Domestic		Water Supply
4903703	17	579614	4849823	Domestic		Water Supply
4903832	17	579314	4849473	Domestic		Water Supply
4903893	17	579564	4849763	Domestic		Water Supply
4904041	17	579374	4849613	Domestic		Water Supply
4904255	17	579712	4849856	Livestock	Domestic	Water Supply
4904256	17	579882	4849907	Domestic		Water Supply
4904407	17	578846	4848676	Domestic		Water Supply
4904412	17	580774	4849521	Domestic		Water Supply
4904488	17	580349	4849567	Domestic		Water Supply
4904489	17	580624	4849458	Domestic		Water Supply
4904555	17	579438	4849307	Domestic		Water Supply
4904661	17	580509	4849246	Domestic		Water Supply
4904662	17	580648	4849216	Domestic		Water Supply
4904689	17	580618	4849631	Domestic		Water Supply
4904724	17	580682	4849561	Domestic		Water Supply
4904725	17	580580	4849183	Domestic		Water Supply
4904726	17	580541	4849306	Domestic		Water Supply
4904727	17	580640	4849222	Domestic		Water Supply
4904728	17	580555	4849441	Domestic		Water Supply
4904750	17	579384	4849547	Domestic		Water Supply

			1		
4904772	17	580617	4849298	Domestic	Water Supply
4904798	17	580670	4849458	Domestic	Water Supply
4904812	17	580541	4849360	Domestic	Water Supply
4904813	17	578861	4849089	Domestic	Water Supply
4904816	17	579434	4849486	Domestic	Water Supply
4904854	17	579373	4849527	Domestic	Water Supply
4904879	17	578914	4849123	Domestic	Water Supply
4904971	17	580464	4849323	Domestic	Water Supply
4904973	17	580664	4849573	Domestic	Water Supply
4905014	17	580549	4849543	Domestic	Water Supply
4905033	17	579164	4849523	Domestic	Water Supply
4905085	17	578914	4849273	Domestic	Water Supply
4905174	17	580414	4849423	Domestic	Water Supply
4905176	17	580784	4849463	Domestic	Water Supply
4905259	17	579114	4849323	Domestic	Water Supply
4905271	17	579364	4849623	Domestic	Water Supply
4905347	17	580364	4849473	Domestic	Water Supply
4905356	17	579064	4849123	Domestic	Water Supply
4905490	17	579514	4849523	Domestic	Water Supply
4905619	17	578914	4849273	Domestic	Water Supply
4905863	17	578864	4849023	Domestic	Water Supply
4905867	17	578814	4848873	Domestic	Water Supply
4906310	17	579338	4849346	Public	Water Supply
4906377	17	579397	4849397	Domestic	Water Supply
4906378	17	579513	4849315	Domestic	Water Supply
4906385	17	579728	4849854	Domestic	Water Supply
4906488	17	579324	4849607	Domestic	Water Supply
4906608	17	579325	4849619	Domestic	Water Supply
4906673	17	579338	4849346	Domestic	Water Supply
4906792	17	579549	4849813	Domestic	Water Supply
4906802	17	579320	4849612	Domestic	Water Supply
4906918	17	579035	4849190	Domestic	Water Supply
4906948	17	579627	4848237		Water Supply
4906996	17	579033	4849190	Domestic	Water Supply
4907142	17	579458	4849367	Domestic	Water Supply
4907143	17	579465	4848760	Domestic	Water Supply
4907305	17	579325	4849619	Domestic	Water Supply
4906377 4906385 4906488 4906608 4906673 4906673 4906802 4906918 4906918 4906918 4906918 4906918 4906918 4906918 4906918 4906918 4906918 4906918 4906918 4906918 4906918 4906918	17 17 17 17 17 17 17 17 17 17 17 17 17	579397 579513 579728 579324 579325 579338 579549 579320 579035 579627 579033 579628 579458	4849397 4849315 4849854 4849607 4849619 4849346 4849813 4849612 4849190 4848237 4849190 4849367 4849367	Domestic	Water SupplyWater Supply

			,			
4907450	17	579342	4848016	Domestic		Water Supply
4907527	17	579431	4849421	Domestic		Water Supply
4907566	17	579432	4849369	Domestic		Water Supply
4907588	17	579513	4848057	Domestic		Water Supply
4907667	17	579467	4849324	Domestic		Water Supply
4907835	17	580054	4849565	Domestic		Water Supply
4907914	17	579020	4849145	Domestic		Water Supply
4907937	17	578605	4848620	Domestic		Water Supply
4908028	17	579359	4849439	Domestic		Water Supply
4908046	17	579773	4849928	Domestic		Water Supply
4908201	17	579212	4849382	Domestic		Water Supply
4908259	17	579615	4849394	Domestic		Water Supply
4908260	17	579070	4849102	Domestic		Water Supply
4908261	17	578985	4849116	Domestic		Water Supply
4908300	17	579279	4849618	Domestic		Water Supply
4908348	17	579255	4848557	Domestic		Water Supply
4908409	17	579237	4849428	Domestic		Water Supply
4908458	17	579548	4848006	Domestic		Water Supply
4908511	17	580573	4849178	Domestic		Water Supply
4908686	17	579519	4849115	Domestic		Water Supply
4908830	17	579562	4849797	Domestic		Water Supply
4908979	17	579679	4849026	Domestic		Water Supply
4909426	17	579463	4849114	Domestic		Water Supply
4909875	17	578977	4848892	Public		Water Supply
7106064	17	578821	4848647	Domestic		Water Supply
7206790	17	578914	4848423	Domestic		Water Supply
7206791	17	578897	4848407	Domestic		Water Supply
7224239	17	579530	4849753	Domestic		Water Supply
7255729	17	579229	4849417	Domestic		Water Supply
7259263	17	580086	4849091	Domestic		Water Supply
7259264	17	579801	4849157	Domestic	Test Hole	Water Supply
7259265	17	579945	4848906	Domestic	Test Hole	Water Supply
7259266	17	579789	4848906	Domestic	Test Hole	Water Supply
7259267	17	579692	4849093	Domestic		Water Supply
7259268	17	579469	4848667	Domestic	Test Hole	Water Supply

Appendix I Water Balance Analysis

Monthly Water Balance Analysis - Thornthwaite and Mather model Existing conditions Belfountain (Pre-development)

Total Site Area (ha)	70.28		
Land Description Factors	Area A (Agricultural)	Sub-Area B (Forest)	
Topography	0.30	0.10	
Soils	0.40	0.40	
Cover	0.10	0.20	
Sum (Infiltration Factor)	0.80	0.70	
Soil Moisture Capacity (mm)	75	200	
Site Area	50.27	20.01	
Percentage of Total Site Area	72%	28%	10

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Climate Data (Data from Orangeville MOE stat	tion, Ontario via	Environment C	anada Website	- 1981-2010, Clir	nate ID: 6155790)							
Average Daily Temperature (°C)	-7.5	-6.5	-2.1	5.3	11.7	16.9	19.4	18.4	14.3	7.8	2.0	-4.1	6.3
Precipitation (mm)	64.3	54.5	60.9	70.1	86.6	81.3	80.8	88.2	87.0	76.6	87.1	64.2	901.6
Evapotranspiration Analysis (Sub-Area A)													
Heat Index	0.0	0.0	0.0	1.1	3.6	6.3	7.8	7.2	4.9	2.0	0.2	0.0	33
Unadjusted Potential Evapotranspiration (mm)	0.0	0.0	0.0	25.9	58.1	84.7	97.5	92.4	71.4	38.4	9.5	0.0	478
Potential Evapotranspiration Adjusting Factor for Latitude	0.81	0.82	1.03	1.12	1.27	1.28	1.30	1.20	1.05	0.95	0.81	0.78	
Adjusted Potential Evapotranspiration (mm)	0	0	0	29	74	109	127	111	75	36	8	0	568
PET (Malstrom, 1969) (mm/month)	0	0	0	29	74	109	127	111	75	36	8	0	568
Precipitation - PET (mm)	64	55	61	41	13	-27	-46	-23	12	40	79	64	334
Accumulated Potential Water Loss (APWL)	0	0	0	0	0	-27	-73	-96	-61	-2	0	0	-260
Storage (S)	75	75	75	75	75	52	28	21	33	73	75	75	
Change in Storage	0	0	0	0	0	-23	-24	-7	12	40	2	0	0
Actual Evapotranspiration (mm)	0	0	0	29	74	104	105	96	75	36	8	0	526
Recharge/Runoff Analysis													
Water Surplus (mm)	64	55	61	41	13	0	0	0	0	0	78	64	376
Potential Infiltration (I)	51	44	49	33	10	0	0	0	0	0	62	51	300
Potential Direct Surface Water Runoff (R)	13	11	12	8	3	0	0	0	0	0	16	13	75
Evapotranspiration (m ³)	0	0	0	14,591	37,037	52,398	52,618	48,050	37,542	18,304	3,883	0	264,422
Runoff (m ³)	6,465	5,479	6,123	4,130	1,299	0	0	0	0	0	7,812	6,455	37,762
Infiltration (m ³)	25,859	21,918	24,492	16,518	5,198	0	0	0	0	0	31,246	25,819	151,050
Evapotranspiration Analysis (Sub-Area B)													
Accumulated Potential Water Loss (APWL)	0	0	0	0	0	-27	-73	-96	-77	-25	0	0	
Storage (S)	200	200	200	200	200	174	139	124	136	176	200	200	

0	0	0	0	0	-21	-15	- 70	- / /	-23	0	0	
200	200	200	200	200	174	139	124	136	176	200	200	
0	0	0	0	0	-26	-36	-15	12	40	24	0	0
0	0	0	29	74	107	117	103	75	36	8	0	548
64	55	61	41	13	0	0	0	0	0	56	64	353
45	38	43	29	9	0	0	0	0	0	39	45	247
19	16	18	12	4	0	0	0	0	0	17	19	106
0	0	0	5808	14742	21387	23339	20633	14944	7286	1546	0	109684
3860	3272	3656	2466	776	0	0	0	0	0	3335	3854	21218
9007	7634	8530	5753	1810	0	0	0	0	0	7781	8992	49508
	0 0 64 45 19 0 3860	0 0 0 0 64 55 45 38 19 16 0 0 3860 3272	0 0 0 0 0 0 64 55 61 45 38 43 19 16 18 0 0 0 3860 3272 3656	0 0 0 0 0 0 0 29 64 55 61 41 45 38 43 29 19 16 18 12 0 0 0 5808 3860 3272 3656 2466	0 0 0 0 0 0 0 0 29 74 64 55 61 41 13 45 38 43 29 9 19 16 18 12 4 0 0 0 5808 14742 3860 3272 3656 2466 776	0 0 0 0 -26 0 0 29 74 107 64 55 61 41 13 0 45 38 43 29 9 0 19 16 18 12 4 0 0 0 0 5808 14742 21387 3860 3272 3656 2466 776 0	200 200 200 200 200 174 139 0 0 0 0 0 -26 -36 0 0 0 29 74 107 117 64 55 61 41 13 0 0 0 45 38 43 29 9 0 0 0 19 16 18 12 4 0 0 0 0 0 0 5808 14742 21387 23339 3860 3272 3656 2466 776 0 0	200 200 200 200 200 174 139 124 0 0 0 0 0 -26 -36 -15 0 0 0 29 74 107 117 103 64 55 61 41 13 0 0 0 0 45 38 43 29 9 0 0 0 0 19 16 18 12 4 0 <td>200 200 200 200 200 174 139 124 136 0 0 0 0 -26 -36 -15 12 0 0 0 29 74 107 117 103 75 64 55 61 41 13 0 0 0 0 45 38 43 29 9 0 0 0 0 19 16 18 12 4 0 0 0 0 0 0 0 5808 14742 21387 2339 20633 14944 3860 3272 3656 2466 776 0 0 0 0</td> <td>200 200 200 200 200 174 139 124 136 176 0 0 0 0 0 -26 -36 -15 12 40 0 0 0 29 74 107 117 103 75 36 64 55 61 41 13 0 0 0 0 0 0 45 38 43 29 9 0</td> <td>200 200 200 200 174 139 124 136 176 200 0 0 0 0 0 -26 -36 -15 12 40 24 0 0 0 29 74 107 117 103 75 36 8 64 55 61 41 13 0 0 0 0 56 45 38 43 29 9 0 0 0 0 39 19 16 18 12 4 0 0 0 0 174 0 0 0 0 0 0 0 174 19 16 18 12 4 0 0 0 0 14944 7286 1546 3860 3272 3656 2466 776 0 0 0 0 0 0 0 <th< td=""><td>200 200 200 200 174 139 124 136 176 200 200 0 0 0 0 0 26 -36 -15 12 40 24 0 0 0 0 29 74 107 117 103 75 36 8 0 0 0 0 29 74 107 117 103 75 36 8 0 64 55 61 41 13 0 0 0 0 0 56 64 45 38 43 29 9 0 0 0 0 0 39 45 19 16 18 12 4 0 0 0 0 0 17 19 0 0 0 0 0 0 0 0 0 3385 33854 3860</td></th<></td>	200 200 200 200 200 174 139 124 136 0 0 0 0 -26 -36 -15 12 0 0 0 29 74 107 117 103 75 64 55 61 41 13 0 0 0 0 45 38 43 29 9 0 0 0 0 19 16 18 12 4 0 0 0 0 0 0 0 5808 14742 21387 2339 20633 14944 3860 3272 3656 2466 776 0 0 0 0	200 200 200 200 200 174 139 124 136 176 0 0 0 0 0 -26 -36 -15 12 40 0 0 0 29 74 107 117 103 75 36 64 55 61 41 13 0 0 0 0 0 0 45 38 43 29 9 0	200 200 200 200 174 139 124 136 176 200 0 0 0 0 0 -26 -36 -15 12 40 24 0 0 0 29 74 107 117 103 75 36 8 64 55 61 41 13 0 0 0 0 56 45 38 43 29 9 0 0 0 0 39 19 16 18 12 4 0 0 0 0 174 0 0 0 0 0 0 0 174 19 16 18 12 4 0 0 0 0 14944 7286 1546 3860 3272 3656 2466 776 0 0 0 0 0 0 0 <th< td=""><td>200 200 200 200 174 139 124 136 176 200 200 0 0 0 0 0 26 -36 -15 12 40 24 0 0 0 0 29 74 107 117 103 75 36 8 0 0 0 0 29 74 107 117 103 75 36 8 0 64 55 61 41 13 0 0 0 0 0 56 64 45 38 43 29 9 0 0 0 0 0 39 45 19 16 18 12 4 0 0 0 0 0 17 19 0 0 0 0 0 0 0 0 0 3385 33854 3860</td></th<>	200 200 200 200 174 139 124 136 176 200 200 0 0 0 0 0 26 -36 -15 12 40 24 0 0 0 0 29 74 107 117 103 75 36 8 0 0 0 0 29 74 107 117 103 75 36 8 0 64 55 61 41 13 0 0 0 0 0 56 64 45 38 43 29 9 0 0 0 0 0 39 45 19 16 18 12 4 0 0 0 0 0 17 19 0 0 0 0 0 0 0 0 0 3385 33854 3860

Water Balance Total	Inputs	Outputs	Water Balance Inputs	Outputs
Precipitation (mm)	901.6		Precipitation (m [^] 633644.5	
Soil Storage (mm)		0.0	Soil Storage (m ³)	
Evapotranspiration+Evaporation (mm)		532	Evapotranspiration (m^3)	374107
Infiltration (mm)		285	Infiltration (m^3)	200558
Runoff (mm)		84	Runoff (m^3)	58980
Total	901.6	901.6	Total 633644.5	633644.5



Appendix J Pumping Test Data

Belfountain						
6 Hour Pupmping Test Results TW1 - Test Well						
TW1 (fully penetrating)						
Well depth (mbgs)	53.94					
Open hole interval (mbgs)	30.78 to 53.94					
standing water level (mbTOC)	19.19					
stick up (m above gs)	1.1					
Datalogger at (mbTOC)	28.2					
Pumping Rate L/sec	0.75					
Pumping Rate L/min	45					

W1 Pumping				TW1 Recovery		
		Water Level				
		Manual	Drawdown	Elapsed Time	Water Level	Drawdown
lapsed Time Manual (mi	n)	(mbTOC)	manual (m)	Manual (min)	Manual (mbTOC)	manual (m)
	0.1	19.02	-0.17	0.1	34.58	
	1	23.3	4.11	1	32.51	2.
	2	26.27	7.08	2	30.57	4.
	4	30.12	10.93	3	28.93	5.
	5	31.7	12.51	4	27.51	7.
	6	32.59	13.4	5	26.29	8.
	7	33.23	14.04	6	25.28	9
	8	33.54	14.35	7	24.39	10.
	9	33.66	14.47	8	23.65	10.
	10	33.72	14.53	9	23.03	11.
	12	33.86	14.67	10	22.53	12.
	15	34.06		12		
	17	34.07	14.88	14	21.27	13.
	18	34.08	14.89	15	21.08	13
	20	34.1	14.91	16	20.92	13.
	25	34.05	14.86	18	20.72	13.
	30	34.26	15.07	20	20.56	14.
	35	34.22	15.03	25	20.33	14.
	40	34.16	14.97	30	20.19	14.
	45	34.19	15	40	20.13	14.
	50	34.25	15.06	45	20.11	14.
	55	34.23	15.04	50	20.02	14.
	60	34.24	15.05	55	19.96	14.
	70	34.26	15.07	60	19.92	14.
	80	34.27	15.08			
	90	34.22	15.03			
:	100	34.28	15.09			
	120	34.26	15.07			
	135	34.27	15.08			
	150	34.31	15.12			
	165	34.4	15.21			
:	180	34.29	15.1			
:	195	34.23	15.04			
:	210	34.52	15.33			
:	225	34.43	15.24			
:	240	34.41	15.22			
:	255	34.39	15.2			
:	270	34.52	15.33			
:	285	34.54	15.35			
:	300	34.55	15.36			
:	315	34.58	15.39			
:	330	34.58	15.39			
:	345	34.62	15.43			
:	360	34.59	15.4			

Belfountain						Belfountain						
6 Hour Pupmpin	g Test Results	TW2 - Test	Well			6 Hour Pupmping Test Results TW3 - Test Well						
TW2 (partially p	enetrating)					TW3 (fully pen	etrating)					
Well depth (mbg	(s)		20.11			Well depth (ml	ogs)		35.96	;		
Open hole interv	al (mbgs)		12.49 to 20.11	L		Open hole interval (mbgs) 22.8 to 35.96						
standing water le			14.07				level (mbTOC)		15.8			
stick up (m abov			0.88			stick up (m abo			0.79			
Datalogger at (m			20			Datalogger at (21.62			
	-						-					
Pumping Rate L/			0.189			Pumping Rate			1.61			
Pumping Rate L/	min		11.34			Pumping Rate	L/min		96.6)		
TW2 Pumping			TW2 Recovery	1		TW3 Pumping			TW3 Reco	overy		
	Water Level	Drawdow	Elapsed Time	Water Level			Water Level		Elapsed Time	Water Level		
Elapsed Time	Manual	n manual	Manual	Manual	Drawdown	Elapsed Time	Manual	Drawdown	Manual	Manual	Drawdown	
Manual (min)	(mbTOC)	(m)	(min)	(mbTOC)	manual (m)	Manual (min)	(mbTOC)	manual (m)	(min)	(mbTOC)	manual (m)	
0.1	14.07	0.01	0.1	14.16	0	0.1	. 15.8	0	0.1	23.62	C	
1			1			1			1.1			
2						2		4.97	2.1			
3	14.11		3			3			3.1			
4	14.11					4			4.1			
4 5	14.11					4			4.1			
6	14.11		6			6			6.1			
7	14.11		7			7			7.1			
8	14.11		8			8			8.1			
9	14.12					9			9.1			
10	14.12	0.06	10	14.11	0.05	10) 22.76	6.96	10.1	. 16.51	7.11	
12	14.12	0.06	12	14.11	0.05	12	23.02	7.22	11.1	. 16.45	7.17	
14	14.12	0.06	15	14.11	0.05	15	23.08	7.28	12.1	. 16.41	7.21	
15	14.12	0.06	20	14.11	0.05	16	5 23.12	7.32	13.1	16.38	7.24	
16	14.12	0.06	25	14.1	0.06	18	3 23.18	7.38	14.1	16.36	7.26	
18									15.1			
20						25			16.1			
25			50			30			17.1			
30			60			35			18.1			
35				14.05	0.07	40			18.1			
40						40						
									20.1			
45						50			21.1			
50						55			22.1			
55						60			23.1	. 15.99	7.63	
60						70						
75						80						
90	14.15	0.09				90	23.64	7.84				
105	14.15	0.09				100	23.65	7.85				
120	14.15	0.09				110	23.65	7.85				
135						120		7.84				
150						135						
165						150						
180						165						
180						186						
210						186						
225	14.16					210		7.83				
240						225						
255						240						
270						255						
285	14.16	0.1				270	23.64	7.84				
300	14.16	0.1				285	23.64	7.84				
315	14.16	0.1				300	23.64	7.84				
330						315						
345						330						
360						345						



Manors of Belfountain Caledon, Ontario

Belfountain								Belfountain						
	ng Test Results T	W4 - Test We	II					s TW5 - Test Well						
TW4 (fully pend						TW5 (fully pe								
Well depth (mb	0,		35.66			Well depth (mbgs) 32.3								
Open hole inter			17.67 to 35.66			Open hole interval (mbgs) 13.41 to 32.30 standing water level (mbTOC) 15.34								
standing water			19.56			-			15.34					
stick up (m abo			0.94			stick up (m ab			0.83 30					
Datalogger at (r			27.72			Datalogger at								
Pumping Rate L			0.5			Pumping Rate			1.26					
Pumping Rate L	./ 11111		30			Pumping Rate	: L/11111		75.6					
TW4 Pumping			TW4 Recovery			TW5 Pumping	5		TW5 Recovery					
	Water Level			Water Level		Elapsed Time	Water Level			Water Level				
Elapsed Time	Manual	Drawdown	Elapsed Time	Manual	Drawdown	Manual	Manual	Drawdown	Elapsed Time	Manual	Drawdown			
Manual (min)	(mbTOC)	manual (m)	Manual (min)	(mbTOC)	manual (m)	(min)	(mbTOC)	manual (m)	Manual (min)	(mbTOC)	manual (m)			
0.1	19.56	0	0.1	19.71	0	0.1	15.34	0	0.1	22.48	0			
1		0.12	1			1		1.63	1	22.01	0.47			
2		0.13	2		0.13	2		2.89	2	21.33				
3		0.13	3		0.13	3		5	3	19.76				
4		0.13	4		0.13	4		7.55	4	18.47				
5		0.13	5		0.135	5		7.75	5	18.13				
6		0.13	6		0.135	6		6.64	6	17.8				
7		0.13	7		0.135	7		6.61	7	17.52				
8		0.13	8		0.135	8 9		6.61	8	17.36				
9 10		0.13 0.13	9 10		0.135 0.135	9 10		6.63 6.66	9 13	17.24 17.14				
10		0.13	10		0.135	10		6.79	15	17.14				
12		0.13	12		0.135	12		6.85	20	16.89				
16		0.13	15		0.135	16		6.9	25	16.81				
18		0.13	16		0.135	18		6.96	35					
20		0.13	18		0.135	20		7.04	45	16.7				
25		0.13	20		0.135	25		7.22	60	16.66				
30	19.69	0.13	25	19.575	0.135	30	22.65	7.31						
35	19.69	0.13	30	19.575	0.135	35	22.74	7.4						
40	19.695	0.135	35	19.575	0.135	40	22.81	7.47						
45		0.135	40		0.135	45		7.56						
50		0.135	45		0.135	50		7.65						
55		0.14	50		0.14	55		7.68						
60		0.14	55		0.14	60		7.72						
70		0.14	60	19.57	0.14	70		7.82						
80 90		0.14 0.145				80 90		7.94 7.97						
90 100		0.145				90 100		7.97 8.03						
100		0.145				100		8.18						
110		0.145				113		8.3						
135		0.145				130		8.46						
150		0.145				160		8.51						
165		0.145				175		8.79						
186		0.145				190		9.06						
195	19.705	0.145				205	24.56	9.22						
210	19.705	0.145				220	24.67	9.33						
225		0.145				235		9.5						
240		0.145				250		9.7						
255		0.145				265		10.45						
270		0.145				280		10.62						
285		0.145				295		10.87						
300		0.145				310								
315		0.15				322	27.12	11.78						
330		0.15 0.15												
345 360		0.15												
560	19./1	0.15				I								



6 Hour Pupmping Test Results TW6 - Tes	st Well	
TW6 (fully penetrating)		
Well depth (mbgs)	32.39	
Open hole interval (mbgs)	13.41 to 32.30	
standing water level (mbTOC)	14.69	
stick up (m above gs)	0.79	
Datalogger at (mbTOC)	30	
Pumping Rate L/sec	1.14	
Pumping Rate L/min	68.4	

TW6 Pumping				TW6 Recovery		
	1	Nater Level			Water Level	
Elapsed Time		Manual	Drawdown	Elapsed Time	Manual	Drawdown
Manual (min)		mbTOC)	manual (m)	Manual (min)	(mbTOC)	manual (m)
, ,	0.1	14.69	0	0.1	20.41	0
	2	18.21	3.52		18.49	1.92
	3	18.49	3.8	2	17.19	3.22
	5	19.8	5.11	3	16.38	4.03
	6	19.86	5.17	4	16.01	4.4
	7	19.96	5.27	5	15.82	4.59
	8	19.94	5.25	6	15.74	4.67
	9	19.93	5.24	7	15.7	4.71
	10	20.36	5.67	9	15.66	4.75
	12	20.02	5.33	10	15.65	4.76
	14	19.83	5.14	12.5	15.62	4.79
	15	19.76	5.07	15	15.6	4.81
	16	19.72	5.03	22	15.55	4.86
	18	19.69	5	25	15.55	4.86
	23	19.68	4.99	30	15.53	4.88
	25	19.68	4.99	35	15.51	4.9
	30	19.7	5.01	40	15.5	4.91
	35	19.73	5.04	45	15.47	4.94
	40	19.75	5.06	50	15.46	4.95
	45	19.78	5.09	55	15.44	4.97
	50	19.84	5.15	60	15.42	4.99
	55	19.81	5.12			
	60	19.83	5.14			
	70	19.87	5.18			
	80	19.9	5.21			
	90	19.93	5.24			
	100	19.96	5.27			
	110	19.98	5.29			
	120	20.01	5.32			
	135	20.03	5.34			
	150	20.06	5.37			
	165	20.09	5.4			
	180	20.12	5.43			
	195	20.15	5.46			
	210	20.18	5.49			
	225	20.22	5.53			
	240	20.24	5.55			
	255	20.27	5.58			
	270	20.29	5.6			
	285	20.32	5.63			
	300	20.34	5.65			
	315	20.35	5.66			
	330	20.36	5.67			
	345	20.38	5.69			
	360	20.41	5.72			

Appendix K

Long-term Drawdown Analysis

Long-term Drawdown Calculations (20 and 50 years)

Table 1 - Based on Peak Pumping Rates (27,000 L/day)

	Estimated					20 years			50 years			Available	Calculated D	rawdown (m)
	Transmissivity	Pumping rate	Radius from		Time (days) 20			Time (days) 50			Static Water	Drawdown		
Well ID	(m^2/day)	(m^3/day)	pumping well (m)	Storage	years	u	W(u)	years	u	W(u)	Level (mbgs)	(m)	20 years	50 years
TW1	9.37	27	0.075	5	7300	1.0E-07	15.5409	18250	4.1E-08	16.4825	19.19	23.17	3.56	3.78
TW2	14.94	27	0.075	5	7300	6.4E-08	15.9872	18250	2.6E-08	16.888	14.07	2.23	2.30	2.43
TW3	84.85	27	0.075	5	7300	1.1E-08	17.7482	18250	4.5E-09	18.642	15.8	13.58	0.45	0.47
TW4	403.19	27	0.075	5	7300	2.4E-09	19.2706	18250	9.6E-10	20.1869	19.56	7.105	0.10	0.11
TW5	26.60	27	0.075	5	7300	3.6E-08	16.5625	18250	1.4E-08	17.507	15.34	7.515	1.34	1.41
TW6	72.10	27	0.075	5	7300	1.3E-08	17.5811	18250	5.3E-09	18.4783	14.69	8.165	0.52	0.55

Table 2 - Based on Average Pumping Rates (2,250 L/day)

	Estimated					20 years			50 years			Available	Calculated D	rawdown (m)
	Transmissivity	Pumping rate	Radius from		Time (days) 20			Time (days) 50			Static Water	Drawdown		
Well ID	(m^2/day)	(m^3/day)	pumping well (m)	Storage	years	u	W(u)	years		W(u)	Level (mbgs)	(m)	20 years	50 years
TW1	9.37	2.25	0.075	5	7300	1.0E-07	15.5409	18250	4.1E-08	16.4825	19.19	23.17	0.30	0.31
TW2	14.94	2.25	0.075	5	7300	6.4E-08	15.9872	18250	2.6E-08	16.888	14.07	2.23	0.19	0.20
TW3	84.85	2.25	0.075	5	7300	1.1E-08	17.7482	18250	4.5E-09	18.642	15.8	13.58	0.04	0.04
TW4	403.19	2.25	0.075	5	7300	2.4E-09	19.2706	18250	9.6E-10	20.1869	19.56	7.105	0.01	. 0.01
TW5	26.60	2.25	0.075	5	7300	3.6E-08	16.5625	18250	1.4E-08	17.507	15.34	7.515	0.11	0.12
TW6	72.10	2.25	0.075	5	7300	1.3E-08	17.5811	18250	5.3E-09	18.4783	14.69	8.165	0.04	0.05

Notes:

Where available drawdown is considered to be the distance between the static water level and the centre of the well screer



Appendix L Radius of Influence Analysis

Radius of Influence for TW1

Observation Well = PW1

Variables Peak Pumping Rate (m^3/day) 27 2.25 Average Pumping Rate (m³/day) Transmissivity (m²/day) 9.37 5 Storage for Limestone (dimensionless) Time (days) 18250 Radius from pumping well (m) - TW1 0.075 Radius from pumping well (m) - PW1 87 Ro = radius of influence where drawdown is zero

TW1 - Peak Pumping Rate

u =	4.11E-08
W(u) =	16.4325
drawdown, s (m) =	3.77

u =	5.53E-02
W(u) =	2.3775
drawdown, s (m) =	0.54

PW1 - Average Pumping Rate

PW1 - Peak Pumping Rate

TW1 - Average Pumping Rate

u =	4.11E-08
W(u) =	16.4325
drawdown, s (m) =	0.31

u =	5.53E-02
W(u) =	2.3775
drawdown, s (m) =	0.05

Radius of Influence

Therefore, pumping at peak pumping rate results in radius of influence of approximately 300 m after 50 years compared to a radius of influence of approximately 100 meters after 50 years for average pumping rate.

Hydrogeological Investigation

Theis (1935)

and,



 $s = \frac{Q}{4\pi T}W(u)$

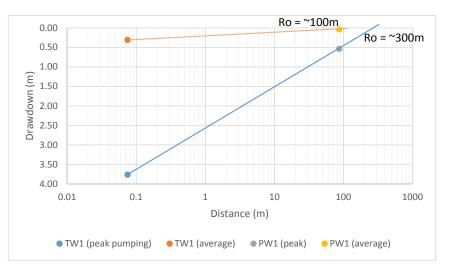
(1)

Where:

- s is drawdown (m)
- Q is pumping rate (m³/d)
- T is transmissivity (m²/d)
- W(u) is the well function S is storativity (-)
- S is storativity (-) t is time (d)
- is the distance from the pumping well to the observation well or point of interest (m)

The assumptions that are implicit in the mathematics used in the Theis derivation include:

- The aquifer is uniform in character and the hydraulic conductivity is the same in all directions.
- b) The aquifer is uniform in thickness and infinite in areal extent.
- c) The aquifer receives no recharge from any source; all water removed from the well comes from aquifer storage.



Radius of Influence for TW1 at 15 m

Observation Well = PW1

Variables	
Peak Pumping Rate (m^3/day)	27
Average Pumping Rate (m^3/day)	2.25
Transmissivity (m^2/day)	9.37
Storage for Limestone (dimensionless)	5
Time (days)	18250
Radius from pumping well (m) - TW1	0.075
Radius from pumping well (m)	15
Ro = radius of influence where drawdown is zero	

TW1 - Peak Pumping Rate

u =	4.11E-08
W(u) =	16.4325
drawdown, s (m) =	3.77

PW1 - Peak Pumping Rate

u =	1.64E-03
W(u) =	5.8621
drawdown, s (m) =	1.34

PW1 - Average Pumping Rate

TW1 - Average Pumping Rate

u =	4.11E-08
W(u) =	16.4325
drawdown, s (m) =	0.31

u =	1.64E-03
W(u) =	5.8621
drawdown, s (m) =	0.11

Radius of Influence

Therefore, pumping at peak pumping rate results in radius of infleunce of approximately 300 m after 50 years compared to a radius of influence of approximately 100 meters after 50 years for average pumping rate.

Theis (1935)

and,

$s = \frac{Q}{4\pi T} W(u) \qquad (1)$

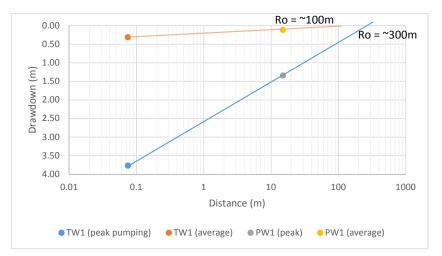
 $u = \frac{r^2 S}{4Tt}$ (2)

Where

- is drawdown (m) s
- is pumping rate (m³/d) is transmissivity (m²/d) 0 т
- W(u) is the well function s is storativity (-)
- is time (d) t
 - is the distance from the pumping well to the observation well or point of interest (m)

The assumptions that are implicit in the mathematics used in the Theis derivation include:

- a) The aquifer is uniform in character and the hydraulic conductivity is the same in all directions.
- b) The aquifer is uniform in thickness and infinite in areal extent.
- c) The aquifer receives no recharge from any source; all water removed from the well comes from aquifer storage.



Radius of Influence for TW4

Observation Well = immaginary at 87 m

Variables Peak Pumping Rate (m^3/day) 27 Average Pumping Rate (m^3/day) 2.25 Transmissivity (m²/day) 403.20 Storage for Limestone (dimensionless) 5 18250 Time (days) Radius from pumping well (m) - TW1 0.075 Radius from pumping well (m) 87 Ro = radius of influence where drawdown is zero

TW4 - Peak Pumping Rate

u =	9.56E-10
W(u) =	20.1869
drawdown, s (m) =	0.11

u =	1.29E-03
W(u) =	6.0695
drawdown, s (m) =	0.03

Obs Well - Average Pumping Rate

Obs well - Peak Pumping Rate

TW4 - Average Pumping Rate

u =	1.29E-03
W(u) =	6.0695
drawdown, s (m) =	0.00

Radius of Influence

drawdown, s (m) =

u =

W(u) =

Therefore, pumping at peak pumping rate results in radius of influence of approximately 1100 m after 50 years compared to a radius of influence of approximately 100 meters after 50 years for average pumping rate.

9.56E-10

20.1869

0.01

Theis (1935)

and,



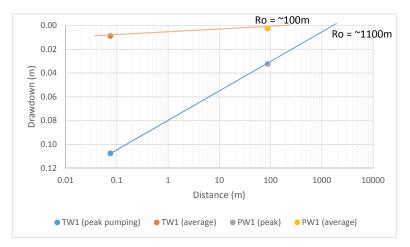
 $s = \frac{Q}{4\pi T} W(u) \qquad (1)$

Where:

- s is drawdown (m) Q is pumping rate (m³/d)
- T is transmissivity (m^2/d)
- W(u) is the well function
- S is storativity (-)
 - is time (d) is the distance from the pumping well to the observation well or point of interest (m)

The assumptions that are implicit in the mathematics used in the Theis derivation include:

- The aquifer is uniform in character and the hydraulic conductivity is the same in all directions.
- b) The aquifer is uniform in thickness and infinite in areal extent
- c) The aquifer receives no recharge from any source; all water removed from the well comes from aquifer storage.



Appendix M

Typical Water and Wastewater Treatment Systems

Advanced Septic Systems

The ideal solution for your **home** and **cottage**

Environmentally Friendly and Sustainable



For more information: www.waterloo-biofilter.com 1-866-366-4329 info@waterloo-biofilter.com





The Waterloo Advantage

Waterloo Biofilter Systems Inc. is a

Canadian-owned and operated company that has for over 20 years developed, designed, manufactured, and maintained advanced onsite wastewater treatment systems.

We are committed to helping protect the environment with technology focused on high quality treatment, low energy usage, and system robustness.



The patented Waterloo Biofilter system was developed at the University of Waterloo's Centre for Groundwater Research.



Permanent Filter Medium

The key to the Waterloo Biofilter system is the absorbent foam filter medium that has been optimized to physically filter and biologically treat sewage. This filter medium is warrantied for 20 years and will likely last generations.

A Waterloo is designed to perform on difficult sites



Small or Remote Lots



Bedrock or Clay Soils





High Watertable Environmentally Sensitive Areas

The environmentally friendly choice



Step 1

Wastewater is collected and distributed over the Waterloo foam filter medium.



Step 2

Wastewater slowly trickles down through the foam pieces where natural occurring bacteria remove contaminants.



Step 3

After passing through the foam, the treated water is put back into the environment.





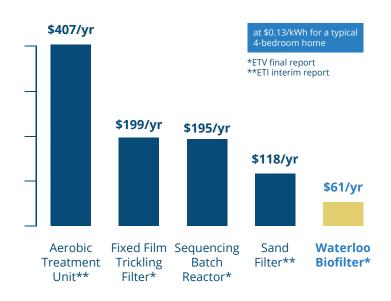
Low Energy, Low Operating Cost

Waterloo Biofilters use very little energy; up to 85% less power than aeration technologies using air compressors. In the long-term we have the lowest operating costs.

Few moving parts

Less energy use

No noisy air compressor





Nitrogen Removal

Standard Waterloo systems remove up to **50-65% total nitrogen**, helping to reduce nitrate levels in groundwater and protect surface waters. With the WaterNOx-LS[™] system add-on, up to 95% TN removal can be achieved passively and cost-effectively.



Phosphorous Removal

With the **Waterloo EC-P**[™] system add-on, greater than 95% total **phosphorus** can be removed – helping protect surface waters from blue-green algae and lake eutrophication. Compact and low energy, the Waterloo EC-P™ permanently removes phosphorus without chemicals or additional sludge production.



Footprint

A Waterloo is discrete and minimizes raised mounding and tree removal. A variety of product configurations are available to suit your unique site conditions and personal tastes.



Seasonal Performance

Whether for seasonal or year-round use, the Waterloo is designed to withstand extreme cold temperatures and can easily handle variable flow rates.



Made in Canada **Tough Enough for Canada**

Residential Products



Waterloo Shed Biofilters are spray foam insulated for winter operation, clad in attractive composite siding, and roofed with 50-year shingles. Shed Biofilters are compact and require only a single pump to operate.



Waterloo Flat Bed Biofilters are constructed of strong yet lightweight fibreglass shells. Flat Bed Biofilters easily blend in with landscaping and require only a single pump to operate.



Waterloo Basket Biofilters are constructed of a rigid steel mesh coated for corrosion protection. Basket Biofilters are placed in a below-ground concrete tank and are ideal for larger homes or increased nitrogen removal.



Waterloo HDPE Tank Biofilters are constructed using very durable below-ground high-density polyethylene tanks. HDPE Tank Biofilters are ideal for difficult access sites and increased nitrogen removal.

Proved and Approved

The Waterloo Biofilter has been thoroughly tested and proven effective by numerous 3rd party verification programs. We pride ourselves on the high treatment levels our technology consistently demonstrates.

Is yours a Waterloo?

CAN/BNQ Certification

	Median Concentration	Percent Removal
cBOD ₅	4 mg/L	98%
TSS	4 mg/L	> 98%
Fecal Coliforms	17,900 cfu/100mL	> 99%

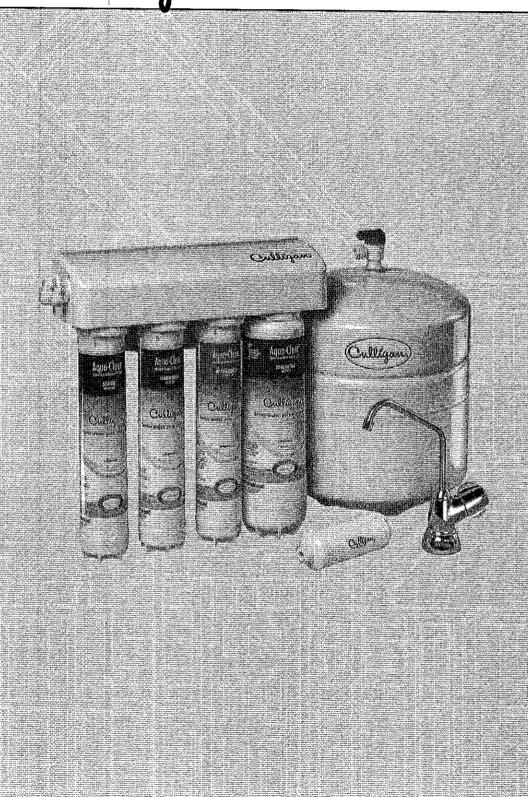
ETV Verification

	Median Concentration	Percent Removal
cBOD ₅	7 mg/L	96%
TSS	5 mg/L	97%
Total Nitrogen	13 mg/L	65%





Culligan® Aqua-Cleer® Advanced Drinking Water Systems Owners Guide





About Your System

Thank you for choosing a Culligan Aqua-Cleer advanced drinking water system. Your new system is designed to bring you years of deliciously crystal-clear Culligan water. The best part is it comes right from the tap. No more lugging around bottles or waiting for pitchers to slowly fill up. With your continuous supply of great tasting water, not only can you get your 8 glasses a day but you can easily use it for cooking, coffee, juice, baby formula, ice cubes, anything you use water with.

The important thing to remember is to change out your filters on a regular basis. The quality of your water is only as good as the quality of your filters. Each filter is designed to last for 1,000 gallons (roughly 12 months). Membranes will last longer if used with pre-filtration. A flow monitor is available with your system to let you know when you have consumed 1,000 gallons of water through your system. If you did not purchase one with your system, you may consider asking your Culligan man about having one installed. Faucets with reminder lights are also available.

System Specifications:

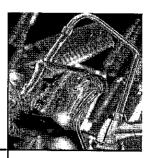
Dimensions	Filter Assembly Standard Storage Tank Medium Storage Tank Large Storage Tank	13.8" wide x 4.2″ deep x 15.5" high 9" diameter x 14" high 11" diameter x 14" high 15.5: diameter x 24" high
Storage Tank Capacity	Standard Medium Large	2 gallons 3 gallons 9 gallons
Reverse Osmosis Efficiency Rating	Standard Medium Large	16.86% 16.86% 16.86%
Reverse Osmosis Recovery Rating	Standard Medium Large	33.49% 33.49% 33.49%

Filtration Options:

Sequence of Filtration	Type of Filtration	Specification
		1
	Sediment	2
Pre-Filtration		3
		Block
	Carbon	Granulated Active Carbon
		Granulated Active Carbon - Large
· · · · ·	Reverse Osmosis	30 gpd
Membrane		50 gpd*
	Nano Filtration ⁺	30 gpd

* Cartridges not for sale in California.

+ Cartridges not for sale in California or Iowa.



Sequence of Filtration	tion Type of Filtration Specification	
	Total Defense Speciality	
Advanced Filtration	Arsenic	Specialty Media [,]
	Perchlorate*	Specialty Media 1
Post-Filtration	Carbon	Granulated Activated Carbon Block

* Cartridges not for sale in California

¹ Specialty media cartridges must be installed after the RO membrane and system must have a Performance Indicator Device (PID) installed to track gallon usage.

Purpose of each level of filtration:

Pre-Filtration:

Pre-filtration for this system is used to reducing large contaminants from the water before they reach either the reverse osmosis or nano filtration membrane. The use of pre-filtration cartridges helps extent the membrane's life. There are two types of pre-filtration available with this system: sediment filtration and carbon filtration.

Sediment Filtration: Sediment is defined as sand, dirt, silt, fine sand and or coarse sand that can be found in many water supplies.

Carbon Filtration: Carbon is used to reduce chlorine taste and odor. Most people often describe this taste as being slightly chemical or they equate their drinking water to that of the local pool. Municipalities use chlorine to disinfect the water on the way to your home. This is a necessary step to delivering safe water to your home but depending on the level of chlorine by the time it reaches your home the taste of your water may be unpalatable.

Membrane Technologies:

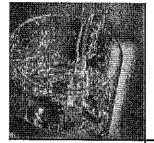
The Aqua-Cleer system can utilize two different membrane technologies; reverse osmosis and nano filtration. Each one of these technologies use a tightly woven membrane that acts as a barrier to contaminants. Water is pushed up against this membrane at pressure. Depending on the weave of the membrane only a certain percentage of contaminants can pass through. Reverse Osmosis can reduce up to 99% of contaminants. The reason you may choose nano filtration versus reverse osmosis is often a question of taste. Some of the things that give water its taste are minerals such as calcium and magnesium. A nano filtration membrane will leave more of those minerals in the water.

Advanced Filtration:

The advanced filtration cartridges are specifically designed to reduce contaminants that reverse osmosis membranes are not efficient in removing.

About Your System (con't)

5



About Your System (con't)

Total Defense: OPTIONAL 5 Stage system only,

The Total Defense cartridge should be added to your system to deal with lead, mercury, aesthetic chloramines, aesthetic chlorine taste and odor, cysts, Volatile Organic Compounds (VOC) and MTBE.

- Chloramines have a stronger taste and are more difficult to remove than chlorine.
- Mercury is a toxin that can cause kidney damage.
- Lead is a toxin that can cause kidney problems or high blood pressure in adults and developmental problems in children.
- Cysts are a common cause of health issues. They can be found in some municipal water sources but more often found in wells under the influence of surface water.
- VOC is a name given to a wide range of organic contaminants, some are known to be carcinogenic.
- MTBE was used in gasoline to reduce emissions and is considered harmful.

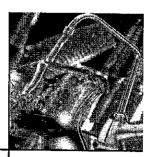
Perchlorate*:

Perchlorate is a by-product of munitions manufacturing (common in solid rocket fuel, road flares, etc) that can be found in some water sources.

Arsenic:

Arsenic (As) is found naturally in some well water. Arsenic in water has no color, taste or odor. It must be measured by a lab test. Public water utilities must have their water tested for arsenic. You can get the result from your water utility. If you have your own well, you can have the water tested by an accredited lab. The local health department or the state environmental health agency can provide a list of certified labs. Culligan International is one such lab. For more information please contact your local Culligan dealer. For additional information about the arsenic in water can be found through the EPA's website at www.epa.gov/safewater/arsenic.html.

There are two forms of arsenic: pentavalent arsenic (As (V)) and trivalent arsenic (As (III)). Special sampling procedures are needed for a lab to determine what type and how much of each type of arsenic is in the water. In well water, arsenic may be pentavalent, trivalent, or a combination of both. Reverse osmosis membranes are effective at reducing pentavalent arsenic but not trivalent arsenic. The Arsenic specific cartridge was specifically designed to reduce trivalent arsenic.



Carbon Block (CB) 🛩

The Carbon Block pre-filter has been tested according to NSF/ANSI 42 for the reduction of the substances listed below. The concentration of the indicated substances in the water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 42.

Substance	Influent Challenge Concentration	Maximum Permissible Product water Concentration	Reduction Requirements	Minimum Reduction	Average Reduction
Standard 42					
Aesthetic Chlorine	2.0 mg/L + 10%		>50%	97.6%	97.3%

Granular Activated Carbon (GAC)

The Granular Activated Carbon has been tested according to NSF/ANSI 42 for the reduction of the substances listed below. The concentration of the indicated substances in the water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 42.

Substance	Influent Challenge Concentration	Maximum Permissible Product water Concentration	Reduction Requirements	Minimum Reduction	Average Reduction
Standard 42				And a second of a second secon	
Aesthetic Chlorine	2.0 mg/L + 10%		>50%	79.4%	64.4%

Granular Activated Carbon - Large (GAC-L)

The Granular Activated Carbon - Large has been tested according to NSF/ANSI 42 for the reduction of the substances listed below. The concentration of the indicated substances in the water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 42.

Substance	Influent Challenge Concentration	Maximum Permissible Product water Concentration	Reduction Requirements	Minimum Reduction	Average Reduction
Standard 42					
Aesthetic Chlorine	2.0 mg/L + 10%		>50%	86.1%	80.3%

Performance Data Sheet (con't)



Performance **Data Sheet** (con't)

St-age 5 Ly. Total Defense (TD) The Total Defense has been tested according to NSF/ANSI 42 and 53 for the reduction of the substances listed below. The concentration of the indicated substances in the water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 42 and 53.

6 V

Substance	Influent Challenge Concentration	Maximum Permissible Product water Concentration	Reduction Requirements	Minimum Reduction	Average Reduction
Standard 42					
Aesthetic Chlorine	2.0 mg/L + 10%		>50%	97.6%	98.0%
Aesthetic Chloramines	3.0 mg/L + 10%	0.5 mg/L	······	97.6%	98.0%
Particulate (0.5 - < um) Class I	At least 10,000 particles/mL		>85%	99.9%	99.9%
Standard 53					
MTBE	0.015 + 20%	0.005 mg/L		74.6%	83.3%
Cyst ⁺	Minimum 50,000/L		99.95%	99.99%	99.99%
Turbidity	11 mg/L + 1 NTU	0.5 NTU	· -	96.6%	98.0%
Lead (pH 6.5)	0.15 mg/L + 10%	0.010 mg/L		99.3%	99.3%
Lead (pH 8.5)	0.15 mg/L + 10%	0.010 mg/L	- <u> </u>	99.3%	99.3%
Mercury (pH 6.5)	0.006 mg/L + 10%	0.002 mg/L		96.6%	96.6%
Mercury (pH 8.5)	0.006 mg/L + 10%	0.002 mg/L		72.4%	95.4%
Chloro- form (VOC surrogate chemical)	0.300 mg/L + 10%	0.015 mg/L		95.2%	91.0%

Flow Rate = 0.5 gpm (1.89 Lpm)

Townals – according to a compare the compared of the compared



Performance Data Sheet (con't)

RO30 with TD ·

These systems have been tested and certified by NSF International according to NSF/ ANSI 42, 53, and 58 for the reduction of the substances listed below. The concentration of the indicated substances in water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ ANSI 42, 53, and 58.

This system is acceptable for treatment of influent concentrations of no more than 27 mg/L nitrate and 3 mg/L nitrite in combination measured as N and is certified for nitrate/nitrite reduction only for water supplies with a pressure of 280 kPa (40 psig) or greater.

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Con- centration mg/L	Reduction Require- ments	Minimum Reduction	Average Reduction
Arsenic (pentavalent) ²	0.050 +/- 10%	0.01			97.4%
Barium	10.0 +/- 10%	2			98.3%
Cadmium	0.03 +/- 10%	0.005			98.7%
Hexavalent Chromium	0.30 +/- 10%	0.05			91.2%
Trivalent Chromium	0.30 +/- 10%	0.05			97.8%
Copper	3.00 +/- 10%	1.3			98,9%
Fluoride	8.0 +/- 10%	1.5			95.6%
Lead	0.15 +/- 10%	0.010			98.7%
Nitrate/Nitrite (both as N)	30 +/- 10%			83.1%	86.8%
Nitrate ^s	27.0 +/- 10%	10.0		83.4%	87.0%
Nitrite	3.0 +/- 10%	1.0		79.5%	84.8%
Radium 226/2283	25pCi/L +/- 10%	5pCi/L			80.0%
Selenium	0.10 +/- 10%	0.05			96.0%
Cyst⁴	>50,000/mL		99.95%	99.99%	99.99%
Turbidity	11 +/- 1 NTU	0.5 NTU			99.00%

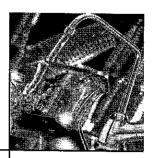
Substance Reduction¹

1 While testing was performed under standard laboratory conditions, actual performance may vary depending on water pressure, temperatures and other substances, which may be found in your water.

2 This system has been tested for the treatment of water containing pentavalent arsenic (also known as As(V), As(+5) or arsenate) at concentrations of 0.050 mg/L or less. This system raduces pentavalent arsenic, but may not remove other forms of arsenic. This system is to be used on water supplies containing a detectable free chlorine residual at the system intet or on water supplies that have been demonstrated to contain only pentavalent arsenic. Treatment with chloramines (combined chlorine) is not sufficient to ensure complete conversion of trivalent arsenic to pentavalent arsenic. Please see the Arsenic Facts Sheet for further Information.

3 Based upon testing methods using Barium as a surrogate. All concentrations in pCi/L pico curie/L, 4 Includes Glardia lamblia, Entamoeba histoiyca and Cryptosporidium.

5 Units are not certified on water supplies with a pressure less than 40 psl (280 kPa). A booster pump is strongly recommended.



Total Defense (TD)

The Total Defense has been tested according to NSF/ANSI 42 and 53 for the reduction of the substances listed below. The concentration of the indicated substances in the water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system, as specified in NSF/ANSI 42 and 53.

Substance Reduction¹

Substance	Influent Challenge Concentration mg/L	Maximum Permissible Product water Con- centration mg/L	Reduction Require- ments	Minimum Reduction	Average Reduction
Standard 42					
Aesthetic Chlorine	2.0 mg/L + 10%		>50%	97.6%	98.0%
Aesthetic Chloramines	3.0 mg/L + 10%	0.5 mg/L		97.6%	98.0%
Particulate (0.5 - < um) Class I	at least 10,000 particles/mL		>85%	99.9%	99.9%
Standard 53					
МТВЕ	0.015 + 20%	0.005 mg/L		74.6%	83.3%
Cyst	Minimum 50,000/L		99.95%	99.99%	99.99%
Turbidity	11 mg/L + 1 NTU	0.5 NTU		96.6%	98.0%
Lead (pH 6.5)	0.15 mg/L + 10%	0.010 mg/L		99.3%	99.3%
Lead (pH 8.5)	0.15 mg/L + 10%	0.010 mg/L		99.3%	99.3%
Mercury (pH 6.5)	0.006 mg/L + 10%	0.002 mg/L		96.6%	96.6%
Mercury (pH 8.5)	0.006 mg/L + 10%	0.002 mg/L		72.4%	95.4%
Chloroform (VOC surro- gate chemical)	0.300 mg/l_ + 10%	0.015 mg/L		95.2%	91.0%

Flow Rate = 0.5 gpm (1.89 Lpm)

Tow Nate ~ 0.5 grant (1.55 cpm) Capacity = 1,000 gations (3786 L) t Based on the use of microspheres or Cryptosporidium parvum oocysts Testing was performed under standard laboratory conditions, actual performance may vary Organic Chemicals included in Surrogate Testing: Applies to Total Defense (TD) only

Performance Data Sheet (con't)



Performance Data Sheet (con't)

4 Stage

The Aqua-Cleer Advanced Drinking Water System with CB, GAC, or GAC-L cartridge has been tested and certified by NSF International against NSF/ANSI Standard 42 for the effective reduction of aesthetic Chlorine Taste and Odor, the TD cartridge for the effective reduction of aesthetic Chlorine Taste and Odor and Nominal Particulate Class 1 and against CSA B483.1.



5 Stage

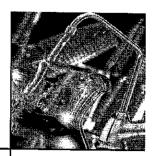
The Aqua-Cleer Advanced Drinking Water System with TD cartridge has been tested and certified by NSF International against NSF/ANSI Standard 53 for the effective reduction of Cyst, Lead, Mercury, VOC, MTBE and Turbidity and against CSA B483.1.

The Aqua-Cleer Advanced Drinking Water System with RO30 or RO50* has been tested and certified by NSF International against NSF/ANSI Standard 58 for the effective reduction of TDS, pentavalent arsenic, barium, cadmium, hexavalent and trivalent chromium, copper, lead, nitrate/nitrite, radium 226/228 and selenium. The concentration of the indicated substances in water entering the system was reduced to a concentration less than or equal to the permissible limit for water leaving the system as specified in NSF/ANSI 58 and against CSA B483.1.

The Aqua-Cleer Advanced Drinking Water System with AS3 has been tested and certified by NSF International against NSF/ANSI Standard 53 for the effective reduction of arsenic (trivalent and pentavalent) when following an RO and against CSA B483.1.

Refer to your Installation and Operating Instructions and printed limited Warranties for more specific product information. To avoid contamination from improper handling and installation, your system should only be installed and serviced by your Culligan Man. Performance will vary based on local water conditions. The substances reduced by these systems are not necessarily in your water.

*RO50 not for sale in California.



Culligan Aqua-Cleer Advanced Drinking Water System

You have just purchased one of the finest drinking water systems made. As an expression of our confidence in Culligan products, your drinking water system is warranted to the original end-user, when installed in accordance with Culligan International Company specifications, against defects in material and workmanship from the date of original installation, as follows:

• For the LIFETIME of the original end-user

The entire reverse osmosis water conditioning unit, EXCLUDING THE EXPENDABLE FILTER CARTRIDGES AND REVERSE OSMOSIS MEMBRANE FILTER USED IN THE UNIT. The Culligan brand reverse osmosis membrane filter.

• For a period of ONE YEAR

If a part described above is found defective within the specified period, you should notify your independently operated Culligan dealer and arrange a time during normal business hours for the dealer to inspect the drinking water system on your premises. Any part found defective within the terms of this warranty will be repaired or replaced by the dealer. You pay only freight from our factory and local dealer charges.

Damage caused by accident, fire, flood, freezing, Act of God, misuse, misapplication, neglect, alteration, installation or operation contrary to our printed instructions, or by the use of accessories or components which do not meet Culligan specifications, is not covered by this warranty.

Our product performance specifications are furnished with each drinking water system. TO THE EXTENT PERMITTED BY LAW, CULLIGAN DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING. WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE; TO THE EXTENT REQUIRED BY LAW, ANY SUCH IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE ONE-YEAR PERIOD SPECIFIED ABOVE FOR THE PARTS DESCRIBED IN THIS LIMITED WARRANTY. As manufacturer, we do not know the characteristics of your water supply or the purpose for which you are purchasing a drinking water system. Please understand that the quality of water supplies may vary seasonally or over a period of time, and that your water usage rate may vary as well. Water characteristics can also change considerably if your drinking water system is moved to a new location. For these reasons, we assume no liability for the determination of the proper equipment necessary to meet your requirements, and we do not authorize others to assume such obligations for us. Further, we assume no liability and extend no warranties, express or implied, for the use of this product on a non-potable water source. OUR OBLIGATIONS UNDER THIS WARRANTY ARE LIMITED TO THE REPAIR OR REPLACEMENT OF THE FAILED PARTS OF THE DRINKING WATER SYSTEM, AND WE ASSUME NO LIABILITY WHATSOEVER FOR DIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL, GENERAL, OR OTHER DAMAGES, WHETHER FROM CORROSION OR OTHER CAUSES.

CONSUMERS:

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Similarly, some states do not allow the exclusion of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Consult your telephone directory for your local independently-operated Culligan dealer, or write Culligan International Company, for warranty and service information.

Culligan International Company

9399 W. Higgins Road, Suite 1100 Rosemont, Illinois 60018



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