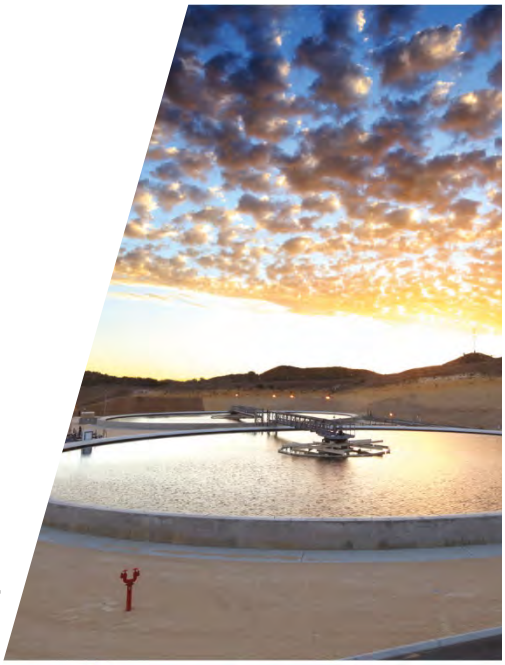

Hydrogeological Assessment

Site Alteration Permit Application &
Supporting Fill Management Plan
18725 McCowan Road
East Gwillimbury, Ontario

Rice Commercial Group Ltd.

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1. Introduction

GHD was retained by Rice Commercial Group Ltd. (Rice) to undertake groundwater monitoring and complete a hydrogeological assessment in support of a Site Alteration and Fill Management Plan application. Rice is proposing to backfill a former sand and gravel pit with excess soil from various sources to return the area to its approximate original topography. The future use of the backfilled pit will be agricultural.

The former pit is located at 18725 McCowan Road in East Gwillimbury, Ontario as shown on **Figure 1.1** (herein referred to as the Site). The Site occupies part of Lots 8 and 9, East Gwillimbury Township Concession 7. The Site is an irregular shaped parcel of land that is approximately 20 hectares (50 acres) in size. The Site Plan is provided in **Figure 2.1.**

The Site was used for agricultural cropland purposes (primarily potatoes, corn, wheat, soybeans, and hay) from at least 1927 to the late 1980s or early 1990s, at which time it was developed as a sand and gravel pit. The Site was operated as a sand and gravel pit from the late 1980s or early 1990s until the mid-2000s, when it was rehabilitated by grading the ground surface to a gradual slope, and reportedly re-distributing overburden soil that was initially stripped from the Site when the sand and gravel pit began operation. The rehabilitation did not restore the site to its original grade. The rehabilitation was complete in 2007 and the licence was surrendered to the Ministry of Natural Resources and Forestry.

Conceptually, the filling operations are envisioned to include backfilling of the former pit to elevations ranging from 260 to 270 metres above mean sea level (mAMSL). Approximately 1.0 to 1.3 million cubic metres (m^3) of excess soil will be required to fill the depression to original grade. Fill operations are anticipated to be three to seven years in duration based on a maximum of 150 loads per day and 200 days per year (approximately 400,000m^3/year). A permit (Site Alteration) will be required from the Town of East Gwillimbury (Town) to permit operation of the Site as a commercial fill site.

The objective of this hydrogeological assessment was to

1. Characterize the current geological and hydrogeological conditions of the Site.
2. Determine potential impacts to the local groundwater regime (quality and quantity) from the filling activities.
3. Develop a groundwater monitoring program.

2. Background

2.1 Site Description

The Site is located within the rural area of the Town of East Gwillimbury and approximately 3 km southwest of the Mount Albert community. The Site is currently owned by Overholt Farm Limited, and is vacant, vegetated land. It is part of a larger parcel of land that is approximately 83 hectares (205 acres) in size, and currently used for agricultural and residential purposes.

The Site is bound to the west by McCowan Road and rural residential properties, and to the south by Mill Road and a residential property (**Figure 2.2**). The Site is bound to the north and east by agricultural cropland. The Site encompasses a farmstead that is owned by Overholt Farm Limited and an access road that is part of the Site is located to the north of the farmstead. An active sand and gravel pit is located approximately 500 metres to the southwest of the Site.

The Site and surrounding rural properties do not have municipal water or sewer services. Potable water is supplied by individual water supply wells, and the properties are serviced by onsite septic systems.

The Site is within the Oak Ridges Moraine Conservation Plan[1] (ORMCP) which governs land use and land use activities within the area defined as the Oak Ridges Moraine. The Site is designated Countryside Area within the ORMCP. The Countryside Areas designation provides for a range of uses which includes mineral aggregate operations. It is proposed that the depression area of the former pit be backfilled to original grade to permit the use of the property for agricultural uses.

The Site is situated within a Lake Simcoe Region Conservation Authority (LSRCA) watershed, and portions of the larger property are within the LSRCA regulated area. There are no permanent or intermittent surface water features on the Site, drainage is provided by ephemeral swales within the agricultural fields on and surrounding the Site, and by road side ditches. Based on existing mapping no wetlands have been identified on the Site (evaluated or not evaluated). There are no provincially significant wetland features located on or within the immediate vicinity of the Site. The Franklin Pond Wetland Complex, a provincially significant wetland is situated more than 500 m to the east of the Site.

The Site is not located within any Wellhead Protection Areas, within the Lakes Simcoe and Couchiching/Black River Source Protection Area[2].

2.2 Regional Setting

The Site is located on the boundary between the Simcoe Lowlands and the Oak Ridges Moraine physiographic regions[3] (**Figure 2.3**). The majority of the Site is situated within the Simcoe Lowlands physiographic region characterized by a sand plain, and the southwest corner of the Site is situated within the Oak Ridges Moraine physiographic region, which is characterized by kame moraine deposits (sand and gravel).

Regionally, the topography is undulating and sloped to the east toward Mount Albert Creek and Franklin Pond (**Figure 2.4**). The Site topography slopes from an elevation of approximately 275 mAMSL at McCowan Road to an elevation of approximately 260 mAMSL along the east side of the Site. A large depression is situated on the southeast portion of the Site at an elevation of approximately 250 mAMSL, which coincides with the former pit operation. The proposed final

[1] Oak Ridges Moraine Conservation Plan (2017). Ministry of Municipal Affairs. May 2017.

[2] South Georgian Bay Lake Simcoe Source Protection Plan. Lake Simcoe Conservation Authority, Nottawasaga Conservation Authority and Severn Sound Environmental Association, 2015.

[3] The Physiography of Southern Ontario (Third Edition). L.J. Chapman and D.F. Putnam. Ontario Geological Survey Special Volume 2, 1984.

elevation of the fill management plan will be sloped to the east, maintaining and coinciding with the natural regional topography.

Mount Albert Creek is situated approximately 700 m to the southeast of the Site, and a headwater tributary of the Black River is located approximately 600 metres to the west (**Figure 2.4**). The Site is situated primarily within the Mount Albert Creek drainage area but also adjacent to the drainage divide between Mount Albert Creek and the headwater tributary. The divide roughly corresponds to the height of land along McCowan Road, between the elevation range of 275 to 280 mAMSL.

The regional surficial geology mapping[4] of the area indicates that the Site and surrounding lands to the south are underlain by glacial ice-contact stratified deposits (sand and gravel, minor silt, clay and till) (**Figure 2.5**). Lands north of the Site are underlain by coarse-textured glaciolacustrine deposits (sand, gravel, minor silt and clay), as well as fine textured glaciolacustrine deposits (silt, clay, minor sand and gravel).

Overburden underlying the Site is greater than 100 m in thickness, and is generally described as a thick sequence of Pleistocene glacial deposits overlying shale bedrock of the Upper Ordovician Georgian Bay Formation[5]. The surficial geology and general stratigraphic framework for the Site and surrounding area consists of the following deposits:

- Surficial Soil – Topsoil and fill in some areas.
- Ice-contact Stratified Deposits –sand and gravel with minor silt and clay.
- Glaciolacustrine Deposits – sand, gravel, silt and clay.

The location of water wells recorded by the Ministry of Environment, Conservation and Parks (MECP) within 500 m of the Site is shown on **Figure 2.6** (MECP 2017)[6], and a summary of the records is presented in **Appendix A**. Based on review of the well records, the majority of wells are utilized for domestic purposes and farm water supplies. The wells are typically drilled wells completed in a sand, and sand and gravel aquifer at depths in the range of 20 to 30 metres below ground surface (mBGS). The static water levels in the wells are typically in the range of 15 to 25 mBGS and the well yields (recommended rate) range from approximately 5 to 10 gallons per minute.

The water well record information indicates that the overburden is primarily comprised of sand, and sand and gravel with layers of clay and silt, which extend to depths of more than 48 mBGS. The hydrostratigraphy consists of the following units:

- Aquifer (unconfined) - ice-contact stratified deposits (sand and gravel with minor silt and clay).
- Aquitard (local) – glaciolacustrine deposits (silt, clay).

[4] Surficial Geology of Southern Ontario; Miscellaneous Release – Data 123-REV (Map). The Ontario Geological Survey, 2010.

[5] 1:250 000 Scale Bedrock Geology of Ontario; Miscellaneous Release---Data 126-Revision 1. Ontario Geological Survey, 2011.

[6] Water Well Information System, Ontario Ministry of the Environment Conservation and Parks (Accessed January 2018).

In general, the ice-contact stratified deposits of sand, and sand and gravel form a relatively deep unconfined aquifer beneath the Site. Fine textured discontinuous layers of silt and clay within the deposit form local confining to semi-confining conditions.

3. Methodology

Cognizant of the objectives of the project, the following activities were undertaken:

- Borehole advancement and installation of monitoring wells in boreholes to facilitate the collection of groundwater levels to determine groundwater flow direction in the overburden.
- Single well response tests (SWRT) to determine hydraulic conductivity of the water-bearing deposits.
- Groundwater level monitoring to determine seasonal fluctuations of the groundwater table.
- Collection of groundwater samples from selected monitoring wells to assess background ground water quality.
- A domestic well survey to inventory the location and use of water supply wells within 500 meters of the site.

The investigative locations are shown on **Figure 3.1**. The details of these investigations are summarized in the following sections, and the field investigation methodology and protocols are provided in **Appendix B**.

3.1 Borehole Advancement/Monitoring Well Installations

The drilling activities were undertaken during November 6 to 17, 2017 and consisted of the advancement of five boreholes and installation of wells in each of the boreholes (denoted as MW1-17 to MW5-17 to depths ranging from 9.5 to 30.5 mBGS.

Two additional groundwater monitoring wells were installed in August 2019 as follows:

- A deeper monitoring well adjacent to existing well MW02-19 to complete a well nest and facilitate vertical flow calculations.
- A shallower well adjacent to existing well MW01-19 to facilitate detection of impacts at the groundwater table. MW01-19 is screened below the groundwater table and below a fine-grained deposit.

The drilling was carried out utilizing a track mounted auger drill rig, supplied and operated by Profile Drilling; a drilling contractor licensed under Regulation 903. The drilling work was conducted under the full-time supervision of a GHD technician.

Soil sampling was undertaken using a 50 mm outside diameter split spoon sampler in general accordance with the specifications of the Standard Penetration Test Method (ASTM D1586). The relative density or consistency of the subsurface soil layers were measured using the Standard Penetration Test (SPT) method, by counting the number of blows ('N') required to drive a conventional split barrel soil sampler 300 mm depth. Soil samples were retrieved from each borehole location to verify strata boundaries and soil properties.

Monitoring wells were installed to depths ranging from 8.9 m to 20.8 mBGS. Each monitoring well was constructed with a 50 mm diameter, Schedule 40 polyvinyl chloride (PVC) screen, 3.1 m in length and completed with 50 mm diameter PVC riser pipe and J-plug. A silica sand pack was placed in the annular space between the PVC screen pipe and the borehole annulus to approximately 0.6 m above the top of the screen. A bentonite seal and hole plug was installed in the remaining borehole annulus above the sand pack. A protective above-ground casing with a concrete collar was placed around each monitoring well.

The ground surface and top of riser pipe elevation for each newly installed monitoring well was surveyed for horizontal and vertical control.

Subsequent to the monitoring well installation, each well was developed to ensure hydraulic connection with the screened hydrostratigraphic unit. A hydraulic connection ensures that groundwater levels and samples are representative of the subsurface condition. Development also aids in achieving low-turbidity samples. The development method is described in **Appendix B**.

The monitoring well locations are shown on **Figure 3.1,** and the completion details for the monitoring wells are provided on **Table 3.1**. Copies of the Stratigraphic and Instrumentation logs for the monitoring wells are provided in **Appendix C.**

Groundwater levels measured subsequent to the completion of the monitoring well installations are presented on the Stratigraphic and Instrumentation logs in **Appendix C**. Groundwater levels were allowed to stabilize for at least 24 hours following well installation before a groundwater level was recorded.

3.2 Groundwater Level Monitoring

Groundwater level monitoring was undertaken for a one year period (late November 2017 to early December 2018) to assess seasonal changes including the ‘high’ groundwater levels though a ‘wet’ season (spring). Groundwater levels were monitored using a combination of manual measurement on a semi-annual basis, and automated measurements. Manual groundwater levels were collected using a water level tape meter. Five monitoring wells were equipped with electronic water level dataloggers (Solinst Model 3001 – Levelogger Edge) to continuously record water levels, and provide a detailed record of the response of groundwater to climatic conditions. A Solinst Barologger Edge was installed on Site and was used to correct the water level data for atmospheric pressure.

Groundwater level measurements are summarized in **Table 3.2** and **Table 3.3**. Groundwater levels measured in mBGS (depth to water table) are presented in **Table 3.2**, and groundwater levels relative to mean sea level (elevation) are presented in **Table 3.3**. The manual and automatic groundwater elevation data is shown graphically in **Appendix D**.

3.3 Single Well Response Tests

In-situ hydraulic response testing, referred to as single well response tests (SWRT), were completed in five monitoring wells to estimate the horizontal hydraulic conductivity of the water bearing deposits.

Single well response tests involve the injection or removal of a known volume of water into/from the well and measuring the water level response in the well until it returns to static conditions

(i.e., falling/rising head test). Details of the SWRT methodology are presented in **Appendix B.** The results of the hydraulic testing were analyzed using the Bouwer and Rice (1976)[7] solution for unconfined conditions using the software AQTESOLV™. These solutions were used to determine the horizontal hydraulic conductivity of the geologic deposits within the immediate vicinity of the screened interval of each monitoring well. The AQTESOLV™ analysis reports are presented in **Appendix E** and are summarized in **Table 3.4.** The results are discussed in Section 4.0.

3.4 Groundwater Quality

Groundwater samples were collected from monitoring wells MW2-17 and MW3-17 on December 12, 2018 for laboratory analysis general chemistry parameters (total metals and inorganics).

Groundwater samples were collected from five monitoring wells (MW1-17, MW2-17, MW3-17, MW4-17 and MW5-17) on June 11, 2018 for analysis of one or more of the following parameters: dissolved metals (including arsenic) and inorganics, PHC fractions (F1 to F4) (including BTEX), and PCBs. Some of the analytical parameters are based on the potential contaminants of concern (pCOC) identified in the Phase Two Environmental Site Assessment (ESA) completed by GHD. The Phase Two ESA is presented under a separate cover.

Prior to sampling, the wells were purged to ensure that the sample collected was representative of groundwater quality. Purging of the well was considered complete when three consistent field measurement readings of pH, conductivity, and temperature had been obtained after each well volume was removed. Samples collected for dissolved metals were filtered using a 0.45 micron in-line disposable filter. Details of the sampling method are presented in **Appendix B**.

The samples were submitted under chain of custody procedures to Maxxam Analytics in Mississauga, Ontario for chemical analysis. The laboratory certificates of analysis are presented in **Appendix F**. The groundwater analytical results are presented in **Table 3.5** and **Table 3.6**.

3.5 Water Balance Analysis

A water balance analysis was undertaken to estimate the volume of water surplus generated as a result of the proposed filling (potential increase in impermeable surfaces), which was then used to assist in the evaluation of options to manage the surplus.

The water balance was estimated using the most recent version of the water balance model developed by Meteorological Service of Canada (MSC, see Johnstone and Louie, 2008). The new MSC's water balance method accounts for snow accumulation and melt (degree-day method of USACE, 1956), potential evapotranspiration (Thornthwaite and Mather, 1955), soil storage (Phillips, 1976), actual evapotranspiration, and moisture deficit and surplus. The MSC program calculated a 'water surplus' as the final product, which is the total water available in a given month to run off as surface overland flow and/or infiltrate to the ground and recharge the groundwater table. The MSC water balance model runs with continuous daily precipitation and air temperature data. The use of

[7] Bouwer, H. and R.C. Rice, 1976. A slug test method for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells, Water Resources Research, vol 12, no. 3, pp. 423-428.

daily data allowed for more accurate modelling of snowmelt and snow storage, which are of particular importance in Canadian climate (Johnstone and Louie, 1983).

Daily air temperature and precipitation data from Environment Canada's weather stations was collected for the period from January 2000 to December 2016 and inputted into the water balance model. Weather data was collected from the following Environment Canada weather stations:

- Baldwin (Climate ID: 6110480).
- Sandford Soletude (Climate ID: 6157875).
- Newmarket (Climate ID: 615N002).
- Uxbridge West (Climate ID: 6159123).
- Aurora (Climate ID: 6150398).
- King Smoke Tree (Climate ID: 6154142).
- Udora (Climate ID: 6119055).
- Marsh Hill (Climate ID: 6155000).

The Site's latitude, longitude, and an estimate of the water holding capacity of the soil was also inputted into the model. The water holding capacity was estimated based on soil and land use characteristics of the study area under existing and proposed conditions. The area of the proposed filling is currently comprised of pervious surfaces and this is not anticipated to change after filling. The soils underlying the Site are described as sand silt, with a low runoff potential and high infiltration soil groups A and B. The water holding capacity was determined from look-up tables provided in the Stormwater Management Planning and Design Manual[8], which relate water holding capacity to soil type and land use.

The water balance calculations for existing and proposed conditions are presented in **Appendix G**.

3.6 Residential Well Survey

A door-to-door survey of residential wells within 500 m of the Site was completed between August 14 and 21, 2019. During the survey, residents were informed of the project and were asked to take part in the well survey. A "Sorry We Missed You" letter, informing property owners of the project and survey, was left at properties where there was no answer. The letter also provided GHD contact information for owners to schedule a survey at their convenience. A survey of the two wells owned by Overholt Farm Limited was completed on June 27, 2018.

Based on available mapping, 34 properties are within or at least partially within 500 m of the Site. A review of aerial imagery indicated that 25 of these properties had potential water users, and these properties were included in the survey. Thirteen residents responded to the survey and a detailed survey was completed at their property. The properties included in the well survey are shown on **Figure 3.2**.

The well surveys included information on well construction and condition, qualitative water quality assessment based on visual/olfactory evidence, potential water demands, water treatment, potential

[8] Stormwater Management Planning and Design Manual. Ministry of the Environment, 2003.

existing sources of well interference and other information. The survey data is summarized in **Table 3.7**.

Background quality samples were collected from eight selected residential wells, including the two wells owned by Overholt Farm Limited and analyzed for the following parameters:

- Dissolved metals (including arsenic) and inorganics.
- Petroleum hydrocarbon fractions (PHC F1 to F4).
- Volatile organic compounds (VOC).

Samples collected from the two wells owned by Overholt Farm Limited on June 27, 2018 were analyzed for general chemistry (total metals and inorganics).

The well water samples were generally collected from outdoor hose taps. Seven of the eight samples were confirmed to be untreated groundwater.

The analytical results from residential well samples are presented in **Table 3.8** and **3.9**. The laboratory certificates of analysis are presented in **Appendix F**.

4. Site Geology and Hydrogeology

The following sections provide a detailed description of the geology and hydrogeology of the Site, based on the results of the investigations completed and on the available background information. Cross-section representations of the Site are shown on **Figure 4.1** and **Figure 4.2**.

4.1 Geology

Based on information collected during the installation of the monitoring wells and advancement of boreholes, the following surficial materials and geologic deposits underlie the Site:

- Topsoil (0 to ~0.5 mBGS) – silt and clay.
- Ice-contact Stratified Deposits (0.5 to >30 mBGS) – predominantly sand and gravel with discontinuous layers of silt and clay.

The Site is underlain by a soft, dark brown topsoil generally comprised of silt and/or clay.

The topsoil is underlain by a coarse-textured glacial deposit comprised of sand and gravel. The sand and gravel was encountered at all boreholes and is typically silty, brown to grey and moist to saturated. The deposit typically has medium to high blow counts to depths of approximately 6 mBGS with SPT ‘N’ values in the range of 10 to 30 blows per 0.3 m of penetration indicating compact to dense conditions. The deposit has higher blow counts at depths greater than 6 mBGS with SPT ‘N’ values of 50 blows per 0.3 m of penetration indicating very dense conditions. The sand and gravel deposit was encountered from near ground surface (~ 275 mAMSL) to an elevation of 243 mAMSL.

Silt and clay layers are present within the sand and gravel deposit that generally range from approximately 3 m to 5 m in thickness, and are locally up to about 7 m to 9 m in thickness. The silt and clay layers have variable sand and gravel content and are typically brown to grey, range from

stiff to hard and are moist. The silt and clay layers were encountered in all of the boreholes, but at different elevations suggesting that these layers are discontinuous.

4.2 Hydrogeology

4.2.1 Hydrostratigraphic Units

Based on information collected during the installation of the monitoring wells and the groundwater level monitoring the aquifer/aquitard units underlying the Site include:

Topsoil **–** Based on the groundwater level monitoring to date the fill is unsaturated across the Site.

Sand and Gravel, Sand, Silt (Aquifer) **–** These Ice-contact Stratified deposits form an aquifer that have a relatively high hydraulic conductivity. Based on the estimates from the SWRTs (**Table 3.4**), the horizontal hydraulic conductivity (K_h) of this aquifer ranges from 3.5 x 10^{-2} to 8.6 x 10^{-2} cm/s (geometric mean = 4.6 x 10^{-2} cm/s).

Silt and Clay (Aquitard) **–** These deposits are discontinuous and locally may form aquitards resulting in confined conditions in the sand deposits below the silt and clay.

4.2.2 Groundwater Flow and Gradients

Based on the groundwater level monitoring data, the highest groundwater table during the monitoring period occurred in May 2018 (**Appendix G**). The depth to the water table on November 29 and 30, 2018 is shown on **Figure 4.3.** The groundwater elevations are shown on **Figure 4.4.**

Based on the results of this monitoring, the groundwater elevation at the Site ranges from approximately 260 mAMSL near McCowan Road to approximately 250 mAMSL at the eastern boundary of the Site. The water table is approximately 2 m below the base of the pit. The groundwater flow is generally in an easterly direction across the Site.

Utilizing the hydraulic conductivity values estimated from the SWRT results, the average linear groundwater flow velocity (v) can be estimated as follows:

$$v = \frac{Ki}{n}$$

where: K = hydraulic conductivity (4.6 x 10^{-2} cm/s/4.6 x 10^{-4} m/s for the aquifer soils)

i = horizontal hydraulic gradient (0.04 m/m average across the Site)

n = porosity (assumed 0.3)

Based on this calculation, the average linear groundwater flow velocity is estimated to be approximately 2.9 m/yr.

4.3 Groundwater Quality

The groundwater analytical results for the samples collected for general chemistry were assessed to:

- Ontario Drinking Water Quality Standards presented in Ontario Regulation 169/03 under the Safe Water Drinking Water Act, 2002 (herein referred to as ODWQS).
- For parameters with no standards available in the ODWQS, the Table 2 (Potable Groundwater) presented in "*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act Ministry of the Environment April 15, 2011 PIBS # 7382e01*" (The 2011 Generic Standard hereinafter).

The general chemistry analytical results from monitoring wells MW2-17 and MW3-17 are presented in **Table 3.5.** Review of **Table 3.5** indicates that all parameters had concentrations below the ODWQS health-related standards, except turbidity, total chromium and total lead. The elevated turbidity of the sample was likely a result of the sampling method (i.e., agitation during sampling) which resulted in the elevated metal concentrations. These elevated concentrations are not representative of undisturbed groundwater in the aquifer.

The analytical results from monitoring wells MW1-17, MW2-17, MW3-17, MW4-17 and MW5-17 are presented in **Table 3.6**. Review of **Table 3.6** indicates that all parameters had concentrations below The 2011 Generic Standard and the ODWQS for the parameters analyzed. Given that the dissolved metals concentrations during this sampling event were below the assessment standards, further supports that the total chromium and lead concentrations detected at MW2-17 and MW3-17 are due to sediment that was present in the sample at the time of sample collection.

4.4 Residential Groundwater Usage

Based on a review of MECP Water Well Records (**Appendix A**), there are approximately 30 water supply wells within 500 m of the Site. The wells were installed between 1959 and 2012. The wells were drilled to depths generally ranging between approximately 30 and 48 mBGS and screened in sands and gravels and below the base of the existing pit. Bedrock was not identified in any of the well records.

As discussed above, a well survey, which included the two wells owned by Overholt Farms Limited, was completed in 2018. The analytical results from the groundwater samples is presented in **Table 3.8**. A review of the analytical data indicates, all samples had concentrations below the ODWQS for all parameters. E. Coli bacteria was detected in one sample, however a confirmatory sample collected at the same location at a later date did not contain detectable coliform bacteria.

As discussed above, a well survey of wells within 500 m of the Site was completed in 2019. The analytical results from these samples are presented in **Table 3.9** and compared to the 2011 Generic Standard. Review of **Table 3.9** indicates that all parameters had concentrations below The 2011 Generic Standard except for copper, which had a concentration marginally above the 2011 Generic Standard in two wells. These slightly elevated concentrations may be from the copper water piping in the residences.

5. Impact Assessment

5.1 Private Wells

The approximate locations of groundwater wells within 500 m of the Site are shown on **Figure 2.6**. All residential supply wells are located upgradient of the Site except the two on-site wells owned by Overholt Farm Limited. The potential for filling activities to impact the upgradient residential homes is extremely low.

Based on the baseline groundwater monitoring, groundwater flow across the Site is in an easterly direction towards Mount Albert Creek. There are no known water supply wells downgradient of the Site. The downgradient property is also owned by Overholt Farm Limited and is used for agricultural purposes.

Two supply wells, which are owned by Overholt Farm Limited, are located cross-gradient of the Site and are potential groundwater receptors (**Figure 5.1).** Boundary trigger wells have been installed on the Site to assess the potential for impacts from the filling activities to these potential receptors.

5.2 Surface Water and Stormwater Management

Water surplus is the total volume of water available in a given time period to runoff as surface overland flow and/or infiltrate to the ground and recharge the groundwater table. The results of the water balance estimate indicate that there will be an increase in evapotranspiration and a decrease in the water surplus of approximately 3,600 m^3 annually after the pit is filled (**Table G4**).

Based on the current topography of the Site, the majority of the runoff accumulates in the pit and infiltrates into the ground. Precipitation, similarly, collects in the pit and gradually infiltrates. Upon completion of the filling activities, there will be an increase in runoff from the Site and decrease in infiltration. It is estimated that infiltration at the Site will decrease by approximately 48,000 m^3 annually (**Table G4**).

The runoff from the site after filling activities have been completed is estimated to increase by approximately 6,385 m^3 compared to current conditions (**Table G4**). However, after filling, the Site topography will be shaped to match the conditions prior to the aggregate extraction, which is anticipated to restore the pre-extraction overland drainage, which predominantly flowed east to the additional lands under the ownership of the applicant. The increase in runoff from the Site is not anticipated to impact surface water resources.

At no time during the site alteration, will surface water be discharged to adjoining properties outside of the control of the permit applicant and landowner.

6. Groundwater Monitoring Program

6.1 Groundwater Monitoring Network

It is anticipated that the completed groundwater monitoring network (seven wells) will be appropriate for monitoring impacts given that groundwater flow from the Site is in an eastward direction towards

Mount Albert Creek and there are no known groundwater receptors downgradient from the Site. The downgradient property is also owned by Overholt Farm Limited. Cross-gradient receptors will be monitored with the existing trigger monitoring wells on the north and south boundaries of the Site.

As the proposed filling activities progress the monitoring wells will be protected. Additional lengths of PVC riser pipe will be added to increase well heights, as needed, and structures will be placed around wells to protect them. As wells are modified, they will be resurveyed for vertical control.

As discussed above, several residential supply wells may be selected for inclusion in the monitoring network.

6.2 Prior to Filling Operations

The groundwater levels in all on-Site monitoring wells will be monitored on a semi-annual basis (spring and fall) prior to filling to confirm background seasonal fluctuations in the water table elevations. Five monitoring wells are equipped with electronic water level dataloggers.

Groundwater samples will be collected semi-annually from all on-Site monitoring wells (except MW01-19 and MW02A-19 – wells that are screened at deeper elevation) and select off-Site residential wells and analyzed for the following parameters:

- Metals (including arsenic) and inorganics.
- Petroleum hydrocarbon fractions (PHC F1 to F4).
- Volatile organic compounds (VOC).

For quality control purposes, one duplicate sample and one trip blank will be submitted along with the samples for each sampling event.

6.3 During Filling Operations

Groundwater level monitoring will continue during filling. Measurement of the groundwater levels and downloading of the previously installed dataloggers will continue on a semi-annual basis. The groundwater level data (manual and automatic) will be tabulated and graphed to assess potential impacts due to the filling activities.

During filling operations groundwater samples will be collected semi-annually from all on-Site monitoring wells (except MW01-19 and MW02A-19) and select off-Site residential wells for analysis of the following parameters:

- Dissolved metals (including arsenic) and inorganics.
- Petroleum hydrocarbon fractions (PHC F1 to F4).
- Volatile organic compounds (VOC).

For quality control purposes, one duplicate sample and one trip blank will be submitted along with the samples for each sampling event. Ongoing groundwater analytical data will be entered into a database and assessed for indications of potential impacts due to the filling activities.

If the results of groundwater sampling program results indicate any of the following, the impact will be assessed and an appropriate action plan will be implemented as detailed in the Fill Management Plan Risk Management Matrix:

- A parameter showing a statistically significant increase in concentration.
- A concentration is above the 2011 Generic Standard or ODWQS.
- Groundwater exhibiting potential aesthetic impacts (i.e., the presence of free phase product or hydrocarbon sheen).

6.4 After Filling Operations

Groundwater Monitoring will continue as described in Section 6.2 for until the filing of a Record of Site Condition for Agricultural land use is completed and all other requirements of the Permit and Agreement have been fulfilled.

6.5 Reporting

Annual monitoring reports will be provided to the Town during the period prior to, during and after the filling activities. In additional, semi-annual update reports will be provided to the Town during filling activities. The reports will provide data from the previous year's monitoring activities, as well as historical data for comparison. The annual reports will include an assessment of the groundwater monitoring results, trends, indication of groundwater impact and recommendations. The recommendations will include potential modification to the groundwater monitoring program, as needed.

7. Summary and Conclusions

Based on the results of the hydrogeological assessment, the following summary and conclusions are provided:

1. The proposed fill area is primarily underlain by sand and gravel with discontinuous layers of silt and clay, which comprise an unconfined aquifer.
2. Groundwater level monitoring indicated that the groundwater elevation at the Site ranges from approximately 260 mAMSL near McCowan Road to approximately 250 mAMSL at the eastern boundary of the Site. The water table was approximately 2 m below the base of the former pit. The groundwater flow is generally in an easterly direction across the Site.
3. The hydraulic conductivity (K_h) of the sand and gravel aquifer is approximately 4.6 x 10^{-2} cm/s (geometric mean of K estimates from SWRT).
4. The groundwater analytical results for on-site groundwater monitoring wells indicated that all parameters had concentrations below 2011 Generic Standards. All concentrations were also below the ODWQS health-related standards, except turbidity, chromium and lead. The elevated chromium and lead concentrations are likely from the sediment that was present in the sample and not indicative of groundwater conditions.

5. All residential wells within 500 m of the Site are hydraulically upgradient of the proposed filling activities. The potential for filling activities to impact the upgradient residential homes is extremely low. Two residential wells, which are owned by Overholt Farm Limited, are located cross-gradient of the Site. Boundary triggers wells have been installed on the Site to assess of the potential for impacts from the filling activities to these wells.
6. The analytical results from upgradient residential wells indicated that all parameters had concentrations below the 2011 Generic Standard except for copper, which exceed The 2011 Generic Standard slightly at two wells.
7. The proposed fill activities at the Site are not anticipated to have an adverse impact on local wells or surface water resources.
8. Semi-annual monitoring of groundwater levels and groundwater quality in the monitoring network should continue through the period prior to, during and after filling activities.

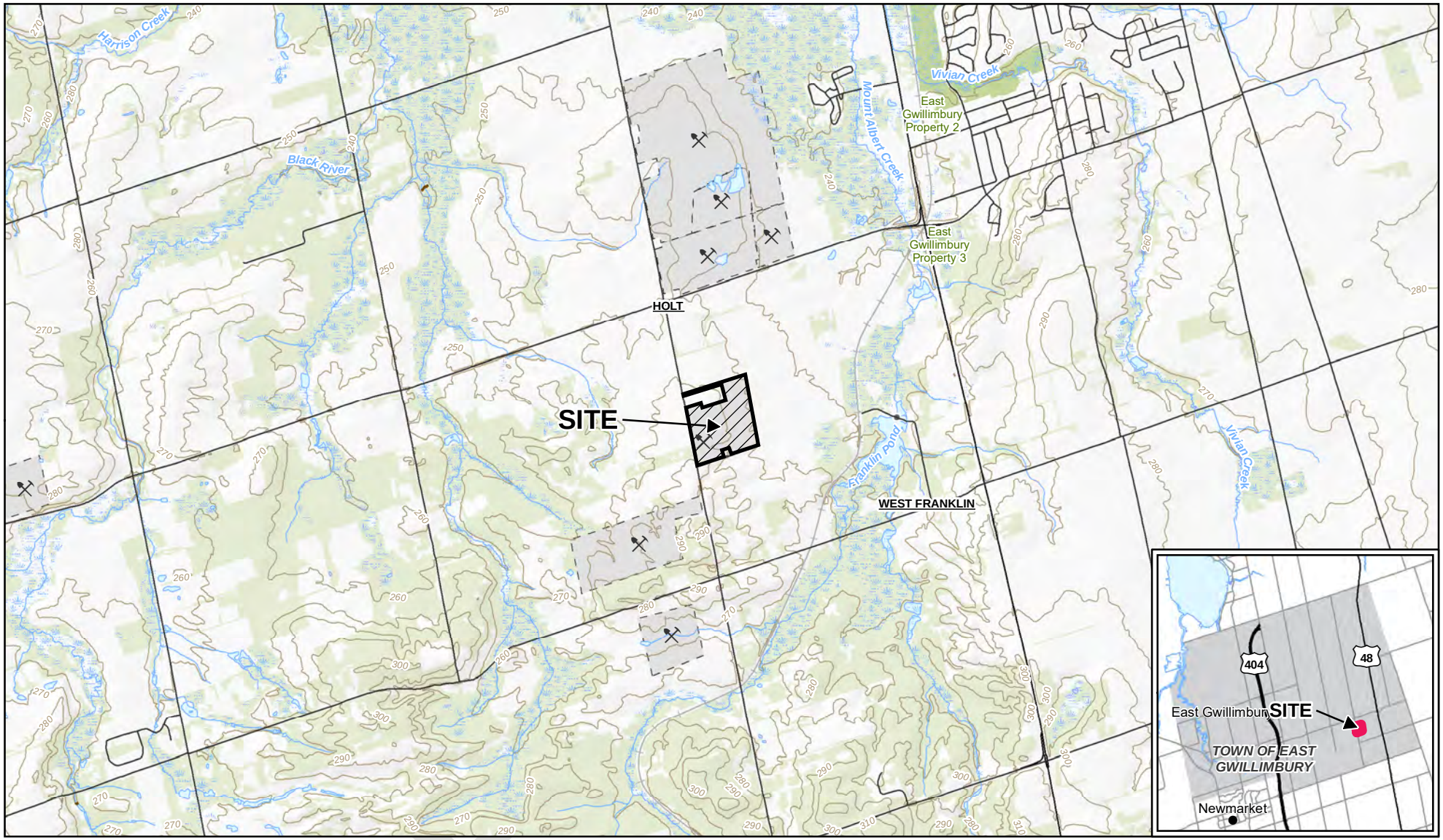
All of Which is Respectfully Submitted,

GHD

Sean Andreou, MSc, P. Geo.

Thomas Guoth, P. Eng.

Figures



Source: MNRF NRVIS, 2017. Produced by GHD under licence from Ontario Ministry of Natural Resources and Forestry, © Queen's Printer 2018.

0 390 780 1,170
Meters

Coordinate System:
NAD 1983 UTM Zone 17N

RICE COMMERCIAL GROUP LIMITED
18725 MCCOWAN ROAD, EAST GWILLIMBURY, ONTARIO
SITE ALTERATION PERMIT APPLICATION & SUPPORTING FILL MANAGEMENT PLAN
HYDROGEOLOGICAL ASSESSMENT
SITE LOCATION MAP

11139891-226
Oct 17, 2018

FIGURE 1.1

GIS File: Q:\GIS\PROJECTS\11139000s\11139891\Layouts\002\11139891-226(002)GIS-WA001.mxd

Source: MNRF NRVIS, 2017. Produced by GHD under licence from Ontario Ministry of Natural Resources and Forestry, © Queen's Printer 2018.
Imagery: Regional Municipality of York 2016 orthoimagery.

0 50 100 150
Meters

Coordinate System:
NAD 1983 UTM Zone 17N

RICE COMMERCIAL GROUP LIMITED
18725 MCCOWAN ROAD, EAST GWILLIMBURY, ONTARIO
SITE ALTERATION PERMIT APPLICATION & SUPPORTING FILL MANAGEMENT PLAN
HYDROGEOLOGICAL ASSESSMENT
SITE PLAN

11139891-226
Oct 17, 2018

FIGURE 2.1

GIS File: Q:\GIS\PROJECTS\11139000s\11139891\Layouts\002\11139891-226(002)GIS-WA002.mxd

Source: MNRF NRVIS, 2017. Produced by GHD under licence from Ontario Ministry of Natural Resources and Forestry, © Queen's Printer 2018.
Imagery: Regional Municipality of York 2016 orthoimagery.

0 100 200 300
Meters

Coordinate System:
NAD 1983 UTM Zone 17N

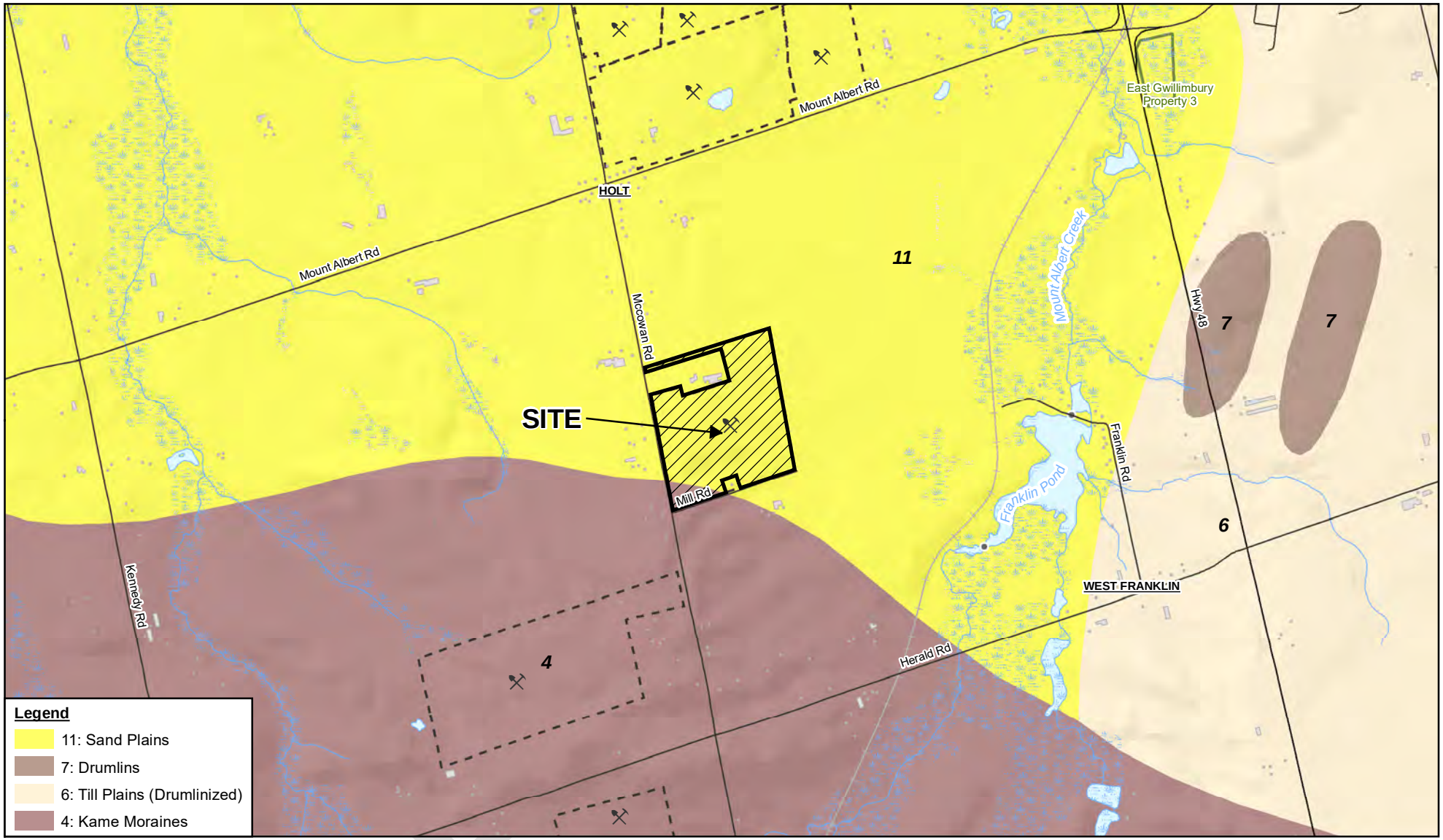
RICE COMMERCIAL GROUP LIMITED
18725 MCCOWAN ROAD, EAST GWILLIMBURY, ONTARIO
SITE ALTERATION PERMIT APPLICATION & SUPPORTING FILL MANAGEMENT PLAN

HYDROGEOLOGICAL ASSESSMENT
LAND USE (AERIAL IMAGE)

11139891-226
Oct 17, 2018

FIGURE 2.2

GIS File: Q:\GIS\PROJECTS\11139000s\11139891\Layouts\002\11139891-226(002)GIS-WA008.mxd



Source: MNRF NRVIS, 2017. Produced by GHD under licence from Ontario Ministry of Natural Resources and Forestry, © Queen's Printer 2018
Chapman, L.J. and Putnam, D.F. 2007. Physiography of southern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 228.

0 200 400 600
Meters

Coordinate System:
NAD 1983 UTM Zone 17N

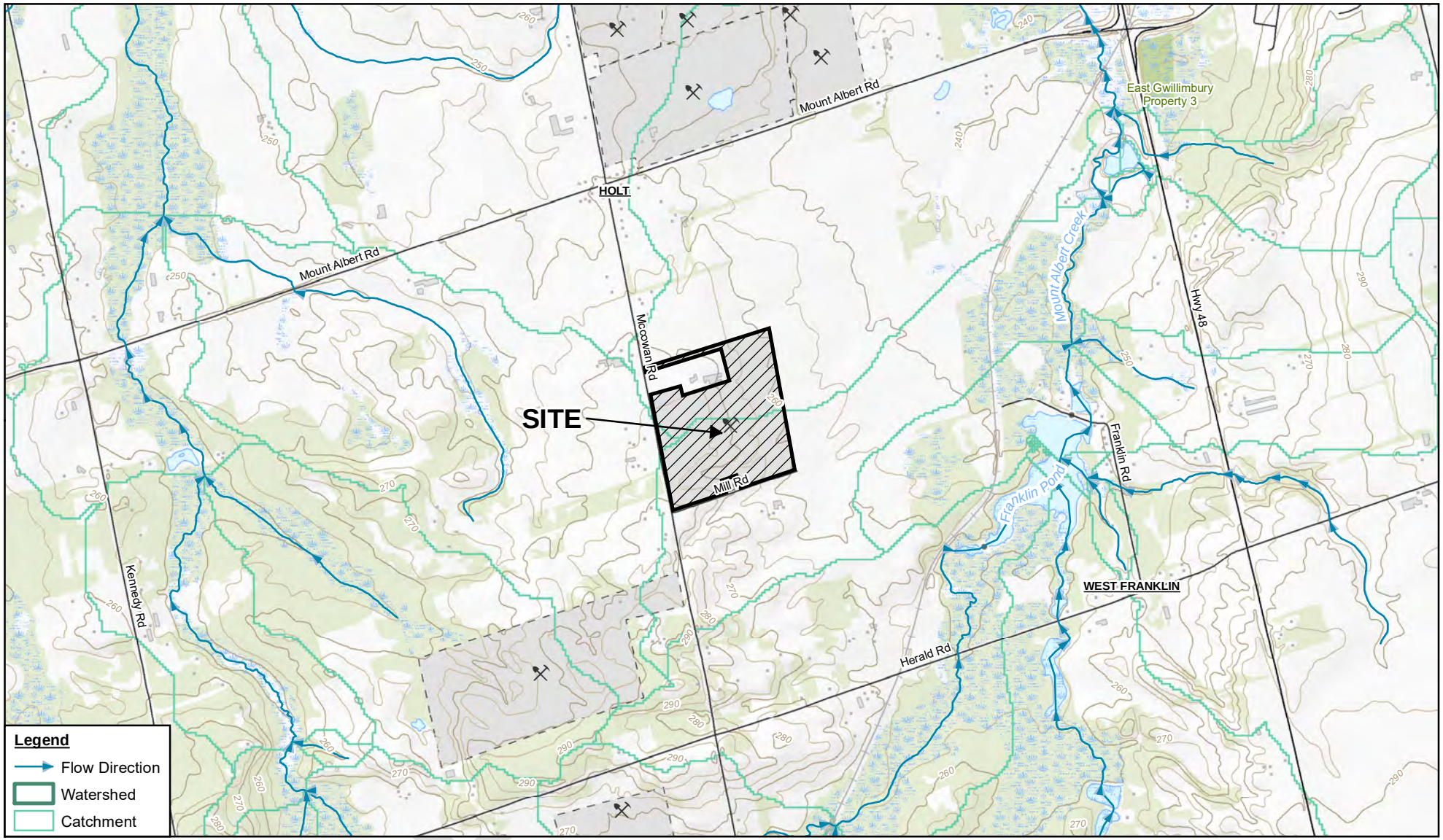
RICE COMMERCIAL GROUP LIMITED
18725 MCCOWAN ROAD, EAST GWILLIMBURY, ONTARIO
SITE ALTERATION PERMIT APPLICATION & SUPPORTING FILL MANAGEMENT PLAN

HYDROGEOLOGICAL ASSESSMENT
PHYSIOGRAPHY

11139891-226
Oct 17, 2018

FIGURE 2.3

GIS File: Q:\GIS\PROJECTS\11139000s\11139891\Layouts\002\11139891-226(002)GIS-WA003.mxd



Source: MNRF NRVIS, 2017. Produced by GHD under licence from Ontario Ministry of Natural Resources and Forestry, © Queen's Printer 2018;

0 200 400 600
Meters

Coordinate System:
NAD 1983 UTM Zone 17N

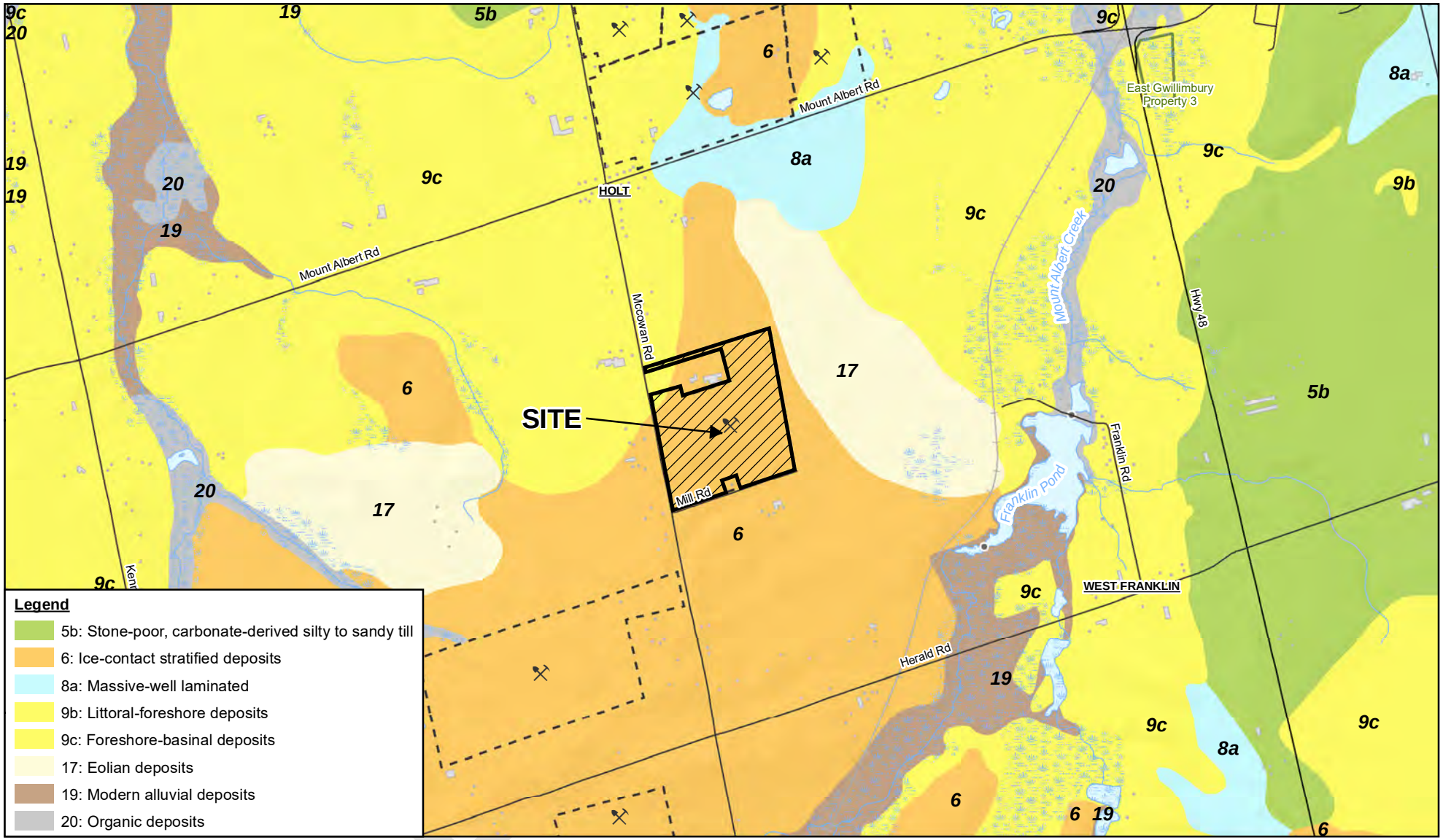
RICE COMMERCIAL GROUP LIMITED
18725 MCCOWAN ROAD, EAST GWILLIMBURY, ONTARIO
SITE ALTERATION PERMIT APPLICATION & SUPPORTING FILL MANAGEMENT PLAN

HYDROGEOLOGICAL ASSESSMENT
SURFACE WATER FEATURES

11139891-226
Oct 17, 2018

FIGURE 2.4

GIS File: Q:\GIS\PROJECTS\11139000s\11139891\Layouts\002\11139891-226(002)GIS-WA005.mxd



Source: MNRF NRVIS, 2017. Produced by GHD under licence from Ontario Ministry of Natural Resources and Forestry, © Queen's Printer 2018;
Ontario Geological Survey 2003. Surficial geology of southern Ontario; Ontario Geological Survey, Miscellaneous Release---Data 128.

0 200 400 600
Meters

Coordinate System:
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RICE COMMERCIAL GROUP LIMITED
18725 MCCOWAN ROAD, EAST GWILLIMBURY, ONTARIO
SITE ALTERATION PERMIT APPLICATION & SUPPORTING FILL MANAGEMENT PLAN
HYDROGEOLOGICAL ASSESSMENT
SURFICIAL GEOLOGY

11139891-226
Oct 17, 2018

FIGURE 2.5

GIS File: Q:\GIS\PROJECTS\11139000s\11139891\Layouts\002\11139891-226(002)GIS-WA004.mxd

Source: MNRF NRVIS, 2017. Produced by GHD under licence from Ontario Ministry of Natural Resources and Forestry, © Queen's Printer 2019;
WWIS, 2017. Ontario Ministry of the Environment and Climate Change (Accessed January 2017); York Region Parcel Data. Image ©2019 Google, Imagery date: 2015 (NOTE copywrite year does NOT equal image year).

0 100 200 300
Meters

Coordinate System:
NAD 1983 UTM Zone 17N

RICE COMMERCIAL GROUP LIMITED
18725 MCCOWAN ROAD, EAST GWILLIMBURY, ONTARIO
SITE ALTERATION PERMIT APPLICATION & SUPPORTING FILL MANAGEMENT PLAN

HYDROGEOLOGICAL ASSESSMENT
MECP WATER WELL REPORTS

11139891-226
Aug 2, 2019

FIGURE 2.6

GIS File: Q:\GIS\PROJECTS\11139000s\11139891\Layouts\002\11139891-226(002)GIS-WA006.mxd

Source: MNRF NRVIS, 2017. Produced by GHD under licence from Ontario Ministry of Natural Resources and Forestry, © Queen's Printer 2019.
Imagery: Regional Municipality of York 2018 orthoimagery.

0 50 100 150
Meters

Coordinate System:
NAD 1983 UTM Zone 17N

N

GHD

RICE COMMERCIAL GROUP LIMITED
18725 MCCOWAN ROAD, EAST GWILLIMBURY, ONTARIO
SITE ALTERATION PERMIT APPLICATION & SUPPORTING FILL MANAGEMENT PLAN

HYDROGEOLOGICAL ASSESSMENT
INVESTIGATIVE LOCATIONS

11139891-226
Aug 14, 2019

FIGURE 3.1

GIS File: Q:\GIS\PROJECTS\11139000s\11139891\Layouts\002\11139891-226(002)GIS-WA009.mxd

Source: ESRI Topographic Basemap, Accessed 2020, Image ©2020 Google, Imagery date: 06/19/2015

0 130 260 390
Meters

Coordinate System:
NAD 1983 UTM Zone 17N

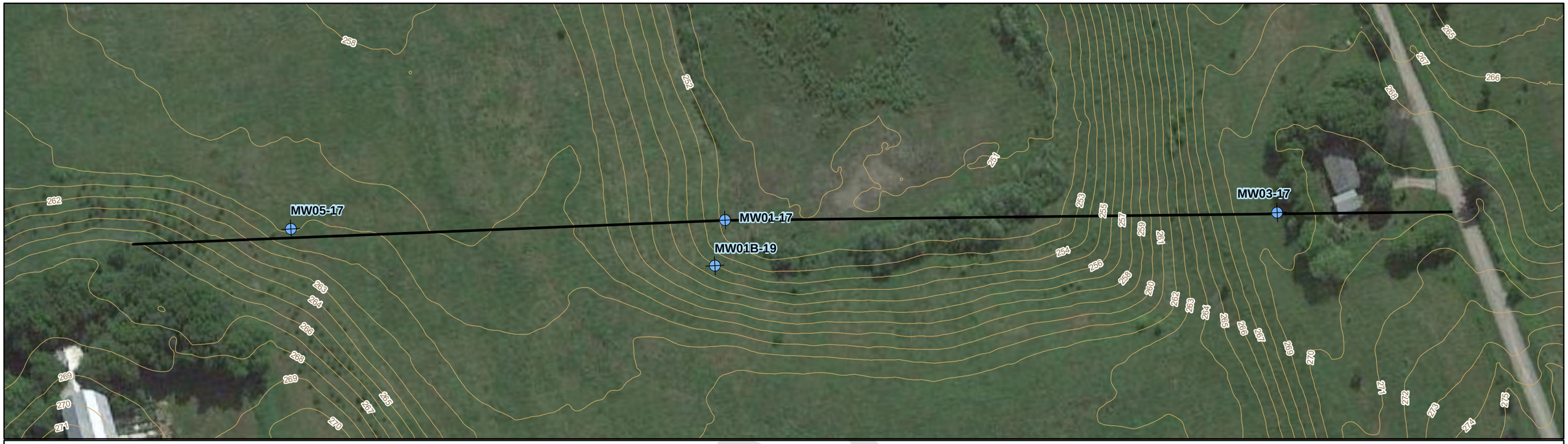
RICE COMMERCIAL GROUP LIMITED
18725 MCCOWAN ROAD, EAST GWILLIMBURY, ONTARIO
SITE ALTERATION PERMIT APPLICATION & SUPPORTING FILL MANAGEMENT PLAN
HYDROGEOLOGICAL ASSESSMENT

11139891
Mar 30, 2020

RESIDENTIAL WELL SURVEY LOCATIONS

FIGURE 3.2

GIS File: Q:\GIS\PROJECTS\11139000s\11139891\Layouts\002\11139891-226(002)GIS-OT001.mxd



Source: Imagery Google 2018

0 10 20 30
Meters
Coordinate System:
NAD 1983 UTM Zone 17N

Legend

- Monitoring Well
- Groundwater Depth (mAMSL)
- Water Table
- Topographic / Cross-Section Line
- Contour (mAMSL)
- Well Screen

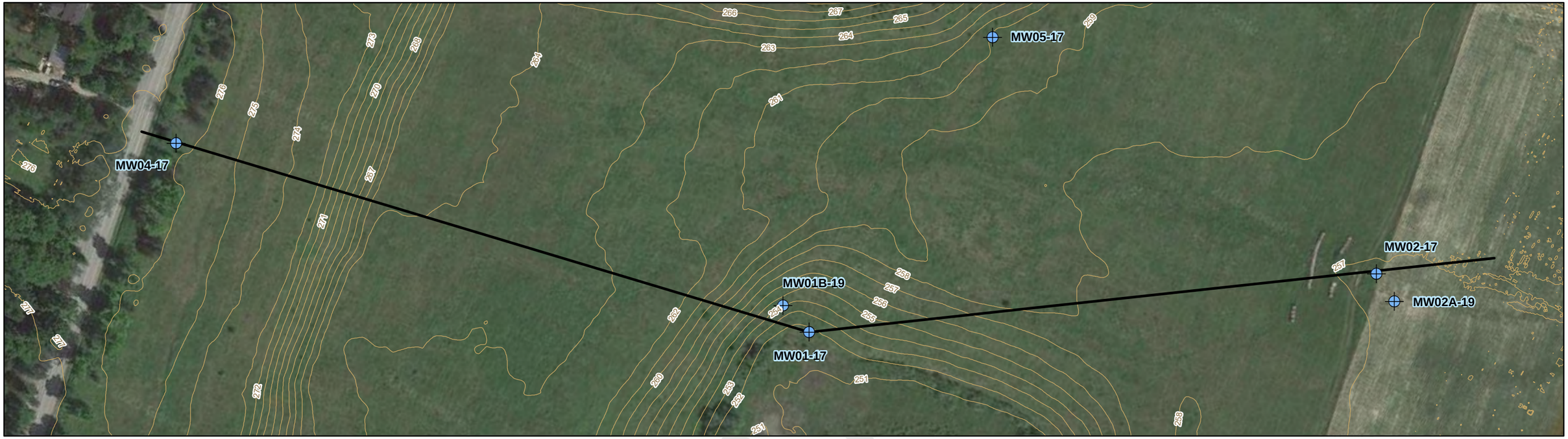
RICE COMMERCIAL GROUP LIMITED
18725 MCCOWAN ROAD, EAST GWILLIMBURY, ONTARIO
SITE ALTERATION PERMIT APPLICATION & SUPPORTING FILE MANAGMENT PLAN

HYDROGEOLOGICAL ASSESSMENT
CROSS SECTION - A - A'

11139891-2.2.6
Mar 25, 2020

FIGURE 4.1

GIS File: Q:\GIS\PROJECTS\11139000s\11139891\Layouts\002\11139891-226(002)GIS-WA011.mxd



Source: Imagery Google 2018

0 15 30 45
Meters

Coordinate System:
NAD 1983 UTM Zone 17N

Legend

- Monitoring Well
- Groundwater Depth (mAMSL)
- Water Table
- Topographic / Cross-Section Line
- Contour (mAMSL)
- Well Screen

RICE COMMERCIAL GROUP LIMITED
18725 MCCOWAN ROAD, EAST GWILLIMBURY, ONTARIO
SITE ALTERATION PERMIT APPLICATION & SUPPORTING FILE MANAGMENT PLAN

HYDROGEOLOGICAL ASSESSMENT
CROSS SECTION - B - B'

11139891-2.2.6
Mar 27, 2020

FIGURE 4.2

GIS File: Q:\GIS\PROJECTS\11139000s\11139891\Layouts\002\11139891-226(002)GIS-WA012.mxd

Source: MNRF NRVIS, 2017. Produced by GHD under licence from Ontario Ministry of Natural Resources and Forestry, © Queen's Printer 2020.
Imagery: Google Maps

0 50 100 150
Meters

Coordinate System:
NAD 1983 UTM Zone 17N

N

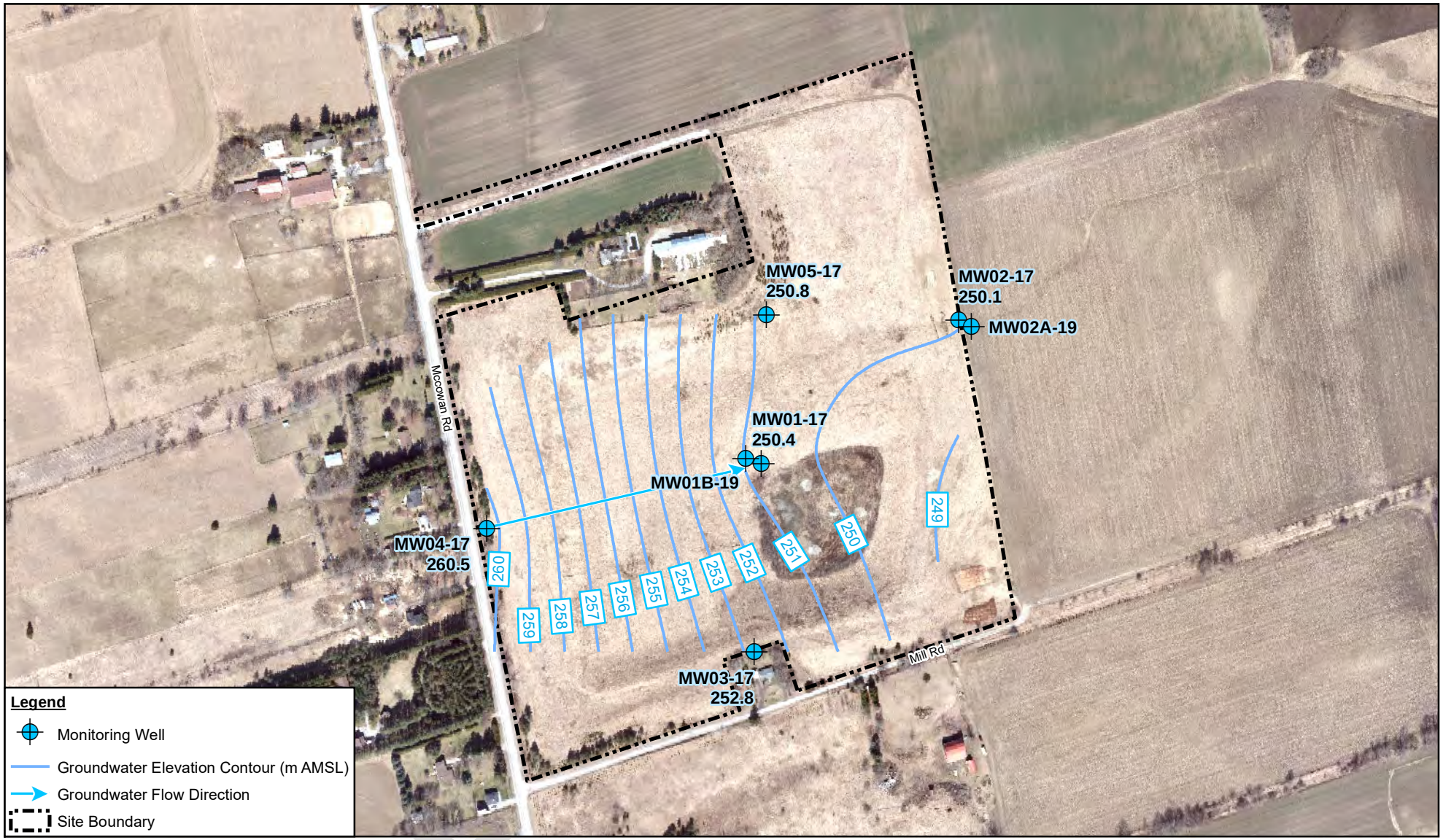
GHD

RICE COMMERCIAL GROUP LIMITED
18725 MCCOWAN ROAD, EAST GWILLIMBURY, ONTARIO
SITE ALTERATION PERMIT APPLICATION & SUPPORTING FILL MANAGEMENT PLAN
HYDROGEOLOGICAL ASSESSMENT
DEPTH TO WATER TABLE (NOVEMBER 29/30, 2017)

11139891-226
Mar 24, 2020

FIGURE 4.3

GIS File: Q:\GIS\PROJECTS\11139000s\11139891\Layouts\002\11139891-226(002)GIS-WA013.mxd



Source: MNRF NRVIS, 2017. Produced by GHD under licence from Ontario Ministry of Natural Resources and Forestry, © Queen's Printer 2020.
Imagery: Regional Municipality of York 2016 orthoimagery.

0 50 100 150
Meters

Coordinate System:
NAD 1983 UTM Zone 17N

RICE COMMERCIAL GROUP LIMITED
18725 MCCOWAN ROAD, EAST GWILLIMBURY, ONTARIO
SITE ALTERATION PERMIT APPLICATION & SUPPORTING FILL MANAGEMENT PLAN
HYDROGEOLOGICAL ASSESSMENT
GROUNDWATER ELEVATION CONTOURS (NOVEMBER 29/30, 2017)

11139891-226
Mar 24, 2020

FIGURE 4.4

GIS File: Q:\GIS\PROJECTS\11139000s\11139891\Layouts\002\11139891-226(002)GIS-WA010.mxd

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0 50 100 150
Meters

Coordinate System:
NAD 1983 UTM Zone 17N

RICE COMMERCIAL GROUP LIMITED
18725 MCCOWAN ROAD, EAST GWILLIMBURY, ONTARIO
SITE ALTERATION PERMIT APPLICATION & SUPPORTING FILL MANAGEMENT PLAN
HYDROGEOLOGICAL ASSESSMENT
POTENTIAL GROUNDWATER RECEPTORS

11139891-226
Aug 2, 2019

FIGURE 5.1

GIS File: Q:\GIS\PROJECTS\11139000s\11139891\Layouts\002\11139891-226(002)GIS-WA016.mxd

Tables

Table 3.1

Monitoring Well Completion Details
Hydrogeological Assessment
Site Alteration Permit Application & Supporting Fill Management Plan
18725 McCowan Road, East Gwillimbury, Ontario
Rice Commercial Group Limited

Well No.	Completion Date	Northing	Easting	Ground Elevation (mAMSL)	Top of Riser Elevation (mAMSL)	Total Depth Drilled (mBGS)	Screened Interval (mBGS)		Screened Interval (mAMSL)		Sand Pack Interval (mBGS)		Sand Pack Interval (mAMSL)		Screened Geologic Material
							Top	Bottom	Top	Bottom	Top	Bottom	Top	Bottom	
MW1-17	6-Nov-2017	4886068	632961	251.7958	252.586	9.47	5.84	8.89	245.95	242.90	5.18	8.89	246.61	242.90	Sand and Gravel
MW1B-19	7-Aug-2019	4886071	632947	251.367	252.287	3.66	1.52	3.05	249.84	248.32	0.91	3.66	250.45	247.71	Sand, Gravel
MW2A-19	9-Aug-2019	4886191	633151	257.062	257.962	24.36	21.34	24.38	235.73	232.68	20.73	24.38	236.34	232.68	Sand, Silt
MW2-17	8-Nov-2017	4886197	633140	256.8676	257.718	17.20	9.09	12.14	247.78	244.73	8.53	13.41	248.33	243.46	Sand, Silt
MW3-17	17-Nov-2017	4885897	632955	268.7367	269.639	25.91	17.77	20.82	250.97	247.92	16.25	22.86	252.49	245.88	Clay
MW4-17	15-Nov-2017	4886009	632712	276.1067	276.962	30.48	16.76	19.81	259.34	256.29	16.31	22.25	259.80	253.86	Clay
MW5-17	9-Nov-2017	4886202	632966	260.0054	260.860	14.15	9.39	12.44	250.62	247.57	8.23	13.72	251.78	246.29	Sand

Notes:

mBGS metres Below Ground Surface
mASD metres Above Site Datum (Reference taken to be the site benchmark with an elevation of 281.476 mASD).

Table 3.2

Summary of Groundwater Levels (mBGS)
Hydrogeological Assessment
Site Alteration Permit Application & Supporting Fill Management Plan
18725 McCowan Road, East Gwillimbury, Ontario
Rice Commercial Group Limited

	MW1-17	MW2-17	MW3-17	MW4-17	MW5-17
Top of Riser (mAMSL)	252.59	257.72	269.64	276.96	260.86
Ground Surface (mAMSL)	251.80	256.87	268.74	276.11	260.01
29-Nov-17	1.36	6.74	-	-	-
30-Nov-17	-	-	15.98	15.64	9.26
1-Dec-17	-	7.58	16.91	16.65	10.24
4-Dec-17	-	-	-	16.61	10.18
30-May-18	1.85	7.23	16.87	16.69	8.36
11-Dec-18	2.21	7.59	16.93	16.73	10.16

Notes:

-	No data available
mBGS	metres below ground surface
mAMSL	metres above mean sea level

Table 3.3

Summary of Groundwater Levels (mAMSL)
Hydrogeological Assessment
Site Alteration Permit Application & Supporting Fill Management Plan
18725 McCowan Road, East Gwillimbury, Ontario
Rice Commercial Group Limited

	MW01-17	MW02-17	MW03-17	MW04-17	MW05-17
Top of Riser (mAMSL)	252.59	257.72	269.64	276.96	260.86
Ground Surface (mAMSL)	251.80	256.87	268.74	276.11	260.01
29-Nov-17	250.43	250.12	-	-	-
30-Nov-17	-	-	252.76	260.47	250.75
1-Dec-17	-	249.29	251.82	259.46	249.77
4-Dec-17	-	-	-	259.50	249.83
30-May-18	249.95	249.64	251.87	259.42	251.65
11-Dec-18	249.59	249.28	251.81	259.38	249.85

Notes:

-	No data available
mBGS	metres below ground surface
mAMSL	metres above mean sea level

Table 3.4

Summary of Hydraulic Conductivity
Hydrogeological Assessment
Site Alteration Permit Application & Supporting Fill Management Plan
18725 McCowan Road, East Gwillimbury, Ontario
Rice Commercial Group Limited

Borehole ID	Geologic Unit (Screened):	Depth (mBGS)		Method	Hydraulic Conductivity[(1)] (m/s)	Hydraulic Conductivity[(1)] (cm/s)
MW1-17	Sand and Gravel	8.84	Falling	Bouwer-Rice	4.0E-04	3.98E-02
				Hvorslev	5.6E-04	5.60E-02
			Rising	Bouwer-Rice	3.5E-04	3.49E-02
				Hvorslev	8.6E-04	8.61E-02
MW2-17	Sand, Silt	17.2	Falling	Bouwer-Rice	3.5E-04	3.53E-02
				Hvorslev	4.9E-04	4.88E-02
			Rising	Bouwer-Rice	3.6E-04	3.57E-02
				Hvorslev	5.1E-04	5.13E-02
					Geometric Mean	**4.63E-02**
MW3-17	Clay w/ Sand and Gravel	25.9	Rising	Bouwer-Rice	2.3E-05	2.27E-03
				Hvorslev	3.3E-05	3.33E-03
					Geometric Mean	**2.75E-03**

Table 3.5

Summary of Groundwater Analytical Results - General Chemistry
Site Alteration Permit Application & Supporting Fill Management Plan
Hydrogeological Assessment
18725 McCowan Road, East Gwillimbury, Ontario
Rice Commercial Group Limited

Sample Location:				**MW2-17**	**MW3-17**
Sample ID:				**GW-11139891-121217-SH-001**	**GW-11139891-121217-SH-002**
Sample Date:				**12/12/2017**	**12/12/2017**
Parameters	**Units**	**ODWQS[(1)]**			
Bio					
Background bacteria	cfu/100mL	-	-	ND(0)	ND(0)
Escherichia coli	cfu/100mL	0	MAC	ND()	ND()
Total coliform bacteria	cfu/100mL	0	MAC	ND()	ND()
Metals					
Aluminum	mg/L	0.10	OG	**2.7**	**23**
Antimony	mg/L	0.006	IMAC	ND(0.0005)	ND(0.0005)
Arsenic	mg/L	0.025	IMAC	0.0019	0.0064
Barium	mg/L	1.0	IMAC	0.081	0.32
Beryllium	mg/L	-	-	ND(0.0005)	0.0009
Boron	mg/L	5.0	IMAC	0.022	0.038
Cadmium	mg/L	0.005	MAC	ND(0.0001)	0.00017
Calcium (dissolved)	mg/L	-	-	110	140
Chromium	mg/L	0.05	MAC	0.025	**0.43**
Cobalt	mg/L	-	-	0.005	0.014
Copper	mg/L	1.0	AO	0.012	0.051
Iron	mg/L	0.30	AO	**6.7**	**55**
Lead	mg/L	0.01	MAC	0.0039	**0.015**
Magnesium (dissolved)	mg/L	-	-	20	33
Manganese	mg/L	0.05	AO	**0.31**	**1.3**
Molybdenum	mg/L	-	-	0.0014	0.015
Nickel	mg/L	-	-	0.0089	0.042
Phosphorus	mg/L	-	-	0.36	2
Potassium (dissolved)	mg/L	-	-	1.2	2.3
Selenium	mg/L	0.01	MAC	ND(0.002)	ND(0.002)
Silver	mg/L	-	-	ND(0.0001)	ND(0.0001)
Sodium	mg/L	20	AO	6.8	8.8
Sodium (dissolved)	mg/L	20	AO	5.9	6.5
Thallium	mg/L	-	-	0.000082	0.00026
Tungsten	mg/L	-	-	0.0011	0.0023
Uranium	mg/L	0.02	MAC	0.00063	0.0024
Vanadium	mg/L	-	-	0.0079	0.043
Zinc	mg/L	5.0	AO	0.068	0.1
Zirconium	mg/L	-	-	0.0014	0.0088
Wet					
%difference/ion balance	%	-	-	4.48	2.81
Alkalinity, bicarbonate (calculated)	mg/L	-	-	330	470
Alkalinity, carbonate (calculated)	mg/L	-	-	2.3	2.4
Alkalinity, total (as CaCO3)	mg/L	30-500	OG	330	480
Ammonia-N	mg/L	-	-	ND(0.050)	0.12
Chloride (dissolved)	mg/L	250	AO	13	6.8
Color	TCU	5	AO	ND(2)	ND(2)
Cyanide (free)	mg/L	-	-	ND(0.001)	ND(0.001)
Dissolved organic carbon (DOC) (dissolved)	mg/L	-	-	1.4	2.2
Fluoride	mg/L	1.5	MAC	ND(0.10)	ND(0.10)
Hardness	mg/L	80-100	OG	**360**	**480**
Nitrate (as N)	mg/L	10.0	MAC	7.44	3.49
Nitrite (as N)	mg/L	1.0	MAC	0.012	0.180
Nitrite/Nitrate	mg/L	10.0	MAC	7.46	3.67
Nitrogen, organic	mg/L	0.15	OG	ND(0.10)	**1.2**
Orthophosphate	mg/L	-	-	ND(0.010)	ND(0.010)
pH, field	s.u.	6.5-8.5	OG	7.07	6.89
pH, lab	s.u.	6.5-8.5	OG	7.86	7.73
Phosphorus	mg/L	-	-	0.20	1.2
Sulfate (dissolved)	mg/L	500	AO	28	29
Sulfide	mg/L	0.05	AO	ND(0.020)	ND(0.020)
Temperature, field	Deg C	15	AO	8.13	7.74
Total dissolved solids (TDS)	mg/L	500	AO	325	430
Total kjeldahl nitrogen (TKN)	mg/L	-	-	ND(0.50)	1.3
Total suspended solids (TSS)	mg/L	-	-	510	2400
Turbidity	NTU	5.0	MAC	**11**	**1400**
Un-ionized ammonia	mg/L	-	-	ND(0.0005)	ND(0.0005)

NOTES

(1) O.Reg. 169/03: Ontario Drinking Water Quality Standards
ND Not detected at the associated reporting limit.
2.7 Concentration exceeds ODWQS
CFU Colony Forming Unit
MAC Maximum Allowable Concentration
AO Aesthetic Objective
IMAC Interim Maximum Allowable Concentration

Table 3.6

Summary of Groundwater Analytical Results - Environmental
Site Alteration Permit Application & Supporting Fill Management Plan
Hydrogeological Assessment
18725 McCowan Road, East Gwillimbury, Ontario
Rice Commercial Group Limited

		Sample Location:	**MW1-17**	**MW2-17**	**MW2-17**	**MW3-17**	**MW4-17**	**MW5-17**	**TRIPBLANK**
		Sample Identification:	**GW-11139891-061118-NC-003**	**GW-11139891-061118-NC-001**	**GW-11139891-061118-NC-002**	**GW-11139891-061118-NC-006**	**GW-11139891-061118-NC-005**	**GW-11139891-061118-NC-004**	**TRIP BLANK LOT# 3489**
		Sample Date:	**6/11/2018**	**6/11/2018**	**6/11/2018**	**6/11/2018**	**6/11/2018**	**6/11/2018**	**6/11/2018**
					Duplicate				
Parameters	**Units**	**MOECC Table 2 Standards [1]**							
Metals									
Antimony (dissolved)	ug/L	6	ND(0.50) /ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-
Arsenic (dissolved)	ug/L	25	ND(1.0) /ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	-
Barium (dissolved)	ug/L	1000	63 /64	36	37	74	57	83	-
Beryllium (dissolved)	ug/L	4	ND(0.50) /ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-
Boron (dissolved)	ug/L	5000	ND(10) /ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	11	-
Cadmium (dissolved)	ug/L	2.7	ND(0.10) /ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	-
Chromium (dissolved)	ug/L	50	ND(5.0) /ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	-
Chromium VI (hexavalent)	ug/L	25	ND(0.50)	0.57	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-
Cobalt (dissolved)	ug/L	3.8	ND(0.50) /ND(0.50)	ND(0.50)	ND(0.50)	0.51	ND(0.50)	0.74	-
Copper (dissolved)	ug/L	87	6.6 /6.8	6.0	ND(1.0)	ND(1.0)	4.9	ND(1.0)	-
Lead (dissolved)	ug/L	10	ND(0.50) /ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-
Mercury	ug/L	0.29	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1) /ND(0.1)	-
Molybdenum (dissolved)	ug/L	70	ND(0.50) /0.52	ND(0.50)	0.66	7.9	17	0.69	-
Nickel (dissolved)	ug/L	100	ND(1.0) /ND(1.0)	ND(1.0)	ND(1.0)	5.7	4.2	ND(1.0)	-
Selenium (dissolved)	ug/L	10	ND(2.0) /ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	-
Silver (dissolved)	ug/L	1.5	ND(0.10) /ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	-
Sodium (dissolved)	ug/L	490000	6800 /6900	7200	7200	5500	13000	5100	-
Thallium (dissolved)	ug/L	2	ND(0.050) /ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Uranium (dissolved)	ug/L	20	0.76 /0.75	0.35	0.38	0.58	0.79	0.77	-
Vanadium (dissolved)	ug/L	6.2	ND(0.50) /ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-
Zinc (dissolved)	ug/L	1100	6.6 /6.5	5.9	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	-
Petrl Prod									
Petroleum hydrocarbons F1 (C6-C10)	ug/L	750	ND(25)	ND(25)	ND(25)	ND(25)	ND(25)	ND(25)	ND(25)
Petroleum hydrocarbons F1 (C6-C10) - less BTEX	ug/L	750	ND(25)	ND(25)	ND(25)	ND(25)	ND(25)	ND(25)	ND(25)
Petroleum hydrocarbons F2 (C10-C16)	ug/L	150	ND(100)	ND(100)	ND(100)	ND(100)	ND(100)	ND(100)	-
Petroleum hydrocarbons F3 (C16-C34)	ug/L	500	ND(200)	ND(200)	ND(200)	ND(200)	ND(200)	ND(200)	-
Petroleum hydrocarbons F4 (C34-C50)	ug/L	500	ND(200)	ND(200)	ND(200)	ND(200)	ND(200)	ND(200)	-
SVOAs									
1+2-Methylnaphthalene	ug/L	3.2	ND(0.071)	ND(0.071)	ND(0.071)	ND(0.071)	ND(0.071)	ND(0.071)	-
1-Methylnaphthalene	ug/L	3.2	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
2-Methylnaphthalene	ug/L	3.2	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Acenaphthene	ug/L	4.1	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Acenaphthylene	ug/L	1	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Anthracene	ug/L	2.4	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Benzo(a)anthracene	ug/L	1	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Benzo(a)pyrene	ug/L	0.01	ND(0.010)	ND(0.010)	ND(0.010)	ND(0.010)	ND(0.010)	ND(0.010)	-
Benzo(b)fluoranthene/Benzo(j)fluoranthene	ug/L	0.1	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Benzo(g,h,i)perylene	ug/L	0.2	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Benzo(k)fluoranthene	ug/L	0.1	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Chrysene	ug/L	0.1	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Dibenz(a,h)anthracene	ug/L	0.2	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Fluoranthene	ug/L	0.41	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Fluorene	ug/L	120	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Indeno(1,2,3-cd)pyrene	ug/L	0.2	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Naphthalene	ug/L	11	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Phenanthrene	ug/L	1	ND(0.030)	ND(0.030)	ND(0.030)	ND(0.030)	ND(0.030)	ND(0.030)	-
Pyrene	ug/L	4.1	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
VOAs									
1,1,1,2-Tetrachloroethane	ug/L	1.1	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
1,1,1-Trichloroethane	ug/L	200	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
1,1,2,2-Tetrachloroethane	ug/L	1	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
1,1,2-Trichloroethane	ug/L	4.7	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
1,1-Dichloroethane	ug/L	5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
1,1-Dichloroethene	ug/L	1.6	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
1,2-Dibromoethane (Ethylene dibromide)	ug/L	0.2	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
1,2-Dichlorobenzene	ug/L	3	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
1,2-Dichloroethane	ug/L	1.6	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
1,2-Dichloropropane	ug/L	5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
1,3-Dichlorobenzene	ug/L	59	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
1,4-Dichlorobenzene	ug/L	1	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	1800	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	640	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
Acetone	ug/L	2700	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Benzene	ug/L	5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Bromodichloromethane	ug/L	16	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Bromoform	ug/L	25	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Bromomethane (Methyl bromide)	ug/L	0.89	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)

Table 3.6

Summary of Groundwater Analytical Results - Environmental
Site Alteration Permit Application & Supporting Fill Management Plan
Hydrogeological Assessment
18725 McCowan Road, East Gwillimbury, Ontario
Rice Commercial Group Limited

		Sample Location:	**MW1-17**	**MW2-17**	**MW2-17**	**MW3-17**	**MW4-17**	**MW5-17**	**TRIPBLANK**
		Sample Identification:	**GW-11139891-061118-NC-003**	**GW-11139891-061118-NC-001**	**GW-11139891-061118-NC-002**	**GW-11139891-061118-NC-006**	**GW-11139891-061118-NC-005**	**GW-11139891-061118-NC-004**	**TRIP BLANK LOT# 3489**
		Sample Date:	**6/11/2018**	**6/11/2018**	**6/11/2018**	**6/11/2018**	**6/11/2018**	**6/11/2018**	**6/11/2018**
					Duplicate				
Parameters	**Units**	**MOECC Table 2 Standards [(1)]**							
Carbon tetrachloride	ug/L	0.79	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Chlorobenzene	ug/L	30	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Chloroform (Trichloromethane)	ug/L	2.4	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Chromatogram to baseline at nC50	ug/L	-	ND() YES	ND() YES	ND() YES	ND() YES	ND() YES	ND() YES	-
cis-1,2-Dichloroethene	ug/L	1.6	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
cis-1,3-Dichloropropene	ug/L	-	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)
cis-1,3-Dichloropropene/trans-1,3-Dichloropropene total	ug/L	0.5	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Dibromochloromethane	ug/L	25	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Dichlorodifluoromethane (CFC-12)	ug/L	590	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Ethylbenzene	ug/L	2.4	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Hexane	ug/L	51	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
m&p-Xylenes	ug/L	-	ND(0.20)	ND(0.20)	ND(0.20)	0.23	ND(0.20)	ND(0.20)	ND(0.20)
Methyl tert butyl ether (MTBE)	ug/L	15	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Methylene chloride	ug/L	50	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
o-Xylene	ug/L	-	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Styrene	ug/L	5.4	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Tetrachloroethene	ug/L	1.6	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Toluene	ug/L	24	ND(0.20)	ND(0.20)	ND(0.20)	0.37	ND(0.20)	0.22	ND(0.20)
trans-1,2-Dichloroethene	ug/L	1.6	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
trans-1,3-Dichloropropene	ug/L	-	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)
Trichloroethene	ug/L	1.6	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Trichlorofluoromethane (CFC-11)	ug/L	150	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Vinyl chloride	ug/L	0.5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Xylenes (total)	ug/L	300	ND(0.20)	ND(0.20)	ND(0.20)	0.23	ND(0.20)	ND(0.20)	ND(0.20)
Wet									
Chloride (dissolved)	ug/L	790000	5200	11000	11000	4400	7100	3500	-
Cyanide (free)	ug/L	66	ND(1)	ND(1) /ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	-

Notes:

[(1)] Ontario Ministry of the Environment of Climate Change (MOECC), "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", April 15, 2011. Table 2 (Potable) for Coarse Grained Soils and All Types of Property Uses.

ug/L micrograms per litre
NV No value
-- Not analyzed
ND(0.20) Not detected above laboratory method detection limit indicated in brackets

Table 3.7

Summary of Residential Well Surveys
Site Alteration Permit Application & Supporting Fill Management Plan
Hydrogeological Assessment
18725 McCowan Road, East Gwillimbury, Ontario
Rice Commercial Group Limited

Location ID	Survey Status	Well Type	Water Treatment	Water Usage Type	Well Used for Drinking Water	Pump Type	Static Water Level (mBTOC)	Water Sample Collected	Water Sample Source	Untreated Sample?
Survey Completed or Resident Contacted.										
2A	Completed	Drilled	No	-	-	Submersible	-	Yes	Storage Garage	Yes
2B	Completed	Drilled	Yes	Domestic, Farm, Commercial	Yes	Submersible	-	Yes	Basement	Yes
3	Completed	Drilled	Non-functioning	Domestic	Yes	Submersible	Not accessible	Yes	Outdoor Hose Tap	Yes
6	Completed	Drilled	Yes	Domestic	Yes	Non-functioning submersible (stuck in well)	-		-	-
7	Completed	Drilled	Yes	Domestic	Yes	Submersible	8.53		-	-
9	Completed	Unknown	Yes	Domestic	-	-	-		-	-
13	Completed	Drilled	Yes	Domestic	Yes	Submersible	12.51		-	-
15	Completed	Drilled	No	Domestic	Yes	Submersible	32.33	Yes	Outdoor Hose Tap	Yes
16	Completed	Drilled	Yes	Domestic	Yes	Submersible	17.97	Yes	Outdoor Hose Tap	Yes
20	Completed	Drilled	Unknown	Domestic	no, bottled water	Submersible	-		-	-
24	Completed	Drilled	None	-	-	-	-	Yes	Outdoor Hose Tap	Unknown
26 (18725B McCowan Road)	Completed (2018)	Drilled	Yes	Domestic	Yes	Submersible	18.26	Yes	Outdoor Hose Tap	Yes
27 (18725 McCowan Road)	Completed (2018)	Drilled	Yes	Domestic	-	-	23.88	Yes	Outdoor Hose Tap	Yes

Notes: "-" data not available

Locations 1, 5, 8, 10, 11, 17, 18, 19, 21, 22, 23 and 25 were not surveyed because the resident could not be contacted or the resident declined to participate.

Table 3.8

Summary of Residential Well Analytical Results - General Chemistry
Site Alteration Permit Application & Supporting Fill Management Plan
Hydrogeological Assessment
18725 McCowan Road, East Gwillimbury, Ontario
Rice Commercial Group Limited

Sample Location:				**18725b McCowan Road**	**18725a McCowan Road**	**18725a McCowan Road**
Sample ID:				**RW-11139891-062718-SA-002**	**RW-11139891-062718-SA-003**	**RW-11139891-062718-SA-004**
Sample Date:				**6/27/2018**	**6/27/2018**	**7/23/2019 (Confirmatory Sample)**
Parameters	**Units**	**ODWS**				
Bio						
Background bacteria	cfu/100mL	-	-	0	12	0
Escherichia coli	cfu/100mL	0	MAC	0	**1**	0
Total coliform bacteria	cfu/100mL	0	MAC	0	**1**	0
Metals						
Aluminum	mg/L	0.10	OG	ND(0.005)	ND(0.005)	-
Antimony	mg/L	0.006	IMAC	ND(0.0005)	ND(0.0005)	-
Arsenic	mg/L	0.025	IMAC	ND(0.001)	ND(0.001)	-
Barium	mg/L	1.0	IMAC	ND(0.002)	0.077	-
Beryllium	mg/L	-	-	ND(0.0005)	ND(0.0005)	-
Boron	mg/L	5.0	IMAC	ND(0.01)	0.011	-
Cadmium	mg/L	0.005	MAC	ND(0.0001)	ND(0.0001)	-
Calcium (dissolved)	mg/L	-	-	ND(0.2)	67	-
Chromium	mg/L	0.05	MAC	ND(0.005)	ND(0.005)	-
Cobalt	mg/L	-	-	ND(0.0005)	ND(0.0005)	-
Copper	mg/L	1.0	AO	0.02	ND(0.001)	-
Iron	mg/L	0.30	AO	ND(0.1)	ND(0.1)	-
Lead	mg/L	0.01	MAC	ND(0.0005)	ND(0.0005)	-
Magnesium (dissolved)	mg/L	-	-	ND(0.05)	20	-
Manganese	mg/L	0.05	AO	ND(0.002)	0.013	-
Molybdenum	mg/L	-	-	ND(0.0005)	0.00063	-
Nickel	mg/L	-	-	ND(0.001)	ND(0.001)	-
Phosphorus	mg/L	-	-	ND(0.1)	ND(0.1)	-
Potassium (dissolved)	mg/L	-	-	0.29	2.4	-
Selenium	mg/L	0.01	MAC	ND(0.002)	ND(0.002)	-
Silver	mg/L	-	-	ND(0.0001)	ND(0.0001)	-
Sodium (dissolved)	mg/L	20	AO	**110 / 110**	10 / 11	-
Thallium	mg/L	-	-	ND(0.00005)	ND(0.00005)	-
Tungsten	mg/L	-	-	ND(0.001)	ND(0.001)	-
Uranium	mg/L	0.02	MAC	0.00012	0.00042	-
Vanadium	mg/L	-	-	ND(0.0005)	ND(0.0005)	-
Zinc	mg/L	5.0	AO	0.014	0.047	-
Zirconium	mg/L	-	-	ND(0.001)	ND(0.001)	-
Wet						
%difference/ion balance	%	-	-	1.60	1.85	-
Alkalinity, bicarbonate (calculated)	mg/L	-	-	200	210	-
Alkalinity, carbonate (calculated)	mg/L	-	-	2.7	1.9	-
Alkalinity, total (as CaCO3)	mg/L	30-500	OG	200	220	-
Ammonia-N	mg/L	-	-	ND(0.050)	ND(0.050)	-
Chloride (dissolved)	mg/L	250	AO	6.5	21	-
Color	TCU	5	AO	ND(2)	3	-
Cyanide (free)	mg/L	-	-	ND(0.001)	ND(0.001)	-
Dissolved organic carbon (DOC) (dissolved)	mg/L	-	-	0.90	0.70	-
Fluoride	mg/L	1.5	MAC	0.14	ND(0.10)	-
Hardness	mg/L	80-100	OG	ND(1.0)	**250**	-
Nitrate (as N)	mg/L	10.0	MAC	ND(0.10)	0.38	-
Nitrite (as N)	mg/L	1.0	MAC	ND(0.010)	0.059	-
Nitrite/Nitrate	mg/L	10.0	MAC	ND(0.10)	0.44	-
Nitrogen, organic	mg/L	0.15	OG	ND(0.10)	ND(0.10)	-
Orthophosphate	mg/L	-	-	ND(0.010)	ND(0.010)	-
pH, lab	s.u.	6.5-8.5	OG	8.16	7.97	-
Phosphorus	mg/L	-	-	ND(0.004)	ND(0.004)	-
Sulfate (dissolved)	mg/L	500	AO	27	38	-
Sulfide	mg/L	0.05	AO	ND(0.020)	ND(0.020)	-
Total dissolved solids (TDS)	mg/L	500	AO	410	440	-
Total kjeldahl nitrogen (TKN)	mg/L	-	-	ND(0.10)	ND(0.10)	-
Total suspended solids (TSS)	mg/L	-	-	ND(1)	ND(1)	-
Turbidity	NTU	5.0	MAC	0.2	0.5	-

Footnotes:

ND	Not detected at the associated reporting limit.
110 / 110	Concentration exceeds ODWQS
MAC	Maximum Allowable Concentration (Health Concern)
OG	Operation Guideline
AO	Aesthetic Objective

Table 3.9

Summary of Residential Well Analytical Results - Metals, PHC, VOC
Site Alteration Permit Application & Supporting Fill Management Plan
Hydrogeological Assessment
18725 McCowan Road, East Gwillimbury, Ontario
Rice Commercial Group Limited

Sample Location:			**2A**	**2B**	**3**	**15**	**16B**	**24**	**18725 McCowan Road**	**18725B McCowan Road**
Sample ID:			**RW-11139891-082119-SH002**	**RW-11139891-082119-SH001**	**RW-11139891-082119-SH003**	**RW-11139891-082119-SH004**	**RW-11139891-082119-SH008**	**RW-11139891-082119-SH007**	**RW-11139891-082119-SH006**	**RW-11139891-082119-SH005**
Sample Date:			**8/21/2019**	**8/21/2019**	**8/21/2019**	**8/21/2019**	**8/21/2019**	**8/21/2019**	**8/21/2019**	**8/21/2019**
Parameters	**Units**	**Table 2 Standards[1]**								
Metals										
Antimony (dissolved)	ug/L	6	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Arsenic (dissolved)	ug/L	25	2.2	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Barium (dissolved)	ug/L	1000	120	180	140	120	74	120	81	ND(2.0)
Beryllium (dissolved)	ug/L	4	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Cadmium (dissolved)	ug/L	2.7	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Chromium (dissolved)	ug/L	50	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
Chromium VI (hexavalent)	ug/L	25	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	0.99	ND(0.50)	ND(0.50)	1.3
Cobalt (dissolved)	ug/L	3.8	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Copper (dissolved)	ug/L	87	2.3	12	13	**140**	**98**	86	ND(1.0)	47
Lead (dissolved)	ug/L	10	ND(0.50)	1.4	ND(0.50)	ND(0.50)	0.81	ND(0.50)	ND(0.50)	ND(0.50)
Mercury	ug/L	0.29	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)
Molybdenum (dissolved)	ug/L	70	ND(0.50)	ND(0.50)	ND(0.50)	0.52	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Nickel (dissolved)	ug/L	100	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Selenium (dissolved)	ug/L	10	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
Silver (dissolved)	ug/L	1.5	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Sodium (dissolved)	ug/L	490000	3400	110000	56000	3800	6300	16000	9600	110000
Thallium (dissolved)	ug/L	2	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)
Uranium (dissolved)	ug/L	20	0.12	0.45	0.42	ND(0.10)	0.46	0.54	0.36	ND(0.10)
Vanadium (dissolved)	ug/L	6.2	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	0.57	ND(0.50)	ND(0.50)	ND(0.50)
Zinc (dissolved)	ug/L	1100	ND(5.0)	33	26	31	6.7	11	21	9.2
Petrl Prod										
Chromatogram to baseline at nC50	ug/L	-	ND() YES	ND() YES	ND() YES	ND() YES	ND() YES	ND() YES	ND() YES	ND() YES
Petroleum hydrocarbons F1 (C6-C10)	ug/L	750	ND(25)	ND(25)	ND(25)	ND(25)	ND(25)	ND(25)	ND(25)	ND(25)
Petroleum hydrocarbons F1 (C6-C10) - less BTEX	ug/L	750	ND(25)	ND(25)	ND(25)	ND(25)	ND(25)	ND(25)	ND(25)	ND(25)
Petroleum hydrocarbons F2 (C10-C16)	ug/L	150	ND(100)	ND(100)	ND(100)	ND(100)	ND(100)	ND(100)	ND(100)	ND(100)
Petroleum hydrocarbons F3 (C16-C34)	ug/L	500	ND(200)	ND(200)	ND(200)	ND(200)	ND(200)	ND(200)	ND(200)	ND(200)
Petroleum hydrocarbons F4 (C34-C50)	ug/L	500	ND(200)	ND(200)	ND(200)	ND(200)	ND(200)	ND(200)	ND(200)	ND(200)
VOAs										
1,1,1,2-Tetrachloroethane	ug/L	1.1	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
1,1,1-Trichloroethane	ug/L	200	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
1,1,2,2-Tetrachloroethane	ug/L	1	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
1,1,2-Trichloroethane	ug/L	4.7	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
1,1-Dichloroethane	ug/L	5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
1,1-Dichloroethene	ug/L	1.6	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
1,2-Dibromoethane (Ethylene dibromide)	ug/L	0.2	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
1,2-Dichlorobenzene	ug/L	3	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
1,2-Dichloroethane	ug/L	1.6	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
1,2-Dichloropropane	ug/L	5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
1,3-Dichlorobenzene	ug/L	59	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
1,4-Dichlorobenzene	ug/L	1	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	1800	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	640	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
Acetone	ug/L	2700	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Benzene	ug/L	5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Bromodichloromethane	ug/L	16	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Bromoform	ug/L	25	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Bromomethane (Methyl bromide)	ug/L	0.89	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Carbon tetrachloride	ug/L	0.79	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Chlorobenzene	ug/L	30	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Chloroform (Trichloromethane)	ug/L	2.4	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
cis-1,2-Dichloroethene	ug/L	1.6	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
cis-1,3-Dichloropropene	ug/L	-	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)
cis-1,3-Dichloropropene/trans-1,3-Dichloropropene total	ug/L	0.5	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Dibromochloromethane	ug/L	25	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Dichlorodifluoromethane (CFC-12)	ug/L	590	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Ethylbenzene	ug/L	2.4	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Hexane	ug/L	51	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
m&p-Xylenes	ug/L	-	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Methyl tert butyl ether (MTBE)	ug/L	15	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Methylene chloride	ug/L	50	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)
o-Xylene	ug/L	-	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Styrene	ug/L	5.4	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Tetrachloroethene	ug/L	1.6	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Toluene	ug/L	24	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
trans-1,2-Dichloroethene	ug/L	1.6	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
trans-1,3-Dichloropropene	ug/L	-	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)
Trichloroethene	ug/L	1.6	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Trichlorofluoromethane (CFC-11)	ug/L	150	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)
Vinyl chloride	ug/L	0.5	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)
Xylenes (total)	ug/L	300	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)

Footnotes:

ND Not detected at the associated reporting limit.
140 Concentration exceeds Table 2 Standards
1) Ontario Ministry of the Environment, April 2011. Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act. Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

Appendices

Appendix A
MECP Well Records

Appendix A.1
Well Record Formation Report

MOECC Water Well Record - Formation Report
11139891 - WWR Report

Well ID: **6900504** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 06(006) Completion Date: 10/14/1965 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632648.7,4885222) [5] Primary Use: Livestock
Depth to bedrock (m): Secondary Use: Domestic
Elevation (masl): 290.650726 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
		MEDIUM SAND	0	15.24
		CLAY MEDIUM SAND	15.24	21.34
		MEDIUM SAND	21.34	36.58
		MEDIUM SAND GRAVEL	36.58	39.62

Well ID: **6900506** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 06(007) Completion Date: 9/19/1966 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632696.7,4885604) [5] Primary Use: Livestock
Depth to bedrock (m): Secondary Use: Domestic
Elevation (masl): 284.986541 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
		TOPSOIL	0	0.3
		TOPSOIL MEDIUM SAND	0.3	11.28
		GRAVEL	11.28	26.82
		GRAVEL MEDIUM SAND	26.82	31.39

Well ID: **6900512** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 06(008) Completion Date: 4/28/1967 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632633.7,4885985) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 275.875946 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
		TOPSOIL	0	0.3
	GREY	*CLAY STONES*	0.3	8.23
		MEDIUM SAND CLAY GRAVEL	8.23	25.91
		MEDIUM SAND	25.91	32.61

Well ID: **6900513** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 06(008) Completion Date: 5/4/1967 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632664.7,4885754) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 280.760192 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	GREY	*CLAY MEDIUM SAND*	0	12.8
		MEDIUM SAND GRAVEL	12.8	19.51
		CLAY GRAVEL	19.51	22.86
		MEDIUM SAND	22.86	29.26

Well ID: **6900515** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 06(009) Completion Date: 7/18/1959 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632550.7,4886301) [5] Primary Use: Livestock
Depth to bedrock (m): Secondary Use: Domestic
Elevation (masl): 270.926788 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
		PREVIOUSLY DUG	0	19.81
		CLAY MEDIUM SAND	19.81	21.34
		COARSE SAND GRAVEL	21.34	27.43

Well ID: **6900518** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 06(010) Completion Date: 7/28/1958 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632461.7,4886833) [9] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: Commerical
Elevation (masl): 259.242706 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
		CLAY MEDIUM SAND	0	15.24
		COARSE SAND GRAVEL	15.24	21.34

Well ID: **6900551** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(006) Completion Date: 12/5/1959 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632884.7,4885228) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 280.327728 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
		FINE SAND	0	18.29
		GRAVEL MEDIUM SAND	18.29	21.34

	STONES	21.34	28.35

Well ID: **6900555** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(008) Completion Date: 12/16/1966 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632935.7,4885827) [5] Primary Use: Livestock
Depth to bedrock (m): Secondary Use: Domestic
Elevation (masl): 270.261322 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
		CLAY	0	0.61
		MEDIUM SAND	0.61	1.83
		GRAVEL	1.83	17.98
		SILT GRAVEL	17.98	31.39
		MEDIUM SAND	31.39	33.53

Well ID: **6900556** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(009) Completion Date: 11/18/1959 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632630.7,4886422) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 269.51715 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
		STONES CLAY	0	15.24
		FINE SAND	15.24	16.76

Well ID: **6900557** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(009) Completion Date: 10/15/1960 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632629.7,4886427) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 269.44403 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
		PREVIOUSLY DUG	0	16.76
		QUICKSAND	16.76	20.12
		COARSE SAND	20.12	22.25

Well ID: **6900559** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(010) Completion Date: 11/29/1958 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632661.7,4886915) [5] Primary Use: Livestock
Depth to bedrock (m): Secondary Use: Domestic
Elevation (masl): 261.057861 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
		PREVIOUSLY DUG	0	10.97
		CLAY MEDIUM SAND	10.97	13.72
		GRAVEL	13.72	16.76
		COARSE SAND	16.76	19.2

Well ID: **6900562** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(010) Completion Date: 5/25/1960 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632577.7,4886713) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 262.168304 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BLUE	*CLAY*	0	6.1
		MEDIUM SAND	6.1	6.71
	BLUE	*CLAY*	6.71	7.62

Well ID: **6900563** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(010) Completion Date: 11/4/1960 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632562.7,4886763) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 261.527496 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
		PREVIOUSLY DUG	0	7.62
		GRAVEL STONES	7.62	14.33
		MEDIUM SAND	14.33	17.98

Well ID: **6900564** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(010) Completion Date: 3/7/1961 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632586.7,4886894) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 261.474761 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
		PREVIOUSLY DUG	0	10.67

	MEDIUM SAND CLAY GRAVEL	10.67	20.12
	MEDIUM SAND	20.12	22.25

Well ID: **6900565** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(010) Completion Date: 12/18/1962 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632567.7,4886799) [5] Primary Use: Livestock
Depth to bedrock (m): Secondary Use: Domestic
Elevation (masl): 261.61795 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
		TOPSOIL	0	0.3
		CLAY BOULDERS	0.3	10.97
		HARDPAN	10.97	12.5
		GRAVEL	12.5	14.33
		GRAVEL MEDIUM SAND	14.33	26.82

Well ID: **6908968** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(010) Completion Date: 3/7/1968 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632574.7,4886873) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 261.582397 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	GREY	*CLAY MEDIUM SAND*	0	2.13
	BLUE	*CLAY*	2.13	7.32
	BLUE	*CLAY GRAVEL*	7.32	9.14
	BLUE	*CLAY*	9.14	16.76
	GREY	*CLAY MEDIUM SAND*	16.76	18.29
		MEDIUM SAND	18.29	19.51

Well ID: **6909561** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(010) Completion Date: 10/31/1969 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632584.7,4886773) [4] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 262.045532 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	YELLOW	*MEDIUM SAND*	0	1.83

	YELLOW	*CLAY STONES*	1.83	24.08
	YELLOW	*MEDIUM SAND*	24.08	25.91

Well ID: **6909980** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 06(006) Completion Date: 8/10/1970 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632754.7,4885253) [4] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 288.647094 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	RED	*MEDIUM SAND*	0	7.01
	RED	*MEDIUM SAND GRAVEL*	7.01	11.89
	RED	*MEDIUM SAND*	11.89	27.43
	BROWN	*MEDIUM SAND CLAY GRAVEL*	27.43	39.62
	RED	*MEDIUM SAND STONES*	39.62	42.67

Well ID: **6911154** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(010) Completion Date: 11/20/1972 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632564.7,4886873) [4] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 261.442779 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*CLAY*	0	9.75
	GREY	*CLAY BOULDERS*	9.75	13.72
	GREY	*CLAY STONES*	13.72	16.15
	RED	*COARSE SAND*	16.15	21.03
	RED	*GRAVEL*	21.03	22.25

Well ID: **6911481** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 06(008) Completion Date: 4/27/1973 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632644.7,4886057) [4] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 275.34851 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	GREY	*CLAY SAND*	0	6.71
	GREY	*SAND*	6.71	23.77

	GREY	*CLAY GRAVEL*	23.77	28.96
		SAND	28.96	31.7

Well ID: **6913216** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 06(008) Completion Date: 3/12/1976 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632576.7,4886132) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 273.678375 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*SAND TOPSOIL*	0	2.13
	BROWN	*GRAVEL*	2.13	3.66
	BROWN	*CLAY*	3.66	21.34
	BROWN	*SAND*	21.34	22.86
	GREY	*CLAY SILT*	22.86	41.45
	GREY	*SILT SAND*	41.45	45.72
	GREY	*SAND*	45.72	47.55

Well ID: **6913347** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 06(006) Completion Date: 6/23/1976 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632764.7,4885223) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 289.587341 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	GREY	*SAND*	0	24.08
	GREY	*SAND GRAVEL*	24.08	36.58
		COARSE SAND	36.58	39.32

Well ID: **6913464** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(009) Completion Date: 7/21/1976 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632624.7,4886543) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 266.036895 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	YELLOW	*CLAY*	0	7.01
	GREY	*CLAY GRAVEL*	7.01	19.81

	BROWN	*SAND*	19.81	21.34

Well ID: **6914542** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(006) Completion Date: 5/4/1978 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632864.7,4885373) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 285.402038 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*SAND DRY*	0	3.05
	BROWN	*CLAY STONES HARD*	3.05	38.1
	BROWN	*GRAVEL CLAY LAYERED*	38.1	40.84
	BROWN	*SAND GRAVEL LOOSE*	40.84	42.67

Well ID: **6917498** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 06(006) Completion Date: 5/8/1985 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632854,4885258) [2] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 282.418273 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*SAND DRY*	0	33.53
	GREY	*SILT SAND SOFT*	33.53	50.29
	GREY	*GRAVEL POROUS*	50.29	53.34

Well ID: **6917596** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(009) Completion Date: 9/5/1985 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632588,4886535) [2] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 266.054077 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BLUE	*CLAY STONES HARD*	0	15.24
	BLUE	*GRAVEL FINE SAND HARD*	15.24	17.98
	GREY	*QUICKSAND POROUS*	17.98	18.29

Well ID: **6918204** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): 06(007) Completion Date: 7/11/1986 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632677,4885372) [4] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 290.174865 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	YELLOW	*CLAY SAND*	0	8.23
	BROWN	*SAND*	8.23	15.24
	BROWN	*GRAVEL SAND*	15.24	25.3
	GREY	*CLAY*	25.3	26.52
	BROWN	*SAND WATER-BEARING*	26.52	28.96
	GREY	*CLAY*	28.96	29.57

Well ID: **6919028** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): 07(007) Completion Date: 9/15/1987 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (633021,4885542) [4] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 269.289001 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*SAND DRY*	0	8.53
	BROWN	*CLAY DENSE*	8.53	12.19
	BROWN	*SAND DRY*	12.19	16.15
	BROWN	*GRAVEL LOOSE*	16.15	16.76
	BROWN	*FINE SAND*	16.76	28.35
	BROWN	*COARSE SAND LOOSE*	28.35	31.7
	GREY	*CLAY STONES HARD*	31.7	33.53

Well ID: **6919131** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): 06(010) Completion Date: 11/18/1987 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632493.7,4886696) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 260.298858 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*CLAY HARD*	0	12.19

BROWN	*CLAY SAND LAYERED*	12.19	21.34
BROWN	*SAND PACKED*	21.34	22.86
BROWN	*CLAY SOFT*	22.86	23.77
BROWN	*SAND COARSE SAND CLEAN*	23.77	28.04

Well ID: **6919132** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): 06(010) Completion Date: 11/19/1987 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632474.7,4886787) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 259.752044 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*CLAY STONEY HARD*	0	12.19
	BROWN	*SAND PACKED*	12.19	21.34
	BROWN	*SAND LOOSE CLEAN*	21.34	27.74

Well ID: **6919133** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 06(010) Completion Date: 11/20/1987 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632544,4886781) [3] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 261.096832 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*CLAY STONEY HARD*	0	12.19
	BROWN	*SAND PACKED*	12.19	21.34
	BROWN	*SAND CLEAN LOOSE*	21.34	27.43

Well ID: **6919135** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): 06(010) Completion Date: 11/17/1987 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632481.7,4886729) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 259.842071 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*CLAY STONES HARD*	0	9.14
	BROWN	*SAND CLAY LAYERED*	9.14	27.43
	BROWN	*SAND COARSE GRAVEL CLEAN*	27.43	29.57

Well ID: **6919136** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): 06(010) Completion Date: 11/11/1987 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632460.7,4886855) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 259.288604 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*CLAY STONES HARD*	0	9.14
	BROWN	*SAND STONES PACKED*	9.14	19.81
	BROWN	*SAND LOOSE CLEAN*	19.81	21.64

Well ID: **6919564** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): 06(006) Completion Date: 5/26/1988 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632583.7,4885451) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: Commerical
Elevation (masl): 282.530273 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*SAND*	0	18.29
	BROWN	*GRAVEL SAND*	18.29	20.42
	GREY	*CLAY*	20.42	21.95
	BROWN	*SAND*	21.95	27.43
	BROWN	*SAND WATER-BEARING*	27.43	29.57

Well ID: **6919779** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): 06(010) Completion Date: 8/8/1988 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632467.7,4886821) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 259.422332 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*SAND LOOSE*	0	1.83
	BROWN	*SAND CLAY LAYERED*	1.83	22.56
	BROWN	*SAND COARSE GRAVEL*	22.56	26.82

Well ID: **6920093** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(009) Completion Date: 12/9/1988 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632615.7,4886563) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 265.230651 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BLACK	*TOPSOIL SOFT*	0	1.22
	BROWN	*CLAY STONES HARD*	1.22	12.19
	BROWN	*GRAVEL SAND LOOSE*	12.19	14.63
	BROWN	*CLAY STONES HARD*	14.63	21.34
	BROWN	*GRAVEL SAND COARSE SAND*	21.34	26.21

Well ID: **6920887** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(010) Completion Date: 1/10/1990 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632547.7,4886823) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 261.059844 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*CLAY DENSE*	0	12.19
	BROWN	*SAND CLAY LAYERED*	12.19	27.43
	BROWN	*SAND COARSE SAND*	27.43	29.87

Well ID: **6921238** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 06(007) Completion Date: 9/17/1990 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632708.7,4885823) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 279.945343 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*CLAY STONES*	0	4.88
	BROWN	*GRAVEL LOOSE*	4.88	6.1
	BROWN	*SAND LOOSE*	6.1	25.6
	BROWN	*SAND GRAVEL WATER-BEARING*	25.6	27.43
	BROWN	*CLAY STONES*	27.43	30.78

Well ID: **6921285** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(006) Completion Date: 10/26/1990 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (633463.7,4885500) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 260.579437 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*CLAY SOFT*	0	3.05
	BROWN	*SAND DRY PACKED*	3.05	16.76
	BROWN	*SAND WATER-BEARING MEDIUM GRAVEL*	16.76	35.66

Well ID: **6921291** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(009) Completion Date: 11/5/1990 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632972.7,4886439) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 262.668029 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
		CLAY GRAVEL	0	3.66
		SAND GRAVEL	3.66	8.53
		GRAVEL	8.53	11.89
		CLAY GRAVEL WATER-BEARING	11.89	14.63
		GRAVEL SAND	14.63	19.81
		SAND GRAVEL WATER-BEARING	19.81	21.34

Well ID: **6922340** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 06(008) Completion Date: 8/28/1993 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632652,4886022) [4] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 275.738861 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*SAND GRAVEL STONES*	0	2.44
	YELLOW	*CLAY SAND*	2.44	9.14
	GREY	*CLAY GRAVEL*	9.14	11.58
	BROWN	*SAND GRAVEL*	11.58	14.94
	BROWN	*SAND*	14.94	17.68

BROWN	*CLAY GRAVEL*	17.68	23.16
BROWN	*GRAVEL SAND*	23.16	28.04
BROWN	*CLAY*	28.04	28.65
BROWN	*SAND*	28.65	31.39

Well ID: **6923235** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(008) Completion Date: 5/2/1995 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632656,4886228) [2] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 273.340942 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*SAND GRAVEL LOOSE*	0	15.24
	GREY	*CLAY STONES HARD*	15.24	32
	GREY	*SAND GRAVEL SILTY*	32	37.19
	BROWN	*COARSE GRAVEL*	37.19	38.4

Well ID: **6925287** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 06(010) Completion Date: 1/30/2000 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632523,4886556) [4] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 264.645385 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
		TOPSOIL	0	0.3
	GREY	*SAND LAYERED CLAY*	0.3	6.71
	BROWN	*SAND DRY*	6.71	12.5
	GREY	*SAND*	12.5	20.73
	BROWN	*FINE SAND*	20.73	24.08
	BROWN	*COARSE SAND*	24.08	25.3
	GREY	*SAND CLAY*	25.3	26.52

Well ID: **6925385** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(010) Completion Date: 4/24/2000 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632562,4886830) [4] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 261.428161 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
		TOPSOIL	0	0.3
	BROWN	*SAND CLAY LAYERED*	0.3	5.49
	GREY	*CLAY SAND*	5.49	17.68
	GREY	*FINE SAND PACKED WATER-BEARING*	17.68	21.03
	BROWN	*FINE SAND*	21.03	22.86
	BROWN	*COARSE SAND*	22.86	24.69
	GREY	*CLAY SILTY*	24.69	25.6

Well ID: **6926426** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(007) Completion Date: 5/25/2002 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (633734.9,4885882) [9] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 254.152862 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*CLAY SOFT*	0	2.44
	BROWN	*STONES CLAY*	2.44	3.05
	BROWN	*SAND CLAY*	3.05	5.49
	BROWN	*SAND*	5.49	12.19
	BROWN	*SAND CLAY*	12.19	14.63
	GREY	*SAND*	14.63	19.51

Well ID: **6927777** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(010) Completion Date: 3/24/2004 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632535,4886595) [5] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 263.816467 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BLACK	*TOPSOIL*	0	0.3

BROWN	*SAND*	0.3	7
BROWN	*CLAY SANDY*	7	19.5
BROWN	*SAND*	19.5	20.4
BROWN	*CLAY SANDY*	20.4	25
BROWN	*SAND*	25	26.5

Well ID: **6928654** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): 06(008) Completion Date: 12/13/2004 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632692,4885530) [9] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 285.690643 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*CLAY PACKED*	0	4.57
	BROWN	*SAND PACKED*	4.57	23.459999
	BROWN	*GRAVEL SILT LAYERED*	23.459999	31.690001
	GREY	*CLAY STONES HARD*	31.690001	45.720001
	BROWN	*SAND MEDIUM SAND*	45.720001	53.939999

Well ID: **6929209** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): 07(007) Completion Date: 6/30/2005 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632872,4885263) [4] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 281.493957 Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*SAND PACKED*	0	18.290001
	BROWN	*GRAVEL COARSE GRAVEL*	18.290001	29.57
	GREY	*GRAVEL COARSE GRAVEL*	29.57	37.189999
	BROWN	*SAND MEDIUM SAND*	37.189999	41.759998

Well ID: **6929976** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): 06(009) Completion Date: 7/11/2005 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632193,4885722) [3] Primary Use: Not Used
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 267.277282 Final Status: Test Hole

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*TOPSOIL*	0	0.45
	GREY	*SAND*	0.45	5.46
	BROWN	*SAND*	5.46	8.53
	GREY	*GRAVEL CLAY SILT*	8.53	17.98
	BROWN	*SAND GRAVEL*	17.98	32.299999
	GREY	*SAND SILT*	32.299999	34.700001
	GREY	*CLAY SILT*	34.700001	44.5
		GRAVEL SAND	44.5	55.16
	GREY	*SAND SILT CLAY*	55.16	73.160004
	BROWN	*GRAVEL SAND*	73.160004	86.400002

Well ID: **6929977** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): 06(009) Completion Date: 7/11/2005 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632192,4885723) [3] Primary Use: Not Used
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): 267.242004 Final Status: Observation Wells

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*TOPSOIL*	0	0.45
	GREY	*SAND*	0.45	5.46
	BROWN	*SAND*	5.46	8.53
	GREY	*GRAVEL CLAY SILT*	8.53	17.98
	BROWN	*SAND SAND*	17.98	32.299999
	GREY	*SILT SAND*	32.299999	34.700001
	GREY	*CLAY SILT*	34.700001	44.5

		GRAVEL SAND	44.5	55.16
	GREY	*SILT SAND CLAY*	55.16	73.160004

Well ID: **7166898** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 07(009) Completion Date: 7/5/2011 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632624,4886549) [3] Primary Use: <null>
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): <null> Final Status: Abandoned-Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
	BROWN	*SAND CLAY FILL*	0	2.44
	BROWN	*SAND CLAY FILL*	2.44	15.24

Well ID: **7193216** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 06(008) Completion Date: 11/15/2012 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632586,4886322) [4] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): <null> Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
		TOPSOIL	0	0.3
	BROWN	*CLAY STONES DENSE*	0.3	26.52
	BROWN	*SAND GRAVEL*	26.52	28.04

Well ID: **7193217** County / Township: YORK / EAST GWILLIMBURY TOWNSHIP
Concession (Lot): CON 06(010) Completion Date: 10/1/2012 12:00 AM
UTM Zone (Easting, Northing) [RC]: 17 (632442,4886859) [4] Primary Use: Domestic
Depth to bedrock (m): Secondary Use: <null>
Elevation (masl): <null> Final Status: Water Supply

Layer	Colour	Description	Top - Bottom Depth (m)	
		TOPSOIL	0	0.3
	BROWN	*CLAY*	0.3	3.66
	GREY	*CLAY STONES HARD*	3.66	21.03
	BROWN	*SAND FINE GRAVEL*	21.03	27.13

Appendix A.2
Individual Records

UTM | 1 7 | Z | 6 3 2 5 8 7 | E 3103c (B)

| 5 | R | 4 8 8 6 0 0 5 | N

69 Nº 512

The Ontario Water Resources Commission Act

Elev. | 5 | R | 0 9 0 0 |

WATER WELL RECORD

Basin | 22 | County or District YORK Township, Village, Town or City E. Gwill. Twp

Con. R 6 Lot 8 Date completed 28 (day) apr (month) 1967 (year)

[redacted] Address HOLT

Casing and Screen Record

Inside diameter of casing 4

Total length of casing 103

Type of screen #10 stainless

Length of screen 6 ft

Depth to top of screen 101

Diameter of finished hole 4"

Pumping Test

Static level 85

Test-pumping rate ~~1 hr~~ 5 G.P.M.

Pumping level 95

Duration of test pumping 1 hr

Water clear or cloudy at end of test clear

Recommended pumping rate 5 G.P.M.

with pump setting of 100 feet below ground surface

Well Log / Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
top soil	0	1	85	fresh
grey clay + stones	1	27		
sand clay + gravel	27	85		
sand	85	107		

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 W. F. Gartshore

Address Sharon

Licence Number 2526

Name of Driller or Borer J Dikeman

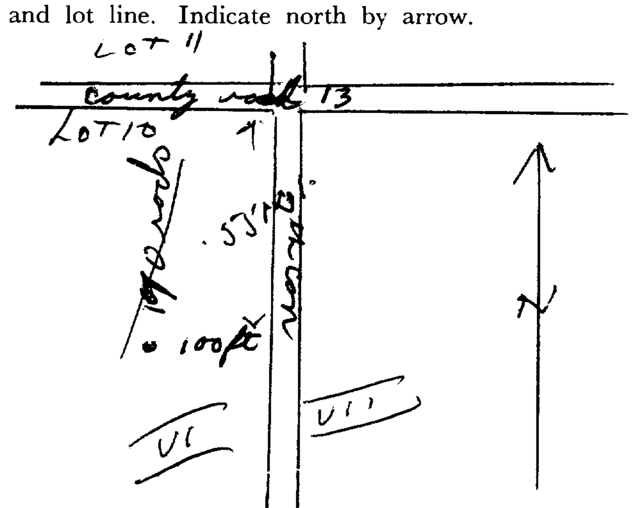
Address Sharon

Date June 3 1967

W. F. Gartshore
(Signature of Licensed Drilling or Boring Contractor)

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



Form 7 15M-60-4138

OWRC COPY

CSS.S8

3103c

UTM 17 Z 6 3 2 5 1 6 E

5 R 4 8 8 6 3 0 5 N

Elev. 5 R 1 0 8 8 0

Basin 2 4

69 No. 515

The Ontario Water Resources Commission Act, 1957

WATER WELL RECORD

County or District York Township, Village, Town or City East Gwillimbury

[redacted] completed 18 (day) July (month) 1959 (year)

[redacted]ess Holt

Casing and Screen Record	
Inside diameter of casing	5/4 in
Total length of casing	90 ft
Type of screen	—
Length of screen	—
Depth to top of screen	—
Diameter of finished hole	5-1/4

Pumping Test	
Static level	64 ft
Test-pumping rate	9 G.P.M.
Pumping level	70 ft
Duration of test pumping	5 hrs
Water clear or cloudy at end of test	clear
Recommended pumping rate	9 G.P.M.
with pumping level of	70

Well Log / Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, sulphur)
dug well	0	65	90	26	fresh
sandy clay	68	70			
course sand & gravel	70	90			

For what purpose(s) is the water to be used? farm

Is well on upland, in valley, or on hillside? upland

Drilling Firm G. R. Boadway & Son

Address Sutton West Ont

Licence Number 62

Name of Driller G. R. Boadway

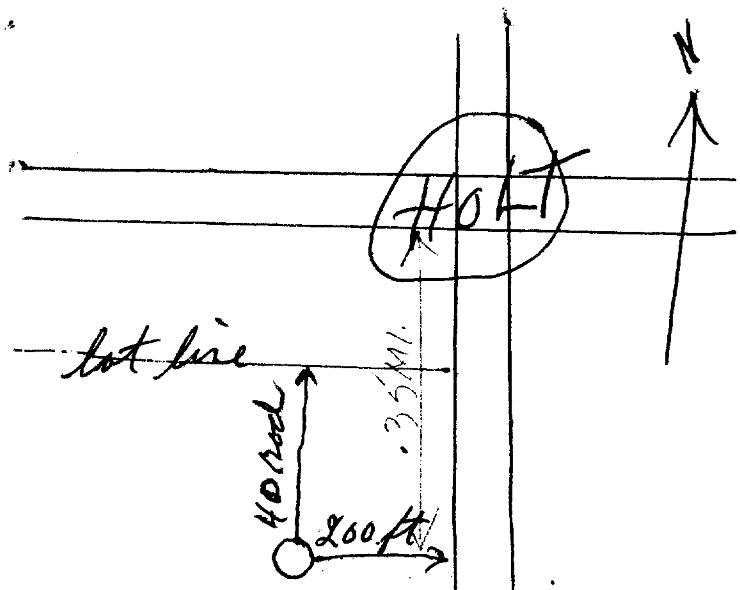
Address Sutton West

Date July 18

G. R. Boadway
(Signature of Licensed Drilling Contractor)

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



CSS.58

Con 6 Con 7

Form 5
15M-58-4149

UTM 17 Z 632896 E 31D30 69 № 555

5 R 4868561 N

Elev. 6 R 0885

The Ontario Water Resources Commission Act

WATER WELL RECORD

Basin 22 County or District York Township, Village, Town or City E. Gwillimbury

Con. 8 Lot 8 Date completed 16 (day) Dec (month) 66 (year)

[redacted]ress Holt

Casing and Screen Record		Pumping Test	
Inside diameter of casing	6	Static level	68
Total length of casing	110	Test-pumping rate	7 G.P.M.
Type of screen	stainless steel	Pumping level	75
Length of screen	3 ft	Duration of test pumping	3 hr
Depth to top of screen	107	Water clear or cloudy at end of test	clear
Diameter of finished hole	6"	Recommended pumping rate	7 G.P.M.
		with pump setting of	95 feet below ground surface

Well Log: Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
clay	0	2	110	
sand	2	6		
clay gravel	6	59		
silt / some gravel	59	103		
medium sand	103	110		

For what purpose(s) is the water to be used? farm

Is well on upland, in valley, or on hillside?

Drilling or Boring Firm Douglas S. Tunghurst Drilling Co Ltd

Address Newmarket

Licence Number 2085

Name of Driller or Borer P. Jonston

Address Ravenshoe

Date Dec. 28

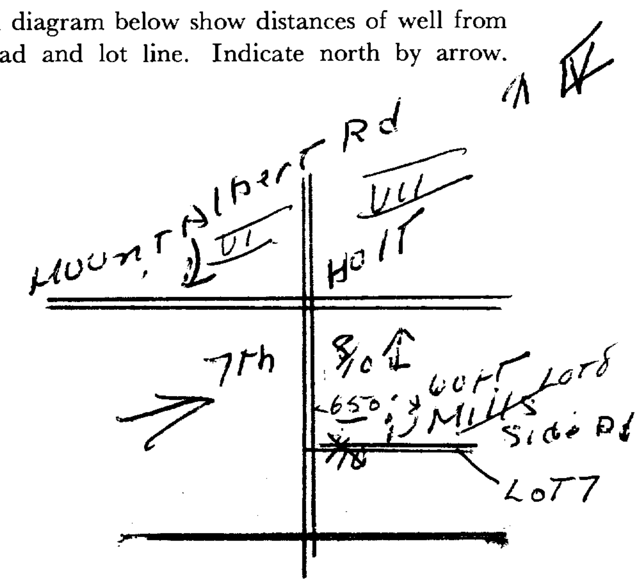
D S Tunghurst
(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M-60-4138

OWRC COPY

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



CSS.S8

UTM 17 Z 632598 E
5TR 4848647 2 N

Elev. 5TR 08705

Basin 22

31D3c

69 No. 556

The Ontario Water Resources Commission Act, 1957

WATER WELL RECORD

County or District York Township, Village, Town or City East Gwill-

[redacted] completed 18 (day) Nov (month) 1959 (year)

[redacted] ress Malt.

Casing and Screen Record

Inside diameter of casing 30"

Total length of casing 55 ft.

Type of screen

Length of screen

Depth to top of screen

Diameter of finished hole 30"

Pumping Test

Static level 40 ft.

Test-pumping rate 6 ft in 2 hours G.P.M.

Pumping level

Duration of test pumping

Water clear or cloudy at end of test clear

Recommended pumping rate G.P.M.

with pumping level of

Well Log

Overburden and Bedrock Record	From ft.	To ft.
Rocks and Hard clay	0	50
fine sand	50	55

Water Record

Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, sulphur)
50	10 ft	fresh

For what purpose(s) is the water to be used?

house

Is well on upland, in valley, or on hillside?

upland

Drilling [redacted] ONTARIO WELL DIGGING COMPANY

Address [redacted] R.R. # 1 NEWMARKET, ONT.

Licence Number 71

Name of Driller Stanley Moore

Address

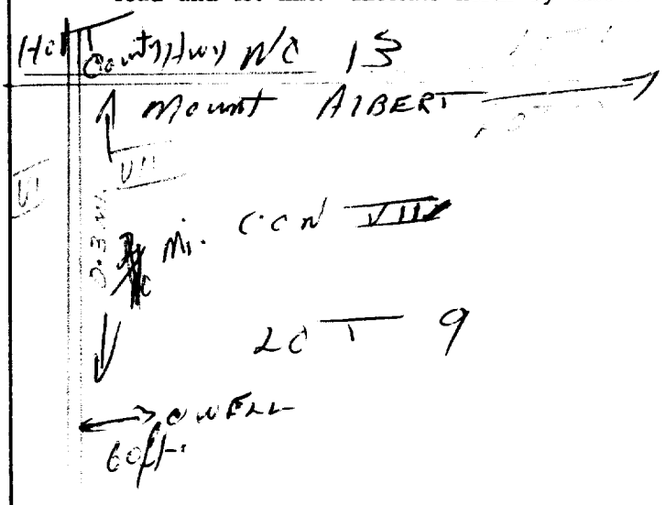
Date Dec.

Roy Heddle

(Signature of Licensed Drilling Contractor)

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



CSS.S8

UTM | 1 | 7 | z | 6 | 3 | 2 | 5 | 9 | 8 | E

| 5 | R | 4 | 8 | 8 | 6 | 4 | 7 | 2 | N

Elev. Con 5 | R | 01 8 7 5 |

Basin 2 2 9 Lot

31030

69 № 557

8

The Ontario Water Resources Commission Act, 1957

WATER WELL RECORD

County or District York — Township, Village, Town or City East Gwillimbury

Con. 7 — Lot 9 — Date completed 15 (day) Oct. (month) 1960 (year)

[redacted]ress Holt P.O.

Casing and Screen Record		Pumping Test	
Inside diameter of casing	2"	Static level	55 ft
Total length of casing	69 ft	Test-pumping rate	3 G.P.M.
Type of screen	80	Pumping level	55 ft
Length of screen	5 ft	Duration of test pumping	3 hrs
Depth to top of screen	68 ft	Water clear or cloudy at end of test	clear
Diameter of finished hole	2"	Recommended pumping rate	3 G.P.M.
		with pumping level of	55 ft

Well Log: Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, sulphur)
dug well	0	55	55	0	
quick sand	55	66			
course sand	66	73	71	16 ft	FRESH

For what purpose(s) is the water to be used?
house hold

Is well on upland, in valley, or on hillside?
upland

Drilling Firm Gordon Koehler

Address Ravenshoe Ont
Box 63

Licence Number 605

Name of Driller Gordon Koehler

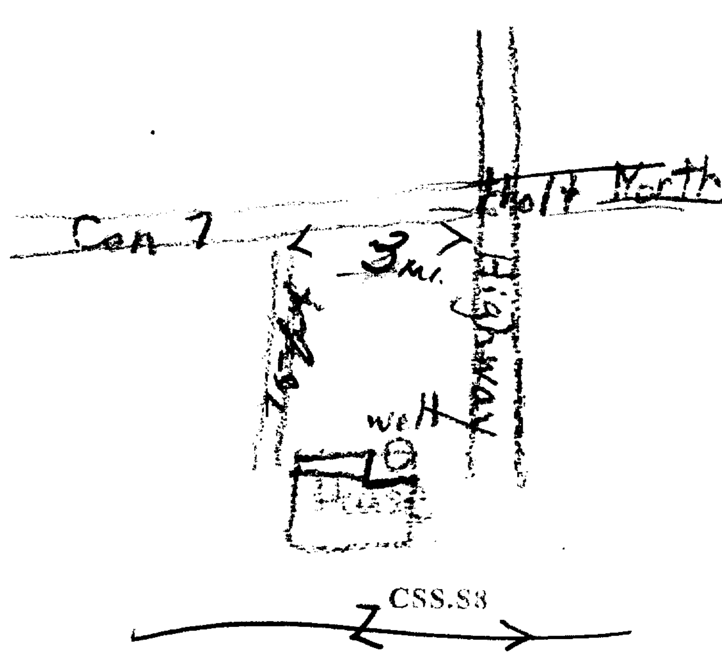
Address Ravenshoe Ont

Date Oct 15, 1960

Gordon Koehler
(Signature of Licensed Drilling Contractor)

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



CSS.S3

Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the Open Data catalogue.

Go Back to Map

Well ID

Well ID Number: 6911481
Well Audit Number:
Well Tag Number:

This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	
Township	EAST GWILLIMBURY TOWNSHIP
Lot	008
Concession	CON 06
County/District/Municipality	YORK
City/Town/Village	
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 632644.70 Northing: 4886057.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
GREY	CLAY	SAND		0 ft	22 ft
GREY	SAND			22 ft	78 ft
GREY	CLAY	GRVL		78 ft	95 ft
	SAND			95 ft	104 ft

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed

Method of Construction & Well Use

Method of Construction	Well Use
Cable Tool	
	Domestic

Status of Well

Water Supply

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To
5 inch	STEEL		97 ft

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To
4 inch		97 ft	101 ft

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 2310

Results of Well Yield Testing

After test of well yield, water was	CLEAR
If pumping discontinued, give reason	
Pump intake set at	
Pumping Rate	4 GPM
Duration of Pumping	1 h:0 m
Final water level	90 ft
If flowing give rate	
Recommended pump depth	96 ft
Recommended pump rate	4 GPM
Well Production	BAILER
Disinfected?	

Draw Down & Recovery

Draw Down Time(min)	Draw Down Water level	Recovery Time(min)	Recovery Water level
SWL	67 ft		
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	67 ft
20		20	
25		25	
30		30	67 ft
40		40	
45		45	67 ft
50		50	
60		60	67 ft

Water Details

Water Found at Depth	Kind
91 ft	Fresh

Hole Diameter

Depth From	Depth To	Diameter

Audit Number:

Date Well Completed: April 27, 1973

Date Well Record Received by MOE: July 03, 1973

Updated: June 28, 2018
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- Drinking water,
- Environment maps,
- Well water

Ministry of the Environment, Conservation and Parks

The Ministry of the Environment, Conservation and Parks works to protect and sustain the quality of Ontario's air, land, and water. We also coordinate Ontario's actions on climate change in the name of healthier communities, ecological protection and economic prosperity.

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ABOUT ONTARIO

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

WATER WELL RECORD

Ontario

31D/3W

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11 — 6913216 — MUNICIP. 69003 — CON. CON — 06

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT	DATE COMPLETED
YORK	EAST GWILLIMBURY	6	005	DAY 12 MO. 03 YR. 76
[redacted]	R#1 MOUNT ALBERT			

RC	ELEVATION	RC	BASIN CODE		
885909	5	890	5	22	JUN 17, 1977 273
				II	III IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
BROWN	SAND	LOAM	DRY	0	7
BROWN	GRAVEL		DRY	7	12
BROWN	CLAY		DENSE	12	70
BROWN	SAND		LOOSE	70	75
GREY	CLAY	SILT	HARD	75	136
GREY	SILT	SAND	LOOSE	136	150
GREY	SAND		CLEAN	150	156

31 — 0007628 02 — 0012611 — 0070605 — 0075628 — 0136 20 50 6 — 0150 20 6 28 — 1

32 — 0156 28

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
156	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
5 1/4 06	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	153
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
010	05.000	04

MATERIAL AND TYPE: JOHNSON STAINLESS

DEPTH TO TOP OF SCREEN: 152 FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
0	147	K. PACKER TOP OF S' SCREEN
		NIPPLE

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ PUMP 2 ☐ BAILER	0010 GPM	02 HOURS 30 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
075 FEET	120 FEET	1 ☒ PUMPING 2 ☐ RECOVERY	FEET	118 FEET	FEET	120 FEET

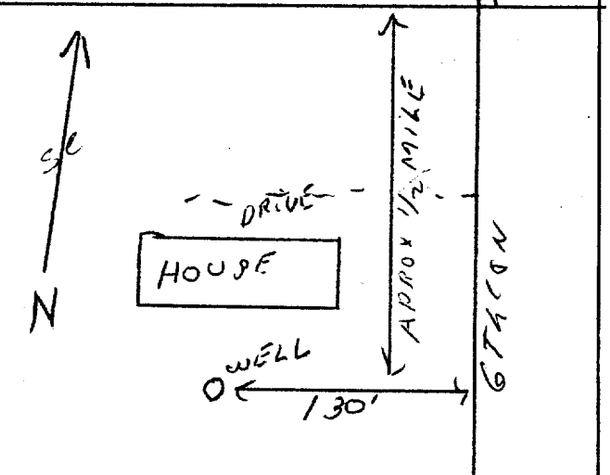
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	120 FEET	1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☒ DEEP	120 FEET	0006 GPM

GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL 3285

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



DRILLERS REMARKS:

FINAL STATUS OF WELL 1

1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE 01

1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING ☐ OTHER 9 ☐ NOT USED

METHOD OF DRILLING 2

1 ☐ CABLE TOOL 2 ☒ ROTARY (CONVENTIONAL) 3 ☒ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: ROGER BOADWAY ENT LTD. — LICENCE NUMBER: 1413

ADDRESS: BOX 397 SUTTON WEST ONT L0E 1R0

NAME OF DRILLER OR BORER: NORM POWELL — LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: Roger Boadway — SUBMISSION DATE: DAY 12 MO. MARCH YR. 76

MINISTRY OF THE ENVIRONMENT COPY

OFFICE USE ONLY

DATA SOURCE 1 — CONTRACTOR 1413 — DATE RECEIVED 090476

DATE OF INSPECTION July 13/76 — INSPECTOR

REMARKS: PSC — WI

CSS.58

FORM 7 MOE 07-091

Ministry of the Environment
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

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11 | 6921238 | MUNICIP 69003 | CON. CON | 06

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON, BLOCK, TRACT, SURVEY, ETC	LOT
[redacted]	[redacted]willimbury	6	7

[redacted] ~~.#1 Mt. Albert, Ontario LOG 1MO~~ 18564 7th Conc.

DATE COMPLETED: DAY 17 MO 9 YR 90

[redacted]85600 | RC. | ELEVATION 282 | RC. | BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Brown	Clay	Pebbles	Firm	0	16
Brown	Gravel		Loose	16	20
Brown	Sand		Loose	20	84
Brown	Sand	Gravel	Wet & Packed	84	90
Brown	Clay	Small Pebbles	Firm	90	101

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
84'	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6¼	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	2'a.g.	84
5	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	90'	to 101
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
3'# 18 3'#16	6 INCHES	6 FEET
MATERIAL AND TYPE: S,S.	DEPTH TO TOP OF SCREEN: 84 FEET	

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER	PUMPING RATE: 6 GPM	DURATION OF PUMPING: 2 HOURS 30 MINS			
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
70 FEET	90 FEET	90 FEET	90 FEET	90 FEET	90 FEET
IF FLOWING, GIVE RATE: GPM	PUMP INTAKE SET AT: FEET	WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY			
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP	RECOMMENDED PUMP SETTING: 95 FEET	RECOMMENDED PUMPING RATE: 5 GPM			

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY
2 ☐ OBSERVATION WELL
3 ☐ TEST HOLE
4 ☐ RECHARGE WELL
5 ☐ ABANDONED, INSUFFICIENT SUPPLY
6 ☐ ABANDONED, POOR QUALITY
7 ☐ UNFINISHED
☐ DEWATERING

WATER USE

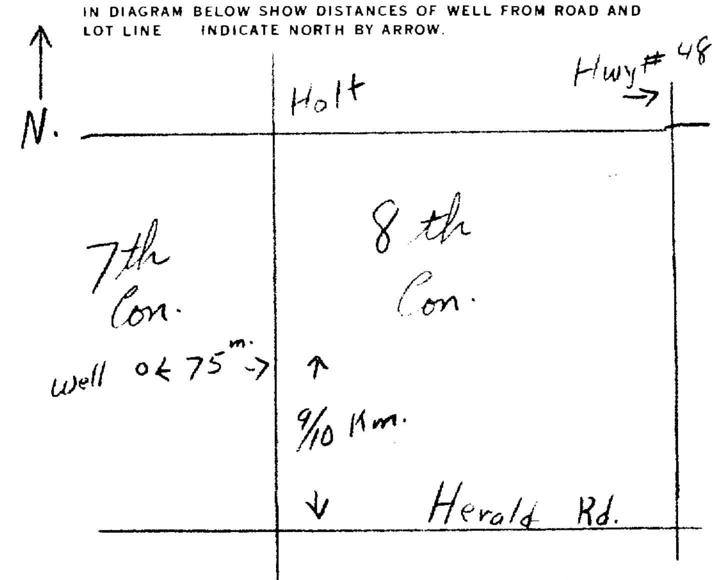
1 ☒ DOMESTIC
2 ☐ STOCK
3 ☐ IRRIGATION
4 ☐ INDUSTRIAL
☐ OTHER
5 ☐ COMMERCIAL
6 ☐ MUNICIPAL
7 ☐ PUBLIC SUPPLY
8 ☐ COOLING OR AIR CONDITIONING
9 ☐ NOT USED

METHOD OF CONSTRUCTION

1 ☒ CABLE TOOL
2 ☐ ROTARY (CONVENTIONAL)
3 ☐ ROTARY (REVERSE)
4 ☐ ROTARY (AIR)
5 ☐ AIR PERCUSSION
6 ☐ BORING
7 ☐ DIAMOND
8 ☐ JETTING
9 ☐ DRIVING
☐ DIGGING
☐ OTHER

LOCATION OF WELL

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



73166

DRILLERS REMARKS

CONTRACTOR

NAME OF WELL CONTRACTOR: Sauder Well Drilling Ltd.
WELL CONTRACTOR'S LICENCE NUMBER: 4743
ADDRESS: R.R. # 4 UXBRIDGE, Ontario LOC 1KO
NAME OF WELL TECHNICIAN: Ab Sauder
WELL TECHNICIAN'S LICENCE NUMBER: T-0241
SIGNATURE OF TECHNICIAN/CONTRACTOR: Ab. Sauder
SUBMISSION DATE: DAY 22 MO. 10 YR. 90

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR 4743 | DATE RECEIVED OCT 30 1990
DATE OF INSPECTION | INSPECTOR
REMARKS

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

11 | 6921291 | MUNICIP 69003 | CON. CON 07

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON. BLOCK, TRACT, SURVEY, ETC.	LOT 25-27
YORK	E. GWILL.	7	9

OWNER (SURNAME FIRST) 28-47	ADDRESS	DATE COMPLETED 48-53
FLOYD PRESTON LTD.	HOLT.	DAY 5 MO 10 YR. 90

[redacted] | NORTHING 4886216 | RC. | ELEVATION | RC. | BASIN CODE | II | III | IV

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
	CLAY / GRAVEL		Eastings 632958	0	12
	SAND / GRAVEL			12	28
	GRAVEL			28	39
	CLAY / GRAVEL	- WET		39	48
	GRAVEL / SAND	- COMPACT.		48	65
	SAND / GRAVEL	- WATER		65	70

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13: 67-70	1 ☑ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS (14)
15-18	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS (19)
20-23	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS (24)
25-28	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS (29)
30-33	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS (34) (50)

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
10-11: 6 1/4	12: 1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	13-16: 67
17-18	19: 1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC (SCREEN)		67	20-23: 70
24-25	26: 1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			27-30

SCREEN

SIZE(S) OF OPENING (SLOT NO.) 31-33: .012
DIAMETER 34-38: 6 INCHES
LENGTH 39-40: 3 FEET
MATERIAL AND TYPE: STAINLESS
DEPTH TO TOP OF SCREEN: 67 / 64 FEET (30)

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER ETC.)
10-13: 0	14-17: 20	HOLE PLUG
18-21	22-25	QUICK SEL
26-29	30-33	(80)

71 PUMPING TEST

PUMPING TEST METHOD 10	PUMPING RATE 11-14	DURATION OF PUMPING
1 ☐ PUMP 2 ☑ BAILER	7 GPM	1 HOURS 15-16 30 MINS 17-18

STATIC LEVEL	WATER LEVEL END OF PUMPING	25 WATER LEVELS DURING (1 ☐ PUMPING 2 ☑ RECOVERY)	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
19-21: 42 FEET	22-24: 60 FEET		26-28: 42 FEET	29-31 FEET	32-34 FEET	35-37 FEET

IF FLOWING, GIVE RATE 38-41	PUMP INTAKE SET AT	WATER AT END OF TEST 42
GPM	FEET	1 ☑ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING 43-45	RECOMMENDED PUMPING RATE 46-49
☐ SHALLOW ☑ DEEP	FEET	7 GPM

50-53

54 FINAL STATUS OF WELL

1 ☑ WATER SUPPLY; 2 ☐ OBSERVATION WELL; 3 ☐ TEST HOLE; 4 ☐ RECHARGE WELL; 5 ☐ ABANDONED, INSUFFICIENT SUPPLY; 6 ☐ ABANDONED, POOR QUALITY; 7 ☐ UNFINISHED; ☐ DEWATERING

55-56 WATER USE

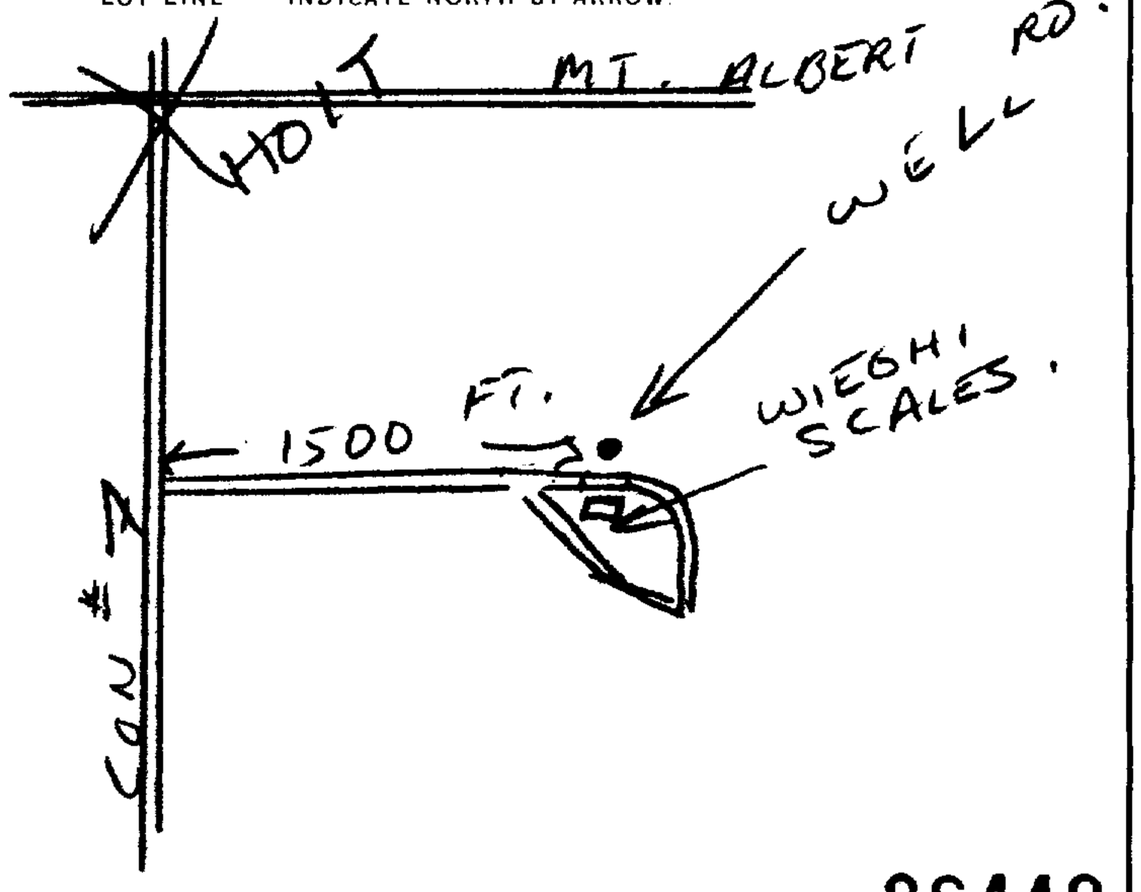
1 ☑ DOMESTIC; 2 ☐ STOCK; 3 ☐ IRRIGATION; 4 ☐ INDUSTRIAL; 5 ☐ COMMERCIAL; 6 ☐ MUNICIPAL; 7 ☐ PUBLIC SUPPLY; 8 ☐ COOLING OR AIR CONDITIONING; ☐ OTHER; 9 ☐ NOT USED

57 METHOD OF CONSTRUCTION

1 ☑ CABLE TOOL; 2 ☐ ROTARY (CONVENTIONAL); 3 ☐ ROTARY (REVERSE); 4 ☐ ROTARY (AIR); 5 ☐ AIR PERCUSSION; 6 ☐ BORING; 7 ☐ DIAMOND; 8 ☐ JETTING; 9 ☐ DRIVING; ☐ DIGGING; ☐ OTHER

LOCATION OF WELL

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



86449

DRILLERS REMARKS

CONTRACTOR

NAME OF WELL CONTRACTOR	WELL CONTRACTOR'S LICENCE NUMBER
DALE BARANIESKI	1350
ADDRESS: RR#3 NEWMARKET	
NAME OF WELL TECHNICIAN: SAME	WELL TECHNICIAN'S LICENCE NUMBER: TO235
SIGNATURE OF TECHNICIAN/CONTRACTOR: Dale Baranieski	SUBMISSION DATE: DAY ____ MO. ____ YR. ____

OFFICE USE ONLY

DATA SOURCE 58	CONTRACTOR 59-62	DATE RECEIVED 63-68 (80)
	1350	NOV 28 1990
DATE OF INSPECTION	INSPECTOR	
REMARKS		

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

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

11 — 6922340 — MUNICIP 69003 — CON. CON — 06

COUNTY OR DISTRICT: [redacted]
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: E. GWILLIMBURY
CON. BLOCK, TRACT, SURVEY, ETC: #6
LOT: 8
DATE COMPLETED: DAY 28 MO 08 YR 93
668 E. GWILL - CON #7

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
BROWN	SAND	GRAVEL SIDES	VERY FINE	0	8
YELLOW	CLAY / SAND			8	30
GREY	CLAY / GRAVEL			30	38
BROWN	SAND / GRAVEL	(DRY)		38	49
BROWN	SAND			49	58
BROWN	CLAY / GRAVEL			58	76
BROWN	GRAVEL / SAND			76	92
BROWN	CLAY			92	94
BROWN	SAND			94	103

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
100-103	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
6¼	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	0	100
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC (SCREEN)		100	103
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
.010	6 INCHES	3 FEET

MATERIAL AND TYPE: STAINLESS STEEL
DEPTH TO TOP OF SCREEN: 100 FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
0	23	QUICK GEL
		1 HOLE PLUG

71 PUMPING TEST

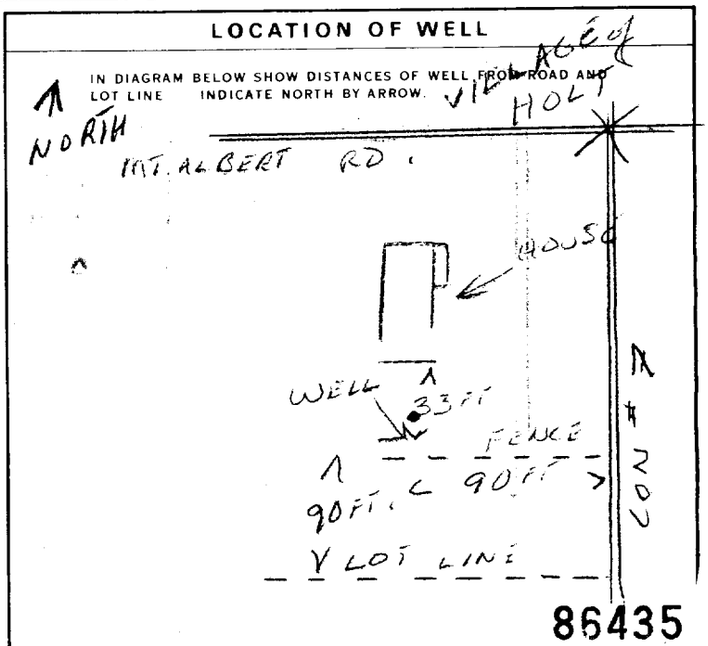
PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER
PUMPING RATE: 8 GPM
DURATION OF PUMPING: 1 HOURS ___ MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☐ PUMPING 2 ☒ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
70 FEET	95 FEET	70 FEET	FEET	FEET	FEET

IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: FEET
WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING: 95 FEET
RECOMMENDED PUMPING RATE: 8 GPM

LOCATION OF WELL

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



86435

DRILLERS REMARKS

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED ☐ DEWATERING

WATER USE

1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF CONSTRUCTION

1 ☒ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: DALE KARANIESKI
WELL CONTRACTOR'S LICENCE NUMBER: 1350
ADDRESS: RR#3 NEWMARKET
NAME OF WELL TECHNICIAN: SAME / BYRON KARANIESKI ASSISANT
WELL TECHNICIAN'S LICENCE NUMBER: TO 222
SIGNATURE OF TECHNICIAN/CONTRACTOR: Dale Karanieski
SUBMISSION DATE: DAY ___ MO. ___ YR. ___

OFFICE USE ONLY

DATA SOURCE
CONTRACTOR: 1350
DATE RECEIVED: SEP 13 1993
DATE OF INSPECTION
INSPECTOR
REMARKS

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FOF

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 (1-2) **6923235** Municipality 69003 (10-14) Con. CON (15-22) 07 (23-24)

County or District	Township/Borough/City/Town/Village	Con	block	tract	survey, etc.	Lot (25-27)
[redacted]	EAST GWILLIMBURY	7				8

Address: 18725 McCowan Rd. Mt. Albert, ON

Date completed (48-53): 02 day 05 month 95 year

21 (1-2) M (10) Northing (12-17) (18-24) RC (25) Elevation (26) RC (30) Basin Code (31) ii iii iv (47)

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
Brown	Sand	Gravel	Loose	0	50
Grey	Clay	Stones	Hard	50	105
Grey	Sand	Gravel	Silty	105	122
Brown	Gravel		Coarse	122	126

31
32 (10-14 15-21 32 43 54 65 75 80)

41 WATER RECORD

Water found at – feet	Kind of water
126 (10-13)	[X] 1 Fresh [ ] 2 Salty [ ] 3 Sulphur [ ] 4 Minerals [ ] 5 Gas (14)
(15-18)	[ ] 1 Fresh [ ] 2 Salty [ ] 3 Sulphur [ ] 4 Minerals [ ] 5 Gas (19)
(20-23)	[ ] 1 Fresh [ ] 2 Salty [ ] 3 Sulphur [ ] 4 Minerals [ ] 5 Gas (24)
(25-28)	[ ] 1 Fresh [ ] 2 Salty [ ] 3 Sulphur [ ] 4 Minerals [ ] 5 Gas (29)
(30-33)	[ ] 1 Fresh [ ] 2 Salty [ ] 3 Sulphur [ ] 4 Minerals [ ] 5 Gas (34) (60)

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
6¼ (10-11)	[X] 1 Steel (12) [ ] 2 Galvanized [ ] 3 Concrete [ ] 4 Open hole [ ] 5 Plastic	188	0	123 (13-16)
(17-18)	[ ] 1 Steel (19) [ ] 2 Galvanized [ ] 3 Concrete [ ] 4 Open hole [ ] 5 Plastic			(20-23)
(24-25)	[ ] 1 Steel (26) [ ] 2 Galvanized [ ] 3 Concrete [ ] 4 Open hole [ ] 5 Plastic			(27-30)

SCREEN

Sizes of opening (Slot No.) (31-33)	Diameter (34-38)	Length (39-40)
40	6 inches	3 feet

Material and type	Depth at top of screen (41-44)	(30)
Johnson S/S	123 feet	

61 PLUGGING & SEALING RECORD

[X] Annular space [ ] Abandonment

Depth set at – feet From	Depth set at – feet To	Material and type (Cement grout, bentonite, etc.)
121 (10-13)	123 (14-17)	K. Packer top 2'
(18-21)	(22-25)	screen nipple
0 (26-29)	10 (30-33) (80)	Benseal

71 PUMPING TEST

Pumping test method (10): [ ] 1 Pump [ ] 2 Bailer [X] 3 AIR

Pumping rate (11-14): 40 GPM

Duration of pumping (15-16 Hours, 17-18 Mins): 1 Hours

Static level	Water level end of pumping	Water levels during (25): [X] 1 Pumping [ ] 2 Recovery			
(19-21) 72 feet	(22-24) 95 feet	15 minutes (26-28) 95 feet	30 minutes (29-31) 95 feet	45 minutes (32-34) 95 feet	60 minutes (35-37) 95 feet

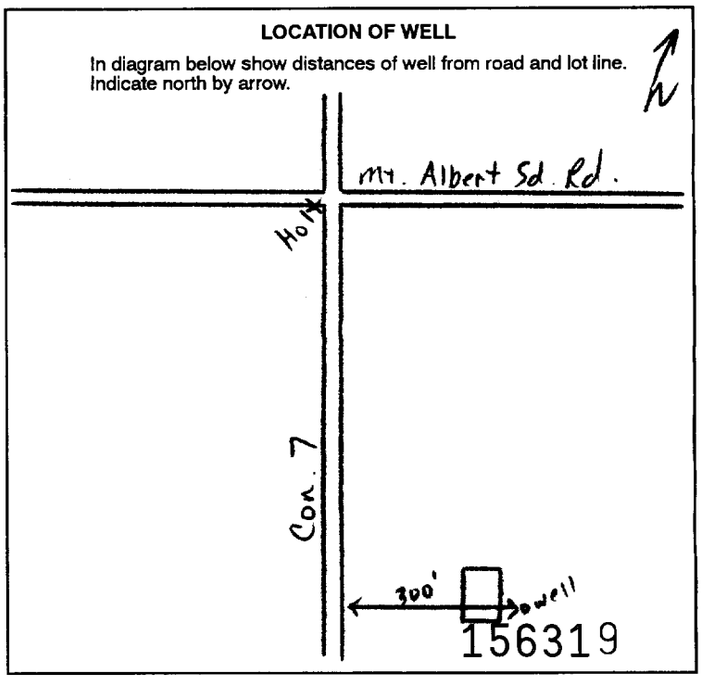
If flowing give rate (38-41)	Pump intake set at	Water at end of test (42)
GPM	95 feet	[X] Clear [ ] Cloudy

Recommended pump type	Recommended pump setting (43-45)	Recommended pump rate (46-49)
[ ] Shallow [X] Deep	95 feet	10 GPM

(50-53)

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



FINAL STATUS OF WELL (54)

[X] 1 Water supply [ ] 2 Observation well [ ] 3 Test hole [ ] 4 Recharge well [ ] 5 Abandoned, insufficient supply [ ] 6 Abandoned, poor quality [ ] 7 Abandoned (Other) [ ] 8 Dewatering [ ] 9 Unfinished [ ] 10 Replacement well

WATER USE (55-56)

[X] 1 Domestic [ ] 2 Stock [ ] 3 Irrigation [ ] 4 Industrial [ ] 5 Commercial [ ] 6 Municipal [ ] 7 Public supply [ ] 8 Cooling & air conditioning [ ] 9 Not used [ ] 10 Other

METHOD OF CONSTRUCTION (57)

[ ] 1 Cable tool [ ] 2 Rotary (conventional) [ ] 3 Rotary (reverse) [X] 4 Rotary (air) [ ] 5 Air percussion [ ] 6 Boring [ ] 7 Diamond [ ] 8 Jetting [ ] 9 Driving [ ] 10 Digging [ ] 11 Other

Name of Well Contractor	Well Contractor's Licence No.
Roger Boadway Ent., Ltd.	1413

Address: Box 397 Sutton West, ON L0E 1R0

Name of Well Technician	Well Technician's Licence No.
Grant Boadway	T0029

Signature of Technician/Contractor: Roger Boadway

Submission date: 02 day 05 mo 95 yr

MINISTRY USE ONLY

Data source (58)	Contractor (59-62)	Date received (63-68) (80)
	1413	JUN 05 1995

Date of inspection	Inspector

Remarks:

2 - MINISTRY OF ENVIRONMENT & ENERGY COPY

0506 (07/94) Front Form 9

Ontario Ministry of the Environment

Measurements recorded in: ☐ Metric ☑ Imperial

Well Tag No. *(Place Sticker and/or Print Below)*

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
McCowan	East Gwillimbury		

County/District/Municipality	City/Town/Village	Province	Postal Code
York	same	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	632706	4855755		

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
	Bentonite Slurry			0	80
	Hole plug			80	90
	Silica sand			90	102

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)

Method of Construction

☐ Cable Tool ☐ Diamond ☐ Rotary (Conventional) ☐ Jetting ☐ Rotary (Reverse) ☐ Driving ☐ Boring ☐ Digging ☐ Air percussion ☐ Other, specify

Well Use

☐ Public ☐ Commercial ☐ Not used ☐ Domestic ☐ Municipal ☐ Dewatering ☐ Livestock ☐ Test Hole ☐ Monitoring ☐ Irrigation ☐ Cooling & Air Conditioning ☐ Industrial ☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To

Status of Well

☐ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☐ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☑ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☐ Abandoned, other, specify ☐ Other, specify

Water Details

Water found at Depth (m/ft) ☐ Gas — Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify

Water found at Depth (m/ft) ☐ Gas — Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify

Water found at Depth (m/ft) ☐ Gas — Kind of Water: ☐ Fresh ☐ Untested ☐ Other, specify

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	102	5"

Results of Well Yield Testing

After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping ___ hrs + ___ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min / GPM)

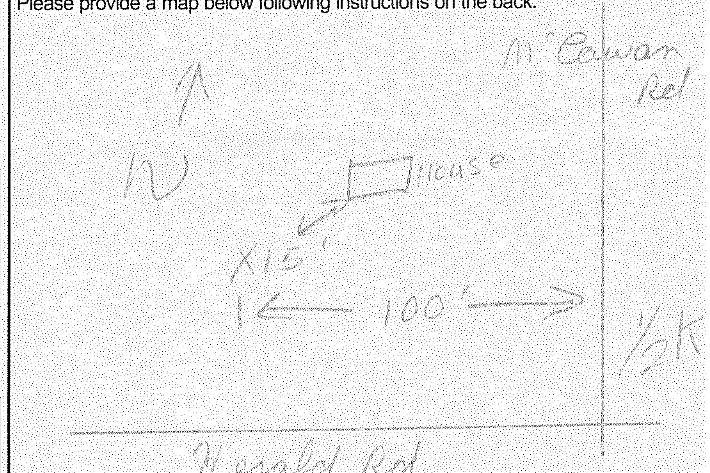
Well production (l/min / GPM)

Disinfected? ☐ Yes ☐ No

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
50		50	
60		60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Wilson's Water Wells	5459

Business Address (Street Number/Name)	Municipality
13787 Hwy 48	Stouffville

Province | Postal Code | Business E-mail Address

Bus.Telephone No. *(inc. area code)* | Name of Well Technician (Last Name, First Name): Eric Ferguson

Well Technician's Licence No.: 3490 | Signature of Technician and/or Contractor | Date Submitted: 2012 06 13

Well owner's information package delivered ☐ Yes ☐ No

Date Package Delivered Y Y Y Y M M D D

Date Work Completed 2012 06 11

Ministry Use Only

Audit No. Z141302

Received AUG 12 2012

Contractor's Copy

Ontario — Ministry of the Environment

Well Tag No. *(Place Sticker and/or Print Below)* **A105028**

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☑ Imperial

Page ____ of ____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
Mancoco	Holdings INC		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
2700 Dufferinst Unit 71	Toronto	ON	M6B4J3	4167920438

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
18786 McCowan Rd.	East Gwillimbury	8	6

County/District/Municipality	City/Town/Village	Province	Postal Code
York	Mt. Albert	Ontario	L4G1M0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	632586	4818632		

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Top	Soil			0	1
Brown	Clay	Stones	Dense	1	87
Brown	Sand / Gravel		mixed.	87	92

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
0	20	Bentonite Grout	1.4 yrds^3

Method of Construction

☐ Cable Tool ☐ Diamond
☑ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☐ Other, *specify* ____

Well Use

☑ Public ☐ Commercial ☐ Not used
☑ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, *specify* ____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6 1/4	Steel	188	0	87

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
5 1/2	STeel	#14	87	92.

Status of Well

☑ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, *specify*
☐ Other, *specify*

Water Details

Water found at Depth (m/ft)	Kind of Water	
87	☐ Fresh ☐ Untested ☐ Gas ☐ Other, *specify*	
	☐ Fresh ☐ Untested ☐ Gas ☐ Other, *specify*	
	☐ Fresh ☐ Untested ☐ Gas ☐ Other, *specify*	

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	20	10 3/4
20	92	8 3/4

Results of Well Yield Testing

After test of well yield, water was:
☑ Clear and sand free
☐ Other, *specify* ____

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM): 6 GPM

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft)

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min / GPM): 6 GPM.

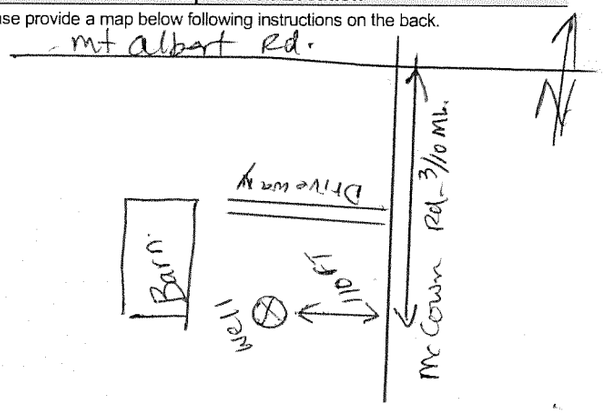
Well production (l/min / GPM): 6 GPM.

Disinfected? ☑ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	42		66-3
1	48-0	1	64-7
2	54-3	2	63-5
3	60-1	3	63-4
4	63-3	4	63-3
5	65-5	5	54-0
10	65-7	10	49-2
15	65-8	15	44-8
20	66-1	20	42-2
25	66-3	25	↓
30	66-3	30	↓
40	↓	40	↓
50	↓	50	↓
60	66-3	60	42-1

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
2024257 ONTARIO LTD	4102

Business Address (Street Number/Name)	Municipality
3661 Mt. Albert Rd	Sharon

Province	Postal Code	Business E-mail Address
ON	L4G1M0	Sales@ontariodrilling.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
9054781643	Moore, David.

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
2299	David Moore	2012/11/15

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
☑ Yes ☐ No	2012/11/12	Audit No. Z154820
	Date Work Completed: 2012/11/15	Received NOV 11 2012

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Ministry's Copy

Appendix B
Field Investigation Methodology and Protocols

Appendix B Field Investigation Methodology and Protocols

1. Borehole Advancement/Monitoring Well Installation

1.1 Field Activities

Prior to initiating the subsurface investigation activities, all applicable utility companies (gas, telephone, network cables, pipelines and sewers) were contacted through Ontario One-Call. Also, a private utility locator (Cable Master Inc.) was utilized to demarcate the location of the respective underground utilities to ensure the lines were not damaged during the investigation work.

1.2 Health and Safety

A Site-specific Health and Safety Plan (HASP) outlining specific job tasks and their related hazards was prepared and implemented by GHD prior to initiating field activities. The HASP presents the visually observed Site conditions and identifies potential physical hazards to field personnel. All GHD field and project staff working on and/or visiting the site were required to sign the HASP to document their knowledge of the potential hazards while on-site.

All drilling activities were conducted under Level D Personal Protective Equipment (PPE), which consisted of protective gloves, hard hats, safety glasses, safety boots and reflective vests at all times.

1.3 Borehole Drilling

The drilling work was carried out utilizing a track-mounted drill rig supplied and operated by Profile Drilling, specialist drilling contractors (Ministry of the Environment and Climate Change Licensed Well Drillers), under the full-time supervision of GHD technical representatives. A track-mounted Mobile Drill B-60 drill rig was used to conduct the site investigation works.

Five boreholes were advanced as part of the Hydrogeological Assessment between November 6 to 17, 2017. The boreholes were advanced by Profile Drilling using track-mounted rotary drill rigs equipped with hollow-stem augers. The boreholes were advanced to depths ranging from 9.5 to 30.5 mBGS.

Boreholes were advanced using hollow stem auger drilling methods and soil samples were collected at selected intervals to the final depth of investigation in all boreholes using a 50 mm outside diameter split spoon sampler. Prior to use and between each borehole location, the drilling and sampling equipment was thoroughly cleaned using Alconox® soap and potable water rinse.

The soil was logged using the Unified Soil Classification System (USGS), making special note of any visual or olfactory evidence of potential impacts.

1.4 Monitoring Well Installations

Monitoring wells were installed in the five selected boreholes by the licensed water well drillers consistent with Regulation 903 – Wells. GHD technical staff supervised the monitoring well construction and well development to ensure conformance with GHD's Standard Operating Procedures.

The monitoring wells were typically constructed with 2-inch (~50 mm) Schedule 40 PVC screen and casing. The screen length used for the monitoring wells was 3.0 metres on average and pre-slotted (No.

10 slot). The annular space between the monitoring well screen and surrounding geological formation were backfilled with No. 3 grade silica sand to an average height of 0.6 metres above the top of the screen. The remaining annular space was backfilled with bentonite. Some monitoring wells were installed with minor alteration to the above installation details, due to the specific conditions encountered.

To complete the instrumentation, an expandable J-plug was installed on the riser style casing to cover the top of the riser pipe to protect against debris falling into the well and surface runoff infiltration. All wells were installed in a monument configuration with concrete collar around the protective casing. Each groundwater monitoring well was instrumented with dedicated sampling equipment consisting of polyethylene tubing and Waterra foot valves for monitoring well development and installation.

1.5 Monitoring Well Development

Subsequent to the monitoring well installation, each well was developed to ensure hydraulic connection with the screened hydrostratigraphic unit. A hydraulic connection ensures that groundwater levels and samples are representative of the subsurface condition. Development also aids in achieving low-turbidity samples.

The wells were developed using dedicated 5/8" (~16 mm) diameter polyethylene tubing with a Waterra foot valve. Well development activities were undertaken until purged water was clear. In cases where a well was purged dry before sufficient development, the well water level was allowed to recover before continuing.

1.6 Surveying

Subsequent to installation, all wells and boreholes were surveyed for vertical and lateral control, and for water table elevation reference, using a geodetic benchmark[1] to tie in vertical elevations relative to metres above mean sea level (mAMSL) at the Site. The ground surface and top of riser pipe elevation of each of well were surveyed with respect to this benchmark.

2. Water Level Measurements

The measurement of groundwater levels in monitoring wells was required during the hydrogeological investigation in order to determine the presence and depth of groundwater. Water level measurements were used to determine: hydraulic head, hydraulic gradients and the direction of groundwater flow.

Since many decisions concerning the vertical and horizontal flow of groundwater through various types of geologic conditions depend on groundwater/fluid measurements, the accuracy of the measurements made at an appropriate level of precision is very important. Typically, the precision required is 1 mm, and the equipment employed had measurement resolution at this level.

Manual groundwater level measurements were measured using a Solinst water level meter. Measurements were obtained by lowering the electrode, attached to a graduated polyethylene tape, slowly into the well until the indicator sounded. To ensure accuracy, all fluid level readings were double-checked in the field when recorded.

[1] Elevations are taken from a benchmark steel rod with brass cap on south side of HWY 12, 1.45 KM West of bridge carrying GWY12 over HWY 11 at Orillia, 4.05 km East of intersection of hwy 12 and Simcoe City RD 22 (Horseshoe Valley Road) in Price's Corners, 0.65 km West of Fit Tons Road, 1.75 km east of Orillia Con 1-2 rd, 34.0 m South of Centreline of Hwy 12.

In order to provide reliable data, each round of water level measurements was collected over as short a period of time as possible. Barometric pressure can affect groundwater levels and, therefore, observation of significant weather changes during the period of water level measurements was noted. Rainfall events and groundwater pumping can also affect groundwater level measurements. Personnel collecting water level data noted if any of these controls are in effect during the groundwater level collection period.

3. Groundwater Sampling

Prior to initiating groundwater sample collection, the wells were purged of the standing stagnant groundwater volume using a dedicated Waterra foot valve and polyethylene tubing. Purging was performed until the water in the well was representative of the actual conditions in the hydrostratigraphic unit. Stabilization was achieved by the removal of at least three times the volume of standing water in the well. Purging was considered complete once purged groundwater field parameters including conductivity, temperature and pH were stable. Stabilization was achieved when field measurements for conductivity and temperature were within a range of plus or minus 10 percent of the average for the last three readings and field measurements for pH were within a range of plus or minus 0.1 pH unit of the average for the last three readings.

The wells were purged using dedicated inertial pumps. In the event of a slowly recharging well, the well was pumped dry to ensure all standing water was removed from the sand pack and then allowed to recover prior to sample collection.

In the event of a well with groundwater that contains a high amount of silt or sediment after well development, a 0.75"x36" PVC water bailer was used to collect the water.

Water samples were collected directly from the dedicated tubing or bailer to laboratory supplied sample containers. Samples were relinquished to Maxxam Analytics in Mississauga, Ontario under Chain of Custody protocols.

4. Single Well Response Tests

Single well response tests (SWRT) were completed three at monitoring well installations to determine the hydraulic conductivity of the screened geologic formation. The SWRT consisted of falling head tests (slug tests), and rising head tests (recovery rests) as described in the sections below.

4.1 Falling Head Test (Slug Test)

The slug test involves causing a sudden change in water level in a well and measuring the water level response within that well. Water level change may be induced by suddenly injecting or emplacing a known quantity or "slug" into the well. The slug can water or solid (stainless steel, polyvinyl chloride). A detailed description of the procedure is provided, as follows:

i) The static water level was determined prior to any testing of the well.

ii) A datalogger, programmed to measure water pressure at an appropriate interval (eg. 5 seconds), was installed in the well at a known depth.

iii) A slug of known dimensions was set in place just above the static water level.

iv) The slug was then released instantaneously until it was completely submerged in the water column.

v) After the initial positive displacement of the water column, water levels were monitored manually.

vi) When the water level reached approximately 90 percent of the original observed (static) water level, the slug was then rapidly removed from the water column to initiate a "rising-head" test.

4.2 Rising Head Test (Recovery Test)

The recovery test also involves causing a sudden change in water level in a well and measuring the water level response within that well. Water level change may be induced by suddenly removing a known quantity or "slug" out of the well. The slug is usually a stainless steel or polyvinyl chloride rod.

Recovery tests were carried out after the slug tests described above. Water level monitoring continued until the water level was within 10 percent of the original static level.

Appendix C
Stratigraphic and Instrumentation Logs

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Hydrogeological and Environmental Assessment
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, Mt. Albert, Ontario

HOLE DESIGNATION: MW1-17
DATE COMPLETED: November 6, 2017
DRILLING METHOD: 8" HSA
FIELD PERSONNEL: S. Howell

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	TOP OF RISER GROUND SURFACE	252.58 251.80						
0.0	CLAY (TOPSOIL), silty, very soft, low plasticity, dark brown, moist, rootlets		CONCRETE					
		251.51		1		58	2	0.0
0.5	CLAY (NATIVE), silty, trace gravel, trace sand, very soft, low plasticity, grey, moist							
1.0				2		75	42	1.0
	- cobble, boulder at 1.22m BGS		BENTONITE SEAL					
1.5		250.27						
	SAND AND GRAVEL, silty, very dense, grey, moist			3		92	61	2.0
2.0	- becomes wet at 2.06m BGS							
2.5				4		88	39	1.0
3.0		248.75						
	SAND, gravelly, trace silt, compact, poorly sorted, brown and grey, wet			5		88	24	1.0
3.5								
4.0			NATIVE SAND AND GRAVEL (CAVED) MATERIAL					
4.5		247.22						
	SAND (TILL), with clay, with silt, trace gravel, very dense, grey, moist			6		38	>50	1.0
5.0								
5.5								
6.0		245.70						
	SAND AND GRAVEL, trace silt, trace clay, occassional cobbles/boulders, very dense, grey, wet			7		38	>50	1.0
6.5								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 29, 2017

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Hydrogeological and Environmental Assessment
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, Mt. Albert, Ontario

HOLE DESIGNATION: MW1-17
DATE COMPLETED: November 6, 2017
DRILLING METHOD: 8" HSA
FIELD PERSONNEL: S. Howell

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
7.5	- brown at 7.62m BGS		SAND PACK; WELL SCREEN	8		71	>50	1.0
8.0								
8.5								
9.0								
9.5	- Split spoon sampler refusal at 9.45m BGS	242.35		9		54	>50	1.0
	END OF BOREHOLE @ 9.45m BGS							
10.0								
10.5								
11.0								
11.5								
12.0								
12.5								
13.0								
13.5								

WELL DETAILS
Screened interval:
246.00 to 242.96m BGS
5.79 to 8.84m BGS
Length: 3.05m
Diameter: 51mm
Slot Size: #10
Material: PVC
Sand Pack:
246.61 to 242.35m BGS
5.18 to 9.45m BGS
Material: #2 Silica

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
STATIC WATER LEVEL ▼ November 29, 2017

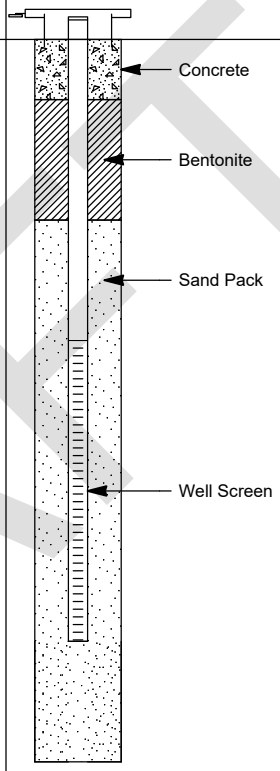
STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Site Alteration Permit Application
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, East Gwillimbury, Ontario

HOLE DESIGNATION: MW01B-19
DATE COMPLETED: 7 August 2019
DRILLING METHOD: HSA
FIELD PERSONNEL: R. Bay

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS
	GROUND SURFACE	251.37
0.5	TOPSOIL, rootlets	251.06
	SILT (FILL), stiff, low plasticity, some clay, trace sand, no gravel, rootlets, dark brown to brown, moist	250.60
1.0	SILTY SAND (NATIVE), dense, some gravel, trace clay, brown to grey, moist, broken rocks	250.00
1.5	GRAVELLY SILTY SAND (NATIVE), very dense, grey, very moist to wet	249.23
2.0	SAND AND GRAVEL (NATIVE), very dense, trace silt, grey, wet	248.32
2.5	SAND AND GRAVEL (NATIVE), trace silt, very dense, grey, wet, broken rocks	247.71
3.0	END OF BOREHOLE @ 3.66m BGS	
3.5		
4.0		
4.5		
5.0		
5.5		
6.0		
6.5		

MONITOR INSTALLATION



WELL DETAILS
Screened interval:
249.84 to 248.32m BGS
1.52 to 3.05m BGS
Length: 1.52m
Diameter: 51mm
Slot Size: #10
Material: PVC
Sand Pack:
250.45 to 247.71m BGS
0.91 to 3.66m BGS
Material: #2 Silica

SAMPLE

NUMBER	INTERVAL	REC (m)	
1		0.61	11
2		0.61	46
3		0.61	>50
4		0.55	>50
5		0.55	>50

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Site Alteration Permit Application
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, East Gwillimbury, Ontario

HOLE DESIGNATION: MW02A-19
DATE COMPLETED: 9 August 2019
DRILLING METHOD: HSA
FIELD PERSONNEL: R. Bay

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (m)	SAMPLE
	GROUND SURFACE	257.06					
0.5	TOPSOIL, rootlets		Concrete	1		0.61	11
	SILT (FILL), some clay, trace sand, compact, dark to light brown, moist	256.70					
1.0	SILT (NATIVE), some sand, trace clay, trace gravel, compact, light brown, moist	256.30		2		0.61	12
1.5	- no gravel at 1.52m BGS			3		0.61	17
2.0	- dense at 2.13m BGS						
2.5				4		0.61	31
3.0							
3.5				5		0.55	44
4.0							
4.5	SANDY SILT (NATIVE), trace gravel, trace clay, dense, brown, very moist	252.49					
5.0				6		0.61	39
5.5							
6.0	SAND (NATIVE), some silt, no gravel, no clay, very dense, brown, moist	250.97					
6.5				7		0.61	>50

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Site Alteration Permit Application
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, East Gwillimbury, Ontario

HOLE DESIGNATION: MW02A-19
DATE COMPLETED: 9 August 2019
DRILLING METHOD: HSA
FIELD PERSONNEL: R. Bay

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (m)	SAMPLE
7.5							
	SAND (NATIVE), coarse grained, some silt, dense, brown, wet	249.44		8		0.61	50
8.0							
8.5							
9.0	- trace gravel, brown to grey at 9.14m BGS						
9.5				9		0.46	46
10.0							
10.5	- very dense, some gravel, grey at 10.67m BGS		Bentonite				
11.0				10		0.61	>50
11.5							
12.0							
	SILTY SAND (NATIVE), trace gravel, dense, grey, wet	244.87					
12.5				11		0.61	32
13.0							
13.5							
	GRAVEL AND SAND (NATIVE), some silt, very dense, grey, wet, broken rocks	243.35					

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Site Alteration Permit Application
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, East Gwillimbury, Ontario

HOLE DESIGNATION: MW02A-19
DATE COMPLETED: 9 August 2019
DRILLING METHOD: HSA
FIELD PERSONNEL: R. Bay

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (m)	SAMPLE
14.5				12		0.53	>50
15.0	- trace silt, broken rocks at 15.24m BGS						
15.5				13			
16.0							
16.5							
17.0				14			>50
17.5							
18.0							
18.5				15			
19.0							
19.5							
20.0	SAND (NATIVE), coarse grained, very dense, some gravel, trace silt, grey, wet to very moist	237.25		16		0.46	>50
20.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Site Alteration Permit Application
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, East Gwillimbury, Ontario

HOLE DESIGNATION: MW02A-19
DATE COMPLETED: 9 August 2019
DRILLING METHOD: HSA
FIELD PERSONNEL: R. Bay

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (m)	SAMPLE
21.5	- some silt, trace gravel at 21.34m BGS			17		0.61	>50
22.0							
22.5			Sand Pack				
23.0	SILTY SAND (NATIVE), very dense, grey, wet	234.20	Well Screen	18		0.61	>50
23.5							
24.0							
24.5				19		0.30	35
25.0	END OF BOREHOLE @ 24.99m BGS	232.07					
25.5							
26.0							
26.5							
27.0							
27.5							

WELL DETAILS
Screened interval:
235.73 to 232.68m BGS
21.34 to 24.38m BGS
Length: 3.05m
Diameter: 51mm
Slot Size: #10
Material: PVC
Sand Pack:
236.34 to 232.68m BGS
20.73 to 24.38m BGS
Material: #2 Silica

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Hydrogeological and Environmental Assessment
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, Mt. Albert, Ontario

HOLE DESIGNATION: MW2-17
DATE COMPLETED: November 8, 2017
DRILLING METHOD: 8" HSA
FIELD PERSONNEL: S. Howell

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	TOP OF RISER GROUND SURFACE	257.72 256.87						
0	SILT (TOPSOIL), with sand, trace clay, compact, dark brown, moist, rootlets	256.71	CONCRETE	1		79	12	0.0
0.5	SILT (NATIVE), with clay, trace sand, compact, brown, moist - grey at 0.53m BGS - trace clay, loose, light brown, moist at 0.76m BGS							
1.0				2		63	6	0.0
1.5	- layer of sand, fine to medium grained, trace gravel, brown, moist at 1.30m BGS - compact, light brown, moist at 1.52m BGS							
2.0				3		100	19	1.0
2.5	- with clay, compact, light brown, moist at 2.29m BGS			4		100	26	1.0
3.0	- becomes dense at 3.05m BGS			5		100	37	1.0
3.5								
4.0								
4.5	- minor oxidation staining at 4.57m BGS		BENTONITE SEAL					
5.0				6		100	37	1.0
5.5								
6.0				7A		100	37	1.0
6.5	SAND, silty, dense, fine grained, light brown, moist	250.62		7B				1.0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 29, 2017

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Hydrogeological and Environmental Assessment
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, Mt. Albert, Ontario

HOLE DESIGNATION: MW2-17
DATE COMPLETED: November 8, 2017
DRILLING METHOD: 8" HSA
FIELD PERSONNEL: S. Howell

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
7.5	- trace silt, dense, fine to medium grained, brown, wet at 7.62m BGS			8		88	46	1.0
8.0								
8.5								
9.0	- trace gravel, compact, fine grained at 9.14m BGS			9		100	24	1.0
9.5								
10.0								
10.5	- trace silt, dense, fine to medium grained, brown, wet at 10.67m BGS		WELL SCREEN					
11.0	SILT, trace clay, dense, grey, wet	245.80	SAND PACK	10A		100	44	1.0
				10B				1.0
11.5								
12.0	SAND, trace silt, compact, fine to medium grained, brown, wet	244.68		11A		100	23	1.0
12.5	SILT, trace sand, trace clay, trace gravel, compact, light brown, wet	244.22		11B				1.0
13.0								
13.5			NATIVE (CAVED) MATERIAL					
	SAND, trace silt, compact, fine grained, brown, wet	243.15		12A		100	29	1.0
	SAND AND GRAVEL, trace silt, compact, poorly	243.00						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 29, 2017

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Hydrogeological and Environmental Assessment
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, Mt. Albert, Ontario

HOLE DESIGNATION: MW2-17
DATE COMPLETED: November 8, 2017
DRILLING METHOD: 8" HSA
FIELD PERSONNEL: S. Howell

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
14.5	sorted, brown, wet - lightly cemented at 14.17m BGS			12B				1.0
15.0			NATIVE (CAVED) MATERIAL					
15.5				13A			37	
	- dense, grey, wet at 15.70m BGS			13B		25	37	2.0
16.0								
16.5								
17.0				14		25	93	2.0
	END OF BOREHOLE @ 17.20m BGS	239.67						
17.5			WELL DETAILS Screened interval: 247.77 to 244.73m BGS 9.09 to 12.14m BGS Length: 3.05m Diameter: 51mm Slot Size: #10 Material: PVC Sand Pack: 248.33 to 243.46m BGS 8.53 to 13.41m BGS Material: #2 Silica					
18.0								
18.5								
19.0								
19.5								
20.0								
20.5								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 29, 2017

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Hydrogeological and Environmental Assessment
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, Mt. Albert, Ontario

HOLE DESIGNATION: MW3-17
DATE COMPLETED: November 17, 2017
DRILLING METHOD: 8" HSA
FIELD PERSONNEL: S. Howell

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	TOP OF RISER GROUND SURFACE	269.64 268.74						
0.5	CLAY (TOPSOIL), silty, trace sand, stiff, dark brown, moist, rootlets	268.48	CONCRETE	1		92	13	1.0
	SILT (NATIVE), with sand, with clay, trace gravel, compact, brown, moist, oxidation stains							
1.0				2		38	10	0.0
1.5	- trace clay, light brown, moist to wet at 1.52m BGS							
	- becomes wet at 1.83m BGS			3		92	16	0.0
2.0								
2.5			BENTONITE SEAL	4		83	24	0.0
3.0	- becomes dense, grey, moist to wet at 3.05m BGS							
				5		83	33	0.0
3.5	- layer of sand, fine grained, grey, moist at 3.58m BGS	265.08						
4.0	SAND, silty, trace clay, trace gravel, compact, fine to medium grained, grey, moist							
4.5								
5.0	- small layer of silt, brown, moist to wet at 4.88m BGS			6		83	31	1.0
5.5								
6.0		262.64						
	SAND AND GRAVEL, trace silt, very dense, fine grained, grey, moist			7		38	>50	1.0
6.5								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 30, 2017

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Hydrogeological and Environmental Assessment
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, Mt. Albert, Ontario

HOLE DESIGNATION: MW3-17
DATE COMPLETED: November 17, 2017
DRILLING METHOD: 8" HSA
FIELD PERSONNEL: S. Howell

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
7.5								
	SAND, with silt, trace gravel, dense, fine grained, grey, moist	261.12		8		38	>50	1.0
8.0			BENTONITE SEAL					
8.5								
9.0								
	SAND AND GRAVEL, with silt, very dense, poorly sorted, grey, moist	259.59		9		33	>50	1.0
9.5								
10.0								
10.5								
11.0				10		41	>50	1.0
11.5								
12.0								
12.5				11		38	>50	1.0
13.0								
13.5								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 30, 2017

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Hydrogeological and Environmental Assessment
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, Mt. Albert, Ontario

HOLE DESIGNATION: MW3-17
DATE COMPLETED: November 17, 2017
DRILLING METHOD: 8" HSA
FIELD PERSONNEL: S. Howell

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	REC (%)	'N' VALUE	PID (ppm)
14.5				12		42	>50	1.0
15.0			BENTONITE SEAL					
15.5				13		79	>50	1.0
16.0								
16.5								
17.0	CLAY, sandy, with gravel, with silt, hard, grey, moist to wet	251.67		14		17	>50	1.0
17.5								
18.0								
18.5				15		83	>50	0.0
19.0								
19.5	- decrease in moisture content at 19.81m BGS		WELL SCREEN SAND PACK					
20.0				16		50	>50	0.0
20.5								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 30, 2017

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Hydrogeological and Environmental Assessment
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, Mt. Albert, Ontario

HOLE DESIGNATION: MW3-17
DATE COMPLETED: November 17, 2017
DRILLING METHOD: 8" HSA
FIELD PERSONNEL: S. Howell

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
21.5								
22.0			SAND PACK	17		46	>50	0.0
22.5								
23.0	- with sand, with gravel, with silt, hard, low plasticity, moist at 22.86m BGS			18		58	<50	1.0
23.5								
24.0								
24.5			NATIVE (CAVED) MATERIAL	19		46	<50	1.0
25.0								
25.5								
26.0								
26.5	END OF BOREHOLE @ 26.21m BGS	242.52		20		50	<50	1.0
27.0								
27.5								

WELL DETAILS
Screened interval:
250.97 to 247.92m BGS
17.77 to 20.82m BGS
Length: 3.05m
Diameter: 51mm
Slot Size: #10
Material: PVC
Sand Pack:
252.49 to 245.88m BGS
16.25 to 22.86m BGS
Material: #2 Silica

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
STATIC WATER LEVEL ▼ November 30, 2017

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Hydrogeological and Environmental Assessment
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, Mt. Albert, Ontario

HOLE DESIGNATION: MW4-17
DATE COMPLETED: November 14, 2017
DRILLING METHOD: 8" HSA
FIELD PERSONNEL: S. Howell

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	TOP OF RISER GROUND SURFACE	276.96 276.11						
0.0	SILT (TOPSOIL), trace clay, trace sand, dark brown, moist, rootlets	275.85	CONCRETE	1		88	5	0.0
0.5	SILT (NATIVE) with sand, trace gravel, trace clay, loose, light brown, moist							
	- trace clay, compact, light brown, moist at 0.76m BGS			2		88	13	0.0
1.0								
1.5				3		83	24	0.0
2.0								
	- increase in moisture content, minor oxidation stains at 2.29m BGS		BENTONITE SEAL	4		100	22	0.0
2.5								
3.0				5A		79	34	0.0
	SAND, gravelly, with silt, trace clay, dense, fine grained, brown, moist, oxidation stains	272.75		5B				0.0
3.5								
4.0								
4.5	- trace silt, dense, fine to medium grained, grey, moist at 4.57m BGS			6		88	63	0.0
5.0								
5.5								
6.0	- trace gravel, trace silt, very dense, fine to medium grained, grey, moist at 6.10m BGS			7		100	57	0.0
6.5								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 30, 2017

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Hydrogeological and Environmental Assessment
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, Mt. Albert, Ontario

HOLE DESIGNATION: MW4-17
DATE COMPLETED: November 14, 2017
DRILLING METHOD: 8" HSA
FIELD PERSONNEL: S. Howell

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
7.5								
8.0			BENTONITE SEAL	8		83	65	0.0
8.5								
9.0	- poorly sorted, light brown at 9.14m BGS							
9.5				9		92	86	1.0
10.0								
10.5								
11.0				10		92	66	0.0
11.5								
12.0	- trace silt, dense, fine to medium grained, brown, moist at 12.19m BGS							
12.5				11		92	31	0.0
13.0								
13.5	- trace silt, trace gravel, very dense, brown, moist at 13.72m BGS							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 30, 2017

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Hydrogeological and Environmental Assessment
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, Mt. Albert, Ontario

HOLE DESIGNATION: MW4-17
DATE COMPLETED: November 14, 2017
DRILLING METHOD: 8" HSA
FIELD PERSONNEL: S. Howell

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	REC (%)	'N' VALUE	PID (ppm)
14.5				12		63	>50	0.0
15.0								
15.5				13		0		
16.0								
16.5			▼					
17.0	CLAY, sandy, with gravel, with silt, hard, brown, moist	259.34		14		63	>50	1.0
17.5								
18.0								
18.5	SILT, with sand, trace gravel, trace clay, very dense, grey, moist	257.82	WELL SCREEN	15		38	>50	1.0
19.0			SAND PACK					
19.5								
20.0	SAND, with gravel, with silt, trace clay, very dense, fine grained, brown, moist to wet	256.29		16		17	>50	1.0
20.5								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 30, 2017

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Hydrogeological and Environmental Assessment
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, Mt. Albert, Ontario

HOLE DESIGNATION: MW4-17
DATE COMPLETED: November 14, 2017
DRILLING METHOD: 8" HSA
FIELD PERSONNEL: S. Howell

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
21.5	CLAY, with silt, with sand, with gravel, hard, low plasticity, grey, moist	254.77		17		46	>50	1.0
22.0								
22.5								
23.0				18		46	<50	0.0
23.5								
24.0								
24.5	- sandy, with gravel, trace silt, hard, low plasticity, grey, moist at 24.38m BGS			19		50	<50	0.0
25.0								
25.5								
26.0	- with silt, with sand, trace gravel, hard, low plasticity, grey, moist at 25.91m BGS			20		33	<50	0.0
26.5			NATIVE (CAVED) MATERIAL					
27.0								
27.5	- with silt, trace gravel, trace sand, hard, low plasticity, grey, moist to wet at 27.43m BGS			21A		38	<50	0.0
	SAND AND SILT, with gravel, with clay, very dense, reddish/brown, moist to wet	248.52		21B				0.0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 30, 2017

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Hydrogeological and Environmental Assessment
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, Mt. Albert, Ontario

HOLE DESIGNATION: MW4-17
DATE COMPLETED: November 14, 2017
DRILLING METHOD: 8" HSA
FIELD PERSONNEL: S. Howell

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
28.5								
29.0	- grey, moist to wet at 28.96m BGS		NATIVE (CAVED) MATERIAL	22		21	>50	0.0
29.5								
30.0								
30.5	SILT, with sand, trace clay, very dense, brown, moist to wet	245.63	WELL DETAILS Screened interval: 259.34 to 256.29m BGS 16.76 to 19.81m BGS Length: 3.05m Diameter: 51mm Slot Size: #10 Material: PVC Sand Pack: 259.80 to 253.86m BGS 16.31 to 22.25m BGS Material: #2 Silica					
31.0	END OF BOREHOLE @ 30.68m BGS	245.42		23		33	>50	1.0
31.5								
32.0								
32.5								
33.0								
33.5								
34.0								
34.5								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
STATIC WATER LEVEL ▼ November 30, 2017

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Hydrogeological and Environmental Assessment
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, Mt. Albert, Ontario

HOLE DESIGNATION: MW5-17
DATE COMPLETED: November 9, 2017
DRILLING METHOD: 8" HSA
FIELD PERSONNEL: S. Howell

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	TOP OF RISER	260.86						
	GROUND SURFACE	260.00						
0	SILT (TOPSOIL), with clay, trace sand, loose, brown, moist	259.95	CONCRETE	1		79	8	1.0
0.5	SAND (NATIVE), silty, with clay, trace gravel, loose, brown, moist							
1.0	SILT, with sand, trace gravel, trace clay, very loose, light brown, moist	259.24		2		25	3	0.0
1.5	- with clay, compact, light brown, moist at 1.52m BGS			3		75	15	1.0
2.0								
2.5	- trace gravel, trace sand, trace clay, compact, light brown, moist at 2.29m BGS			4		75	15	0.0
3.0								
3.5				5		83	14	0.0
4.0			BENTONITE SEAL					
4.5	SILT AND CLAY, trace gravel, trace sand, compact, light brown, moist	255.43		6		100	15	1.0
5.0								
5.5								
6.0	CLAY, silty, trace sand, trace gravel, stiff, minor plasticity, light brown, moist	253.91		7		100	15	1.0
6.5								
7.0								
7.5	SAND, with gravel, with silt, compact, fine grained, light brown, moist	252.38		8		25	22	1.0

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL ▼ November 30, 2017

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Hydrogeological and Environmental Assessment
PROJECT NUMBER: 11139891
CLIENT: Rice Commercial Group Ltd.
LOCATION: 18725 McCowan Road, Mt. Albert, Ontario

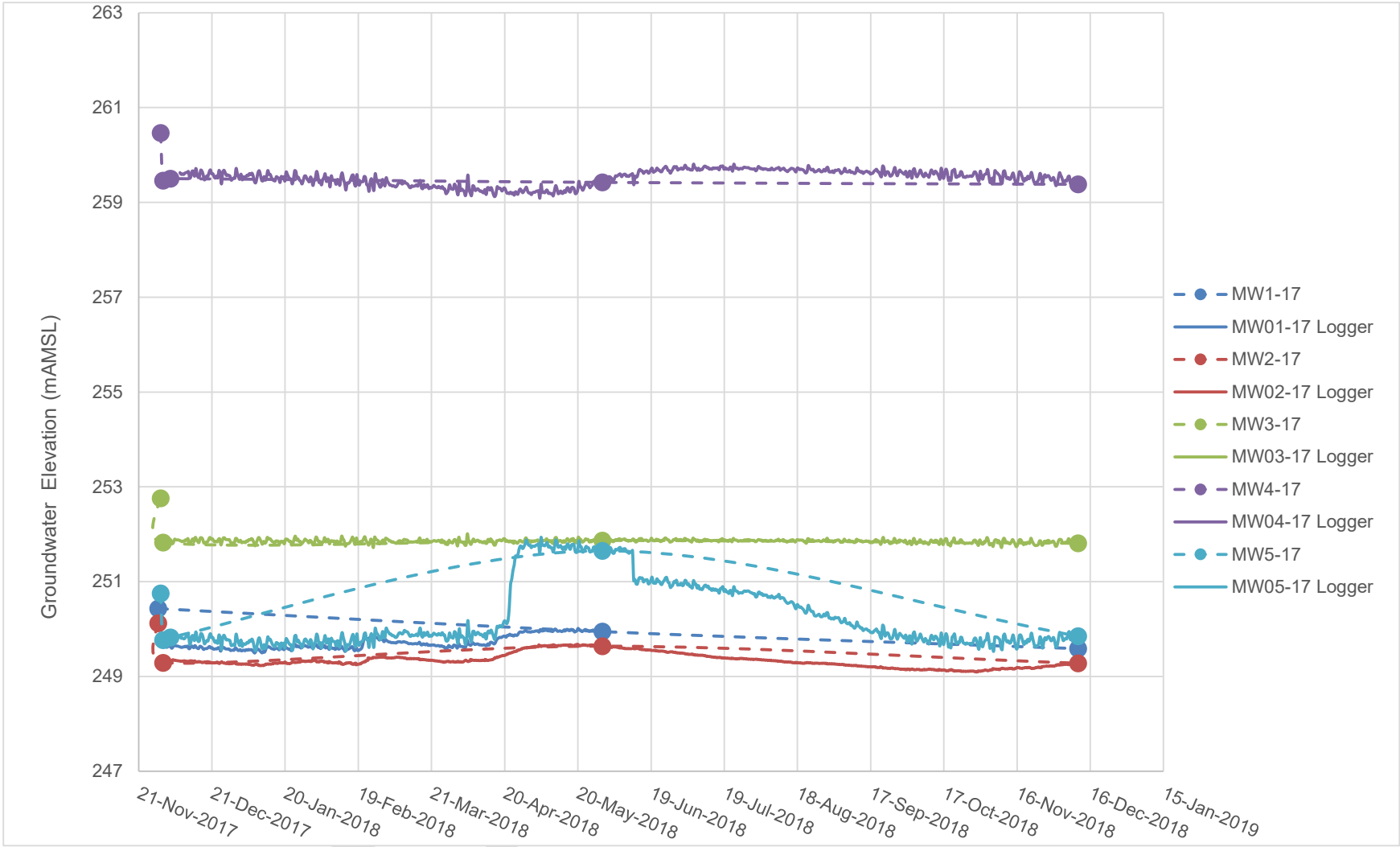
HOLE DESIGNATION: MW5-17
DATE COMPLETED: November 9, 2017
DRILLING METHOD: 8" HSA
FIELD PERSONNEL: S. Howell

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
8.5								
9.0	- very dense at 9.14m BGS							
9.5				9A		67	>50	1.0
	SAND (TILL), gravelly, with silt, trace clay, very dense, brown, moist	250.40	WELL SCREEN	9B				1.0
10.0								
10.5								
	SAND, silty to silt with gravel, trace clay, very dense, brown, moist	249.34	SAND PACK	10		46	>50	1.0
11.0								
11.5								
12.0								
12.5				11		63	>50	1.0
13.0								
13.5								
	- small layer of silt, trace clay, brown, wet at 13.72m BGS							
14.0	- with silt, trace gravel, trace clay, very dense, fine grained, brown, wet at 13.74m BGS		NATIVE (CAVED) MATERIAL	12		71	>50	1.0
	END OF BOREHOLE @ 14.15m BGS	245.85						
14.5								
15.0								
15.5								

WELL DETAILS
Screened interval:
250.62 to 247.57m BGS
9.39 to 12.44m BGS
Length: 3.05m
Diameter: 51mm
Slot Size: #10
Material: PVC
Sand Pack:
251.77 to 246.29m BGS
8.23 to 13.72m BGS
Material: #2 Silica

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
STATIC WATER LEVEL ▼ November 30, 2017

Appendix D
Groundwater Elevation Hydrograph



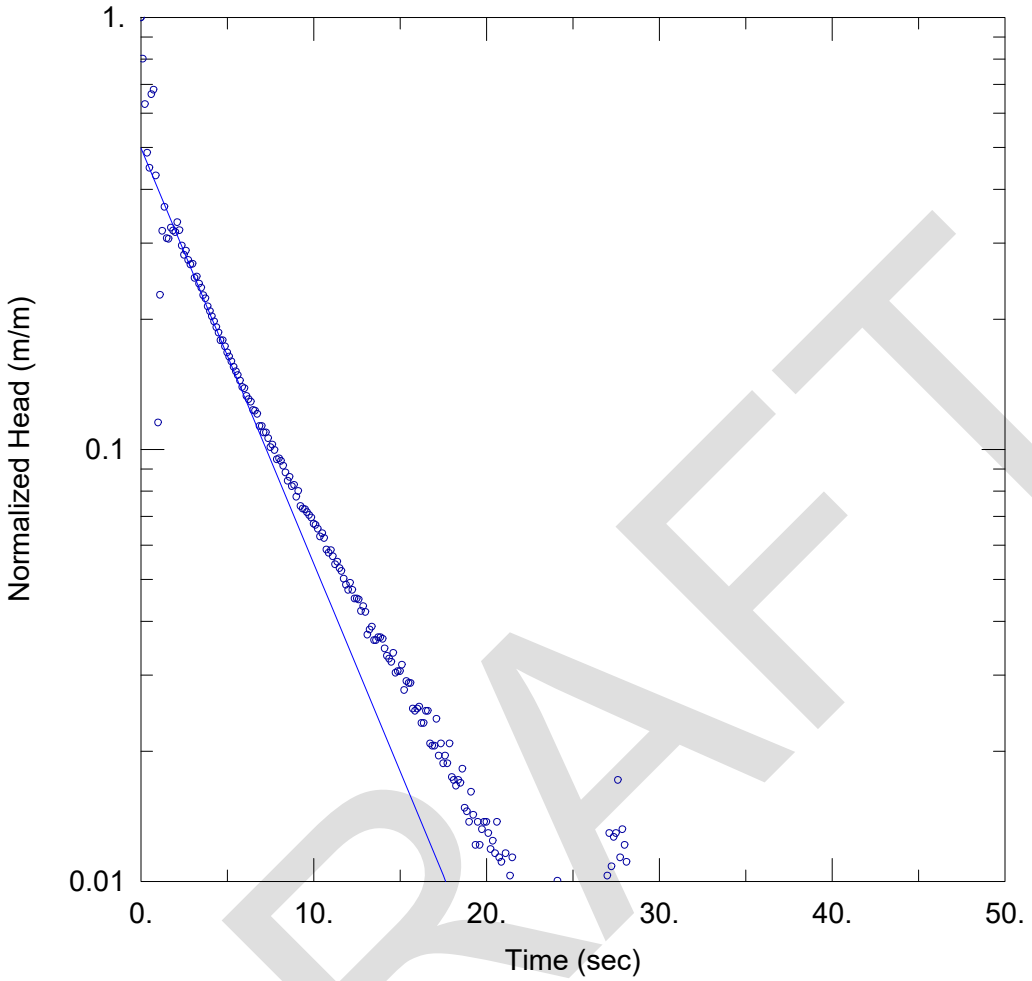
Rice Commercial Group Limited
18725 McCowan Road, East Gwillimbury, Ontario
Site Alteration Permit Application & Supporting Fill Management Plan
Hydrogeological Assessment

Groundwater Elevation Hydrograph

Appendix E
Single Well Response Test Analyses

MW1-17 Falling Head Test 1

Prepared By:	Prepared For:
GHD	Rice Commercial Group LTD
Project:	**Location:**
11139891	Mill Road and McCowan Road



Data Set: \...\MW1-17 Falling 1.aqt
Date: 10/11/18 Time: 15:29:00

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.03975 cm/sec y0 = 0.1887 m

AQUIFER DATA

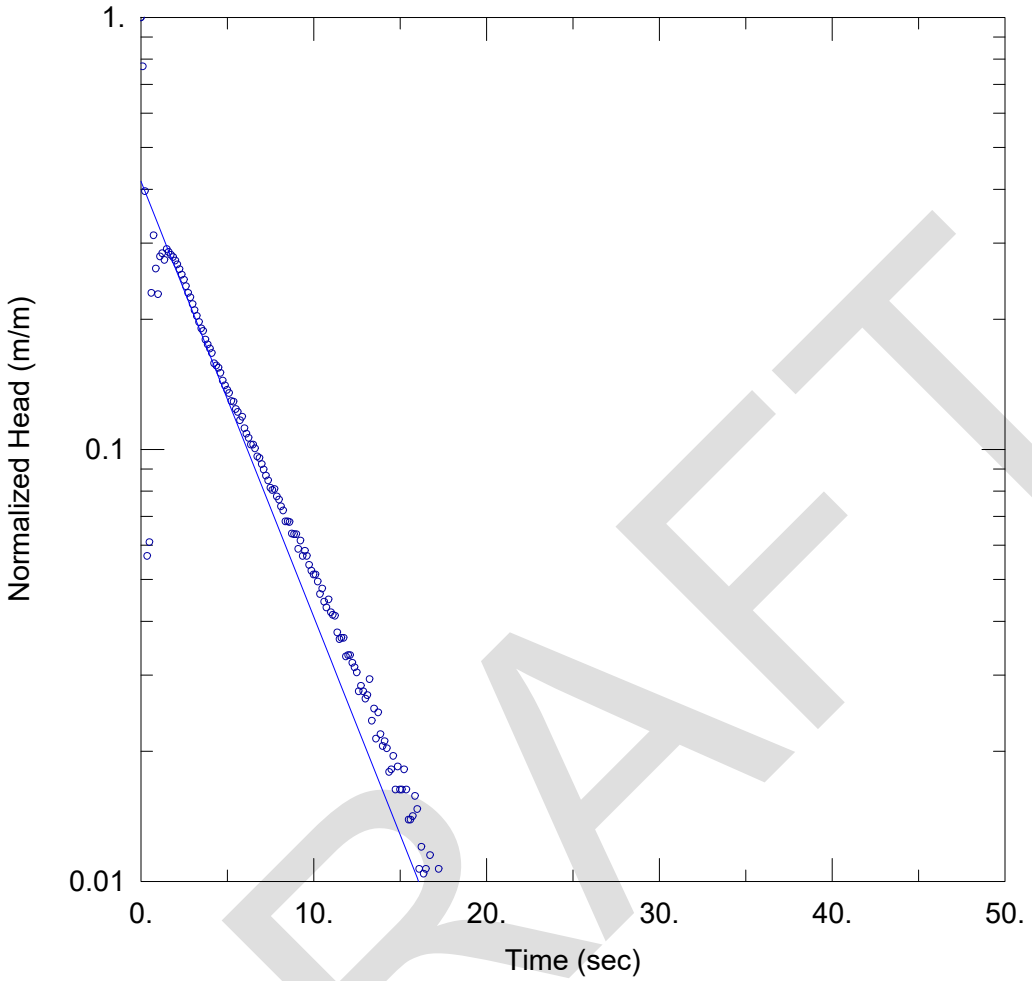
Saturated Thickness: 6.62 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW1-17)

Initial Displacement: 0.3788 m
Static Water Column Height: 6.62 m
Total Well Penetration Depth: 6.62 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.1016 m
Gravel Pack Porosity: 0.3

MW1-17 Falling Head Test 2

Prepared By:	Prepared For:
GHD	Rice Commercial Group LTD
Project:	**Location:**
11139891	Mill Road and McCowan Road



Data Set: \...\MW1-17 Falling 2 - Hvorslev.aqt
Date: 10/11/18 Time: 15:29:17

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.056 cm/sec y0 = 0.1561 m

AQUIFER DATA

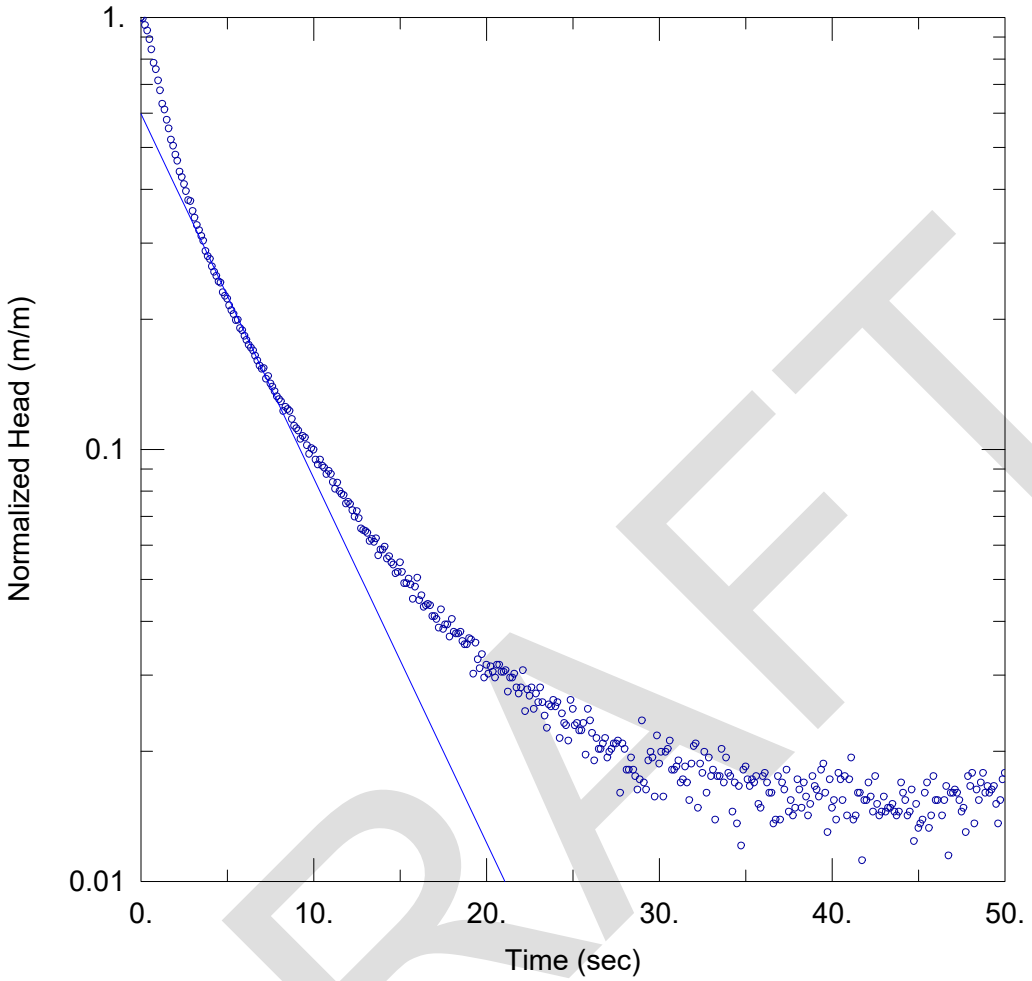
Saturated Thickness: 6.62 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW1-17)

Initial Displacement: 0.3744 m
Static Water Column Height: 6.62 m
Total Well Penetration Depth: 6.62 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.1016 m
Gravel Pack Porosity: 0.3

MW1-17 Rising Head Test 2

Prepared By:	Prepared For:
GHD	Rice Commercial Group LTD
Project:	**Location:**
11139891	Mill Road and McCowan Road



Data Set: \...\MW1-17 Rising 2.aqt
Date: 10/11/18 Time: 15:30:52

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.03487 cm/sec y0 = 0.198 m

AQUIFER DATA

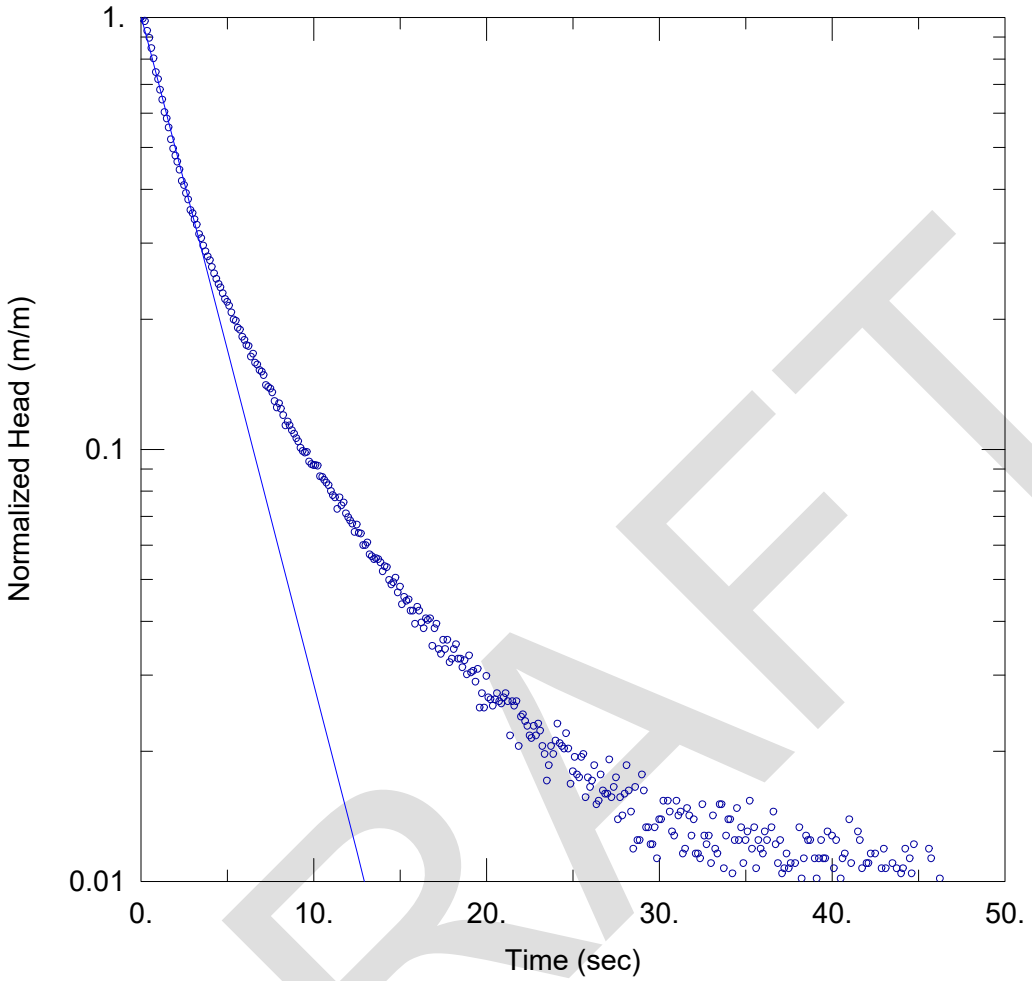
Saturated Thickness: 6.62 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW1-17)

Initial Displacement: 0.331 m
Static Water Column Height: 6.62 m
Total Well Penetration Depth: 6.62 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.1016 m
Gravel Pack Porosity: 0.3

MW1-17 Rising Head Test 1

Prepared By:	Prepared For:
GHD	Rice Commercial Group LTD
Project:	**Location:**
11139891	Mill Road and McCowan Road



Data Set: \...\MW1-17 Rising 1 - Hvorslev.aqt
Date: 10/11/18 Time: 15:29:46

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.08606 cm/sec y0 = 0.3494 m

AQUIFER DATA

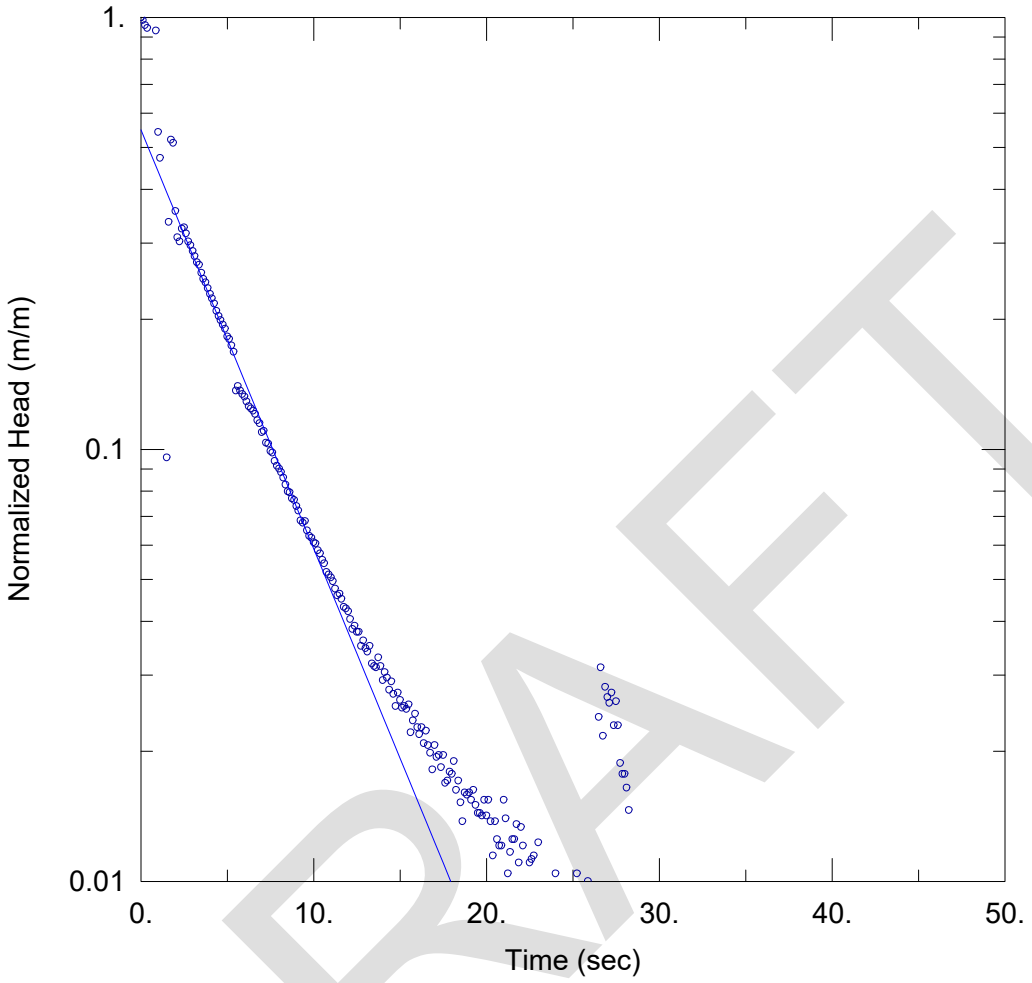
Saturated Thickness: 6.62 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW1-17)

Initial Displacement: 0.3451 m
Static Water Column Height: 6.62 m
Total Well Penetration Depth: 6.62 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.1016 m
Gravel Pack Porosity: 0.3

MW2-17 Falling Head Test

Prepared By:	Prepared For:
GHD	Rice Commercial Group LTD
Project:	**Location:**
11139891	Mill Road and McCowan Road



Data Set: I:\...\MW2-17 Falling.aqt
Date: 07/13/18 Time: 15:06:53

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.03533 cm/sec y0 = 0.2632 m

AQUIFER DATA

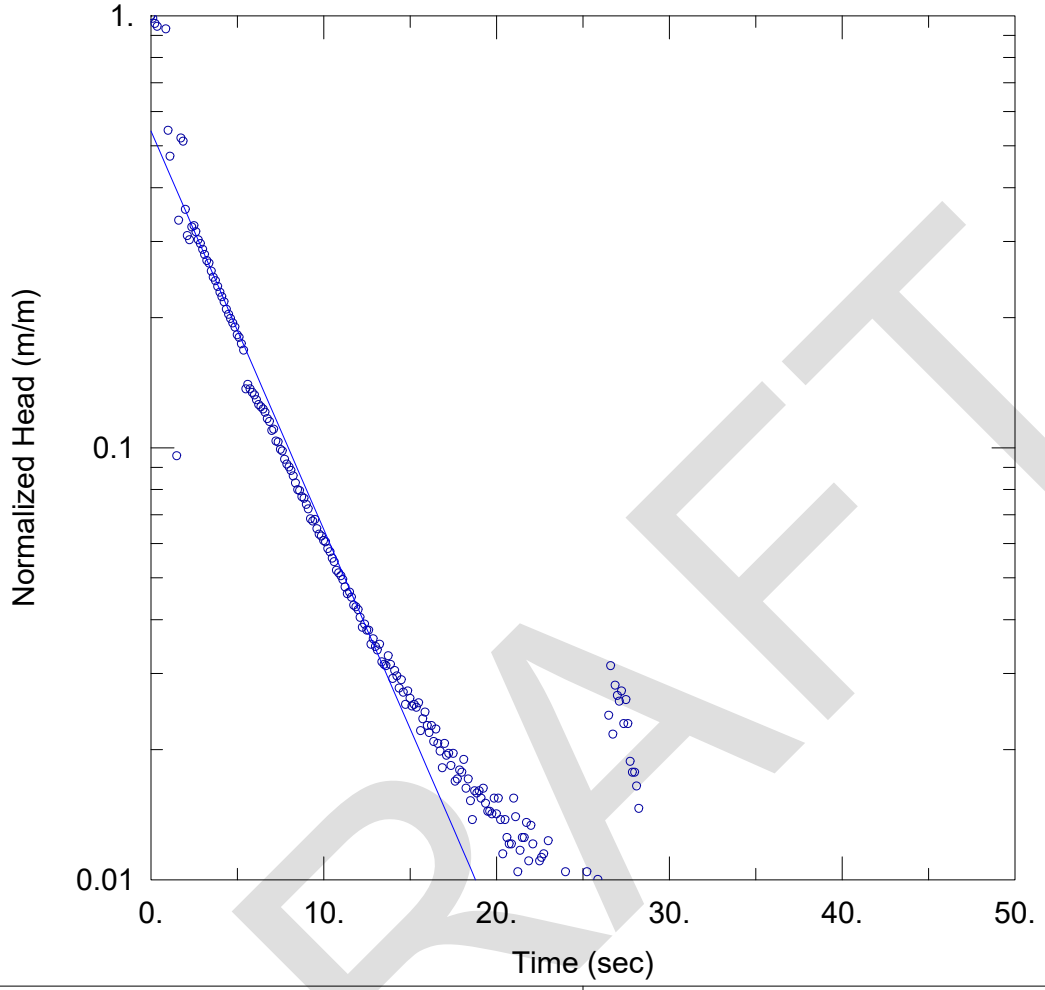
Saturated Thickness: 4.72 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW2-17)

Initial Displacement: 0.4793 m
Static Water Column Height: 4.72 m
Total Well Penetration Depth: 4.72 m
Screen Length: 3.2 m
Casing Radius: 0.0254 m
Well Radius: 0.1016 m
Gravel Pack Porosity: 0.3

MW2-17 Falling Head Test

Prepared By:	Prepared For:
GHD	Rice Commercial Group LTD
Project:	**Location:**
11139891	Mill Road and McCowan Road



Data Set: G:\...\MW2-17 Falling - Hvorslev.aqt
Date: 10/16/18 Time: 13:26:04

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.04879 cm/sec y0 = 0.2591 m

AQUIFER DATA

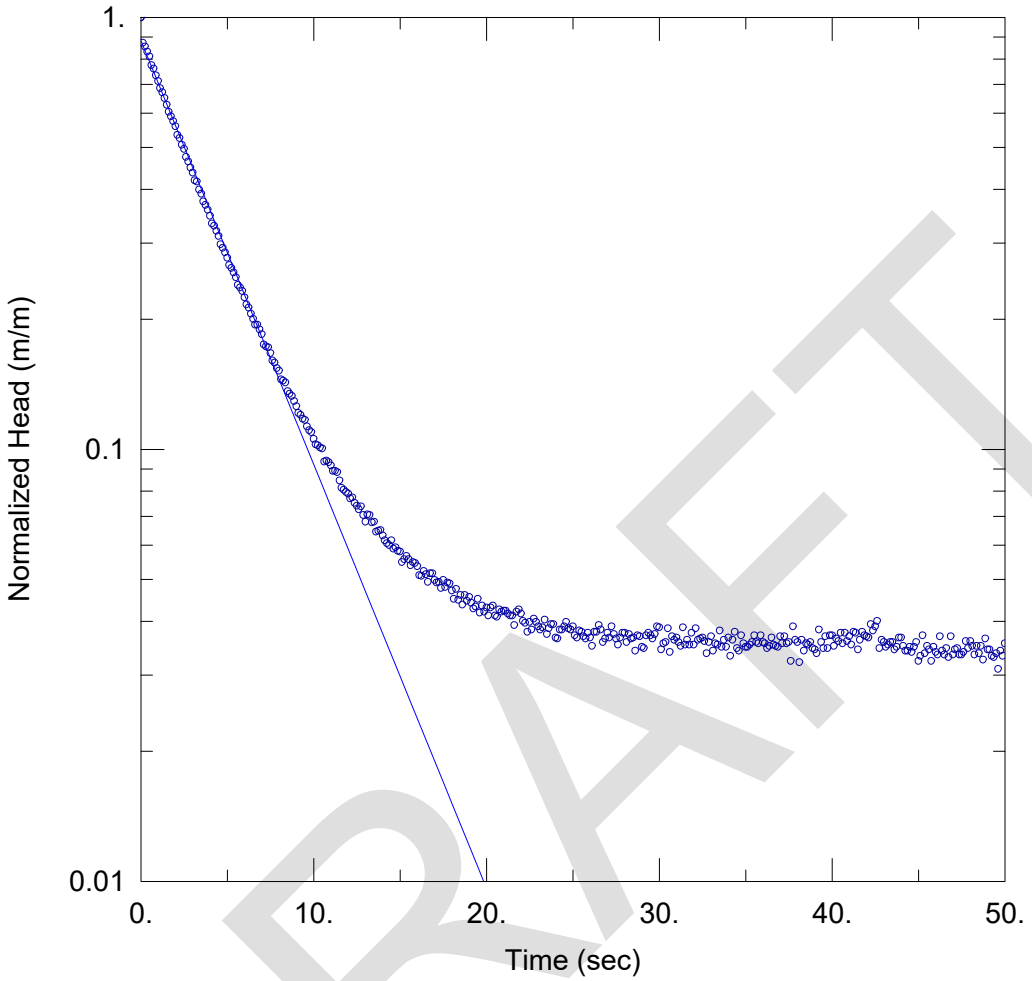
Saturated Thickness: 4.72 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW2-17)

Initial Displacement: 0.4793 m
Static Water Column Height: 4.72 m
Total Well Penetration Depth: 4.72 m
Screen Length: 3.2 m
Casing Radius: 0.0254 m
Well Radius: 0.1016 m
Gravel Pack Porosity: 0.3

MW2-17 Rising Head Test

Prepared By:	Prepared For:
GHD	Rice Commercial Group LTD
Project:	**Location:**
11139891	Mill Road and McCowan Road



Data Set: I:\...\MW2-17 Rising.aqt
Date: 07/13/18 Time: 15:07:34

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.03572 cm/sec y0 = 0.3897 m

AQUIFER DATA

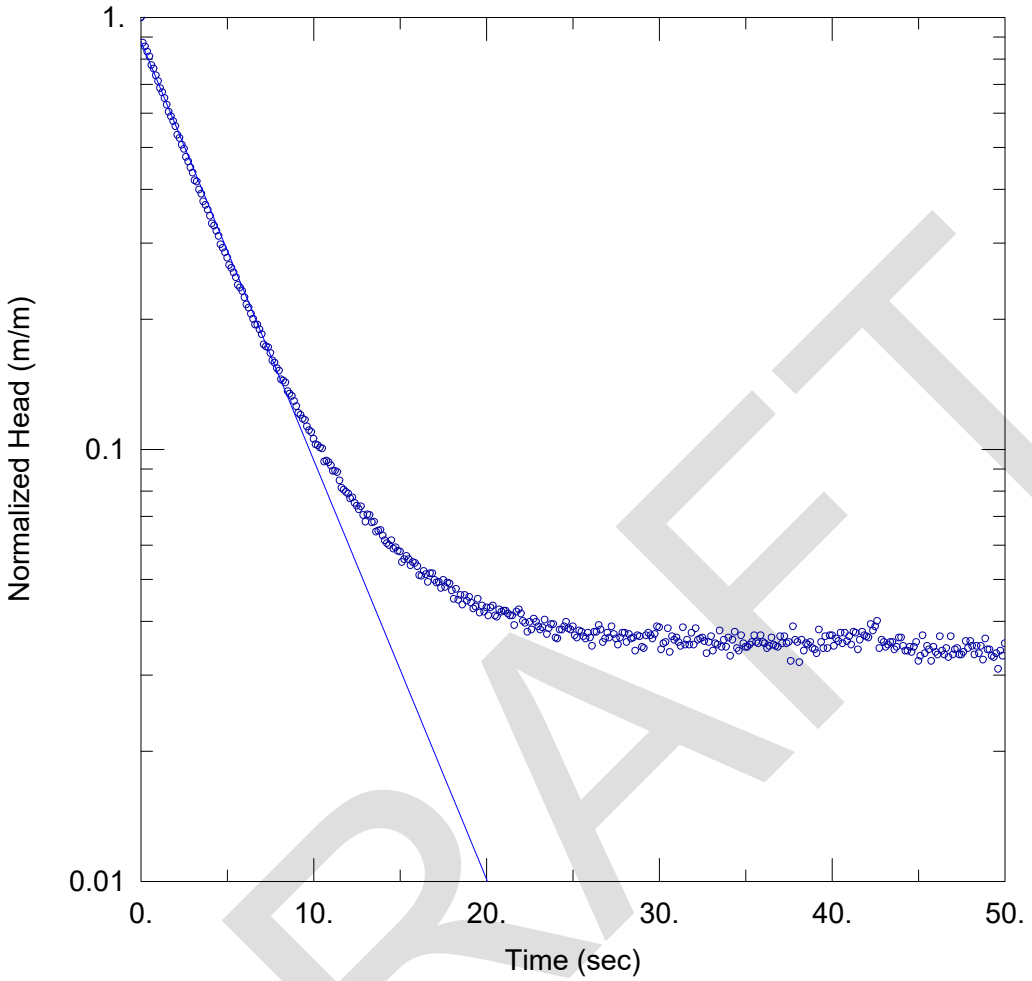
Saturated Thickness: 4.72 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW2-17)

Initial Displacement: 0.4418 m
Static Water Column Height: 4.72 m
Total Well Penetration Depth: 4.72 m
Screen Length: 3.2 m
Casing Radius: 0.0254 m
Well Radius: 0.1016 m
Gravel Pack Porosity: 0.3

MW2-17 Rising Head Test

Prepared By:	Prepared For:
GHD	Rice Commercial Group LTD
Project:	**Location:**
11139891	Mill Road and McCowan Road



Data Set: I:\...\MW2-17 Rising - Hvorslev.aqt
Date: 07/13/18 Time: 15:07:15

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.05129 cm/sec y0 = 0.3887 m

AQUIFER DATA

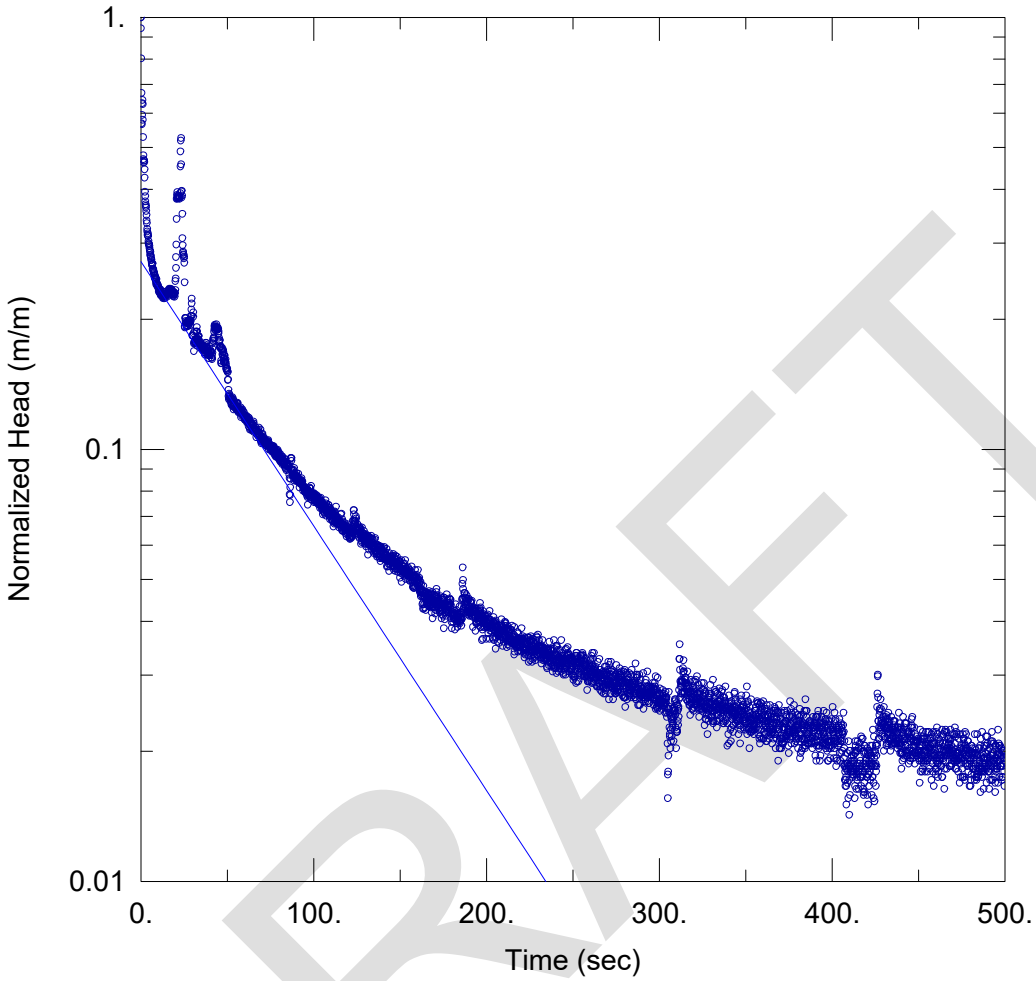
Saturated Thickness: 4.72 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW2-17)

Initial Displacement: 0.4418 m
Static Water Column Height: 4.72 m
Total Well Penetration Depth: 4.72 m
Screen Length: 3.2 m
Casing Radius: 0.0254 m
Well Radius: 0.1016 m
Gravel Pack Porosity: 0.3

MW3-17 Rising Head Test

Prepared By:	Prepared For:
GHD	Rice Commercial Group LTD
Project:	**Location:**
11139891	Mill Road and McCowan Road



Data Set: I:\...\MW3-17 Rising.aqt
Date: 07/13/18 Time: 15:08:40

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.002266 cm/sec y0 = 0.1031 m

AQUIFER DATA

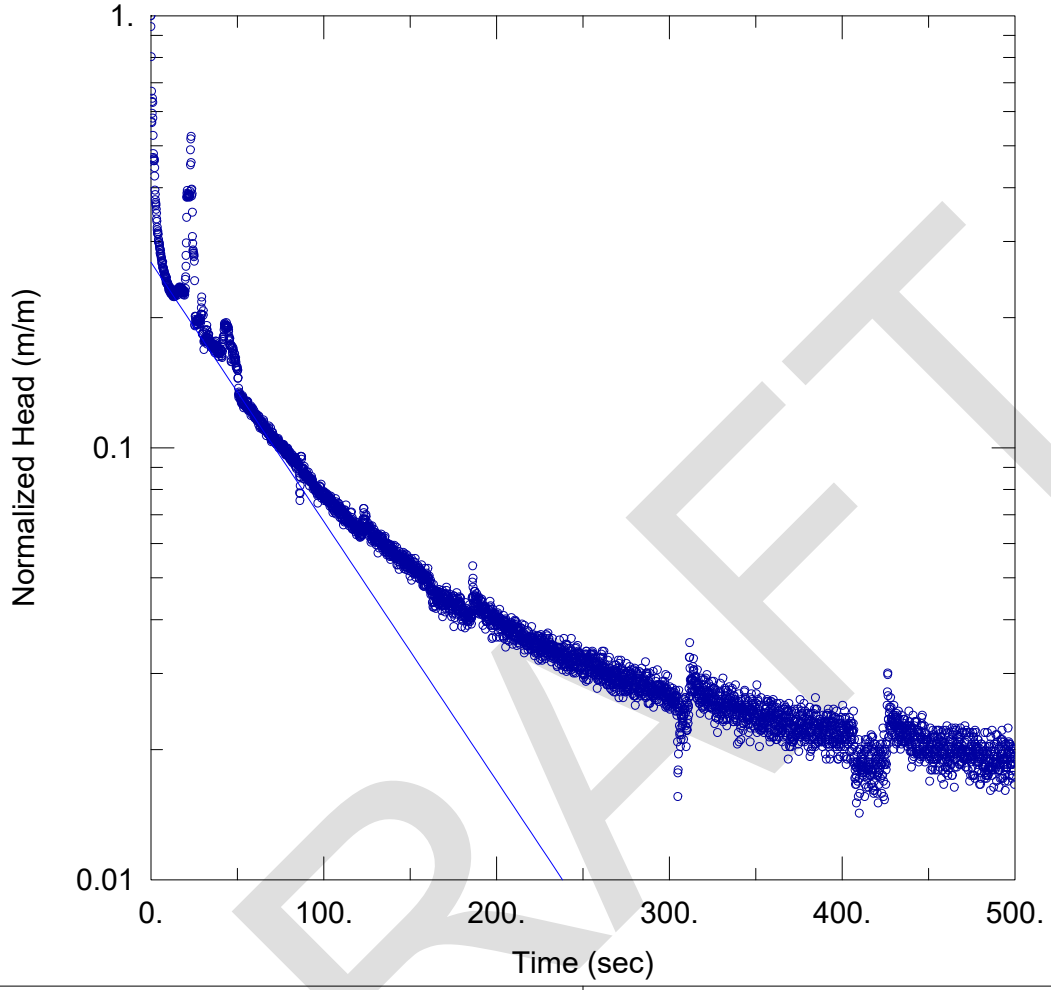
Saturated Thickness: 3.89 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW3-17)

Initial Displacement: 0.3791 m
Static Water Column Height: 3.89 m
Total Well Penetration Depth: 3.89 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.1016 m
Gravel Pack Porosity: 0.3

MW3-17 Rising Head Test

Prepared By:	Prepared For:
GHD	Rice Commercial Group LTD
Project:	**Location:**
11139891	Mill Road and McCowan Road



Data Set: G:\...\MW3-17 Rising - Hvorslev.aqt
Date: 10/16/18 Time: 14:14:43

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.003333 cm/sec y0 = 0.1018 m

AQUIFER DATA

Saturated Thickness: 3.89 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW3-17)

Initial Displacement: 0.3791 m
Static Water Column Height: 3.89 m
Total Well Penetration Depth: 3.89 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.1016 m
Gravel Pack Porosity: 0.3

Appendix F
Laboratory Certificates of Analysis

Maxxam
A Bureau Veritas Group Company

Your P.O. #: 73509652
Your Project #: 11139891-2.2.6
Your C.O.C. #: 642489-01-01

Attention: 11139891-2.2.6 Distribution

GHD Limited
651 Colby Dr
Waterloo, ON
N2V 1C2

Report Date: 2018/01/02
Report #: R4926418
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7S1850
Received: 2017/12/13, 08:37

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	2	N/A	2017/12/15	CAM SOP-00448	SM 22 2320 B m
Carbonate, Bicarbonate and Hydroxide	2	N/A	2017/12/18	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	2	N/A	2017/12/15	CAM SOP-00463	EPA 325.2 m
Colour	2	N/A	2017/12/15	CAM SOP-00412	SM 22 2120C m
Free (WAD) Cyanide	2	N/A	2017/12/15	CAM SOP-00457	OMOE E3015 m
Dissolved Organic Carbon (DOC) (1)	2	N/A	2017/12/15	CAM SOP-00446	SM 22 5310 B m
Fluoride	2	2017/12/14	2017/12/15	CAM SOP-00449	SM 22 4500-F C m
Hardness (calculated as CaCO3)	2	N/A	2017/12/15	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	2	N/A	2017/12/15	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS	2	N/A	2017/12/19	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	2	N/A	2017/12/18		
Total Coliforms/ E. coli, CFU/100mL	2	N/A	2017/12/13	CAM SOP-00551	MOE E3407
Total Ammonia-N	2	N/A	2017/12/18	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	2	N/A	2017/12/16	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Organic Nitrogen	2	N/A	2017/12/18		
pH	2	N/A	2017/12/15	CAM SOP-00413	SM 4500H+ B m
Field pH (3)	2	N/A	2017/12/13		Field pH Meter
Orthophosphate	2	N/A	2017/12/15	CAM SOP-00461	EPA 365.1 m
Sulphate by Automated Colourimetry	2	N/A	2017/12/15	CAM SOP-00464	EPA 375.4 m
Sulphide	2	N/A	2017/12/19	CAM SOP-00455	SM 22 4500-S G m
Total Dissolved Solids	2	2017/12/14	2017/12/14	CAM SOP-00428	SM 22 2540C m
Field Temperature (3)	2	N/A	2017/12/13		Field Thermometer
Total Kjeldahl Nitrogen in Water	2	2017/12/15	2017/12/18	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	2	2017/12/15	2017/12/18	CAM SOP-00407	SM 22 4500 P B H m
Total Suspended Solids	1	2017/12/15	2017/12/15	CAM SOP-00428	SM 22 2540D m
Low Level Total Suspended Solids	1	2017/12/14	2017/12/14	CAM SOP-00428	SM 22 2540D m
Turbidity	2	N/A	2017/12/14	CAM SOP-00417	SM 22 2130 B m
Un-ionized Ammonia	2	2017/12/13	2018/01/02		

Remarks:

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Your P.O. #: 73509652
Your Project #: 11139891-2.2.6
Your C.O.C. #: 642489-01-01

Attention: 11139891-2.2.6 Distribution

GHD Limited
651 Colby Dr
Waterloo, ON
N2V 1C2

Report Date: 2018/01/02
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CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7S1850
Received: 2017/12/13, 08:37

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(3) This is a field test, therefore, the results relate to items that were not analysed at Maxxam Analytics Inc.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Tanya Fidlin, Project Manager
Email: tfidlin@maxxam.ca
Phone# (905)817-5700
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B7S1850
Report Date: 2018/01/02

GHD Limited
Client Project #: 11139891-2.2.6
Your P.O. #: 73509652
Sampler Initials: SH

RESULTS OF ANALYSES OF WATER

Maxxam ID		FTB411			FTB412		
Sampling Date		2017/12/12 11:35			2017/12/12 14:20		
COC Number		642489-01-01			642489-01-01		
	UNITS	GW-11139891-121217-SH-001	RDL	QC Batch	GW-11139891-121217-SH-002	RDL	QC Batch
Calculated Parameters							
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	330	1.0	5313482	470	1.0	5313482
Carb. Alkalinity (calc. as CaCO3)	mg/L	2.3	1.0	5313482	2.4	1.0	5313482
Hardness (CaCO3)	mg/L	360	1.0	5313444	480	1.0	5313444
Ion Balance (% Difference)	%	4.48	N/A	5313483	2.81	N/A	5313483
Total Organic Nitrogen	mg/L	ND	0.10	5313459	1.2	0.10	5313459
Total Un-ionized Ammonia	mg/L	ND	0.0005	5313353	ND	0.0005	5313353
Field Measurements							
Field Temperature	Celcius	8.13	N/A	ONSITE	7.74	N/A	ONSITE
Field pH	pH	7.07		ONSITE	6.89		ONSITE
Inorganics							
Total Ammonia-N	mg/L	ND	0.050	5318110	0.12	0.050	5318110
Colour	TCU	ND	2	5316058	ND	2	5316058
Total Dissolved Solids	mg/L	325	10	5315520	430	10	5315520
Fluoride (F-)	mg/L	ND	0.10	5316743	ND	0.10	5316743
Total Kjeldahl Nitrogen (TKN)	mg/L	ND (1)	0.50	5318213	1.3	0.20	5318213
Dissolved Organic Carbon	mg/L	1.4	0.50	5316207	2.2	0.50	5316207
Orthophosphate (P)	mg/L	ND	0.010	5316755	ND	0.010	5316755
pH	pH	7.86		5316731	7.73		5316731
Total Phosphorus	mg/L	0.20	0.04	5318199	1.2	0.2	5318199
Total Suspended Solids	mg/L	510	3	5316170	2400	50	5317754
Dissolved Sulphate (SO4)	mg/L	28	1.0	5316745	29	1.0	5316745
Sulphide	mg/L	ND	0.020	5323484	ND	0.020	5323484
Turbidity	NTU	11	0.1	5313841	1400	0.1	5313841
WAD Cyanide (Free)	ug/L	ND	1	5317807	ND	1	5317807
Alkalinity (Total as CaCO3)	mg/L	330	1.0	5316738	480	1.0	5316738
Dissolved Chloride (Cl)	mg/L	13	1.0	5316744	6.8	1.0	5316744
Nitrite (N)	mg/L	0.012	0.010	5315754	0.180	0.010	5316217
Nitrate (N)	mg/L	7.44	0.10	5315754	3.49	0.10	5316217
Nitrate + Nitrite (N)	mg/L	7.46	0.10	5315754	3.67	0.10	5316217

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
ND = Not detected
(1) Due to a high concentration of NOx, the sample required dilution. The detection limit was adjusted accordingly.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B7S1850
Report Date: 2018/01/02

GHD Limited
Client Project #: 11139891-2.2.6
Your P.O. #: 73509652
Sampler Initials: SH

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		FTB411			FTB411		
Sampling Date		2017/12/12 11:35			2017/12/12 11:35		
COC Number		642489-01-01			642489-01-01		
	UNITS	GW-11139891-121217-SH-001	RDL	QC Batch	GW-11139891-121217-SH-001 Lab-Dup	RDL	QC Batch
Metals							
Total Aluminum (Al)	ug/L	2700	5.0	5321312			
Total Antimony (Sb)	ug/L	ND	0.50	5321312			
Total Arsenic (As)	ug/L	1.9	1.0	5321312			
Total Barium (Ba)	ug/L	81	2.0	5321312			
Total Beryllium (Be)	ug/L	ND	0.50	5321312			
Total Boron (B)	ug/L	22	10	5321312			
Total Cadmium (Cd)	ug/L	ND	0.10	5321312			
Dissolved Calcium (Ca)	ug/L	110000	200	5315702	110000	200	5315702
Total Chromium (Cr)	ug/L	25	5.0	5321312			
Total Cobalt (Co)	ug/L	5.0	0.50	5321312			
Total Copper (Cu)	ug/L	12	1.0	5321312			
Total Iron (Fe)	ug/L	6700	100	5321312			
Total Lead (Pb)	ug/L	3.9	0.50	5321312			
Dissolved Magnesium (Mg)	ug/L	20000	50	5315702	20000	50	5315702
Total Manganese (Mn)	ug/L	310	2.0	5321312			
Total Molybdenum (Mo)	ug/L	1.4	0.50	5321312			
Total Nickel (Ni)	ug/L	8.9	1.0	5321312			
Total Phosphorus (P)	ug/L	360	100	5321312			
Dissolved Potassium (K)	ug/L	1200	200	5315702	1200	200	5315702
Total Selenium (Se)	ug/L	ND	2.0	5321312			
Total Silver (Ag)	ug/L	ND	0.10	5321312			
Dissolved Sodium (Na)	ug/L	5900	100	5315702	6000	100	5315702
Total Sodium (Na)	ug/L	6800	100	5321312			
Total Thallium (Tl)	ug/L	0.082	0.050	5321312			
Total Tungsten (W)	ug/L	1.1	1.0	5321312			
Total Uranium (U)	ug/L	0.63	0.10	5321312			
Total Vanadium (V)	ug/L	7.9	0.50	5321312			
Total Zinc (Zn)	ug/L	68	5.0	5321312			
Total Zirconium (Zr)	ug/L	1.4	1.0	5321312			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

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Maxxam Job #: B7S1850
Report Date: 2018/01/02

GHD Limited
Client Project #: 11139891-2.2.6
Your P.O. #: 73509652
Sampler Initials: SH

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		FTB412		
Sampling Date		2017/12/12 14:20		
COC Number		642489-01-01		
	UNITS	GW-11139891-121217 -SH-002	RDL	QC Batch
Metals				
Total Aluminum (Al)	ug/L	23000	25	5321312
Total Antimony (Sb)	ug/L	ND	0.50	5321312
Total Arsenic (As)	ug/L	6.4	1.0	5321312
Total Barium (Ba)	ug/L	320	2.0	5321312
Total Beryllium (Be)	ug/L	0.90	0.50	5321312
Total Boron (B)	ug/L	38	10	5321312
Total Cadmium (Cd)	ug/L	0.17	0.10	5321312
Dissolved Calcium (Ca)	ug/L	140000	200	5315702
Total Chromium (Cr)	ug/L	430	5.0	5321312
Total Cobalt (Co)	ug/L	14	0.50	5321312
Total Copper (Cu)	ug/L	51	1.0	5321312
Total Iron (Fe)	ug/L	55000	100	5321312
Total Lead (Pb)	ug/L	15	0.50	5321312
Dissolved Magnesium (Mg)	ug/L	33000	50	5315702
Total Manganese (Mn)	ug/L	1300	2.0	5321312
Total Molybdenum (Mo)	ug/L	15	0.50	5321312
Total Nickel (Ni)	ug/L	42	1.0	5321312
Total Phosphorus (P)	ug/L	2000	100	5321312
Dissolved Potassium (K)	ug/L	2300	200	5315702
Total Selenium (Se)	ug/L	ND	2.0	5321312
Total Silver (Ag)	ug/L	ND	0.10	5321312
Dissolved Sodium (Na)	ug/L	6500	100	5315702
Total Sodium (Na)	ug/L	8800	100	5321312
Total Thallium (Tl)	ug/L	0.26	0.050	5321312
Total Tungsten (W)	ug/L	2.3	1.0	5321312
Total Uranium (U)	ug/L	2.4	0.10	5321312
Total Vanadium (V)	ug/L	43	0.50	5321312
Total Zinc (Zn)	ug/L	100	5.0	5321312
Total Zirconium (Zr)	ug/L	8.8	1.0	5321312

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Maxxam Job #: B7S1850
Report Date: 2018/01/02

GHD Limited
Client Project #: 11139891-2.2.6
Your P.O. #: 73509652
Sampler Initials: SH

MICROBIOLOGY (WATER)

Maxxam ID		FTB411	FTB412	
Sampling Date		2017/12/12 11:35	2017/12/12 14:20	
COC Number		642489-01-01	642489-01-01	
	UNITS	GW-11139891-121217 -SH-001	GW-11139891-121217 -SH-002	QC Batch
Microbiological				
Background	CFU/100mL	NDOGN (1)	NDOGN (1)	5313848
Total Coliforms	CFU/100mL	NDOGN (1)	NDOGN (1)	5313848
Escherichia coli	CFU/100mL	NDOGN (1)	NDOGN (1)	5313848

QC Batch = Quality Control Batch
(1) NDOGN: No data due to overgrowth. Total coliforms and / or E.coli not detected

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Maxxam Job #: B7S1850
Report Date: 2018/01/02

GHD Limited
Client Project #: 11139891-2.2.6
Your P.O. #: 73509652
Sampler Initials: SH

TEST SUMMARY

Maxxam ID: FTB411
Sample ID: GW-11139891-121217-SH-001
Matrix: Water

Collected: 2017/12/12
Shipped:
Received: 2017/12/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5316738	N/A	2017/12/15	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	5313482	N/A	2017/12/18	Automated Statchk
Chloride by Automated Colourimetry	KONE	5316744	N/A	2017/12/15	Deonarine Ramnarine
Colour	SPEC	5316058	N/A	2017/12/15	Viorica Rotaru
Free (WAD) Cyanide	SKAL/CN	5317807	N/A	2017/12/15	Xuanhong Qiu
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5316207	N/A	2017/12/15	Anastasia Hamanov
Fluoride	ISE	5316743	2017/12/14	2017/12/15	Surinder Rai
Hardness (calculated as CaCO3)		5313444	N/A	2017/12/15	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5315702	N/A	2017/12/15	Prempal Bhatti
Total Metals Analysis by ICPMS	ICP/MS	5321312	N/A	2017/12/19	Prempal Bhatti
Ion Balance (% Difference)	CALC	5313483	N/A	2017/12/18	Automated Statchk
Total Coliforms/ E. coli, CFU/100mL	PL	5313848	N/A	2017/12/13	Farhana Rahman
Total Ammonia-N	LACH/NH4	5318110	N/A	2017/12/18	Sarabjit Raina
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5315754	N/A	2017/12/16	Chandra Nandlal
Organic Nitrogen	CALC	5313459	N/A	2017/12/18	Automated Statchk
pH	AT	5316731	N/A	2017/12/15	Surinder Rai
Field pH	PH	ONSITE	N/A	2017/12/13	Tanya Fidlin
Orthophosphate	KONE	5316755	N/A	2017/12/15	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5316745	N/A	2017/12/15	Alina Dobreanu
Sulphide	ISE/S	5323484	N/A	2017/12/19	Tahir Anwar
Total Dissolved Solids	BAL	5315520	2017/12/14	2017/12/14	Arpan Shah
Field pH	PH	ONSITE	N/A	2017/12/13	Tanya Fidlin
Total Kjeldahl Nitrogen in Water	SKAL	5318213	2017/12/15	2017/12/18	Bramdeo Motiram
Total Phosphorus (Colourimetric)	LACH/P	5318199	2017/12/15	2017/12/18	Amanpreet Sappal
Low Level Total Suspended Solids	BAL	5316170	2017/12/14	2017/12/14	Bansari Ray
Turbidity	AT	5313841	N/A	2017/12/14	Tahir Anwar
Un-ionized Ammonia	CALC/NH3	5313353	2018/01/02	2018/01/02	Automated Statchk

Maxxam ID: FTB411 Dup
Sample ID: GW-11139891-121217-SH-001
Matrix: Water

Collected: 2017/12/12
Shipped:
Received: 2017/12/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	5315702	N/A	2017/12/15	Prempal Bhatti

Maxxam ID: FTB412
Sample ID: GW-11139891-121217-SH-002
Matrix: Water

Collected: 2017/12/12
Shipped:
Received: 2017/12/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5316738	N/A	2017/12/15	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	5313482	N/A	2017/12/18	Automated Statchk
Chloride by Automated Colourimetry	KONE	5316744	N/A	2017/12/15	Deonarine Ramnarine
Colour	SPEC	5316058	N/A	2017/12/15	Viorica Rotaru

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Maxxam Job #: B7S1850
Report Date: 2018/01/02

GHD Limited
Client Project #: 11139891-2.2.6
Your P.O. #: 73509652
Sampler Initials: SH

TEST SUMMARY

Maxxam ID: FTB412
Sample ID: GW-11139891-121217-SH-002
Matrix: Water

Collected: 2017/12/12
Shipped:
Received: 2017/12/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	SKAL/CN	5317807	N/A	2017/12/15	Xuanhong Qiu
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5316207	N/A	2017/12/15	Anastasia Hamanov
Fluoride	ISE	5316743	2017/12/14	2017/12/15	Surinder Rai
Hardness (calculated as CaCO3)		5313444	N/A	2017/12/15	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5315702	N/A	2017/12/15	Prempal Bhatti
Total Metals Analysis by ICPMS	ICP/MS	5321312	N/A	2017/12/19	Prempal Bhatti
Ion Balance (% Difference)	CALC	5313483	N/A	2017/12/18	Automated Statchk
Total Coliforms/ E. coli, CFU/100mL	PL	5313848	N/A	2017/12/13	Farhana Rahman
Total Ammonia-N	LACH/NH4	5318110	N/A	2017/12/18	Sarabjit Raina
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5316217	N/A	2017/12/16	Chandra Nandlal
Organic Nitrogen	CALC	5313459	N/A	2017/12/18	Automated Statchk
pH	AT	5316731	N/A	2017/12/15	Surinder Rai
Field pH	PH	ONSITE	N/A	2017/12/13	Tanya Fidlin
Orthophosphate	KONE	5316755	N/A	2017/12/15	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5316745	N/A	2017/12/15	Alina Dobreanu
Sulphide	ISE/S	5323484	N/A	2017/12/19	Tahir Anwar
Total Dissolved Solids	BAL	5315520	2017/12/14	2017/12/14	Arpan Shah
Field pH	PH	ONSITE	N/A	2017/12/13	Tanya Fidlin
Total Kjeldahl Nitrogen in Water	SKAL	5318213	2017/12/15	2017/12/18	Bramdeo Motiram
Total Phosphorus (Colourimetric)	LACH/P	5318199	2017/12/15	2017/12/18	Amanpreet Sappal
Total Suspended Solids	BAL	5317754	2017/12/15	2017/12/15	Bansari Ray
Turbidity	AT	5313841	N/A	2017/12/14	Tahir Anwar
Un-ionized Ammonia	CALC/NH3	5313353	2018/01/02	2018/01/02	Brad Newman

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Maxxam Job #: B7S1850
Report Date: 2018/01/02

GHD Limited
Client Project #: 11139891-2.2.6
Your P.O. #: 73509652
Sampler Initials: SH

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	-1.3°C

Revised Report (2018/01/02): Unionized Ammonia has been included in this report.

Results relate only to the items tested.

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Maxxam Job #: B7S1850
Report Date: 2018/01/02

QUALITY ASSURANCE REPORT

GHD Limited
Client Project #: 11139891-2.2.6
Your P.O. #: 73509652
Sampler Initials: SH

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5313841	Turbidity	2017/12/14			101	85 - 115	ND, RDL=0.1	NTU	0.54 (1)	20		
5315520	Total Dissolved Solids	2017/12/14					ND, RDL=10	mg/L	NC (1)	25	95	90 - 110
5315702	Dissolved Calcium (Ca)	2017/12/15	NC (2)	80 - 120	98	80 - 120	ND, RDL=200	ug/L	1.6 (3)	20		
5315702	Dissolved Magnesium (Mg)	2017/12/15	97 (2)	80 - 120	96	80 - 120	ND, RDL=50	ug/L	1.4 (3)	20		
5315702	Dissolved Potassium (K)	2017/12/15	101 (2)	80 - 120	98	80 - 120	ND, RDL=200	ug/L	3.4 (3)	20		
5315702	Dissolved Sodium (Na)	2017/12/15	95 (2)	80 - 120	97	80 - 120	ND, RDL=100	ug/L	1.7 (3)	20		
5315754	Nitrate (N)	2017/12/16	94	80 - 120	96	80 - 120	ND, RDL=0.10	mg/L	1.5 (1)	20		
5315754	Nitrite (N)	2017/12/16	96	80 - 120	105	80 - 120	ND, RDL=0.010	mg/L	NC (1)	20		
5316058	Colour	2017/12/15			101	80 - 120	ND,RDL=2	TCU	NC (1)	25		
5316170	Total Suspended Solids	2017/12/14					ND,RDL=1	mg/L	4.3 (1)	25	95	85 - 115
5316207	Dissolved Organic Carbon	2017/12/14	97	80 - 120	99	80 - 120	ND, RDL=0.50	mg/L	0.12 (1)	20		
5316217	Nitrate (N)	2017/12/16	NC	80 - 120	86	80 - 120	ND, RDL=0.10	mg/L	4.7 (1)	20		
5316217	Nitrite (N)	2017/12/16	100	80 - 120	108	80 - 120	ND, RDL=0.010	mg/L	NC (1)	20		
5316731	pH	2017/12/15			102	98 - 103			1.1 (1)	N/A		
5316738	Alkalinity (Total as CaCO3)	2017/12/15			96	85 - 115	ND, RDL=1.0	mg/L	5.4 (1)	20		
5316743	Fluoride (F-)	2017/12/15	94	80 - 120	104	80 - 120	ND, RDL=0.10	mg/L	1.4 (1)	20		
5316744	Dissolved Chloride (Cl)	2017/12/15	NC	80 - 120	103	80 - 120	ND, RDL=1.0	mg/L	0.16 (1)	20		
5316745	Dissolved Sulphate (SO4)	2017/12/15	NC	75 - 125	104	80 - 120	ND, RDL=1.0	mg/L	1.0 (1)	20		
5316755	Orthophosphate (P)	2017/12/15	100	75 - 125	99	80 - 120	ND, RDL=0.010	mg/L	0.57 (1)	25		
5317754	Total Suspended Solids	2017/12/15					ND, RDL=10	mg/L	0 (1)	25	100	85 - 115
5317807	WAD Cyanide (Free)	2017/12/15	107	80 - 120	109	80 - 120	ND,RDL=1	ug/L	NC (1)	20		
5318110	Total Ammonia-N	2017/12/18	98	80 - 120	99	85 - 115	ND, RDL=0.050	mg/L	NC (1)	20		
5318199	Total Phosphorus	2017/12/18	91	80 - 120	96	80 - 120	ND, RDL=0.004	mg/L	NC (1)	20	96	80 - 120
5318213	Total Kjeldahl Nitrogen (TKN)	2017/12/18	104	80 - 120	99	80 - 120	ND, RDL=0.10	mg/L	NC (1)	20	100	80 - 120
5321312	Total Aluminum (Al)	2017/12/19	98	80 - 120	96	80 - 120	ND, RDL=5.0	ug/L	6.3 (1)	20		
5321312	Total Antimony (Sb)	2017/12/19	105	80 - 120	101	80 - 120	ND, RDL=0.50	ug/L				

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5321312	Total Arsenic (As)	2017/12/19	103	80 - 120	99	80 - 120	ND, RDL=1.0	ug/L				
5321312	Total Barium (Ba)	2017/12/19	98	80 - 120	98	80 - 120	ND, RDL=2.0	ug/L	9.5 (1)	20		
5321312	Total Beryllium (Be)	2017/12/19	101	80 - 120	103	80 - 120	ND, RDL=0.50	ug/L				
5321312	Total Boron (B)	2017/12/19	92	80 - 120	97	80 - 120	ND, RDL=10	ug/L				
5321312	Total Cadmium (Cd)	2017/12/19	104	80 - 120	103	80 - 120	ND, RDL=0.10	ug/L	NC (1)	20		
5321312	Total Chromium (Cr)	2017/12/19	96	80 - 120	94	80 - 120	ND, RDL=5.0	ug/L	NC (1)	20		
5321312	Total Cobalt (Co)	2017/12/19	99	80 - 120	99	80 - 120	ND, RDL=0.50	ug/L				
5321312	Total Copper (Cu)	2017/12/19	98	80 - 120	101	80 - 120	ND, RDL=1.0	ug/L	NC (1)	20		
5321312	Total Iron (Fe)	2017/12/19	98	80 - 120	99	80 - 120	ND, RDL=100	ug/L	NC (1)	20		
5321312	Total Lead (Pb)	2017/12/19	101	80 - 120	99	80 - 120	ND, RDL=0.50	ug/L	NC (1)	20		
5321312	Total Manganese (Mn)	2017/12/19	100	80 - 120	99	80 - 120	ND, RDL=2.0	ug/L	1.3 (1)	20		
5321312	Total Molybdenum (Mo)	2017/12/19	97	80 - 120	93	80 - 120	ND, RDL=0.50	ug/L				
5321312	Total Nickel (Ni)	2017/12/19	96	80 - 120	96	80 - 120	ND, RDL=1.0	ug/L	1.2 (1)	20		
5321312	Total Phosphorus (P)	2017/12/19	101	80 - 120	104	80 - 120	ND, RDL=100	ug/L				
5321312	Total Selenium (Se)	2017/12/19	105	80 - 120	103	80 - 120	ND, RDL=2.0	ug/L				
5321312	Total Silver (Ag)	2017/12/19	101	80 - 120	99	80 - 120	ND, RDL=0.10	ug/L				
5321312	Total Sodium (Na)	2017/12/19	NC	80 - 120	96	80 - 120	280, RDL=100	ug/L	2.2 (1)	20		
5321312	Total Thallium (Tl)	2017/12/19	98	80 - 120	96	80 - 120	ND, RDL=0.050	ug/L				
5321312	Total Tungsten (W)	2017/12/19	104	80 - 120	100	80 - 120	ND, RDL=1.0	ug/L				
5321312	Total Uranium (U)	2017/12/19	101	80 - 120	100	80 - 120	ND, RDL=0.10	ug/L				
5321312	Total Vanadium (V)	2017/12/19	97	80 - 120	93	80 - 120	ND, RDL=0.50	ug/L				
5321312	Total Zinc (Zn)	2017/12/19	102	80 - 120	103	80 - 120	ND, RDL=5.0	ug/L	NC (1)	20		
5321312	Total Zirconium (Zr)	2017/12/19	100	80 - 120	97	80 - 120	ND, RDL=1.0	ug/L				

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
5323484	Sulphide	2017/12/19	86	80 - 120	90	80 - 120	ND, RDL=0.020	mg/L	NC (1)	20		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Duplicate Parent ID

(2) Matrix Spike Parent ID [FTB411-07]

(3) Duplicate Parent ID [FTB411-07]

(4) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Maxxam Job #: B7S1850
Report Date: 2018/01/02

GHD Limited
Client Project #: 11139891-2.2.6
Your P.O. #: 73509652
Sampler Initials: SH

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Brad Newman, Scientific Service Specialist

Cristina Carriere, Scientific Service Specialist

Farhana Rahman

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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RUSH!! 2017/12/13 T.K **MICRO**

Maxxam Analytics International Corporation o/a Maxxam Analytics
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel (905) 817-5700 Toll-free 800-563-6266 Fax (905) 817-5777 www.maxxam.ca

13-Dec-17 08:37
Tanya Fidlin
B7S1850
MAF ENV-793

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:	
Company Name	#3000 GHD Limited	Company Name	SAME	Quotation #	B65652
Attention	Jennifer Balkwill	Attention		P.O. #	73510043
Address	651 Colby Dr, Waterloo ON N2V 1C2	Address		Project	11139891-2.2.6
				Project Name	RICE COMMERCIAL GRP LTD
Tel	(519) 884-7780 x3599 Fax (519) 725-1394 x	Tel	Fax	Site #	
Email	Jennifer.Balkwill@ghd.com, NationalEDDsupport@max	Email		Sampled By	SIMON HOWELL

Bottle Order #: 642489
COC #: C#642489-01-01
Project Manager: Tanya Fidlin

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ___ ☐ PWQO ☐ Other ___

Special Instructions:

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required: Please provide advance notice for rush projects

Regular (Standard) TAT: ☑
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___
Rush Confirmation Number: ___ (call lab for #)

#	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): (DISSOLVED) Metals / Hg / Cr VI	Select Total and Dissolved Metals by ICPMS, Hardness and Ion Balance	Speciated Alkalinity and pH	Project Anions	Dissolved Organic Carbon (DOC)	Colour and Turbidity	Total and Unionized Ammonia, Organic and Kjeldahl Nitrogen and LL Total P	Total Dissolved and Low Level Suspended Solids	Sulphide and Free (WAD) Cyanide	Total Coliforms/ E. coli, CFU/100mL	Field pH and Temperature	# of Bottles	Comments
1		GW-11139891-121217-SH-001	17/12/12	11:35	GW	Y	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	NOTE: SHORT HOLDING TIME FOR TOTAL COLIFORMS / E. COLI
2		GW-11139891-121217-SH-002	17/12/12	14:20	GW	Y	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	
3		~~GW-11139891-___17-SH-003~~			~~GW~~													-EMPTIES RETURNED TO LAB.
4		~~GW-11139891-___17-SH-004~~			~~GW~~													-EMPTIES RETURNED TO LAB.
5																		
6																		
7																		
8																		
9																		
10																		

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
[signature] / SIMON HOWELL	17/12/12	8:37	[signature] / TAYFUN [illegible]	2017/12/13	08:37	

Laboratory Use Only: Time Sensitive; Temperature (°C) on Recei: 1/2/1; Custody Seal Present: Yes ✓; Intact: No ✓

White: Maxxa Yellow: Client

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam
A Bureau Veritas Group Company

Your P.O. #: 73511983
Your Project #: 11139891-2.2.5
Your C.O.C. #: 668371-01-01

Attention:
11139891-2.2.5 - PO - 73511983

GHD Limited
455 Phillip St
Waterloo, ON
CANADA N2L 3X2

Report Date: 2018/06/25
Report #: R5265113
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8E4117
Received: 2018/06/12, 15:00

Sample Matrix: Water
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum	6	N/A	2018/06/18	CAM SOP-00301	EPA 8270D m
1,3-Dichloropropene Sum	7	N/A	2018/06/19		EPA 8260C m
Chloride by Automated Colourimetry	6	N/A	2018/06/18	CAM SOP-00463	EPA 325.2 m
Chromium (VI) in Water	6	N/A	2018/06/18	CAM SOP-00436	EPA 7199 m
Free (WAD) Cyanide	6	N/A	2018/06/18	CAM SOP-00457	OMOE E3015 m
Petroleum Hydro. CCME F1 & BTEX in Water	1	N/A	2018/06/22	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (1)	6	2018/06/16	2018/06/17	CAM SOP-00316	CCME PHC-CWS m
Mercury	6	2018/06/18	2018/06/18	CAM SOP-00453	EPA 7470A m
Dissolved Metals by ICPMS	6	N/A	2018/06/18	CAM SOP-00447	EPA 6020B m
PAH Compounds in Water by GC/MS (SIM)	6	2018/06/16	2018/06/16	CAM SOP-00318	EPA 8270D m
Volatile Organic Compounds and F1 PHCs	6	N/A	2018/06/18	CAM SOP-00230	EPA 8260C m
Volatile Organic Compounds in Water	1	N/A	2018/06/18	CAM SOP-00228	EPA 8260C m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

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Your P.O. #: 73511983
Your Project #: 11139891-2.2.5
Your C.O.C. #: 668371-01-01

Attention:
11139891-2.2.5 - PO - 73511983

GHD Limited
455 Phillip St
Waterloo, ON
CANADA N2L 3X2

Report Date: 2018/06/25
Report #: R5265113
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8E4117
Received: 2018/06/12, 15:00

(1) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Tanya Fidlin, Project Manager
Email: tfidlin@maxxam.ca
Phone# (905)817-5700

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8E4117
Report Date: 2018/06/25

GHD Limited
Client Project #: 11139891-2.2.5
Your P.O. #: 73511983
Sampler Initials: NC

RESULTS OF ANALYSES OF WATER

Maxxam ID		GYI635			GYI635		
Sampling Date		2018/06/11 12:30			2018/06/11 12:30		
COC Number		668371-01-01			668371-01-01		
	UNITS	GW-11139891-061118-NC-001	RDL	QC Batch	GW-11139891-061118-NC-001 Lab-Dup	RDL	QC Batch
Inorganics							
WAD Cyanide (Free)	ug/L	ND	1	5585653	ND	1	5585653
Dissolved Chloride (Cl)	mg/L	11	1.0	5584634			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

Maxxam ID		GYI636	GYI637	GYI638	GYI639		
Sampling Date		2018/06/11 12:45	2018/06/11 14:15	2018/06/11 16:26	2018/06/11 17:24		
COC Number		668371-01-01	668371-01-01	668371-01-01	668371-01-01		
	UNITS	GW-11139891-061118-NC-002	GW-11139891-061118-NC-003	GW-11139891-061118-NC-004	GW-11139891-061118-NC-005	RDL	QC Batch
Inorganics							
WAD Cyanide (Free)	ug/L	ND	ND	ND	ND	1	5585653
Dissolved Chloride (Cl)	mg/L	11	5.2	3.5	7.1	1.0	5584634

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

Maxxam ID		GYI640		
Sampling Date		2018/06/11 18:40		
COC Number		668371-01-01		
	UNITS	GW-11139891-061118-NC-006	RDL	QC Batch
Inorganics				
WAD Cyanide (Free)	ug/L	ND	1	5585653
Dissolved Chloride (Cl)	mg/L	4.4	1.0	5584634

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Maxxam Job #: B8E4117
Report Date: 2018/06/25

GHD Limited
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Your P.O. #: 73511983
Sampler Initials: NC

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		GYI635	GYI636	GYI637		
Sampling Date		2018/06/11 12:30	2018/06/11 12:45	2018/06/11 14:15		
COC Number		668371-01-01	668371-01-01	668371-01-01		
	UNITS	GW-11139891-061118-NC-001	GW-11139891-061118-NC-002	GW-11139891-061118-NC-003	RDL	QC Batch
Metals						
Chromium (VI)	ug/L	0.57	ND	ND	0.50	5581391
Mercury (Hg)	ug/L	ND	ND	ND	0.1	5585428
Dissolved Antimony (Sb)	ug/L	ND	ND	ND	0.50	5584631
Dissolved Arsenic (As)	ug/L	ND	ND	ND	1.0	5584631
Dissolved Barium (Ba)	ug/L	36	37	63	2.0	5584631
Dissolved Beryllium (Be)	ug/L	ND	ND	ND	0.50	5584631
Dissolved Boron (B)	ug/L	ND	ND	ND	10	5584631
Dissolved Cadmium (Cd)	ug/L	ND	ND	ND	0.10	5584631
Dissolved Chromium (Cr)	ug/L	ND	ND	ND	5.0	5584631
Dissolved Cobalt (Co)	ug/L	ND	ND	ND	0.50	5584631
Dissolved Copper (Cu)	ug/L	6.0	ND	6.6	1.0	5584631
Dissolved Lead (Pb)	ug/L	ND	ND	ND	0.50	5584631
Dissolved Molybdenum (Mo)	ug/L	ND	0.66	ND	0.50	5584631
Dissolved Nickel (Ni)	ug/L	ND	ND	ND	1.0	5584631
Dissolved Selenium (Se)	ug/L	ND	ND	ND	2.0	5584631
Dissolved Silver (Ag)	ug/L	ND	ND	ND	0.10	5584631
Dissolved Sodium (Na)	ug/L	7200	7200	6800	100	5584631
Dissolved Thallium (Tl)	ug/L	ND	ND	ND	0.050	5584631
Dissolved Uranium (U)	ug/L	0.35	0.38	0.76	0.10	5584631
Dissolved Vanadium (V)	ug/L	ND	ND	ND	0.50	5584631
Dissolved Zinc (Zn)	ug/L	5.9	ND	6.6	5.0	5584631

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Report Date: 2018/06/25

GHD Limited
Client Project #: 11139891-2.2.5
Your P.O. #: 73511983
Sampler Initials: NC

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		GYI637			GYI638		
Sampling Date		2018/06/11 14:15			2018/06/11 16:26		
COC Number		668371-01-01			668371-01-01		
	UNITS	GW-11139891-061118-NC-003 Lab-Dup	RDL	QC Batch	GW-11139891-061118-NC-004	RDL	QC Batch
Metals							
Chromium (VI)	ug/L				ND	0.50	5581391
Mercury (Hg)	ug/L				ND	0.1	5585428
Dissolved Antimony (Sb)	ug/L	ND	0.50	5584631	ND	0.50	5584631
Dissolved Arsenic (As)	ug/L	ND	1.0	5584631	ND	1.0	5584631
Dissolved Barium (Ba)	ug/L	64	2.0	5584631	83	2.0	5584631
Dissolved Beryllium (Be)	ug/L	ND	0.50	5584631	ND	0.50	5584631
Dissolved Boron (B)	ug/L	ND	10	5584631	11	10	5584631
Dissolved Cadmium (Cd)	ug/L	ND	0.10	5584631	ND	0.10	5584631
Dissolved Chromium (Cr)	ug/L	ND	5.0	5584631	ND	5.0	5584631
Dissolved Cobalt (Co)	ug/L	ND	0.50	5584631	0.74	0.50	5584631
Dissolved Copper (Cu)	ug/L	6.8	1.0	5584631	ND	1.0	5584631
Dissolved Lead (Pb)	ug/L	ND	0.50	5584631	ND	0.50	5584631
Dissolved Molybdenum (Mo)	ug/L	0.52	0.50	5584631	0.69	0.50	5584631
Dissolved Nickel (Ni)	ug/L	ND	1.0	5584631	ND	1.0	5584631
Dissolved Selenium (Se)	ug/L	ND	2.0	5584631	ND	2.0	5584631
Dissolved Silver (Ag)	ug/L	ND	0.10	5584631	ND	0.10	5584631
Dissolved Sodium (Na)	ug/L	6900	100	5584631	5100	100	5584631
Dissolved Thallium (Tl)	ug/L	ND	0.050	5584631	ND	0.050	5584631
Dissolved Uranium (U)	ug/L	0.75	0.10	5584631	0.77	0.10	5584631
Dissolved Vanadium (V)	ug/L	ND	0.50	5584631	ND	0.50	5584631
Dissolved Zinc (Zn)	ug/L	6.5	5.0	5584631	ND	5.0	5584631

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

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Maxxam Job #: B8E4117
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GHD Limited
Client Project #: 11139891-2.2.5
Your P.O. #: 73511983
Sampler Initials: NC

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		GYI638			GYI639	GYI640		
Sampling Date		2018/06/11 16:26			2018/06/11 17:24	2018/06/11 18:40		
COC Number		668371-01-01			668371-01-01	668371-01-01		
	UNITS	GW-11139891-061118-NC-004 Lab-Dup	RDL	QC Batch	GW-11139891-061118-NC-005	GW-11139891-061118-NC-006	RDL	QC Batch
Metals								
Chromium (VI)	ug/L				ND	ND	0.50	5581391
Mercury (Hg)	ug/L	ND	0.1	5585428	ND	ND	0.1	5585428
Dissolved Antimony (Sb)	ug/L				ND	ND	0.50	5584631
Dissolved Arsenic (As)	ug/L				ND	ND	1.0	5584631
Dissolved Barium (Ba)	ug/L				57	74	2.0	5584631
Dissolved Beryllium (Be)	ug/L				ND	ND	0.50	5584631
Dissolved Boron (B)	ug/L				ND	ND	10	5584631
Dissolved Cadmium (Cd)	ug/L				ND	ND	0.10	5584631
Dissolved Chromium (Cr)	ug/L				ND	ND	5.0	5584631
Dissolved Cobalt (Co)	ug/L				ND	0.51	0.50	5584631
Dissolved Copper (Cu)	ug/L				4.9	ND	1.0	5584631
Dissolved Lead (Pb)	ug/L				ND	ND	0.50	5584631
Dissolved Molybdenum (Mo)	ug/L				17	7.9	0.50	5584631
Dissolved Nickel (Ni)	ug/L				4.2	5.7	1.0	5584631
Dissolved Selenium (Se)	ug/L				ND	ND	2.0	5584631
Dissolved Silver (Ag)	ug/L				ND	ND	0.10	5584631
Dissolved Sodium (Na)	ug/L				13000	5500	100	5584631
Dissolved Thallium (Tl)	ug/L				ND	ND	0.050	5584631
Dissolved Uranium (U)	ug/L				0.79	0.58	0.10	5584631
Dissolved Vanadium (V)	ug/L				ND	ND	0.50	5584631
Dissolved Zinc (Zn)	ug/L				ND	ND	5.0	5584631

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

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Maxxam Job #: B8E4117
Report Date: 2018/06/25

GHD Limited
Client Project #: 11139891-2.2.5
Your P.O. #: 73511983
Sampler Initials: NC

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		GYI635	GYI636	GYI637	GYI638		
Sampling Date		2018/06/11 12:30	2018/06/11 12:45	2018/06/11 14:15	2018/06/11 16:26		
COC Number		668371-01-01	668371-01-01	668371-01-01	668371-01-01		
	UNITS	GW-11139891-061118-NC-001	GW-11139891-061118-NC-002	GW-11139891-061118-NC-003	GW-11139891-061118-NC-004	RDL	QC Batch
Calculated Parameters							
Methylnaphthalene, 2-(1-)	ug/L	ND	ND	ND	ND	0.071	5583254
Polyaromatic Hydrocarbons							
Acenaphthene	ug/L	ND	ND	ND	ND	0.050	5584356
Acenaphthylene	ug/L	ND	ND	ND	ND	0.050	5584356
Anthracene	ug/L	ND	ND	ND	ND	0.050	5584356
Benzo(a)anthracene	ug/L	ND	ND	ND	ND	0.050	5584356
Benzo(a)pyrene	ug/L	ND	ND	ND	ND	0.010	5584356
Benzo(b/j)fluoranthene	ug/L	ND	ND	ND	ND	0.050	5584356
Benzo(g,h,i)perylene	ug/L	ND	ND	ND	ND	0.050	5584356
Benzo(k)fluoranthene	ug/L	ND	ND	ND	ND	0.050	5584356
Chrysene	ug/L	ND	ND	ND	ND	0.050	5584356
Dibenz(a,h)anthracene	ug/L	ND	ND	ND	ND	0.050	5584356
Fluoranthene	ug/L	ND	ND	ND	ND	0.050	5584356
Fluorene	ug/L	ND	ND	ND	ND	0.050	5584356
Indeno(1,2,3-cd)pyrene	ug/L	ND	ND	ND	ND	0.050	5584356
1-Methylnaphthalene	ug/L	ND	ND	ND	ND	0.050	5584356
2-Methylnaphthalene	ug/L	ND	ND	ND	ND	0.050	5584356
Naphthalene	ug/L	ND	ND	ND	ND	0.050	5584356
Phenanthrene	ug/L	ND	ND	ND	ND	0.030	5584356
Pyrene	ug/L	ND	ND	ND	ND	0.050	5584356
Surrogate Recovery (%)							
D10-Anthracene	%	103	99	92	92		5584356
D14-Terphenyl (FS)	%	68	65	47 (1)	40 (2)		5584356
D8-Acenaphthylene	%	95	91	87	93		5584356

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
(1) Surrogate recovery was below the lower control limit due to matrix interference. This may represent a low bias in some results.

(2) Surrogate recovery may have been impacted by the amount of sediment that was present in sample.

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Maxxam Job #: B8E4117
Report Date: 2018/06/25

GHD Limited
Client Project #: 11139891-2.2.5
Your P.O. #: 73511983
Sampler Initials: NC

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		GYI639	GYI640		
Sampling Date		2018/06/11 17:24	2018/06/11 18:40		
COC Number		668371-01-01	668371-01-01		
	UNITS	GW-11139891-061118-NC-005	GW-11139891-061118-NC-006	RDL	QC Batch
Calculated Parameters					
Methylnaphthalene, 2-(1-)	ug/L	ND	ND	0.071	5583254
Polyaromatic Hydrocarbons					
Acenaphthene	ug/L	ND	ND	0.050	5584356
Acenaphthylene	ug/L	ND	ND	0.050	5584356
Anthracene	ug/L	ND	ND	0.050	5584356
Benzo(a)anthracene	ug/L	ND	ND	0.050	5584356
Benzo(a)pyrene	ug/L	ND	ND	0.010	5584356
Benzo(b/j)fluoranthene	ug/L	ND	ND	0.050	5584356
Benzo(g,h,i)perylene	ug/L	ND	ND	0.050	5584356
Benzo(k)fluoranthene	ug/L	ND	ND	0.050	5584356
Chrysene	ug/L	ND	ND	0.050	5584356
Dibenz(a,h)anthracene	ug/L	ND	ND	0.050	5584356
Fluoranthene	ug/L	ND	ND	0.050	5584356
Fluorene	ug/L	ND	ND	0.050	5584356
Indeno(1,2,3-cd)pyrene	ug/L	ND	ND	0.050	5584356
1-Methylnaphthalene	ug/L	ND	ND	0.050	5584356
2-Methylnaphthalene	ug/L	ND	ND	0.050	5584356
Naphthalene	ug/L	ND	ND	0.050	5584356
Phenanthrene	ug/L	ND	ND	0.030	5584356
Pyrene	ug/L	ND	ND	0.050	5584356
Surrogate Recovery (%)					
D10-Anthracene	%	36 (1)	89		5584356
D14-Terphenyl (FS)	%	29 (1)	36 (1)		5584356
D8-Acenaphthylene	%	27 (1)	93		5584356

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
(1) Surrogate recovery may have been impacted by the amount of sediment that was present in sample.

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Your P.O. #: 73511983
Sampler Initials: NC

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		GYI635	GYI636	GYI637		
Sampling Date		2018/06/11 12:30	2018/06/11 12:45	2018/06/11 14:15		
COC Number		668371-01-01	668371-01-01	668371-01-01		
	UNITS	GW-11139891-061118-NC-001	GW-11139891-061118-NC-002	GW-11139891-061118-NC-003	RDL	QC Batch
Calculated Parameters						
1,3-Dichloropropene (cis+trans)	ug/L	ND	ND	ND	0.50	5583197
Volatile Organics						
Acetone (2-Propanone)	ug/L	ND	ND	ND	10	5582536
Benzene	ug/L	ND	ND	ND	0.20	5582536
Bromodichloromethane	ug/L	ND	ND	ND	0.50	5582536
Bromoform	ug/L	ND	ND	ND	1.0	5582536
Bromomethane	ug/L	ND	ND	ND	0.50	5582536
Carbon Tetrachloride	ug/L	ND	ND	ND	0.20	5582536
Chlorobenzene	ug/L	ND	ND	ND	0.20	5582536
Chloroform	ug/L	ND	ND	ND	0.20	5582536
Dibromochloromethane	ug/L	ND	ND	ND	0.50	5582536
1,2-Dichlorobenzene	ug/L	ND	ND	ND	0.50	5582536
1,3-Dichlorobenzene	ug/L	ND	ND	ND	0.50	5582536
1,4-Dichlorobenzene	ug/L	ND	ND	ND	0.50	5582536
Dichlorodifluoromethane (FREON 12)	ug/L	ND	ND	ND	1.0	5582536
1,1-Dichloroethane	ug/L	ND	ND	ND	0.20	5582536
1,2-Dichloroethane	ug/L	ND	ND	ND	0.50	5582536
1,1-Dichloroethylene	ug/L	ND	ND	ND	0.20	5582536
cis-1,2-Dichloroethylene	ug/L	ND	ND	ND	0.50	5582536
trans-1,2-Dichloroethylene	ug/L	ND	ND	ND	0.50	5582536
1,2-Dichloropropane	ug/L	ND	ND	ND	0.20	5582536
cis-1,3-Dichloropropene	ug/L	ND	ND	ND	0.30	5582536
trans-1,3-Dichloropropene	ug/L	ND	ND	ND	0.40	5582536
Ethylbenzene	ug/L	ND	ND	ND	0.20	5582536
Ethylene Dibromide	ug/L	ND	ND	ND	0.20	5582536
Hexane	ug/L	ND	ND	ND	1.0	5582536
Methylene Chloride(Dichloromethane)	ug/L	ND	ND	ND	2.0	5582536
Methyl Ethyl Ketone (2-Butanone)	ug/L	ND	ND	ND	10	5582536
Methyl Isobutyl Ketone	ug/L	ND	ND	ND	5.0	5582536
Methyl t-butyl ether (MTBE)	ug/L	ND	ND	ND	0.50	5582536
Styrene	ug/L	ND	ND	ND	0.50	5582536
1,1,1,2-Tetrachloroethane	ug/L	ND	ND	ND	0.50	5582536

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Your P.O. #: 73511983
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VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		GYI635	GYI636	GYI637		
Sampling Date		2018/06/11 12:30	2018/06/11 12:45	2018/06/11 14:15		
COC Number		668371-01-01	668371-01-01	668371-01-01		
	UNITS	GW-11139891-061118-NC-001	GW-11139891-061118-NC-002	GW-11139891-061118-NC-003	RDL	QC Batch
1,1,2,2-Tetrachloroethane	ug/L	ND	ND	ND	0.50	5582536
Tetrachloroethylene	ug/L	ND	ND	ND	0.20	5582536
Toluene	ug/L	ND	ND	ND	0.20	5582536
1,1,1-Trichloroethane	ug/L	ND	ND	ND	0.20	5582536
1,1,2-Trichloroethane	ug/L	ND	ND	ND	0.50	5582536
Trichloroethylene	ug/L	ND	ND	ND	0.20	5582536
Trichlorofluoromethane (FREON 11)	ug/L	ND	ND	ND	0.50	5582536
Vinyl Chloride	ug/L	ND	ND	ND	0.20	5582536
p+m-Xylene	ug/L	ND	ND	ND	0.20	5582536
o-Xylene	ug/L	ND	ND	ND	0.20	5582536
Total Xylenes	ug/L	ND	ND	ND	0.20	5582536
F1 (C6-C10)	ug/L	ND	ND	ND	25	5582536
F1 (C6-C10) - BTEX	ug/L	ND	ND	ND	25	5582536
Surrogate Recovery (%)						
4-Bromofluorobenzene	%	98	98	98		5582536
D4-1,2-Dichloroethane	%	100	102	99		5582536
D8-Toluene	%	98	98	98		5582536

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
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VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		GYI638	GYI639	GYI640		
Sampling Date		2018/06/11 16:26	2018/06/11 17:24	2018/06/11 18:40		
COC Number		668371-01-01	668371-01-01	668371-01-01		
	UNITS	GW-11139891-061118-NC-004	GW-11139891-061118-NC-005	GW-11139891-061118-NC-006	RDL	QC Batch
Calculated Parameters						
1,3-Dichloropropene (cis+trans)	ug/L	ND	ND	ND	0.50	5583197
Volatile Organics						
Acetone (2-Propanone)	ug/L	ND	ND	ND	10	5582536
Benzene	ug/L	ND	ND	ND	0.20	5582536
Bromodichloromethane	ug/L	ND	ND	ND	0.50	5582536
Bromoform	ug/L	ND	ND	ND	1.0	5582536
Bromomethane	ug/L	ND	ND	ND	0.50	5582536
Carbon Tetrachloride	ug/L	ND	ND	ND	0.20	5582536
Chlorobenzene	ug/L	ND	ND	ND	0.20	5582536
Chloroform	ug/L	ND	ND	ND	0.20	5582536
Dibromochloromethane	ug/L	ND	ND	ND	0.50	5582536
1,2-Dichlorobenzene	ug/L	ND	ND	ND	0.50	5582536
1,3-Dichlorobenzene	ug/L	ND	ND	ND	0.50	5582536
1,4-Dichlorobenzene	ug/L	ND	ND	ND	0.50	5582536
Dichlorodifluoromethane (FREON 12)	ug/L	ND	ND	ND	1.0	5582536
1,1-Dichloroethane	ug/L	ND	ND	ND	0.20	5582536
1,2-Dichloroethane	ug/L	ND	ND	ND	0.50	5582536
1,1-Dichloroethylene	ug/L	ND	ND	ND	0.20	5582536
cis-1,2-Dichloroethylene	ug/L	ND	ND	ND	0.50	5582536
trans-1,2-Dichloroethylene	ug/L	ND	ND	ND	0.50	5582536
1,2-Dichloropropane	ug/L	ND	ND	ND	0.20	5582536
cis-1,3-Dichloropropene	ug/L	ND	ND	ND	0.30	5582536
trans-1,3-Dichloropropene	ug/L	ND	ND	ND	0.40	5582536
Ethylbenzene	ug/L	ND	ND	ND	0.20	5582536
Ethylene Dibromide	ug/L	ND	ND	ND	0.20	5582536
Hexane	ug/L	ND	ND	ND	1.0	5582536
Methylene Chloride(Dichloromethane)	ug/L	ND	ND	ND	2.0	5582536
Methyl Ethyl Ketone (2-Butanone)	ug/L	ND	ND	ND	10	5582536
Methyl Isobutyl Ketone	ug/L	ND	ND	ND	5.0	5582536
Methyl t-butyl ether (MTBE)	ug/L	ND	ND	ND	0.50	5582536
Styrene	ug/L	ND	ND	ND	0.50	5582536
1,1,1,2-Tetrachloroethane	ug/L	ND	ND	ND	0.50	5582536

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Maxxam Job #: B8E4117
Report Date: 2018/06/25

GHD Limited
Client Project #: 11139891-2.2.5
Your P.O. #: 73511983
Sampler Initials: NC

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		GYI638	GYI639	GYI640		
Sampling Date		2018/06/11 16:26	2018/06/11 17:24	2018/06/11 18:40		
COC Number		668371-01-01	668371-01-01	668371-01-01		
	UNITS	GW-11139891-061118-NC-004	GW-11139891-061118-NC-005	GW-11139891-061118-NC-006	RDL	QC Batch
1,1,2,2-Tetrachloroethane	ug/L	ND	ND	ND	0.50	5582536
Tetrachloroethylene	ug/L	ND	ND	ND	0.20	5582536
Toluene	ug/L	0.22	ND	0.37	0.20	5582536
1,1,1-Trichloroethane	ug/L	ND	ND	ND	0.20	5582536
1,1,2-Trichloroethane	ug/L	ND	ND	ND	0.50	5582536
Trichloroethylene	ug/L	ND	ND	ND	0.20	5582536
Trichlorofluoromethane (FREON 11)	ug/L	ND	ND	ND	0.50	5582536
Vinyl Chloride	ug/L	ND	ND	ND	0.20	5582536
p+m-Xylene	ug/L	ND	ND	0.23	0.20	5582536
o-Xylene	ug/L	ND	ND	ND	0.20	5582536
Total Xylenes	ug/L	ND	ND	0.23	0.20	5582536
F1 (C6-C10)	ug/L	ND	ND	ND	25	5582536
F1 (C6-C10) - BTEX	ug/L	ND	ND	ND	25	5582536
Surrogate Recovery (%)						
4-Bromofluorobenzene	%	99	98	98		5582536
D4-1,2-Dichloroethane	%	100	101	98		5582536
D8-Toluene	%	98	98	99		5582536

RDL = Reportable Detection Limit
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Maxxam Job #: B8E4117
Report Date: 2018/06/25

GHD Limited
Client Project #: 11139891-2.2.5
Your P.O. #: 73511983
Sampler Initials: NC

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		GYI641		
Sampling Date		2018/06/11		
COC Number		668371-01-01		
	UNITS	TRIP BLANK LOT# 3489	RDL	QC Batch
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/L	ND	0.50	5583197
Volatile Organics				
Acetone (2-Propanone)	ug/L	ND	10	5582179
Benzene	ug/L	ND	0.20	5582179
Bromodichloromethane	ug/L	ND	0.50	5582179
Bromoform	ug/L	ND	1.0	5582179
Bromomethane	ug/L	ND	0.50	5582179
Carbon Tetrachloride	ug/L	ND	0.20	5582179
Chlorobenzene	ug/L	ND	0.20	5582179
Chloroform	ug/L	ND	0.20	5582179
Dibromochloromethane	ug/L	ND	0.50	5582179
1,2-Dichlorobenzene	ug/L	ND	0.50	5582179
1,3-Dichlorobenzene	ug/L	ND	0.50	5582179
1,4-Dichlorobenzene	ug/L	ND	0.50	5582179
Dichlorodifluoromethane (FREON 12)	ug/L	ND	1.0	5582179
1,1-Dichloroethane	ug/L	ND	0.20	5582179
1,2-Dichloroethane	ug/L	ND	0.50	5582179
1,1-Dichloroethylene	ug/L	ND	0.20	5582179
cis-1,2-Dichloroethylene	ug/L	ND	0.50	5582179
trans-1,2-Dichloroethylene	ug/L	ND	0.50	5582179
1,2-Dichloropropane	ug/L	ND	0.20	5582179
cis-1,3-Dichloropropene	ug/L	ND	0.30	5582179
trans-1,3-Dichloropropene	ug/L	ND	0.40	5582179
Ethylbenzene	ug/L	ND	0.20	5582179
Ethylene Dibromide	ug/L	ND	0.20	5582179
Hexane	ug/L	ND	1.0	5582179
Methylene Chloride(Dichloromethane)	ug/L	ND	2.0	5582179
Methyl Ethyl Ketone (2-Butanone)	ug/L	ND	10	5582179
Methyl Isobutyl Ketone	ug/L	ND	5.0	5582179
Methyl t-butyl ether (MTBE)	ug/L	ND	0.50	5582179
Styrene	ug/L	ND	0.50	5582179
1,1,1,2-Tetrachloroethane	ug/L	ND	0.50	5582179

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Maxxam Job #: B8E4117
Report Date: 2018/06/25

GHD Limited
Client Project #: 11139891-2.2.5
Your P.O. #: 73511983
Sampler Initials: NC

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		GYI641		
Sampling Date		2018/06/11		
COC Number		668371-01-01		
	UNITS	TRIP BLANK LOT# 3489	RDL	QC Batch
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	5582179
Tetrachloroethylene	ug/L	ND	0.20	5582179
Toluene	ug/L	ND	0.20	5582179
1,1,1-Trichloroethane	ug/L	ND	0.20	5582179
1,1,2-Trichloroethane	ug/L	ND	0.50	5582179
Trichloroethylene	ug/L	ND	0.20	5582179
Trichlorofluoromethane (FREON 11)	ug/L	ND	0.50	5582179
Vinyl Chloride	ug/L	ND	0.20	5582179
p+m-Xylene	ug/L	ND	0.20	5582179
o-Xylene	ug/L	ND	0.20	5582179
Total Xylenes	ug/L	ND	0.20	5582179
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	97		5582179
D4-1,2-Dichloroethane	%	100		5582179
D8-Toluene	%	95		5582179

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		GYI635	GYI636	GYI637	GYI638		
Sampling Date		2018/06/11 12:30	2018/06/11 12:45	2018/06/11 14:15	2018/06/11 16:26		
COC Number		668371-01-01	668371-01-01	668371-01-01	668371-01-01		
	UNITS	GW-11139891-061118-NC-001	GW-11139891-061118-NC-002	GW-11139891-061118-NC-003	GW-11139891-061118-NC-004	RDL	QC Batch
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	ug/L	ND	ND	ND	ND	100	5584357
F3 (C16-C34 Hydrocarbons)	ug/L	ND	ND	ND	ND	200	5584357
F4 (C34-C50 Hydrocarbons)	ug/L	ND	ND	ND	ND	200	5584357
Reached Baseline at C50	ug/L	Yes	Yes	Yes	Yes		5584357
Surrogate Recovery (%)							
o-Terphenyl	%	99	99	100	99		5584357

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

Maxxam ID		GYI639	GYI640			GYI641		
Sampling Date		2018/06/11 17:24	2018/06/11 18:40			2018/06/11		
COC Number		668371-01-01	668371-01-01			668371-01-01		
	UNITS	GW-11139891-061118-NC-005	GW-11139891-061118-NC-006	RDL	QC Batch	TRIP BLANK LOT# 3489	RDL	QC Batch
BTEX & F1 Hydrocarbons								
F1 (C6-C10)	ug/L					ND	25	5589292
F1 (C6-C10) - BTEX	ug/L					ND	25	5589292
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/L	ND	ND	100	5584357			
F3 (C16-C34 Hydrocarbons)	ug/L	ND	ND	200	5584357			
F4 (C34-C50 Hydrocarbons)	ug/L	ND	ND	200	5584357			
Reached Baseline at C50	ug/L	Yes	Yes		5584357			
Surrogate Recovery (%)								
1,4-Difluorobenzene	%					102		5589292
4-Bromofluorobenzene	%					94		5589292
D10-Ethylbenzene	%					88		5589292
D4-1,2-Dichloroethane	%					101		5589292
o-Terphenyl	%	100	100		5584357			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Maxxam Job #: B8E4117
Report Date: 2018/06/25

GHD Limited
Client Project #: 11139891-2.2.5
Your P.O. #: 73511983
Sampler Initials: NC

TEST SUMMARY

Maxxam ID: GYI635
Sample ID: GW-11139891-061118-NC-001
Matrix: Water

Collected: 2018/06/11
Shipped:
Received: 2018/06/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5583254	N/A	2018/06/18	Automated Statchk
1,3-Dichloropropene Sum	CALC	5583197	N/A	2018/06/19	Automated Statchk
Chloride by Automated Colourimetry	KONE	5584634	N/A	2018/06/18	Deonarine Ramnarine
Chromium (VI) in Water	IC	5581391	N/A	2018/06/18	Lang Le
Free (WAD) Cyanide	SKAL/CN	5585653	N/A	2018/06/18	Xuanhong Qiu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5584357	2018/06/16	2018/06/17	Zhiyue (Frank) Zhu
Mercury	CV/AA	5585428	2018/06/18	2018/06/18	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5584631	N/A	2018/06/18	Arefa Dabhad
PAH Compounds in Water by GC/MS (SIM)	GC/MS	5584356	2018/06/16	2018/06/16	Lingyun Feng
Volatile Organic Compounds and F1 PHCs	GC/MSFD	5582536	N/A	2018/06/18	Manpreet Sarao

Maxxam ID: GYI635 Dup
Sample ID: GW-11139891-061118-NC-001
Matrix: Water

Collected: 2018/06/11
Shipped:
Received: 2018/06/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	SKAL/CN	5585653	N/A	2018/06/18	Xuanhong Qiu

Maxxam ID: GYI636
Sample ID: GW-11139891-061118-NC-002
Matrix: Water

Collected: 2018/06/11
Shipped:
Received: 2018/06/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5583254	N/A	2018/06/18	Automated Statchk
1,3-Dichloropropene Sum	CALC	5583197	N/A	2018/06/19	Automated Statchk
Chloride by Automated Colourimetry	KONE	5584634	N/A	2018/06/18	Deonarine Ramnarine
Chromium (VI) in Water	IC	5581391	N/A	2018/06/18	Lang Le
Free (WAD) Cyanide	SKAL/CN	5585653	N/A	2018/06/18	Xuanhong Qiu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5584357	2018/06/16	2018/06/17	Zhiyue (Frank) Zhu
Mercury	CV/AA	5585428	2018/06/18	2018/06/18	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5584631	N/A	2018/06/18	Arefa Dabhad
PAH Compounds in Water by GC/MS (SIM)	GC/MS	5584356	2018/06/16	2018/06/16	Lingyun Feng
Volatile Organic Compounds and F1 PHCs	GC/MSFD	5582536	N/A	2018/06/18	Manpreet Sarao

Maxxam ID: GYI637
Sample ID: GW-11139891-061118-NC-003
Matrix: Water

Collected: 2018/06/11
Shipped:
Received: 2018/06/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5583254	N/A	2018/06/18	Automated Statchk
1,3-Dichloropropene Sum	CALC	5583197	N/A	2018/06/19	Automated Statchk
Chloride by Automated Colourimetry	KONE	5584634	N/A	2018/06/18	Deonarine Ramnarine
Chromium (VI) in Water	IC	5581391	N/A	2018/06/18	Lang Le
Free (WAD) Cyanide	SKAL/CN	5585653	N/A	2018/06/18	Xuanhong Qiu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5584357	2018/06/16	2018/06/17	Zhiyue (Frank) Zhu

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Maxxam Job #: B8E4117
Report Date: 2018/06/25

GHD Limited
Client Project #: 11139891-2.2.5
Your P.O. #: 73511983
Sampler Initials: NC

TEST SUMMARY

Maxxam ID: GYI637 **Collected:** 2018/06/11
Sample ID: GW-11139891-061118-NC-003 **Shipped:**
Matrix: Water **Received:** 2018/06/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury	CV/AA	5585428	2018/06/18	2018/06/18	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5584631	N/A	2018/06/18	Arefa Dabhad
PAH Compounds in Water by GC/MS (SIM)	GC/MS	5584356	2018/06/16	2018/06/16	Lingyun Feng
Volatile Organic Compounds and F1 PHCs	GC/MSFD	5582536	N/A	2018/06/18	Manpreet Sarao

Maxxam ID: GYI637 Dup **Collected:** 2018/06/11
Sample ID: GW-11139891-061118-NC-003 **Shipped:**
Matrix: Water **Received:** 2018/06/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	5584631	N/A	2018/06/18	Arefa Dabhad

Maxxam ID: GYI638 **Collected:** 2018/06/11
Sample ID: GW-11139891-061118-NC-004 **Shipped:**
Matrix: Water **Received:** 2018/06/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5583254	N/A	2018/06/18	Automated Statchk
1,3-Dichloropropene Sum	CALC	5583197	N/A	2018/06/19	Automated Statchk
Chloride by Automated Colourimetry	KONE	5584634	N/A	2018/06/18	Deonarine Ramnarine
Chromium (VI) in Water	IC	5581391	N/A	2018/06/18	Lang Le
Free (WAD) Cyanide	SKAL/CN	5585653	N/A	2018/06/18	Xuanhong Qiu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5584357	2018/06/16	2018/06/17	Zhiyue (Frank) Zhu
Mercury	CV/AA	5585428	2018/06/18	2018/06/18	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5584631	N/A	2018/06/18	Arefa Dabhad
PAH Compounds in Water by GC/MS (SIM)	GC/MS	5584356	2018/06/16	2018/06/16	Lingyun Feng
Volatile Organic Compounds and F1 PHCs	GC/MSFD	5582536	N/A	2018/06/18	Manpreet Sarao

Maxxam ID: GYI638 Dup **Collected:** 2018/06/11
Sample ID: GW-11139891-061118-NC-004 **Shipped:**
Matrix: Water **Received:** 2018/06/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury	CV/AA	5585428	2018/06/18	2018/06/18	Ron Morrison

Maxxam ID: GYI639 **Collected:** 2018/06/11
Sample ID: GW-11139891-061118-NC-005 **Shipped:**
Matrix: Water **Received:** 2018/06/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5583254	N/A	2018/06/18	Automated Statchk
1,3-Dichloropropene Sum	CALC	5583197	N/A	2018/06/19	Automated Statchk
Chloride by Automated Colourimetry	KONE	5584634	N/A	2018/06/18	Deonarine Ramnarine
Chromium (VI) in Water	IC	5581391	N/A	2018/06/18	Lang Le
Free (WAD) Cyanide	SKAL/CN	5585653	N/A	2018/06/18	Xuanhong Qiu

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Maxxam Job #: B8E4117
Report Date: 2018/06/25

GHD Limited
Client Project #: 11139891-2.2.5
Your P.O. #: 73511983
Sampler Initials: NC

TEST SUMMARY

Maxxam ID: GYI639
Sample ID: GW-11139891-061118-NC-005
Matrix: Water

Collected: 2018/06/11
Shipped:
Received: 2018/06/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5584357	2018/06/16	2018/06/17	Zhiyue (Frank) Zhu
Mercury	CV/AA	5585428	2018/06/18	2018/06/18	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5584631	N/A	2018/06/18	Arefa Dabhad
PAH Compounds in Water by GC/MS (SIM)	GC/MS	5584356	2018/06/16	2018/06/16	Lingyun Feng
Volatile Organic Compounds and F1 PHCs	GC/MSFD	5582536	N/A	2018/06/18	Manpreet Sarao

Maxxam ID: GYI640
Sample ID: GW-11139891-061118-NC-006
Matrix: Water

Collected: 2018/06/11
Shipped:
Received: 2018/06/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5583254	N/A	2018/06/18	Automated Statchk
1,3-Dichloropropene Sum	CALC	5583197	N/A	2018/06/19	Automated Statchk
Chloride by Automated Colourimetry	KONE	5584634	N/A	2018/06/18	Deonarine Ramnarine
Chromium (VI) in Water	IC	5581391	N/A	2018/06/18	Lang Le
Free (WAD) Cyanide	SKAL/CN	5585653	N/A	2018/06/18	Xuanhong Qiu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5584357	2018/06/16	2018/06/17	Zhiyue (Frank) Zhu
Mercury	CV/AA	5585428	2018/06/18	2018/06/18	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	5584631	N/A	2018/06/18	Arefa Dabhad
PAH Compounds in Water by GC/MS (SIM)	GC/MS	5584356	2018/06/16	2018/06/16	Lingyun Feng
Volatile Organic Compounds and F1 PHCs	GC/MSFD	5582536	N/A	2018/06/18	Manpreet Sarao

Maxxam ID: GYI641
Sample ID: TRIP BLANK LOT# 3489
Matrix: Water

Collected: 2018/06/11
Shipped:
Received: 2018/06/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	5583197	N/A	2018/06/19	Automated Statchk
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	5589292	N/A	2018/06/22	Anca Ganea
Volatile Organic Compounds in Water	GC/MS	5582179	N/A	2018/06/18	Karen Hughes

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Maxxam Job #: B8E4117
Report Date: 2018/06/25

GHD Limited
Client Project #: 11139891-2.2.5
Your P.O. #: 73511983
Sampler Initials: NC

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	4.0°C
Package 2	3.7°C

Sample TRIP BLANK LOT#3489 analyzed for F1 PHCs as per client request.

Results relate only to the items tested.

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Maxxam Job #: B8E4117
Report Date: 2018/06/25

QUALITY ASSURANCE REPORT

GHD Limited
Client Project #: 11139891-2.2.5
Your P.O. #: 73511983
Sampler Initials: NC

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5582179	4-Bromofluorobenzene	2018/06/18	101	70 - 130	101	70 - 130	99	%		
5582179	D4-1,2-Dichloroethane	2018/06/18	104	70 - 130	99	70 - 130	100	%		
5582179	D8-Toluene	2018/06/18	98	70 - 130	99	70 - 130	95	%		
5582536	4-Bromofluorobenzene	2018/06/18	103	70 - 130	102	70 - 130	100	%		
5582536	D4-1,2-Dichloroethane	2018/06/18	101	70 - 130	97	70 - 130	96	%		
5582536	D8-Toluene	2018/06/18	100	70 - 130	100	70 - 130	99	%		
5584356	D10-Anthracene	2018/06/16	93	50 - 130	99	50 - 130	96	%		
5584356	D14-Terphenyl (FS)	2018/06/16	74	50 - 130	81	50 - 130	79	%		
5584356	D8-Acenaphthylene	2018/06/16	92	50 - 130	95	50 - 130	91	%		
5584357	o-Terphenyl	2018/06/16	102	60 - 130	100	60 - 130	101	%		
5589292	1,4-Difluorobenzene	2018/06/22	101	70 - 130	102	70 - 130	103	%		
5589292	4-Bromofluorobenzene	2018/06/22	95	70 - 130	94	70 - 130	97	%		
5589292	D10-Ethylbenzene	2018/06/22	87	70 - 130	88	70 - 130	92	%		
5589292	D4-1,2-Dichloroethane	2018/06/22	100	70 - 130	100	70 - 130	99	%		
5581391	Chromium (VI)	2018/06/18	104	80 - 120	103	80 - 120	ND, RDL=0.50	ug/L	NC (1)	20
5582179	1,1,1,2-Tetrachloroethane	2018/06/18	93	70 - 130	97	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582179	1,1,1-Trichloroethane	2018/06/18	94	70 - 130	101	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582179	1,1,2,2-Tetrachloroethane	2018/06/18	98	70 - 130	96	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582179	1,1,2-Trichloroethane	2018/06/18	95	70 - 130	95	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582179	1,1-Dichloroethane	2018/06/18	94	70 - 130	99	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582179	1,1-Dichloroethylene	2018/06/18	93	70 - 130	101	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582179	1,2-Dichlorobenzene	2018/06/18	95	70 - 130	101	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582179	1,2-Dichloroethane	2018/06/18	99	70 - 130	99	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582179	1,2-Dichloropropane	2018/06/18	95	70 - 130	98	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582179	1,3-Dichlorobenzene	2018/06/18	96	70 - 130	104	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582179	1,4-Dichlorobenzene	2018/06/18	96	70 - 130	104	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582179	Acetone (2-Propanone)	2018/06/18	107	60 - 140	100	60 - 140	ND, RDL=10	ug/L	NC (1)	30
5582179	Benzene	2018/06/18	93	70 - 130	98	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582179	Bromodichloromethane	2018/06/18	97	70 - 130	99	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582179	Bromoform	2018/06/18	100	70 - 130	100	70 - 130	ND, RDL=1.0	ug/L	NC (1)	30

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5582179	Bromomethane	2018/06/18	100	60 - 140	101	60 - 140	ND, RDL=0.50	ug/L	NC (1)	30
5582179	Carbon Tetrachloride	2018/06/18	94	70 - 130	101	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582179	Chlorobenzene	2018/06/18	94	70 - 130	99	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582179	Chloroform	2018/06/18	94	70 - 130	98	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582179	cis-1,2-Dichloroethylene	2018/06/18	95	70 - 130	98	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582179	cis-1,3-Dichloropropene	2018/06/18	100	70 - 130	97	70 - 130	ND, RDL=0.30	ug/L	NC (1)	30
5582179	Dibromochloromethane	2018/06/18	98	70 - 130	100	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582179	Dichlorodifluoromethane (FREON 12)	2018/06/18	90	60 - 140	97	60 - 140	ND, RDL=1.0	ug/L	NC (1)	30
5582179	Ethylbenzene	2018/06/18	92	70 - 130	100	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582179	Ethylene Dibromide	2018/06/18	101	70 - 130	100	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582179	Hexane	2018/06/18	93	70 - 130	101	70 - 130	ND, RDL=1.0	ug/L	NC (1)	30
5582179	Methyl Ethyl Ketone (2-Butanone)	2018/06/18	109	60 - 140	102	60 - 140	ND, RDL=10	ug/L	NC (1)	30
5582179	Methyl Isobutyl Ketone	2018/06/18	105	70 - 130	101	70 - 130	ND, RDL=5.0	ug/L	NC (1)	30
5582179	Methyl t-butyl ether (MTBE)	2018/06/18	98	70 - 130	100	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582179	Methylene Chloride(Dichloromethane)	2018/06/18	104	70 - 130	106	70 - 130	ND, RDL=2.0	ug/L	NC (1)	30
5582179	o-Xylene	2018/06/18	91	70 - 130	100	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582179	p+m-Xylene	2018/06/18	93	70 - 130	102	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582179	Styrene	2018/06/18	99	70 - 130	106	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582179	Tetrachloroethylene	2018/06/18	92	70 - 130	100	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582179	Toluene	2018/06/18	90	70 - 130	96	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582179	Total Xylenes	2018/06/18					ND, RDL=0.20	ug/L	NC (1)	30
5582179	trans-1,2-Dichloroethylene	2018/06/18	93	70 - 130	99	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582179	trans-1,3-Dichloropropene	2018/06/18	104	70 - 130	96	70 - 130	ND, RDL=0.40	ug/L	NC (1)	30
5582179	Trichloroethylene	2018/06/18	93	70 - 130	99	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582179	Trichlorofluoromethane (FREON 11)	2018/06/18	89	70 - 130	96	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582179	Vinyl Chloride	2018/06/18	93	70 - 130	100	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582536	1,1,1,2-Tetrachloroethane	2018/06/18	104	70 - 130	102	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582536	1,1,1-Trichloroethane	2018/06/18	100	70 - 130	99	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582536	1,1,2,2-Tetrachloroethane	2018/06/18	106	70 - 130	99	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582536	1,1,2-Trichloroethane	2018/06/18	101	70 - 130	97	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5582536	1,1-Dichloroethane	2018/06/18	98	70 - 130	97	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582536	1,1-Dichloroethylene	2018/06/18	98	70 - 130	98	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582536	1,2-Dichlorobenzene	2018/06/18	104	70 - 130	102	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582536	1,2-Dichloroethane	2018/06/18	100	70 - 130	96	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582536	1,2-Dichloropropane	2018/06/18	99	70 - 130	96	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582536	1,3-Dichlorobenzene	2018/06/18	104	70 - 130	105	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582536	1,4-Dichlorobenzene	2018/06/18	105	70 - 130	105	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582536	Acetone (2-Propanone)	2018/06/18	105	60 - 140	95	60 - 140	ND, RDL=10	ug/L	NC (1)	30
5582536	Benzene	2018/06/18	99	70 - 130	97	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582536	Bromodichloromethane	2018/06/18	100	70 - 130	97	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582536	Bromoform	2018/06/18	106	70 - 130	101	70 - 130	ND, RDL=1.0	ug/L	NC (1)	30
5582536	Bromomethane	2018/06/18	94	60 - 140	93	60 - 140	ND, RDL=0.50	ug/L	NC (1)	30
5582536	Carbon Tetrachloride	2018/06/18	101	70 - 130	101	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582536	Chlorobenzene	2018/06/18	101	70 - 130	99	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582536	Chloroform	2018/06/18	101	70 - 130	99	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582536	cis-1,2-Dichloroethylene	2018/06/18	103	70 - 130	100	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582536	cis-1,3-Dichloropropene	2018/06/18	97	70 - 130	93	70 - 130	ND, RDL=0.30	ug/L	NC (1)	30
5582536	Dibromochloromethane	2018/06/18	105	70 - 130	101	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582536	Dichlorodifluoromethane (FREON 12)	2018/06/18	95	60 - 140	97	60 - 140	ND, RDL=1.0	ug/L	NC (1)	30
5582536	Ethylbenzene	2018/06/18	99	70 - 130	99	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582536	Ethylene Dibromide	2018/06/18	105	70 - 130	99	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582536	F1 (C6-C10) - BTEX	2018/06/18					ND, RDL=25	ug/L	NC (1)	30
5582536	F1 (C6-C10)	2018/06/18	101	60 - 140	95	60 - 140	ND, RDL=25	ug/L	NC (1)	30
5582536	Hexane	2018/06/18	90	70 - 130	90	70 - 130	ND, RDL=1.0	ug/L	NC (1)	30
5582536	Methyl Ethyl Ketone (2-Butanone)	2018/06/18	106	60 - 140	95	60 - 140	ND, RDL=10	ug/L	NC (1)	30
5582536	Methyl Isobutyl Ketone	2018/06/18	103	70 - 130	94	70 - 130	ND, RDL=5.0	ug/L	NC (1)	30
5582536	Methyl t-butyl ether (MTBE)	2018/06/18	101	70 - 130	98	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582536	Methylene Chloride(Dichloromethane)	2018/06/18	106	70 - 130	102	70 - 130	ND, RDL=2.0	ug/L	NC (1)	30
5582536	o-Xylene	2018/06/18	100	70 - 130	99	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582536	p+m-Xylene	2018/06/18	98	70 - 130	98	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5582536	Styrene	2018/06/18	99	70 - 130	99	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582536	Tetrachloroethylene	2018/06/18	103	70 - 130	104	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582536	Toluene	2018/06/18	96	70 - 130	96	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582536	Total Xylenes	2018/06/18					ND, RDL=0.20	ug/L	NC (1)	30
5582536	trans-1,2-Dichloroethylene	2018/06/18	103	70 - 130	102	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582536	trans-1,3-Dichloropropene	2018/06/18	96	70 - 130	91	70 - 130	ND, RDL=0.40	ug/L	NC (1)	30
5582536	Trichloroethylene	2018/06/18	104	70 - 130	103	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5582536	Trichlorofluoromethane (FREON 11)	2018/06/18	97	70 - 130	97	70 - 130	ND, RDL=0.50	ug/L	NC (1)	30
5582536	Vinyl Chloride	2018/06/18	94	70 - 130	95	70 - 130	ND, RDL=0.20	ug/L	NC (1)	30
5584356	1-Methylnaphthalene	2018/06/16	114	50 - 130	112	50 - 130	ND, RDL=0.050	ug/L	NC (1)	30
5584356	2-Methylnaphthalene	2018/06/16	104	50 - 130	101	50 - 130	ND, RDL=0.050	ug/L	NC (1)	30
5584356	Acenaphthene	2018/06/16	102	50 - 130	99	50 - 130	ND, RDL=0.050	ug/L	NC (1)	30
5584356	Acenaphthylene	2018/06/16	104	50 - 130	100	50 - 130	ND, RDL=0.050	ug/L	NC (1)	30
5584356	Anthracene	2018/06/16	100	50 - 130	97	50 - 130	ND, RDL=0.050	ug/L	NC (1)	30
5584356	Benzo(a)anthracene	2018/06/16	98	50 - 130	95	50 - 130	ND, RDL=0.050	ug/L	NC (1)	30
5584356	Benzo(a)pyrene	2018/06/16	101	50 - 130	99	50 - 130	ND, RDL=0.010	ug/L	NC (1)	30
5584356	Benzo(b/j)fluoranthene	2018/06/16	106	50 - 130	104	50 - 130	ND, RDL=0.050	ug/L	NC (1)	30
5584356	Benzo(g,h,i)perylene	2018/06/16	97	50 - 130	94	50 - 130	ND, RDL=0.050	ug/L	NC (1)	30
5584356	Benzo(k)fluoranthene	2018/06/16	109	50 - 130	103	50 - 130	ND, RDL=0.050	ug/L	NC (1)	30
5584356	Chrysene	2018/06/16	101	50 - 130	99	50 - 130	ND, RDL=0.050	ug/L	NC (1)	30
5584356	Dibenz(a,h)anthracene	2018/06/16	94	50 - 130	91	50 - 130	ND, RDL=0.050	ug/L	NC (1)	30
5584356	Fluoranthene	2018/06/16	103	50 - 130	100	50 - 130	ND, RDL=0.050	ug/L	NC (1)	30
5584356	Fluorene	2018/06/16	98	50 - 130	94	50 - 130	ND, RDL=0.050	ug/L	NC (1)	30
5584356	Indeno(1,2,3-cd)pyrene	2018/06/16	101	50 - 130	98	50 - 130	ND, RDL=0.050	ug/L	NC (1)	30
5584356	Naphthalene	2018/06/16	106	50 - 130	103	50 - 130	ND, RDL=0.050	ug/L	NC (1)	30
5584356	Phenanthrene	2018/06/16	107	50 - 130	103	50 - 130	ND, RDL=0.030	ug/L	NC (1)	30
5584356	Pyrene	2018/06/16	103	50 - 130	100	50 - 130	ND, RDL=0.050	ug/L	NC (1)	30
5584357	F2 (C10-C16 Hydrocarbons)	2018/06/17	110	50 - 130	107	60 - 130	ND, RDL=100	ug/L	NC (1)	30
5584357	F3 (C16-C34 Hydrocarbons)	2018/06/17	NC	50 - 130	104	60 - 130	ND, RDL=200	ug/L	NC (1)	30
5584357	F4 (C34-C50 Hydrocarbons)	2018/06/17	101	50 - 130	98	60 - 130	ND, RDL=200	ug/L	NC (1)	30

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5584631	Dissolved Antimony (Sb)	2018/06/18	101 (2)	80 - 120	103	80 - 120	ND, RDL=0.50	ug/L	NC (3)	20
5584631	Dissolved Arsenic (As)	2018/06/18	97 (2)	80 - 120	99	80 - 120	ND, RDL=1.0	ug/L	NC (3)	20
5584631	Dissolved Barium (Ba)	2018/06/18	97 (2)	80 - 120	101	80 - 120	ND, RDL=2.0	ug/L	1.8 (3)	20
5584631	Dissolved Beryllium (Be)	2018/06/18	94 (2)	80 - 120	96	80 - 120	ND, RDL=0.50	ug/L	NC (3)	20
5584631	Dissolved Boron (B)	2018/06/18	93 (2)	80 - 120	89	80 - 120	ND, RDL=10	ug/L	NC (3)	20
5584631	Dissolved Cadmium (Cd)	2018/06/18	102 (2)	80 - 120	102	80 - 120	ND, RDL=0.10	ug/L	NC (3)	20
5584631	Dissolved Chromium (Cr)	2018/06/18	93 (2)	80 - 120	97	80 - 120	ND, RDL=5.0	ug/L	NC (3)	20
5584631	Dissolved Cobalt (Co)	2018/06/18	94 (2)	80 - 120	98	80 - 120	ND, RDL=0.50	ug/L	NC (3)	20
5584631	Dissolved Copper (Cu)	2018/06/18	101 (2)	80 - 120	103	80 - 120	ND, RDL=1.0	ug/L	2.5 (3)	20
5584631	Dissolved Lead (Pb)	2018/06/18	98 (2)	80 - 120	98	80 - 120	ND, RDL=0.50	ug/L	NC (3)	20
5584631	Dissolved Molybdenum (Mo)	2018/06/18	105 (2)	80 - 120	104	80 - 120	ND, RDL=0.50	ug/L	4.1 (3)	20
5584631	Dissolved Nickel (Ni)	2018/06/18	94 (2)	80 - 120	97	80 - 120	ND, RDL=1.0	ug/L	NC (3)	20
5584631	Dissolved Selenium (Se)	2018/06/18	97 (2)	80 - 120	100	80 - 120	ND, RDL=2.0	ug/L	NC (3)	20
5584631	Dissolved Silver (Ag)	2018/06/18	103 (2)	80 - 120	104	80 - 120	ND, RDL=0.10	ug/L	NC (3)	20
5584631	Dissolved Sodium (Na)	2018/06/18	94 (2)	80 - 120	101	80 - 120	ND, RDL=100	ug/L	2.1 (3)	20
5584631	Dissolved Thallium (Tl)	2018/06/18	100 (2)	80 - 120	102	80 - 120	ND, RDL=0.050	ug/L	NC (3)	20
5584631	Dissolved Uranium (U)	2018/06/18	95 (2)	80 - 120	95	80 - 120	ND, RDL=0.10	ug/L	1.7 (3)	20
5584631	Dissolved Vanadium (V)	2018/06/18	96 (2)	80 - 120	96	80 - 120	ND, RDL=0.50	ug/L	NC (3)	20
5584631	Dissolved Zinc (Zn)	2018/06/18	93 (2)	80 - 120	99	80 - 120	ND, RDL=5.0	ug/L	1.1 (3)	20
5584634	Dissolved Chloride (Cl)	2018/06/18	105	80 - 120	103	80 - 120	ND, RDL=1.0	mg/L	1.5 (1)	20
5585428	Mercury (Hg)	2018/06/18	104 (4)	75 - 125	104	80 - 120	ND, RDL=0.1	ug/L	NC (5)	20
5585653	WAD Cyanide (Free)	2018/06/18	108 (6)	80 - 120	105	80 - 120	ND,RDL=1	ug/L	NC (7)	20
5589292	F1 (C6-C10) - BTEX	2018/06/22					ND, RDL=25	ug/L	NC (1)	30

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5589292	F1 (C6-C10)	2018/06/22	106	70 - 130	122	70 - 130	ND, RDL=25	ug/L	NC (1)	30

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Duplicate Parent ID

(2) Matrix Spike Parent ID [GYI637-04]

(3) Duplicate Parent ID [GYI637-04]

(4) Matrix Spike Parent ID [GYI638-07]

(5) Duplicate Parent ID [GYI638-07]

(6) Matrix Spike Parent ID [GYI635-06]

(7) Duplicate Parent ID [GYI635-06]

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8E4117
Report Date: 2018/06/25

GHD Limited
Client Project #: 11139891-2.2.5
Your P.O. #: 73511983
Sampler Initials: NC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Brad Newman, Scientific Service Specialist

Cristina Carriere, Scientific Service Specialist

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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12-Jun-18 15:00
Tanya Fidlin
B8E4117

Page 1 of 1

INVOICE TO:		REPORT TO: SAME AS INVOICE		PROJECT INFORMATION:		Lab Use Only:
Company Name	#3000 GHD Limited	Company Name		Quotation #	B80174	Bottle Order #: 668371
Attention	Jennifer Balkwill	Attention		P.O. #	73511983	
Address	651 Colby Dr Waterloo ON N2V 1C2	Address		Project	11139891-2.2.5	Project Manager: Tanya Fidlin
Tel	(519) 884-7780 Ext: 3599 Fax (519) 725-1394	Tel	Fax	Project Name	URE ENV-650	COC #: C#668371-01-01
Email	Jennifer.Balkwill@ghd.com, NationalEDDsupport@max	Email		Site #		
				Sampled By	N. Coyne	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___	☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ___ ☐ PWQO ☐ Other ___	

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required*

Please provide advance notice for rush projects

Regular (Standard) TAT: (will be applied if Rush TAT is not specified) ☒

Standard TAT = 5-7 Working days for most tests.

Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)

Date Required: ___ Time Required: ___ ☐

Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle) (Metals / Hg / Cr VI)	O. Reg 153 VOCs by HS & F1-F4	O. Reg 153 Metals & Inorganics Pkg	O. Reg 153 PAHs	Cyanide NC	Phenol NC	F2-F4 + PAH NC	VOC NC	VOC			# of Bottles	Comments
1		GW-11139891-06[11]18-NC-001	June 11	12:30	GW	X	X	X	X	X	X	X	X				10	
2		GW-11139891-06[11]18-NC-002	June 11	12.45	GW	X	X	X	X	X	X	X	X				10	
3		GW-11139891-06[11]18-NC-003	June 11	14:15	GW	X	X	X	X	X	X	X	X				10	
4		GW-11139891-06[11]18-NC-004	June 11	16:26	GW	X	X	X	X	X	X	X	X				10	heavy silt
5		GW-11139891-06[11]18-NC-005	June 11	17:24	GW	X	X	X	X	X	X	X	X				10	heavy silt
6		GW-11139891-06[11]18-NC-006	June 11	18:40	GW	X	X	X	X	X	X	X	X				10	heavy silt
7		GW-11139891-06__18-NC-			GW												NC	
8		GW-11139891-06__18-NC-			GW												NC	
9		TRIP BLANK LOT # 3489	June 11		W									X			2	
10		TRIP BLANK LOT # 3489	June 11		W									X			2	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Nicholas Coyne	18/06/12	17:51	BRENDA WOODWARD	2018/06/12	15:00	
BRENDA WOODWARD	2018/06/13	10.00	Rijet PARAMJEET SINGH	2018/06/13	13:03	

Laboratory Use Only

Time Sensitive

Temperature (°C) on Recei: 3.4/5.0 4.4/3.5

Custody Seal	Yes	No
Present	✓	
Intact	✓	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

11/01 11/11 REC'D IN PORT HOPE

MW # 449509

Appendix G
Water Balance Analysis

Table G1

Water Balance Analysis - Land Type Parameters
Hydrogeological Assessment
Site Alteration Permit Application & Supporting Fill Management Plan
18725 McCowan Road, East Gwillimbury, Ontario
Rice Commercial Group Limited

Pervious Area - Sand Silt

Month	Temperature (°C)	Precipitation (mm)	Rainfall (mm)	Snowmelt (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Water Surplus (mm)	Snow Accumulation (mm)
January	-6.2	74	28	21	2	2	47	44
February	-6.1	70	22	24	1	1	44	67
March	-0.3	71	45	71	10	10	108	23
April	6.7	80	74	29	35	35	69	0
May	13.3	87	87	0	80	80	21	0
June	18.5	89	89	0	116	116	6	0
July	20.6	110	110	0	132	125	4	0
August	19.7	73	73	0	116	102	0	0
September	15.9	93	93	0	80	75	3	0
October	9.4	94	94	0	41	39	14	0
November	3.5	87	77	9	14	14	39	1
December	-2.6	83	46	17	3	3	55	21
Total		1011	838	171	630	602	409	

Pervious Area - Silt Loam

Month	Temperature (°C)	Precipitation (mm)	Rainfall (mm)	Snowmelt (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Water Surplus (mm)	Snow Accumulation (mm)
January	-6.2	74	28	21	2	2	44	44
February	-6.1	70	22	24	1	1	42	67
March	-0.3	71	45	71	10	10	108	23
April	6.7	80	74	29	35	35	69	0
May	13.3	87	87	0	80	80	21	0
June	18.5	89	89	0	116	116	6	0
July	20.6	110	110	0	132	131	4	0
August	19.7	73	73	0	116	110	0	0
September	15.9	93	93	0	80	78	3	0
October	9.4	94	94	0	41	40	13	0
November	3.5	87	77	9	14	14	35	1
December	-2.6	83	46	17	3	3	45	21
Total		1011	838	171	630	620	391	

Table G1

Water Balance Analysis - Land Type Parameters
Hydrogeological Assessment
Site Alteration Permit Application & Supporting Fill Management Plan
18725 McCowan Road, East Gwillimbury, Ontario
Rice Commercial Group Limited

Impervious Area

Month	Temperature (°C)	Precipitation (mm)	Rainfall (mm)	Snowmelt (mm)	Potential Evapotranspiration (mm)	Actual Evapotranspiration (mm)	Water Surplus (mm)	Snow Accumulation (mm)
January	-6.2	74	28	21	2	2	47	44
February	-6.1	70	22	24	1	1	45	67
March	-0.3	71	45	71	10	10	107	23
April	6.7	80	74	29	35	35	69	0
May	13.3	87	87	0	80	66	21	0
June	18.5	89	89	0	116	81	7	0
July	20.6	110	110	0	132	98	12	0
August	19.7	73	73	0	116	68	5	0
September	15.9	93	93	0	80	67	26	0
October	9.4	94	94	0	41	38	56	0
November	3.5	87	77	9	14	14	72	1
December	-2.6	83	46	17	3	3	60	21
Total		1011	838	171	630	483	528	

Note:
1. Estimated using the most recent version of the water balance model developed by Meteorological Service of Canada (MSC, see Johnstone and Louie, 2008).

Table G2

Water Balance Analysis - Pre-Filling Conditions
Hydrogeological Assessment
Site Alteration Permit Application & Supporting Fill Management Plan
18725 McCowan Road, East Gwillimbury, Ontario
Rice Commercial Group Limited

Detail	*Units*	January			Feburary			March			April			May			June		
		Impervious Area	*Pervious Area*	*Total*	*Impervious Area*	*Pervious Area*	*Total*	*Impervious Area*	*Pervious Area*	*Total*	*Impervious Area*	*Pervious Area*	*Total*	*Impervious Area*	*Pervious Area*	*Total*	*Impervious Area*	*Pervious Area*	*Total*
Input Information																			
	%	5	95	100	5	95	100	5	95	100	5	95	100	5	95	100	5	95	100
Area	ha	1.05	20.02	21.07	1.05	20.02	21.07	1.05	20.02	21.07	1.05	20.02	21.07	1.05	20.02	21.07	1.05	20.02	21.07
Soil Type		Sand Silt	Sand Silt		Sand Silt	Sand Silt		Sand Silt	Sand Silt		Sand Silt	Sand Silt		Sand Silt	Sand Silt		Sand Silt	Sand Silt	
Hydrologic Soil Group		AB	AB		AB	AB		AB	AB		AB	AB		AB	AB		AB	AB	
Pervious Infiltration Factor																			
Topography		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2	
Soil		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2	
Land Type		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2	
TOTAL		0	0.6		0	0.6		0	0.6		0	0.6		0	0.6		0	0.6	
Average Monthly Depth																			
Precipitation	*mm*	74	74		70	70		71	71		80	80		87	87		89	89	
Evapotranspiration	*mm*	2	2		1	1		10	10		35	35		66	80		81	116	
Water Surplus	*mm*	47	47		45	44		107	108		69	69		21	21		7	6	
Output Information																			
Rainfall Volume	m^3	**780**	**14,812**	**15,592**	**737**	**14,012**	**14,749**	**748**	**14,212**	**14,960**	**843**	**16,013**	**16,856**	**917**	**17,414**	**18,331**	**938**	**17,815**	**18,752**
Evapotranspiration Volume	m^3	**21**	**400**	**421**	**11**	**200**	**211**	**105**	**2,002**	**2,107**	**369**	**7,006**	**7,375**	**695**	**16,013**	**16,709**	**853**	**23,219**	**24,072**
Precipitation Surplus	m^3	**499**	**9,345**	9,844	**478**	**8,735**	9,213	**1,125**	**21,533**	22,659	**722**	**13,814**	14,536	**223**	**4,266**	4,489	**74**	**1,219**	1,293
Groundwater Recharge Volume	m^3	**0**	**5,607**	**5,607**	**0**	**5,241**	**5,241**	**0**	**12,920**	**12,920**	**0**	**8,288**	**8,288**	**0**	**2,560**	**2,560**	**0**	**731**	**731**
Runoff Volume [1]	m^3	**499**	**3,738**	**4,237**	**478**	**3,494**	**3,972**	**1,125**	**8,613**	**9,739**	**722**	**5,526**	**6,247**	**223**	**1,706**	**1,929**	**74**	**488**	**562**

Detail	*Units*	July			August			September			October			November			December			Annual
		Impervious Area	*Pervious Area*	*Total*	*Impervious Area*	*Pervious Area*	*Total*	*Impervious Area*	*Pervious Area*	*Total*	*Impervious Area*	*Pervious Area*	*Total*	*Impervious Area*	*Pervious Area*	*Total*	*Impervious Area*	*Pervious Area*	*Total*	Average Total
Input Information																				
	%	5	95	100	5	95	100	5	95	100	5	95	100	5	95	100	5	95	100	
Area	ha	1.05	20.02	21.07	1.05	20.02	21.07	1.05	20.02	21.07	1.05	20.02	21.07	1.05	20.02	21.07	1.05	20.02	21.07	
Soil Type		Sand Silt	Sand Silt		Sand Silt	Sand Silt		Sand Silt	Sand Silt		Sand Silt	Sand Silt		Sand Silt	Sand Silt		Sand Silt	Sand Silt		
Hydrologic Soil Group		AB	AB		AB	AB		AB	AB		AB	AB		AB	AB		AB	AB		
Pervious Infiltration Factor																				
Topography		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2		
Soil		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2		
Land Type		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2		
TOTAL		0	0.6		0	0.6		0	0.6		0	0.6		0	0.6		0	0.6		
Average Monthly Depth																				
Precipitation	*mm*	110	110		73	73		93	93		94	94		87	87		83	83		1011
Evapotranspiration	*mm*	98	125		68	102		67	75		38	39		14	14		3	3		596
Water Surplus	*mm*	12	4		5	0		26	3		56	14		72	39		60	55		415
Output Information																				
Rainfall Volume	m^3	**1,159**	**22,018**	**23,177**	**769**	**14,612**	**15,381**	**980**	**18,615**	**19,595**	**990**	**18,816**	**19,806**	**917**	**17,414**	**18,331**	**874**	**16,614**	**17,488**	**213,018**
Evapotranspiration Volume	m^3	**1,032**	**25,021**	**26,053**	**716**	**20,417**	**21,133**	**706**	**15,012**	**15,718**	**400**	**7,806**	**8,207**	**147**	**2,802**	**2,950**	**32**	**600**	**632**	**125,588**
Precipitation Surplus	m^3	**127**	**813**	940	**53**	**0**	53	**276**	**609**	885	**594**	**2,844**	3,438	**754**	**7,720**	8,473	**637**	**10,970**	11,607	**87,430**
Groundwater Recharge Volume	m^3	**0**	**488**	**488**	**0**	**0**	**0**	**0**	**366**	**366**	**0**	**1,706**	**1,706**	**0**	**4,632**	**4,632**	**0**	**6,582**	**6,582**	**49,120**
Runoff Volume [1]	m^3	**127**	**325**	**452**	**53**	**0**	**53**	**276**	**244**	**520**	**594**	**1,138**	**1,732**	**754**	**3,088**	**3,842**	**637**	**4,388**	**5,025**	**38,309**

Notes:

1. All runoff during existing conditions will not discharge from the pit area and will infiltrate over time.

Table G3

Water Balance Analysis - Post-Filling Conditions
Hydrogeological Assessment
Site Alteration Permit Application & Supporting Fill Management Plan
18725 McCowan Road, East Gwillimbury, Ontario
Rice Commercial Group Limited

Detail	*Units*	**January** *Impervious Area*	**January** *Pervious Area*	**January** *Total*	**Feburary** *Impervious Area*	**Feburary** *Pervious Area*	**Feburary** *Total*	**March** *Impervious Area*	**March** *Pervious Area*	**March** *Total*	**April** *Impervious Area*	**April** *Pervious Area*	**April** *Total*	**May** *Impervious Area*	**May** *Pervious Area*	**May** *Total*	**June** *Impervious Area*	**June** *Pervious Area*	**June** *Total*
Input Information																			
	%	5	95	100	5	95	100	5	95	100	5	95	100	5	95	100	5	95	100
Area	ha	1.05	20.02	21.07	1.05	20.02	21.07	1.05	20.02	21.07	1.05	20.02	21.07	1.05	20.02	21.07	1.05	20.02	21.07
Soil Type		Silt Loam	Silt Loam		Silt Loam	Silt Loam		Silt Loam	Silt Loam		Silt Loam	Silt Loam		Silt Loam	Silt Loam		Silt Loam	Silt Loam	
Hydrologic Soil Group		C	C		C	C		C	C		C	C		C	C		C	C	
Pervious Infiltration Factor																			
Topography		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2	
Soil		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2	
Land Type		-	0.1		-	0.1		-	0.1		-	0.1		-	0.1		-	0.1	
TOTAL		0	0.5		0	0.5		0	0.5		0	0.5		0	0.5		0	0.5	
Average Monthly Depth																			
Precipitation	*mm*	74	74		70	70		71	71		80	80		87	87		89	89	
Evapotranspiration	*mm*	2	2		1	1		10	10		35	35		66	80		81	116	
Water Surplus	*mm*	47	44		45	42		107	108		69	69		21	21		7	6	
Output Information																			
Rainfall Volume	m^3	**780**	**14,812**	**15,592**	**737**	**14,012**	**14,749**	**748**	**14,212**	**14,960**	**843**	**16,013**	**16,856**	**917**	**17,414**	**18,331**	**938**	**17,815**	**18,752**
Evapotranspiration Volume	m^3	**21**	**400**	**421**	**11**	**200**	**211**	**105**	**2,002**	**2,107**	**369**	**7,006**	**7,375**	**695**	**16,013**	**16,709**	**853**	**23,219**	**24,072**
Precipitation Surplus	m^3	**499**	**8,787**	9,286	**478**	**8,378**	8,856	**1,125**	**21,661**	22,786	**722**	**13,896**	14,617	**223**	**4,291**	4,514	**74**	**1,226**	1,300
Groundwater Recharge Volume	m^3	**0**	**4,393**	**4,393**	**0**	**4,189**	**4,189**	**0**	**10,830**	**10,830**	**0**	**6,948**	**6,948**	**0**	**2,146**	**2,146**	**0**	**613**	**613**
Runoff Volume	m^3	**499**	**4,393**	**4,892**	**478**	**4,189**	**4,667**	**1,125**	**10,830**	**11,956**	**722**	**6,948**	**7,670**	**223**	**2,146**	**2,369**	**74**	**613**	**687**

Detail	*Units*	**July** *Impervious Area*	**July** *Pervious Area*	**July** *Total*	**August** *Impervious Area*	**August** *Pervious Area*	**August** *Total*	**September** *Impervious Area*	**September** *Pervious Area*	**September** *Total*	**October** *Impervious Area*	**October** *Pervious Area*	**October** *Total*	**November** *Impervious Area*	**November** *Pervious Area*	**November** *Total*	**December** *Impervious Area*	**December** *Pervious Area*	**December** *Total*	**Annual** *Average Total*
Input Information																				
	%	5	95	100	5	95	100	5	95	100	5	95	100	5	95	100	5	95	100	
Area	ha	1.05	20.02	21.07	1.05	20.02	21.07	1.05	20.02	21.07	1.05	20.02	21.07	1.05	20.02	21.07	1.05	20.02	21.07	
Soil Type		Silt Loam	Silt Loam		Silt Loam	Silt Loam		Silt Loam	Silt Loam		Silt Loam	Silt Loam		Silt Loam	Silt Loam		Silt Loam	Silt Loam		
Hydrologic Soil Group		C	C		C	C		C	C		C	C		C	C		C	C		
Pervious Infiltration Factor																				
Topography		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2		
Soil		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2		-	0.2		
Land Type		-	0.1		-	0.1		-	0.1		-	0.1		-	0.1		-	0.1		
TOTAL		0	0.5		0	0.5		0	0.5		0	0.5		0	0.5		0	0.5		
Average Monthly Depth																				
Precipitation	*mm*	110	110		73	73		93	93		94	94		87	87		83	83		1011
Evapotranspiration	*mm*	98	131		68	110		67	78		38	40		14	14		3	3		613
Water Surplus	*mm*	12	4		5	0		26	3		56	13		72	35		60	45		398
Output Information																				
Rainfall Volume	m^3	**1,159**	**22,018**	**23,177**	**769**	**14,612**	**15,381**	**980**	**18,615**	**19,595**	**990**	**18,816**	**19,806**	**917**	**17,414**	**18,331**	**874**	**16,614**	**17,488**	**213,018**
Evapotranspiration Volume	m^3	**1,032**	**26,222**	**27,254**	**716**	**22,018**	**22,735**	**706**	**15,613**	**16,319**	**400**	**8,007**	**8,407**	**147**	**2,802**	**2,950**	**32**	**600**	**632**	**129,191**
Precipitation Surplus	m^3	**127**	**817**	945	**53**	**0**	53	**276**	**613**	889	**594**	**2,656**	3,251	**754**	**6,948**	7,701	**637**	**8,991**	9,628	**83,827**
Groundwater Recharge Volume	m^3	**0**	**409**	**409**	**0**	**0**	**0**	**0**	**307**	**307**	**0**	**1,328**	**1,328**	**0**	**3,474**	**3,474**	**0**	**4,496**	**4,496**	**39,132**
Runoff Volume	m^3	**127**	**409**	**536**	**53**	**0**	**53**	**276**	**307**	**583**	**594**	**1,328**	**1,923**	**754**	**3,474**	**4,228**	**637**	**4,496**	**5,133**	**44,695**

Table G4

Water Balance Analysis - Summary of Calculations
Hydrogeological Assessment
Site Alteration Permit Application & Supporting Fill Management Plan
18725 McCowan Road, East Gwillimbury, Ontario
Rice Commercial Group Limited

Details	Precipitation (m^3)	Evapotranspiration (m^3)	Surplus (m^3)	Infiltration (m^3)	Runoff (m^3)
Pre-Development					
Pre-Development Conditions [1]	**213,018**	**125,588**	**87,430**	**87,430**	**38,309**
Percentage of Annual Precipitation		59%		41%	18%
Post-development					
Proposed Conditions	**213,018**	**129,191**	**83,827**	**39,132**	**44,695**
Percentage of Annual Precipitation		61%		18%	21%
Pre- to Post-development Difference					
Proposed Conditions (Controlled)		**3,603**	**-3,603**	**-48,298**	**6,385**
Percentage Change		3%	-4%	-55%	17%

Notes:

1. All runoff during existing conditions will not discharge from the pit area and will infiltrate over time.

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