GEI Consultants

Consulting Engineers and Scientists

Preliminary Hydrogeological Investigation

Proposed Residential and Commercial Development

664, 674 & 692 Essa Road & 320 Mapleview Drive West, Barrie, Ontario

Submitted to:
Pearl Builders

Submitted by:
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Executive Summary

GEI Consultants (GEI) was retained by Pearl Builders to complete a hydrogeological study and report for the proposed residential and commercial development at 664, 674 & 692 Essa Road and 320 Mapleview Drive West, in Barrie, Ontario.

GEI was provided with the following drawings for review in preparation of this report:

- "*Mapleview, Barrie*", Dwg. 01, by IBI Group, dated Oct. 20, 2022.
- "*Preliminary Grading Plan, Mapleview Essa Development, City of Barrie*", File No. 422433, Dwg. GP-1, dated October 2020, by Tatham Engineering.

Based on both GEI's review of these drawings and our correspondence, it is understood that the development is conceptualized to include:

- Townhouse blocks within the northern half of the combined properties and will be interconnected by internal roadways. Over half of this area will be underlain by a single level of underground parking situated at approximately 8 metres below proposed grade. 0 to 2 metres of grade raise will be required in this area.
- The drainage channel will be re-aligned as an up to 63-metre-wide drainage easement that will run from east to west near the centre of the site.
- The southern quarter of the combined properties will contain 4 mid-rise apartment buildings ranging in height between 6 to 12 stories. The majority of this area will be underlain by a single level of underground parking situated at approximately 8 metres below proposed grade. 2 to 3 metres of grade raise will be required in this area.

At the time of the original subsurface investigation, only one (1) shallow underground parking level was proposed for the buildings at the site and GEI advanced boreholes across the site accordingly. As this is no longer the case, additional deeper boreholes must be advanced by GEI under a separate scope of work to confirm the preliminary engineering recommendations for the deeper underground levels that are provided in this report.

Key preliminary recommendations and conclusion are discussed below. The executive summary must not be relied upon for design parameters and recommendations. The full report must be reviewed for design purposes. If there is a discrepancy between the executive summary and the full report, the full report must be followed.

- Fifteen (15) boreholes were advanced across the site and typically encountered 0.8 to 2.3 metres of earth fill overlying silty sand to sandy silt glacial till. Cohesionless deposits of sands and silts were typically encountered underlying the glacial till. The native soils were mostly dense to very dense below depths of 1.5 to 4.0 metres below grade.
- GEI used eleven (11) existing monitoring wells on site installed previously by a different consultant to determine that the high groundwater table measured on April 1, 2020 was located at Elev. 304.4 to 304.9 metres (about 0.7 to 3.9 metres below existing grade). The earth fill, glacial till and other cohesionless soil deposits are relatively permeable such that they will allow for the free flow of

water when wet. In-situ hydraulic conductivity was measured for the strata beneath the site, and for design the hydraulic conductivity of the cohesionless glacial till is 1 x 10^{-5} m/s and is 5 x 10^{-5} m/s for the other cohesionless deposits.

- Baseline groundwater chemical testing was completed. Unfiltered groundwater samples were collected from monitoring wells 3 and 10, and encountered total suspended solids (TSS), zinc, and copper exceedances relative to City of Barrie Storm Sewer Use By-law, and TSS exceedances to the Sanitary Sewer Use By-law. Unfiltered groundwater samples were collected from monitoring wells 2 and 11 and encountered exceedances to Provincial Water Quality Objectives (PWQO) for metals such as zinc, iron, lead, copper and cobalt. Treatment systems such as filtration or decantation may be required during dewatering to reduce the exceedances.
- Positive dewatering will be required during construction for typical service trench excavations and for deeper levels of underground parking. Greater than 400,000 L/day of water taking is expected and a Permit to Take Water (PTTW) must be obtained from the Ministry of Environment, Conservation and Parks (MECP). This must be confirmed once the deeper boreholes are advanced and the site plans are finalized.
- Potential impacts for construction dewatering is summarized below. They are subject to change and must be updated once the deeper boreholes are advanced:
    - Dewatering can cause some settlement of nearby land. The amount of settlement will decrease exponentially to zero towards the radius of influence limit. It is not expected that settlement-sensitive structures will be located in the immediate vicinity of any of the dewatering locations. The existing residential and commercial buildings in the area surrounding the site are set back far enough from potential dewatering locations such that negligible to no settlement of the structures is anticipated.
    - Dewatering activities are expected to be restricted to the upper unconfined Aquifer A1 only (not used for drinking water) and will not impact the deeper drinking water supply Aquifers A3 and A4.
    - Construction dewatering is temporary and would likely be completed in phases across the site, therefore long-term impacts to groundwater levels or flow directions are not expected. Any potential impacts to baseflow entering Bear Creek that flows through the site could potentially be offset by discharging pumped groundwater into the creek (with appropriate filtration and treatment as required).
- Structures with underground parking levels made below the groundwater table must be fully waterproofed and designed to resist hydrostatic pressure, in which case permanent dewatering would not be required. It is noted that in recent years, the City of Barrie typically does not allow permanent dewatering and a fully waterproofed system will likely be required for any underground levels within the groundwater table
- Alternatively, structures with underground parking levels made below the groundwater table could have perimeter and subfloor drainage systems and must pump groundwater permanently. Greater than 400,000 L/day is expected for long-term water taking and a PTTW from the MECP would need to be obtained.
    - Permanent dewatering activities may reduce the surface groundwater levels in the local area surrounding the site over time. A reduction in baseflow to Bear Creek could potentially

be offset by discharge some of the pumped groundwater into the creek to maintain a baseflow (with appropriate filtration and treatment as required).
    - A local reduction in surface groundwater levels near the site is not expected to impact groundwater quantity in the deep drinking water aquifers. The surrounding areas are serviced by municipal water (no private drinking water wells should be impacted).
    - It is noted that in recent years, the City of Barrie typically does not allow permanent dewatering and a fully waterproofed system will likely be required for any underground levels within the groundwater table.
- A pre- and post-development water balance was completed and suggests that without low impact development (LID) measures, the proposed development will decrease average infiltration by about 14,874 m^3/year (56% decrease). The proposed development will increase runoff by about 38,058 m^3/year (291% increase).
- All structures on site can be supported on shallow spread footings per GEI's geotechnical report under a separate cover. In the Barrie area, drinking water Aquifers A3 and A4 are typically encountered at or below Elev. 195 metres. The proposed development may extend to near Elev. 296 metres, which is more than 100 metres above the highest elevation of Aquifers A3 or A4. Deep foundations (e.g., piles, caissons) are not expected to be required at this site and therefore will not extend into the drinking water aquifers.

1 Introduction

GEI Consultants (GEI) was retained by Pearl Builders to complete a geotechnical investigation and report for the proposed residential and commercial development at 664, 674 & 692 Essa Road and 320 Mapleview Drive West, in Barrie, Ontario. A site location plan is provided as Figure 1. The site is irregular in shape and consists of the four parcels of land with a total area of approximately 10.2 hectares. The overall length is about 315 metres in length (north to south) and 240 to 425 metres in width (east to west). The site is currently vegetated with low-lying grasses, farmland and a few trees, and is developed with a gravel parking area and two residential dwellings with driveways, sheds, and garages. The site is relatively flat with minor changes in topographic relief, but the northern half of the site is generally 1 to 2 metres higher in elevation (near Elev. 308 metres) than the southern half of the site (near Elev. 306 metres). A constructed drainage channel runs from east to west through the site, about 90 metres north of Mapleview Drive West. An aerial image of the site from 2018 is provided as Figure 2.

GEI was provided with the following drawings for review in preparation of this report:

- "*Mapleview, Barrie*", Dwg. 01, by IBI Group, dated Oct. 20, 2022.
- "*Preliminary Grading Plan, Mapleview Essa Development, City of Barrie*", File No. 422433, Dwg. GP-1, dated October 2020, by Tatham Engineering.

Based on both GEI's review of these drawings and our correspondence, it is understood that the development is conceptualized to include:

- Townhouse blocks within the northern half of the combined properties and will be interconnected by internal roadways. Over half of this area will be underlain by a single level of underground parking situated at approximately 8 metres below proposed grade. 0 to 2 metres of grade raise will be required in this area.
- The drainage channel will be re-aligned as an up to 63-metre-wide drainage easement that will run from east to west near the centre of the site.
- The southern quarter of the combined properties will contain 4 mid-rise apartment buildings ranging in height between 6 to 12 stories. The majority of this area will be underlain by a single level of underground parking situated at approximately 8 metres below proposed grade. 2 to 3 metres of grade raise will be required in this area.

The GEI hydrogeological report summarizes the existing site conditions, provides hydrogeological engineering recommendations, conducts an impact assessment for groundwater quality and quantity, and provides measures for mitigating the impacts. This report has been prepared following Conservation Authority guidelines for hydrogeological report submissions. GEI has also been retained to complete a geotechnical report for the site which is provided under a separate cover.

At the time of the original subsurface investigation, only one (1) shallow underground parking level was proposed for the buildings at the site and GEI advanced boreholes across the site accordingly. As this is no longer the case, additional deeper boreholes must be advanced by GEI under a separate scope of work

to confirm the preliminary engineering recommendations for the deeper underground levels that are provided in this report.

2 Site Setting

2.1 Physiography, Surficial and Bedrock Geology

The site is located within the physiographic area denoted as the Peterborough Drumlin Field (Chapman & Putnam, 1984), which consists of drumlinized till plains.

Based on surficial and bedrock geology mapping of the site by the Ontario Geological Survey, the surficial geology at the site consists of stone-poor, sandy silt to silty sand textured glacial till on Paleozoic terrain. At depth, limestone and shale bedrock of the Lindsay Formation is present.

2.2 Topography and Drainage

The site is relatively flat with minor changes in topographic relief, but the northern half of the site is generally 1 to 2 metres higher in elevation (near Elev. 308 metres) than the southern half of the site (near Elev. 306 metres) based on Simcoe County mapping with contours and the borehole ground surface elevations. A constructed drainage channel (Bear Creek) runs from east to west through the site, about 90 metres north of Mapleview Drive West, and the channel is about 2 metres deep and 8 metres wide. The drainage channel is shown as a permanent watercourse on MNRF and Simcoe County GIS mapping. It appears that the area north of the channel gently slopes south toward the channel, and the area south of the channel gently slopes north toward the channel. Sheet drainage likely runs off into the channel from most of the site. An aerial image of the site is shown on Figure 2.

The site is located in the Middle Nottawasaga River sub-watershed, within the jurisdiction of the Nottawasaga Valley Conservation Authority (NVCA). The drainage channel that runs through the site is a watercourse that is part of a tributary that flows west and converges with Nottawasaga River about 12 km west of the site. The Nottawasaga River meanders north until it eventually outlets into Georgian Bay of Lake Huron. City of Barrie maps indicate the watercourse is called Bear Creek.

The Ontario Watershed Information Tool (OWIT) by MNRF was used to corroborate that the site mostly drains into the channel. OFAT estimates that the total drainage area to the north, east, and south that drains into the channel at the western property line is about 2 km^2.

2.3 MECP Well Records

Ministry of Environment, Conservation and Parks (MECP) water well records were obtained within 500 metres of the site area to assess the general nature of the groundwater resource in near vicinity of the site, and historical/current uses of wells in the area. Thirty-eight (38) well records were found, and a summary of the data obtained from this review is presented below. The approximate MECP well locations are shown on Figure 5 and the well records along with a summary table are included in Appendix E.

The wells were installed for the following uses:

- Twenty (20) of the wells were installed for domestic use.
- One (1) of the wells was installed for cooling and air conditioning.
- Two (2) of the wells were installed for farm use.
- Five (5) of the wells were installed for monitoring.
- One (1) of the wells was installed for municipal use.
- Nine (9) of the records were for domestic well abandonment.

It is expected that most or all the domestic water supply wells within 500 metres of the site have been abandoned or are no longer in use for domestic supply since the surrounding area is now developed and serviced by the City of Barrie.

The stratigraphic descriptions within the MECP monitoring well records are typically inaccurate due to the methodology in which they are determined (observations of cuttings and no consistency between descriptions of soil between different drillers). Though this is the case, an overall sense of the deep stratigraphy can be determined by looking at commonalities between most stratigraphic descriptions and where the wells were terminated in an aquifer. In the area surrounding the site, the well records generally indicate that the stratigraphy predominantly consists of “sands” that are interbedded with “clays” and “gravels” at various depths. Many wells encountered shallower groundwater at depths of 4.3 to 12.2 metres below grade, with some deeper groundwater encountered at depths of about 23 to 50 metres below grade. These conditions are relatively consistent with the GEI boreholes, which predominantly encountered cohesionless soils with some clay layers, and a shallow groundwater surface.

2.4 Visual Inspection of Site

A visual site inspection was carried out on April 2, 2020 by senior GEI staff. The temperature was 6°C and it was sunny and clear during the inspection.

There is a drainage channel that runs from east to west through the site near the middle. South of the channel is mostly former farmland that is used as a driving range. There is also a chip truck and a gravel parking lot. North of the channel is farmland and two residential farmhouses with sheds and garages. The site is predominantly vegetated with short grasses and a few trees.

The northern and southern parts of the site gently slope toward in the channel in the middle of the site, and sheet drainage will typically flow toward the channel. The channel flows from east to west, is about 2 metres deep by 8 metres wide with sloped sidewalls, and about 0.3 to 0.4 metres of flowing water was observed during the inspection. The channel flows under Essa Road via a concrete box culvert, and there is a crossing near the middle of the site where the channel flows through a CPS culvert. There is a crossing at the eastern property line for a driveway to one of the dwellings where the channel flows through three CSP culverts.

Based on our preliminary visual estimates, it appears the following impermeable and permeable cover surfaces currently exist:

- Impermeable – gravel and paved driveways / parking lot, buildings, surface water (8%).
- Permeable – mostly flat grass areas with sporadic trees (92%).

2.5 Regulatory Requirements

2.5.1 Source Water Protection

The following document should be referenced for source water protection at this site:

- "*Approved South Georgian Bay Lake Simcoe Source Protection Plan*", dated January 26, 2015, by NVCA.

Based on Simcoe County and NVCA online mapping, the following is noted:

- Wellhead Protection Area (WHPA): The site is located within a WHPA Q2 (Figure 6A).
- Highly Vulnerable Aquifer (HVA): The site is located within an HVA (Figure 6B).
- Significant Groundwater Recharge Area (SGRA): The site is not located within an SGRA (Figure 6C).

2.5.2 City of Barrie Comments

The City of Barrie has historically had the following comments about hydrogeologic information for this particular site, which are provided below along with GEI's responses.

City Comment: Deep construction activities have the potential to impact or intercept the municipal supply aquifer (e.g., deep drilling, installation of deep foundation support, underground parking, dewatering, etc.), including development in areas of known or suspected groundwater contamination.

GEI Response: The City of Barrie is underlain by complex and extensive regional aquifers. The four major aquifers identified beneath Barrie include aquifer A1 (upper and mostly unconfined), A2 (intermediate) and A3 / A4 (lower) aquifers. Aquifer A1 is mostly unconfined, but A2 is typically confined by 5 to 20 metres of fine-grained deposits. The lower aquifers A3 and A4 typically consist of sands and gravels, and most of Barrie's groundwater is supplied by these deep aquifers. Active City Wells 3A, 5, and 12 are screened within aquifer A4, City Wells 7, 9, 11, 13, 14, 15, 17 and 18 are screened in both aquifers A3 and A4, and City Wells 4, 10 and 16 are screened in aquifer A3. In the Barrie area, the elevation of aquifer A3 ranges from approximately Elev. 150 to 195 metres, and the elevation of aquifer A4 ranges from approximately Elev. 115 to 160 metres.

The boreholes extended to depths of about 6.6 metres below grade and encountered an upper unconfined aquifer (assumed to be aquifer A1). GEI will be advancing deeper boreholes across the site to accommodate the newest site plans where most buildings will now have deeper levels of underground parking and additional comments about the stratigraphy and groundwater conditions will be provided after the deeper boreholes are advanced. On a preliminary basis, an underground parking level extending to 8 metres below grade and the buildings will likely be founded on spread footings that may extend 1 metre below the parking slab. The ground surface elevation of the site ranges from approximately Elev. 306 to 308 metres, meaning the development may extend to near Elev. 296 to 298 metres. The development therefore will not extend into the drinking water aquifers A3 or A4, which are an estimated 100 metres or more below the deepest extent of the development. Similarly, any dewatering activities during construction are expected to be restricted to the upper unconfined Aquifer A1 only (not used for drinking water). Deep

foundations (e.g., piles, caissons) are not expected to be required to support new structures at this site as discussed in the geotechnical report by GEI under a separate cover.

City Comment: The applicant is required to provide the following information to screen for risk management requirements:

i. Anticipated Maximum Depth of Excavation
ii. Anticipated Maximum Depth of Foundation
iii. Anticipated Percentage of site to be developed

GEI Response: This information will be confirmed and provided by the architect or civil engineer by the Site Plan Approval application phase.

City Comment: It is noted that based on the information provided above:

a. A hydrogeological study may be required for the site in accordance with the Terms of Reference.
b. The hydrogeological study may require detailed risk management plans within the Mitigation Measures section of the report including a dewatering management plan, a contamination management plan, and/or a recharge management plant.

GEI Response: This hydrogeological study has been prepared by GEI and follows *"Hydrogeological Assessment Submissions, Conservation Authority Guidelines for Development Applications"* (June 2013). Recommended mitigation measures are discussed in Section 5.4.

City Comment: Site plan drawings will need to clearly note proposed elevations of foundation supports. Building supports shall be designed to stay above the municipal supply aquifer.

GEI Response: Final site plans showing the foundation types and elevations will be provided by the architect or structural engineer. As discussed above, the municipal supply aquifers A3 and A4 are located at or below Elev. 195 metres in the Barrie area. GEI provided a geotechnical engineering report under a separate cover, and based on the subsurface conditions, the recommended foundation option was conventional spread and strip footings. The shallow foundations are expected to be made as deep as Elev. 296 to 298 metres (on a preliminary basis) and will not extend into aquifers A3 or A4. Deep foundations are not expected to be required.

City Comment: Deep drilling and the undertaking of deep construction activities (piles, caissons, excavations, underground parking etc.) can create a transport pathway for contaminant migration to the deep municipal supply aquifer. We request that no drilling or construction activities occur without formal consultation with the City to ensure a plan is in place to address the risks to the drinking water supply aquifer, and off-site contaminant migration.

GEI Response: GEI is advancing deeper boreholes across the site and will confirm the deeper stratigraphy and groundwater conditions beneath the site. Based on current subsurface information and the understanding that Aquifer A2 is typically confined by 5 to 20 metres of fine-grained deposits, the proposed development is not expected to penetrate into confined aquifer A2 and will not extend into the drinking water supply aquifers A3 and A4. There is very low to negligible risk that contaminants will be transported from the development into the drinking water supply aquifers. In addition, it is not expected that deep

construction activities such as piles to support foundations or temporary shoring will be implemented at this site.

2.5.3 Temporary Groundwater Dewatering

The volume of water entering the excavation will be based on both ground water infiltration and precipitation events. Based on O.Reg. 63/16, the following dewatering limits and requirements are as follows:

- Construction Dewatering less than 50,000 L/day: The takings of both groundwater and stormwater do not require a hydrogeological report and does not require a Permit to Take Water (PTTW) from the Ministry of Environment, Conservation and Parks (MECP).
- Construction Dewatering greater than 50,000 L/day and less than 400,000 L/day: The taking of groundwater and/or stormwater requires a hydrogeological report and registration on the Environmental Activity and Sector Registry (EASR) but does not require a PTTW from the MECP.
- Construction Dewatering greater than 400,000 L/day: The taking of groundwater and/or stormwater requires a hydrogeological report and a PTTW from the MECP.

For any permanent dewatering, based on Section 34 of O.Reg. 387/04, the dewatering limits and requirements are as follows:

- Water Taking less than 50,000 L/day: A Permit to Take Water (PTTW) is not required from the MECP.
- Water Taking greater than 50,000 L/day: A PTTW is required from the MECP (likely Category 3).

3 Procedures and Methodology

Prior to the commencement of drilling activities, the locations of underground utilities including natural gas, electrical, telephone, water, etc. were marked out by public and private utility locating companies. The fieldwork for the drilling program was carried out on March 3 to 5, 2020. A total of fifteen boreholes (Borehole 1 to 15) were advanced on site by Drilltech Drilling using a track-mounted drill rig. To advance the boreholes, continuous flight solid stem augers and standard soil sampling equipment was utilized. All samples were collected as per ASTM D1586 to assess the strength characteristics of the substrate.

The GEI boreholes were advanced to depths of 6.2 to 6.6 metres below existing grade. The horizontal locations were laid out in the field by GEI prior to the drilling operations and the locations are shown on Figure 2. Ground surface elevations of the boreholes were measured using survey equipment in reference to a geodetic benchmark (a fire hydrant and a monitoring well casing) with known geodetic elevations. GPS measurements measured with a handheld GPS unit and referenced to the NAD 83 geodetic datum.

The field staff examined and classified characteristics of the soils encountered in the boreholes, including the presence of fill materials, made groundwater observations during and upon completion of the drilling, recorded observations of borehole construction, and processed the recovered samples. Soil sampling was conducted at regular intervals for the full depth of the borehole. The boreholes were backfilled upon completion. All recovered soil samples were logged in the field, carefully packaged and transported to the laboratory for more detailed examination and classification. In the laboratory, the samples were classified

as to their visual and textural characteristics and geotechnical laboratory testing was carried out with the results included in Appendix B.

There are eleven (11) existing monitoring wells (shown on Figure 2) installed previously at the site by other consultants. It is unknown who installed the wells, when they were installed, or for what purpose. Borehole logs, monitoring well information or previous reports for the site are not available from the client. GEI reviewed the MECP Well Records database but no detailed information about wells were available. GEI measured the diameter, stick-up, depth of well, and depth of water for each well during the investigation to ascertain the approximate well construction and water levels. The GEI boreholes were generally advanced in close proximity to the existing wells such that the screened strata can be inferred. The screen lengths are inferred to be 1.5 metres.

GEI did not observe the installation of the monitoring wells, but it is expected that they were installed by a licenced well driller and therefore were installed following typical drilling practices for the method of drilling, sand pack, bentonite seal, etc. Less stringent controls are needed for geotechnical studies compared to environmental studies, so using the existing wells is suitable to determine water table measurements and for sampling and testing purposes in this hydrogeological report.

4 Subsurface Conditions

4.1 General Overview

The detailed soil profiles encountered in the boreholes are indicated on the attached borehole logs in Appendix A and the geotechnical laboratory results are included in Appendix B. The borehole locations are shown on Figure 2 and detailed subsurface profiles for the northern, eastern, southern and western areas of the site are provided as Figures 3A to 3D.

It should be noted that the conditions indicated on the borehole logs and subsurface profiles are for specific locations only and can vary between and beyond the borehole locations. It should be noted that the soil boundaries indicated on the borehole logs are inferred from non-continuous sampling and observations during drilling. These boundaries are intended to reflect approximate transition zones and should not be interpreted as exact planes of geological change.

In addition, the descriptions provided in the borehole logs are inferred from a variety of factors, including: visual observations of the soil samples retrieved, laboratory testing, measurements prior to and after drilling, and the drilling process itself (speed of drilling, shaking/grinding of the augers, etc.). The passage of time also may result in changes in conditions interpreted to exist at locations where sampling was conducted.

As discussed in Section 2.0, GEI measured the diameter, stick-up, depth of well, and depth of water in each existing well on site during the geotechnical investigation to ascertain the approximate well construction and water levels. The GEI boreholes were generally advanced in close proximity to the existing wells such that the screened strata can be inferred, and the wells are shown on the nearest GEI borehole log for illustrative context.

4.2 Stratigraphy

4.2.1 Topsoil and Earth Fill

Boreholes 1 to 11 and 13 to 15 encountered a topsoil layer at the ground surface that ranged in thickness from 180 to 610 mm (280 mm on average).

Earth fill was encountered underlying the topsoil layer in Boreholes 1 to 7, 9 to 11, and 13 to 15, and at the ground surface in Borehole 12. The earth fill extended to depths of 0.8 to 2.3 metres below grade (Elev. 307.1 to 303.3 metres) and was generally brown to dark brown and moist. The earth fill ranged in consistency from silty sand, to sandy silt, to sand and silt with variable amounts of clay and gravel. Trace rootlets were also encountered within the earth fill in some boreholes. The Standard Penetration Test (SPT) results ("N" Values) measured in the earth fill ranged from 2 to 14 blows per 300 mm of penetration, indicating a very loose to compact (but generally loose) relative density.

4.2.2 Native Soils

Native soils were encountered underlying the earth fill in Boreholes 1 to 7 and 9 to 15 and underlying the topsoil in Borehole 8. The native soils were encountered at depths of 0.6 to 2.3 metres below grade (Elev. 307.1 to 303.3 metres and extended beyond the vertical depth of investigation at depths of 6.2 to 6.6 metres below grade (Elev. 301.9 to 298.5 metres). In general, the native soil below the site consists of glacial till underlain by cohesionless deposits with some interbedded layers of clay and silt. The glacial till was also interbedded with sands and silts in some boreholes.

The glacial till has a cohesionless matrix consisting of silty sand, to sandy silt, to sand and silt, with trace to some clay and trace gravel. The glacial till is brown and moist, becoming wet with depth. The till deposit is generally thicker in the northern part of the site compared to the southern part of the site. The other cohesionless deposits typically encountered underlying the upper glacial till ranged in consistency from silty sand, to sandy silt, to sand and silt, to sand, to gravelly sand. These cohesionless deposits are generally brown and wet, turning grey with depth. Some deposits of grey and moist silt and clay to clayey silt with trace sand and frequent silt partings were encountered interbedded in Boreholes 3 to 6, 9 and 10.

The Standard Penetration Test (SPT) results ("N" Values) measured in the glacial till and cohesionless deposits ranged from 4 to greater than 50 blows per 300 mm of penetration, indicating a loose to very dense relative density. At or below a depth of approximately 2 metres below existing grade, these deposits are generally uniformly compact to dense. The SPT "N" Values measured in the clay and silt to clayey silt deposits were greater than 30 blows per 300 mm of penetration, indicating a hard consistency.

4.3 Groundwater

4.3.1 Groundwater Levels

Unstabilized groundwater level measurements and cave measurements were taken upon completion of drilling of each borehole. These measurements provide a rough estimate of the possible excavation and temporary ground water control constructability considerations that may arise. Unstabilized water levels

were measured at depths of 1.8 to 5.5 metres below grade, and the boreholes remained open or caved to a depth of 2.1 metres below grade.

There are eleven (11) existing monitoring wells installed previously at the site by other consultants as shown on Figure 2. It is unknown who installed the wells, when they were installed, or for what purpose. Borehole logs, monitoring well information or previous reports for the site are not available from the client. GEI measured the diameter, stick-up, depth of well, and depth of water for each existing well during the geotechnical investigation to ascertain the approximate well construction and water levels. Existing monitoring wells 1 to 4 and 7 were 32 mm in diameter and wells 5, 6, and 8 to 11 were 50 mm in diameter. The screen lengths are inferred to be 1.5 metres.

GEI advanced boreholes in proximity to the existing monitoring wells on site so that the existing monitoring wells could be transposed onto the GEI borehole logs as shown in Appendix A. To summarize the approach taken:

- The top of pipe of the existing monitoring wells were surveyed to centimeter accuracy relative to a geodetic elevation. Therefore, all measurements of the groundwater elevations taken in those wells are also accurate to centimeter accuracy.
- The ground surface elevation at the existing monitoring wells were not surveyed. The rationale behind this was that the elevation of the groundwater table is primarily what matters, not depth below grade, especially when no stratigraphic information is available.
- To provide context to the depth of the water level relative to existing grade, the elevation of the water level in the monitoring wells was projected onto the nearest GEI borehole advanced and shown on the borehole log to provide visual context and give a sense of the general depth that groundwater exists below grade. The purpose of showing the wells on the boreholes was also important to understand what stratigraphic unit the existing well screen was likely located in.
- The groundwater elevations shown on Figure 4 are accurate in both location and elevation to centimeter accuracy. Interpolated groundwater contours are also shown on Figure 4.

The groundwater measurements are summarized in the table below and were measured over a 4-month period during Spring of 2020 to determine the seasonally high level. The following assumptions were made when transposing the existing monitoring well information onto the GEI logs:

- The geodetic elevations for groundwater, screen depth and base of well are based off the measurements at the existing monitoring well locations.
- The depth below grade shown is based off the projection of the elevations at the monitoring well location to the closest borehole location. The depth measurements are not reflective of the actual monitoring well locations, but are used to provide context to the general depth below grade and what stratigraphic unit the wells were screened in.

Monitoring Well and Nearby GEI Borehole	Inferred Well Screen Location		Inferred Strata Screened	Depth / Elevation (m) of Groundwater Table			
	Depth (m)	Elevation (m)		March 5, 2020	April 1, 2020	May 5, 2020	June 4, 2020
MW1 (BH2)	5.7 to 7.2	302.2 to 300.7	Silty Sand	3.89 / 303.92	**3.11 / 304.70**	3.55 / 304.26	3.68 / 304.13
MW2 (BH3)	5.7 to 7.2	302.2 to 300.7	Silty Sand to Sandy Silt	3.84 / 304.04	**3.21 / 304.67**	3.49 / 304.39	3.66 / 304.22
MW3 (BH1)	5.8 to 7.3	301.5 to 300.0	Silty Sand	3.48 / 303.79	**2.61 / 304.66**	3.11 / 304.16	3.22 / 304.05
MW4 (BH7)	4.6 to 6.1	300.0 to 301.5	Silty Sand Glacial Till	3.57 / 303.99	**2.67 / 304.89**	3.24 / 304.32	3.37 / 304.19
MW5 (BH5)	9.4 to 10.9	298.4 to 296.9	Unknown*	3.82 / 304.01	**3.03 / 304.80**	3.48 / 304.35	3.62 / 304.21
MW6 (BH4)	9.4 to 10.9	299.1 to 297.6	Unknown*	4.72 / 303.73	**3.85 / 304.60**	4.38 / 304.07	4.46 / 303.99
MW7 (BH6)	7.8 to 9.3	298.2 to 296.7	Unknown*	2.33 / 303.67	**1.44 / 304.56**	2.00 / 304.00	2.05 / 303.95
MW8 (BH11)	5.7 to 7.2	299.6 to 298.1	Sand, Some Silt to Silty	1.47 / 303.84	**0.68 / 304.63**	1.18 / 304.13	1.26 / 304.05
MW9 (BH13)	8.1 to 9.6	297.9 to 296.4	Unknown*	2.15 / 303.76	**1.38 / 304.53**	1.78 / 304.13	1.88 / 304.03
MW10 (BH15)	7.4 to 8.9	298.3 to 296.8	Unknown*	1.57 / 304.06	**0.91 / 304.72**	1.35 / 304.28	1.36 / 304.27
MW11 (BH9)	6.7 to 8.2	298.7 to 297.2	Unknown*	1.79 / 303.60	**1.01 / 304.38**	1.45 / 303.94	1.53 / 303.86

*Screened strata is unknown because the well screen extends below the vertical extent of the nearby GEI borehole.
Note: The seasonally high groundwater level measured in each monitoring well is in **bold**. The highest levels were measured in April 1, 2020 within each well.

Based on the results of the water levels, the seasonally high groundwater table was measured on April 1, 2020 and was located between Elev. 304.4 to 304.9 metres across the site (ranging from about 0.7 to 3.9 metres below grade). Groundwater elevations and contours are shown on Figure 4. The groundwater table gently slopes down to the southwest but overall is relatively flat across the site. Based on the groundwater contours and depth of the drainage channel through the site (Bear Creek), groundwater flows into Bear Creek as baseflow (i.e., it is a “gaining” watercourse). The earth fill, glacial till and other cohesionless soil deposits are relatively permeable such that they will allow for the free flow of water when wet.

4.3.2 In-Situ Permeability and Infiltration

Rising head tests were completed in selected monitoring wells on April 1, 2020. Water was manually purged from monitoring wells 1 to 4 and 7 using LDPE piping and a foot valve. The static water level was measured prior to the start of testing, and the change in water level was monitored using a level logger. In monitoring wells 8 to 10, a slug test was carried out using a cylindrical metal slug measuring 1.2 metres long by 38 mm (1.5”) in diameter that was lowered quickly into the wells to displace a known volume of water, with the near-instantaneous increase and then decrease in water level back to the static level being measured by the level logger. The tests were completed to estimate the horizontal hydraulic conductivity (K) of the soils at the well screen depths.

A hydraulic conductivity value was calculated from the rising head data using Hvorslev's solution (1951). Due to lower permeability, the rising head test conducted in monitoring well 11 was of such low permeability that it did not recover sufficiently to reach T_0, which is the time required for the water level to rise to 37% of the initial change in water level. As such, the result was approximated by extrapolating a line of best fit to estimate T_0. The semi-log plot for drawdown versus time for the tests are provided in Appendix D and are summarized in the table below.

Monitoring Well and Nearby GEI Borehole	Well Screen Location		Inferred Strata Screened	Hydraulic Conductivity
	Depth (m)	Elevation (m)		
MW1, BH2	5.7 to 7.2	302.2 to 300.7	Silty Sand	6×10^{-6} m/s
MW2, BH3	5.7 to 7.2	302.2 to 300.7	Silty Sand to Sandy Silt	7×10^{-5} m/s
MW3, BH1	5.8 to 7.3	301.5 to 300.0	Silty Sand	3×10^{-5} m/s
MW4, BH7	4.6 to 6.1	300.0 to 301.5	Silty Sand Glacial Till	9×10^{-6} m/s
MW7, BH6	7.8 to 9.3	298.2 to 296.7	Unknown*	3×10^{-6} m/s
MW8, BH11	5.7 to 7.2	299.6 to 298.1	Sand, Some Silt to Silty	1×10^{-5} m/s
MW9, BH13	8.1 to 9.6	297.9 to 296.4	Unknown*	8×10^{-6} m/s
MW10, BH15	7.4 to 8.9	298.3 to 296.8	Unknown*	2×10^{-5} m/s
MW11, BH9	6.7 to 8.2	298.7 to 297.2	Unknown*	2×10^{-7} m/s**

*Screened strata is unknown because the well screen extends below the vertical extent of the nearby GEI borehole.
**Estimated through extrapolation of initial rising head test data conducted which showed limited recovery of the lowered groundwater over a 45-minute time period.

In addition to the above-noted permeability data, the hydraulic conductivity of the soils encountered on site was estimated from grain size distribution curves (as provided in Appendix B). According to Freeze and Cherry (1979), the typical hydraulic conductivity of the strata investigated are:

- Sand: 10^{-3} m/s to 10^{-5} m/s
- Silty Sand: 10^{-4} m/s to 10^{-7} m/s
- Glacial Till: 10^{-6} m/s to 10^{-10} m/s

The actual measured hydraulic conductivity of the cohesionless silty sand, to sandy silt, to sand deposits are within the expected range. The measured hydraulic conductivity of the glacial till is more permeable than the typical range listed in Freeze and Cherry (1979), likely due to its cohesionless nature and that the deposit is thin (the well screen may partially penetrate into the more permeable cohesionless deposits underlying the glacial till). For the purposes of design, the following hydraulic conductivities are recommended for this site:

- Cohesionless Glacial Till: 1×10^{-5} m/s
- Other Cohesionless Deposits: 5×10^{-5} m/s

Determination of percolation rates are based on the "*Ministry of Municipal Affairs and Housing (MMAH) Supplementary Guidelines SB-6, Percolation Time and Soil Descriptions, September 14, 2012*". Under the Unified Soil Classification System, the upper cohesionless deposits and glacial till are typically classified as S.M. (silty sands, sand-silt mixtures) to M.L. (silty fine sands). Based on this document, the soil type, and the results of the hydraulic conductivity testing, the estimated unfactored percolation rate (T-Time) and infiltration rate for the near surface soils is 20 mins/cm (30 mm/hr). This infiltration rate is not applicable below the water table. If LID infiltration measures will be designed and constructed on site, GEI can further refine the infiltration rates by excavating test pits and conducting Guelph Permeameter tests in the exact footprints of the LID measures.

4.3.3 Baseline Groundwater Chemical Testing

To establish baseline conditions and assess the suitability for discharge of pumped groundwater to the land surface or to City of Barrie storm or sanitary sewers during potential dewatering activities, the following groundwater and surface water samples were collected on April 1, 2020:

- Two (2) unfiltered groundwater samples were collected, one from monitoring well 2 and one from monitoring well 11 and tested relative to Provincial Water Quality Objectives (PWQO) for metals, inorganics, volatile organic compounds (VOCs) and petroleum hydrocarbons (PHCs).
- Two (2) unfiltered groundwater samples were collected, one from monitoring well 3 and one from monitoring well 10 and tested relative to City of Barrie Storm and Sanitary Sewer Use By-law standards for discharge.

The samples were collected and placed into pre-cleaned laboratory-supplied vials and/or bottles provided with analytical test group specific preservatives, as required. Dedicated nitrile gloves were used during sample handling. The samples were submitted to CALA- accredited Caduceon Environmental Laboratories for analysis. The results of the groundwater chemistry are presented in the laboratory Certificates of Analysis provided in Appendix G.

A summary of the results is presented in the table below for samples relative to City of Barrie Storm and Sanitary Sewer Use By-law standards for discharge.

Monitoring Well Sample Location	**Exceedances of Groundwater Parameters to Discharge Standards**	
	City of Barrie Storm	**City of Barrie Sanitary**
MW3 (Unfiltered)	TSS, Zinc, Copper	TSS
MW10 (Unfiltered)		

A summary of the results is presented in the table below for samples relative to Provincial Water Quality Objectives (PWQO).

Sample Location	Water Sample Parameter Exceedances to PQWO
MW2 (Unfiltered)	Metals (Zinc, Lead, Iron, Copper, Cobalt)
MW11 (Unfiltered)	Metals (Zinc, Iron)

The metals exceedances to PWQO guidelines from the groundwater samples also likely occur naturally as there are no nearby industries or other likely sources of contamination. Groundwater quality mitigation measures and disposal recommendations are discussed in Section 5.5.

5 Discussion and Analysis

5.1 Proposed Development Plan

GEI was provided with the following drawings for review in preparation of this report:

- "*Mapleview, Barrie*", Dwg. 01, by IBI Group, dated Oct. 20, 2022.
- "*Preliminary Grading Plan, Mapleview Essa Development, City of Barrie*", File No. 422433, Dwg. GP-1, dated October 2020, by Tatham Engineering.

Based on both GEI's review of these drawings and our correspondence, it is understood that the development is conceptualized to include:

- Townhouse blocks within the northern half of the combined properties and will be interconnected by internal roadways. Over half of this area will be underlain by a single level of underground parking situated at approximately 8 metres below proposed grade. 0 to 2 metres of grade raise will be required in this area.
- The drainage channel will be re-aligned as an up to 63-metre-wide drainage easement that will run from east to west near the centre of the site.
- The southern quarter of the combined properties will contain 4 mid-rise apartment buildings ranging in height between 6 to 12 stories. The majority of this area will be underlain by a single level of underground parking situated at approximately 8 metres below proposed grade. 2 to 3 metres of grade raise will be required in this area.

5.2 Groundwater Control Methodology

5.2.1 Temporary Construction Groundwater Control

Based on the results of the water levels, the groundwater table is located at Elev. 304.4 to 304.9 metres across the site (ranging from about 0.7 to 3.9 metres below grade). Groundwater elevations and contours are shown on Figure 4, and the groundwater table is relatively flat across the site. The earth fill, glacial till

and other cohesionless soil deposits are relatively permeable such that they will allow for the free flow of water when wet.

For excavations that extend into the prevailing groundwater table, the cohesionless soils will allow for the free flow of water when wet. Local sumps placed at the base of the excavation can typically control groundwater seepage where excavations are between 0 to no more than 0.5 metres into the prevailing groundwater table in cohesionless deposits. Sumps created with a corrugated steel pipe filled with gravel which allows the water to enter the sumps and continuously pumping the sumps until all the water stored within the cohesionless soils are drained can typically control groundwater seepage where excavations are between 0.5 to no more than 1.0 metres into the prevailing groundwater table in cohesionless deposits.

Positive methods for control of groundwater seepages may be required for deeper excavations that extend more than 1.0 metre into the prevailing groundwater table in cohesionless deposits. These methods may include, although may not necessarily be limited to, lowering the groundwater table a minimum of 0.5 metres below the pipe invert or footing level prior to construction using a system such as well-points.

The exact scenario where these groundwater control techniques will work are estimates only and are directly correlated to how coarse/fine the native soils are in an excavation, and both the lateral and vertical extent of the cohesionless deposits encountered. If the groundwater table is not controlled during construction, the base of the excavations will probably be unstable, leading to difficulties in excavating and placement of pipes or footings. A dewatering contractor must review and assess the subsurface conditions to verify which dewatering techniques will work for the site and the proposed utility / foundation installations, based on their experience and interpretation of the data. A test dig could be carried out to assist prospective contractors determine the most appropriate dewatering methods based on their own means and methods.

No draft or final grading plans, foundation plans, or utility plans were provided to GEI in preparation of this report. GEI has carried out preliminary dewatering calculations to estimate water taking volumes during construction for an assumed utility trench. The following assumptions were made in the preliminary assessment, since detailed site servicing plans were not available:

- It was assumed that final site grades will match existing grades, and typical service trenches will extend about 3 metres below grade. The trench for site servicing will be in Type 3 soil with 1 horizontal to 1 vertical side walls sloped from the bottom of the excavation, and a 2-metre-wide trench base was assumed.
- The preliminary calculations were completed using borehole information from the southern part of the site, where the groundwater table is closer to surface and the surficial glacial till deposit is less thick to account for the worst-case scenario.
- Borehole 11 was used to determine the subsurface soil conditions and monitoring wells 8 and 10 were used for groundwater levels (the groundwater table was measured at Elev. 304.6 to 304.7 metres).
- The ground surface elevation of Borehole 11 is Elev. 305.3 metres, therefore the assumed trench will extend to Elev. 302.3 metres. The assumed dewatering target is 0.5 metres below the bottom of the trench (i.e., Elev. 301.8 metres) for a total drawdown of 2.9 metres.

Radius of Influence

Typically, the radius of influence (ROI) for the construction dewatering is calculated based on the empirical Sichardt equation. The Sichardt was specifically developed for coarse sands and gravels. This equation is used to predict the distance at which the drawdown resulting from pumping is negligible. This equation is empirical and was developed to provide representative flow rates using the steady state flow dewatering equations, as discussed below.

It is noted that in steady state conditions, the radius of influence of pumping will extend until boundary flow conditions are reached and provide sufficient water inputs to the aquifer, such as recharge and surface water bodies. The radius of influence (R_o) of pumping based on the Sichardt formula is described as follows:

$$R_o = 3000 \times (H - h) \times \sqrt{K}$$

Where: H = Water level above the base of the aquifer prior to dewatering
h = water level at the equivalent radius of the excavation
K = Hydraulic Conductivity in m/sec

The radius of influence for the assumed utility trench at the southern part of the site in the glacial till and cohesionless soils was calculated to be on the order of 40 metres.

Preliminary Construction Dewatering Calculations

The glacial till and other cohesionless deposits are an unconfined aquifer. To reach a dewatered condition, water held in storage (i.e., pore spaces of the soil) also needs to be removed in addition to steady-state flow as the groundwater head is lowered to the desired level. The amount of water released from storage can be significant and can take on the order of days to weeks and sometimes months to be removed before steady-state conditions are achieved.

The dewatering system designed by the professional dewatering subcontractor should consider that a higher pumping rate will likely be initially required due to the water held in storage, but a lower pumping rate may be suitable for longer-term pumping once steady-state is reached to maintain the dewatered site conditions. The initial increase in pumping rate depends on factors such as the total volume of water held in storage and the time available for dewatering activities prior to the start of construction.

Preliminary construction dewatering estimates for the assumed utility trench were carried out using the groundwater finite element modeller in the commercially available computer program Slide (Version 8.031) provided by RocScience Inc. The finite element model is for steady-state conditions and does not model transient flow or water released from storage. Data including assumed excavation geometry, groundwater levels, drawdown targets, radius of influence, and hydraulic conductivity were input into the model. The model discretizations and mesh were refined in more critical areas such as around the trench cut, and the element type consisted of 6-noded triangles. The results are included in Appendix H.

The following considerations/limitations must be considered as part of the finite element model:

- The estimates do not include the dewatering influence at the end of the trenches which must also be accounted for.
- The estimates are for steady state conditions. Initial drawdown of the groundwater table will result in higher initial dewatering volumes due to storage. A high-level estimate indicates that the initial pumping rate could be two to three times the rate for steady-state conditions. An in-situ pumping test can help to estimate storage and initial pumping rates because storage being released has an effect similar to a temporary recharge source.
- The calculations were carried out assuming sloped excavation sidewalls. Even if trench boxes are used to support the excavation, the calculated dewatering rates will be the same as the open cut excavations since trench boxes do not exclude groundwater flow.
- The model does not account for precipitation that enters the excavation which must also be pumped out.

To confirm the results of the finite element model, the Dupuit equation and equivalent well radius method was used to calculate steady-state flow to a linear excavation from both sides of a trench and at both ends of the trench through an unconfined aquifer resting on a horizontal impervious surface. This equation which was used to obtain a flow rate estimate while dewatering is expressed as follows for an unconfined aquifer:

$$Q_w = \left(\frac{\pi K (H^2 - h^2)}{\ln {}^{R_O}/_{r_s}} \right) + 2 \left(\frac{x K (H^2 - h^2)}{2 R_O} \right)$$

Where: Q_w = Rate of pumping (m^3/sec)
x = Length of excavation (m)
K = Hydraulic conductivity (m/sec)
H = Head beyond the influence of pumping (static groundwater elevation) (m)
h = Head above base of aquifer at the excavation (m)
R_o = Radius or zone of influence (m)
r_s = Equivalent well radius (m)

For the assumed utility trench with a length of 100 metres, as well as provision for a typical 25 mm precipitation event, the estimated steady-state water taking rates (unfactored) are:

- Finite Element Model: 810,000 L/day
- Dupuit Equation: 1,100,000 L/day

A factor of safety of at least 2 is recommended to be applied to these water taking rates for design. Based on this, the factored groundwater flows are in excess of 400,000 L/day and therefore the assumed water taking rates during construction will require a Permit to Take Water (PTTW) from the MECP. These estimates must be updated once final grading and site servicing plans are available.

In addition to a hydrogeological report, a specific water taking and discharge plan is required as part of the PTTW application to the MECP.

Preliminary Impact Assessment for Service Trenches

For the assumed site servicing groundwater drawdown of 2.9 metres, settlement of the soil within the zone of influence must be calculated based on the increase in effective stress (10 kPa per metre of drawdown) from reducing the pore water pressures. The maximum settlement is estimated to be less than 5 mm and will occur adjacent to the dewatering system where the maximum drawdown occurs. Settlement has the potential to damage buried utilities, building foundations, or cause subsidence in adjacent lands. The amount of settlement will decrease exponentially to zero towards the radius of influence limit. It is expected that there will be negligible impact to nearby existing buildings or infrastructure from settlement caused by dewatering activities. Updated settlement estimates will be provided resulting from the drawdown for the parking level excavations once the deeper boreholes are advanced across the site.

Another cause of significant dewatering related settlement is due to pumping of fines through the system. It is imperative that any dewatering systems shall be designed and installed adequately to ensure no soil is conveyed through the system. Sufficient filtering techniques are incorporated at the entry point to avoid migration fines in the pumping/dewatering system. The turbidity of pumped water should be monitored daily to ensure that only minimal fines are being conveyed through the system.

Twenty (20) domestic water wells indicated on the MECP well record database to be within a 500-metre radius of the site. Many of the wells were screened in a shallow groundwater table near surface. It is expected that most or all of the domestic water supply wells within 500 metres of the site have been abandoned or are no longer in use for domestic supply since the surrounding area is now mostly developed and serviced by the City of Barrie. Furthermore, the wells are outside of the estimated radius of influence for drawdown, so the domestic water wells will not be impacted by the temporary dewatering.

Minimal impacts to groundwater levels or flow directions, the watercourse on site, deeper aquifers, or other impacts to environmental features are expected due to the construction dewatering being a temporary condition, the radius of influence for drawdown being relatively small, and the limited extent of area expected to be dewatered at any time during construction.

The City of Barrie is underlain by complex and extensive regional aquifers. The four major aquifers identified beneath Barrie include aquifer A1 (upper and mostly unconfined), A2 (intermediate) and A3 / A4 (lower) aquifers. Aquifer A1 is mostly unconfined, but A2 is typically confined by 5 to 20 metres of fine-grained deposits. The lower aquifers A3 and A4 typically consist of sands and gravels, and most of Barrie's groundwater is supplied by these deep aquifers. Active Wells 3A, 5, and 12 are screened within aquifer A4, Wells 7, 9, 11, 13, 14, 15, 17 and 18 are screened in both aquifers A3 and A4, and Wells 4, 10 and 16 are screened in aquifer A3. In the Barrie area, the elevation of aquifer A3 ranges from approximately Elev. 150 to 195 metres, and the elevation of aquifer A4 ranges from approximately Elev. 115 to 160 metres.

The existing GEI boreholes extended to depths of about 6.6 metres below grade and encountered an upper unconfined aquifer (assumed to be aquifer A1). The ground surface elevation of the site ranges from approximately Elev. 306 to 308 metres, meaning the development may extend to near Elev. 296 to 298 metres. The deepest extent of the development therefore will not extend into the drinking water aquifers A3 or A4. Dewatering activities are expected to be restricted to the upper unconfined Aquifer A1 only (not used for drinking water) and will not impact the lower drinking water supply aquifers.

A Discharge Agreement must be obtained from the City of Barrie prior to temporary discharge of groundwater during construction that is discharged into either the City storm or sanitary sewers.

Considerations Deeper Underground Parking Levels

GEI will be advancing deeper boreholes with deeper monitoring wells across the site under a separate scope of work and can only provide updated / final recommendations with more detailed calculations for deeper underground parking levels at the Site Plan Approval application phase, after the deeper boreholes are completed. The considerations provided below are high-level and are for preliminary design and discussion purposes only.

On a preliminary level, the deeper levels of underground parking are expected to extend about 8 metres below grade, foundations may extend an additional 1 metre, and the temporary dewatering target would be about 0.5 metres below the founding level. Groundwater levels were measured at depths of as shallow as 0.7 metres below grade. The total drawdown for groundwater control during the parking level excavations may be on the order of 9 metres below grade. Based on this drawdown, the estimated radius of influence could be on the order of 100 to 200 metres depending on the deeper stratigraphy.

Based on the drawdown level, size of the various buildings within the proposed development, and preliminary calculations GEI performed above for the assumed utility trench, temporary water taking rates of much greater than 1,000,000 L/day are expected during construction of a proposed structure with underground parking levels. A PTTW from the MECP is therefore required. More detailed estimates and calculations can be performed once the deeper boreholes are advanced at the site and once GEI is provided with detailed grading, servicing, and foundation plans.

Potential impacts for construction dewatering of deeper underground parking levels is discussed below. They are subject to change and must be updated once the deeper boreholes are advanced:

- Settlement related to construction dewatering could be on the order of 10-20 mm and will occur adjacent to the dewatering system where the maximum drawdown occurs. The amount of settlement will decrease exponentially to zero towards the radius of influence limit. It is not expected that settle-sensitive structures will be located in the immediate vicinity of any of the dewatering locations. Nearby utilities beneath Essa Road or Mapleview Drive may experience minor settlement (e.g., 5 mm or less) which would have a negligible impact on existing buried utilities. The existing residential and commercial buildings in the area surrounding the site are set back far enough from potential dewatering locations such that negligible to no settlement of the structures is anticipated.
- Most of Barrie's groundwater is supplied by deep regional Aquifers A3 and A4 which typical consist of sand and gravel. In the Barrie area, the elevation of aquifer A3 ranges from approximately Elev. 150 to 195 metres, and the elevation of aquifer A4 ranges from approximately Elev. 115 to 160 metres. Three levels of underground parking could extend down to near Elev. 296 to 298 metres. The deepest extent of the development therefore will not extend into the drinking water aquifers A3 or A4. Dewatering activities are expected to be restricted to the upper unconfined Aquifer A1 only (not used for drinking water) and will not impact the lower drinking water supply aquifers.
- Bear Creek that flows through the site appears to be a gaining stream (i.e., receives groundwater baseflow from the site), and construction dewatering for underground levels may temporarily

reduce baseflow into the creek which could have adverse environmental impacts which should be confirmed by a specialist. Impacts could potentially be offset or mitigated by discharging some or all the pumped groundwater into the creek to maintain flows. Construction dewatering is temporary and would likely be completed in phases across the site, therefore long-term impacts to groundwater levels or flow directions are not expected. If groundwater levels of the surficial aquifer and lowered near the site, they will recharge after dewatering is completed.

5.2.2 Permanent Building Drainage

For new structures that will be slab-on-grade with no basement levels, perimeter and under-slab drainage at the foundation level is not required, provided that the underside of concrete slab is at least 200 mm above the prevailing grade of the site and the surrounding surfaces slope away from the building at a gradient of at least 2% to promote surface water run-off and to reduce groundwater infiltration adjacent to foundations. To minimize infiltration of surface water, the upper 150 mm of backfill could comprise compacted relatively impervious soil material (such as the clayey silt till or clay and silt from the site).

Where basements are constructed, all basement foundation walls must be provided with damp-proofing provisions in conformance to the Ontario Building Code. Backfill along the foundation wall must consist of Granular 'B' Type 1 (OPSS 1010) for a minimum lateral distance of 600 mm out from the foundation wall. Alternatively, if a filtered cellular drainage media is provided adjacent to the foundation wall, the backfill may consist of common earth fill.

For buildings with basements, a perimeter drainage system must be installed that will remove any water that infiltrates into the building backfill, to ensure that any water does not infiltrate into the basement. The perimeter drains must consist of minimum 100 mm diameter perforated pipes wrapped in filter socks, sufficiently covered on all sides by 19 mm clear stone. Perimeter drains should be directed to the sump underneath the basement floor in solid pipes so as not to surcharge the underfloor drainage layer with water. The basement slab should also be provided with subfloor 100 mm diameter perforated pipes, trenched 0.3 metres below the slab granular base material and covered with 19 mm clear stone. One run of subfloor pipe is recommended for the townhouse units and runs with 6 metre on-centre spacing is recommended for larger buildings. All sump pumps should be on emergency power for redundancy in case of a power outage. A typical basement drainage detail is included in Appendix C.

In conditions where there is a high groundwater level and relatively permeable soils coupled with a basement level as part of the proposed building design, it is common practice to set the basement level a minimum of 0.5 metres above the seasonally high groundwater level. The seasonally high groundwater levels measured at the site are discussed in Section 4.3.1. The newest site plans show that most of the site will have a deeper underground parking set 8 metres below proposed grade and this will be made below the groundwater table. Since the basement levels will be made below the groundwater table, it is possible that perimeter drainage issues may occur in the future (e.g., sump pump failure, blockage of drainage pipes, etc.), which would lead to potential foundation cracking and basement flooding. Basements can be set below the groundwater table provided these risks are fully acknowledged and all obligations set by the governing bodies in the jurisdiction are met which stipulate minimum clearance distances between basement slab elevation and seasonal high groundwater table.

GEI must be provided with the final site and grading plans to calculate the long-term water taking rates to determine the need for a PTTW from the MECP (a PTTW for long-term water taking is expected, i.e., greater than 400,000 L/day).

Alternatively, basement levels made below the groundwater table could be fully waterproofed and designed to resist hydrostatic pressure, in which case permanent dewatering would not be required. Benefits of waterproofing can also include reducing or eliminating sump pump maintenance, streamlining permits / approvals, and reducing the radius of influence around the site. Waterproofing typically requires thicker foundation walls and slabs, waterproofing materials, etc. which can increase costs compared to a dewatering structure. A cost comparison could be completed by others to determine the pros and cons of permanent dewatering versus fully waterproofing the structures. Buoyancy calculations can be completed by GEI once basement elevations and total number of storeys are finalized for the structures. It is noted that in recent years, the City of Barrie typically does not allow permanent dewatering and a fully waterproofed system will likely be required for any underground levels within the groundwater table.

Any settlement of soil due to dewatering will occur during construction dewatering and there will be no additional settlement concerns related to long-term dewatering. Permanent dewatering activities may reduce the surface groundwater levels in the local area surrounding the site over time. A reduction in baseflow to Bear Creek could potentially be offset by discharge some of the pumped groundwater into the creek to maintain a baseflow.

The lower aquifers A3 and A4 are located deep below the site and are separated from the surficial A1 aquifer by two different confining layers and by aquifer A2. It is expected that very little to no infiltration at the ground surface of this site reaches the deep aquifers where the City drinking water wells are located. A local reduction in surface groundwater levels near the site is not expected to impact groundwater quantity in the drinking water aquifers. The surrounding area is serviced by municipal water from the City of Barrie, and therefore no nearby drinking water wells should be impacted.

5.3 Preliminary Water Balance

5.3.1 Water Balance Components

A water balance is an accounting of the water resources within a given area. The water balance equates the precipitation (P) over a given area to the summation of the change in ground water storage (S), evapotranspiration/evaporation (ET), surface water runoff (R) and infiltration (I) using the following equation:

$$\mathrm{P} = S + I + ET + R$$

The components of the water balance vary in space and time and depend on climatic conditions as well as the soil and land cover conditions (i.e., rainfall intensity, land slope, soil hydraulic conductivity and vegetation). For example, runoff occurs at a higher percentage during periods of snowmelt when the ground is frozen or during intense rainfall events.

Precise measurement of the water balance components is difficult, and as such, approximations and simplifications are made to characterize the water balance of a property. Field observations of the drainage

conditions, land cover and soil types, groundwater levels and local climatic records are important inputs to the water balance calculations.

- Precipitation (P): For the purposes of approximating the annual precipitation at this site, the monthly rainfall between 1981 and 2010 was used based on Government of Canada historical weather data for the Barrie WPCC weather station (Climate ID 6110557, Latitude 44.38 N, Longitude -79.69 W, Elevation 221 metres), which is located about 5 km north of the site.
- Storage (S): Although there are groundwater storage gains and losses on a short-term basis, the net change in groundwater storage on a long-term basis is assumed to be zero.
- Evapotranspiration/Evaporation (PET): The evapotranspiration and evaporation components vary based on the characteristics of the land surface cover (i.e., type of vegetation, soil moisture conditions, perviousness of surfaces, etc.). Potential evapotranspiration refers to the water loss from a vegetated surface to the atmosphere under conditions of an unlimited water supply. Evaporation occurs from a hard surface (such as flat rooftops, asphalt, gravel parking areas, etc.).
- Water Surplus (R + I): The difference between the mean precipitation and evapotranspiration is referred to as the water surplus. The water surplus is divided into two parts: as surface or overland runoff (R) and the infiltration into the surficial soil (I). The infiltration is comprised of two end member components: one component that moves vertically downward to underlying aquifers (referred to as percolation, deep infiltration or net recharge) and a second component that moves laterally through the near surface soil profile or shallow soils as interflow that re-emerges locally to surface (i.e., as runoff) at some short distance and time following precipitation.

5.3.2 Approach and Methodology

The analytical approach to calculate the water balance involves monthly soil-moisture balance calculations to determine the pre-development infiltration volumes. The detailed water balance calculation is provided in Appendix F, which are summarized in this and subsequent sections of the report. The following assumptions were used as part of the soil-moisture balance calculations:

- A soil moisture balance approach assumes that soils do not release water as potential recharge while a soil moisture deficit exists.
- During wetter periods, any excess of precipitation over evapotranspiration first goes to restore soil moisture. Considering the nature of the cohesionless near surface soils (sandy silts to silty sands) and mostly grassed areas or farmland with assumed shorter-rooted crops, a soil moisture storage capacity of 100 mm was used.
- Once the soil moisture deficit is overcome, any further excess water can then pass through the soil as infiltration and either become interflow (indirect runoff) or recharge (deep infiltration).
- Since permanent drainage for any underground structures is unlikely to be permitted by the City of Barrie, the extent of underground parking and its impact on reducing infiltration have been ignored.

Monthly potential evapotranspiration calculations accounting for latitude, climate and the actual evapotranspiration and water surplus components of the water balance based on the monthly precipitation and soil moisture conditions was calculated. The MOECC SWM Planning and Design Manual (2003) methodology for calculating total infiltration based on topography, soil type and land cover was used, and a corresponding infiltration factor was calculated. The water surplus was multiplied by the infiltration factor

to determine both the pre-existing and post-condition annual volumes for run-off and infiltration for the property.

A post-development water balance scenario was also calculated based on *"Draft Landscape Concept Plan,"* by Strybos Barron King Landscape Architecture. This plan shows general information about the locations of impermeable features including buildings, roadways, parking lots and surface water, and permeable features including landscaped and open areas. The total site area is approximately 10.2 hectares. The amount of impermeable area calculated from the site plan was approximately 60% of the total site area (about 6.1 hectares), and the amount of permeable area was 40% of the total site area (about 4.1 hectares). The water balance must be updated if the site plan changes after being finalized.

It is noted that the infiltration and runoff values presented in Appendix F are estimates only. Single values are used for the water balance calculations, but it is important to understand that infiltration rates are dependent upon the hydraulic conductivity of the surficial soils which may vary over several orders of magnitude. As such, the margins of error for the calculated infiltration and runoff component values are potentially quite large. These margins of error are recognized, but for the purposes of this assessment, the numbers used in the water balance calculations are considered reasonable estimates based on the site-specific conditions and useful for comparison of pre- to post-development conditions.

5.3.3 Pre and Post Water Balance

The detailed water balance calculations are included in Appendix F. The pre and post development calculations are summarized in the table below but are preliminary only and must be updated once site plans are finalized.

Condition	Permeable Areas	Impermeable Areas	Average Annual Runoff Volume (m^3/year)	Average Annual Infiltration Volume (m^3/year)
Pre-Development Land Use	92% (Grass areas, farmland)	8% (Driveways, parking, buildings, surface water)	13,081	26,467
Post-Development Land Use (Assumed Conditions)	40% (Landscaped and open areas)	76% (Paved areas, buildings, surface water)	51,139	11,593

These calculations suggest that, without mitigation such as low impact development (LID) measures, the proposed development will decrease average infiltration by about 14,874 m^3/year (56% decrease). The proposed development will increase runoff by about 38,058 m^3/year (291% increase).

The potential impacts of these changes and recommended mitigation measures are discussed below. Once the site plan is finalized and LID infiltration measures have been designed by the civil engineer, GEI can confirm if the LID measures maintain the water balance.

5.4 Recommended Mitigation Measures

The three broad categories which typically need to be mitigated and accounted for are:

- Reducing the volume and speed in which additional surface water runoff occurs;
- Increasing the amount of infiltration to match predevelopment conditions; and
- Ensuring that the quality of existing surface water features and groundwater will not be adversely impacted.

5.4.1 Runoff Quantity

Urban development of an area affects the natural water balance. The most significant difference is the addition of impervious surfaces as a type of surface cover (i.e., roads, parking lots, driveways, and rooftops). Impervious surfaces prevent infiltration of water into the soils and the removal of the vegetation reduces the evapotranspiration component of the natural water balance. The evaporation component from impervious surfaces is relatively minor (estimated to be 15% of precipitation) compared to the evapotranspiration component that occurs with vegetation in this area (up to two thirds of precipitation). So, the net effect of the urbanization of the site is that most of the precipitation that falls onto impervious surfaces increases the surplus water resulting in more direct runoff from developed areas and reduced natural infiltration.

In conjunction with increased runoff, there is a reduction in infiltration to the shallow groundwater system. A reduction in infiltration can potentially lead to a lowering of the local water table and reduce the potential for this seasonal water table intersection and discharge.

Methods which do not necessarily increase infiltration rate, but decrease the volume and concentration of surface water runoff can be considered at this site include (but are not limited to):

- Increasing the topsoil thickness by about two times the normal thickness (up to 30 cm) to retain more water in storage; and
- Implementation of rainwater harvesting which intercepts, diverts and stores roof runoff (i.e., cisterns) for future use.

5.4.2 Mitigation Measures for Maintaining Infiltration

The increases in surface water runoff that will occur with urban development and mitigation of the potential impacts to the local water table due to reduction of infiltration may be minimized by using appropriate stormwater management and using low impact development (LID) measures to promote infiltration. These measures can be implemented on-site.

The basic premise for low impact development is to try to minimize changes to runoff and infiltration. As outlined in the MOECC SWMP Design Manual (2003) and Low Impact Development Stormwater Management Planning and Design Guide published by the CVC and TRCA (2010), there are a suite of techniques that may be considered to promote infiltration and reduce runoff. In order to maintain ground water function at the site the following typical LID measures can be considered as part of typical site developments:

- Collection of runoff from the building rooftops and redirection to grass areas and overland flow. If feasible, it is recommended that there be a minimum 5 metre flow path over pervious areas to allow this mitigation method to be fully effective;
- Provision of gentle slopes in open areas or along grass swales in order to allow time for water infiltration;
- Construction of engineered infiltration measures such as soakaway pits, infiltration galleries or bioswales. Subsurface infiltration methods can only be considered in areas where there is sufficient soil permeability and depth to water table to accommodate the systems within the unsaturated zone (typically the infiltration elevation must be kept 1 metre or more above the seasonal high groundwater level); and
- Construction of grass channels or filter strips which allow infiltration, discharge at a lower rate and direct roof runoff to overland flow.

Implementation of LID measures will not only allow for infiltration of the surface water into the near-surface groundwater regime but will also allow for increase in natural filtration of surficial runoff, prevent sedimentation transport and potential erosion, and help reduce flooding by increasing the transit time for water on the site. These types of LID techniques promote natural infiltration by providing additional water volumes in the pervious areas. This is particularly effective in the summer months when natural infiltration would not generally occur because the additional water overcomes the natural soil moisture deficit.

Details and designs for LID measures will be provided in a stormwater management report for the site (by others). This includes demonstrating through plans and sections (including all dimensions, materials used and including the seasonal high groundwater level) how this infiltration deficit will be mitigated. In addition, the stormwater management report will need to include calculations to demonstrate that the LID facilities will be adequately sized both volumetrically and for area to allow completed drawdown within a 24 to 48 hour time period.

As it is typically a requirement of maintaining the same levels of infiltration post construction, no appreciable change in the groundwater table elevation should occur over the long-term condition. As such, there should be no adverse effects to baseflow into the watercourse on site nor to the Q2 wellhead protection area or highly vulnerable aquifer beneath the site. The groundwater quantity of neighbouring properties that utilize drinking water wells as the source of their potable water will not be affected by any changes in infiltration volumes as it is expected that most or all of the domestic water supply wells within 500 metres of the site have been abandoned or are no longer in use for domestic supply since the surrounding area is now mostly developed and serviced by the City of Barrie.

The lower aquifers A3 and A4 are located deep below the site and are separated from the surficial A1 aquifer by two different confining layers and by aquifer A2. It is expected that very little to no infiltration at the ground surface of this site reaches the deep aquifers where the City drinking water wells are located.

5.4.3 Groundwater Quality

Depending on land use, runoff from urban developments may contain a variety of dilute contaminants such as suspended solids, chloride from road salt, oil and grease, metals, pesticide residues, phosphorous,

bacteria and viruses. For groundwater, generally except for the dissolved constituents such as nitrogen and salt, most contaminants are attenuated by filtration during groundwater flow through the soils.

LID measures or end treatments such as oil/grit separators or wet ponds also help to remove suspended solids and other contaminants in runoff prior to infiltration or conveying the flows off the site, especially when a treatment train approach is taken for stormwater management. The stormwater management facilities (to be designed by others) must be designed such that the water quality is maintained or improved prior to discharging water from the site or infiltrating water into the ground.

The potential for effects on groundwater quality from infiltration in the proposed development area is expected to be limited from the residential areas of the development. Pollution “hotspots” such as commercial parking lots typically should not be infiltrated unless approved by the local authorities and pre-treatment is completed to remove contaminants, but runoff from rooftops and landscaped areas from commercial developments is “clean” and can be collected and infiltrated.

It is expected that most or all of the domestic water supply wells within 500 metres of the site have been abandoned or are no longer in use for domestic supply since the surrounding area is now mostly developed and serviced by the City of Barrie. Since only clean or pre-treated runoff will be infiltrated, the groundwater quality will not be degraded and will not impact nearby domestic wells, the watercourse or other nearby environmental features.

The City of Barrie is underlain by complex and extensive regional aquifers. The four major aquifers identified beneath Barrie include aquifer A1 (upper and mostly unconfined), A2 (intermediate) and A3 / A4 (lower) aquifers. Aquifer A1 is mostly unconfined, but A2 is typically confined by 5 to 20 metres of fine-grained deposits. The lower aquifers A3 and A4 typically consist of sands and gravels, and most of Barrie’s groundwater is supplied by these deep aquifers. Active Wells 3A, 5, and 12 are screened within aquifer A4, Wells 7, 9, 11, 13, 14, 15, 17 and 18 are screened in both aquifers A3 and A4, and Wells 4, 10 and 16 are screened in aquifer A3. In the Barrie area, the elevation of aquifer A3 ranges from approximately Elev. 150 to 195 metres, and the elevation of aquifer A4 ranges from approximately Elev. 115 to 160 metres.

The boreholes extended to depths of about 6.6 metres below grade and encountered an upper unconfined aquifer (assumed to be aquifer A1). GEI will be advancing deeper boreholes across the site to accommodate the newest site plans where most buildings will now have deeper levels of underground parking and additional comments about the stratigraphy and groundwater conditions will be provided at that time. On a preliminary basis, the proposed deeper underground parking will extend to 8 metres below grade and the buildings will likely be founded on spread footings that may extend 1 metre below the parking slab. The ground surface elevation of the site ranges from approximately Elev. 306 to 308 metres, meaning the development may extend to near Elev. 296 to 298 metres. The deepest extent of the development therefore will not extend into the drinking water aquifers A3 or A4. Similarly, dewatering activities are expected to be restricted to the upper unconfined Aquifer A1 only (not used for drinking water) and will not impact the lower aquifers.

Based on current subsurface information and the understanding that Aquifer A2 is typically confined by 5 to 20 metres of fine-grained deposits, the proposed development is not expected to penetrate into confined aquifer A2 and will not extend into the drinking water supply aquifers A3 and A4. There is negligible risk that contaminants will be transported from the development into the dinking water supply aquifers.

5.5 Groundwater Disposal Recommendations

Baseline groundwater chemical testing was carried out at the site and the results are summarized in Section 4.3.3. A summary of the results is presented in the table below for samples relative to City of Barrie Storm and Sanitary Sewer Use By-law standards for discharge.

Monitoring Well Sample Location	Exceedances of Groundwater Parameters to Discharge Standards	
	City of Barrie Storm	City of Barrie Sanitary
MW3 (Unfiltered)	TSS, Zinc, Copper	TSS
MW10 (Unfiltered)		

Treatment options such as a filtration system or decantation tanks and silt bags will be required to lower Total Suspended Solids (TSS) in the groundwater discharge during construction to within tolerable limits for the storm and sanitary sewers. Since metals typically bind to sediments, the zinc and copper exceedances relative to the storm sewer discharge standards may also be reduced using filtration or decantation methods. Collecting and testing field-filtered samples during construction, prior to discharge, could be completed to confirm the suitability of filtering techniques. The dewatering contractor is responsible for ensuring that the exceedances are removed prior to discharge. Regular sampling and monitoring is recommended during groundwater discharge activities to ensure compliance with the applicable By-Law. Approval to discharge to the sewer systems will be required from the City prior to commencing discharge.

A summary of the results is presented in the table below for samples relative to Provincial Water Quality Objectives (PWQO).

Sample Location	Water Sample Parameter Exceedances to PQWO
MW2 (Unfiltered)	Metals (Zinc, Lead, Iron, Copper, Cobalt)
MW11 (Unfiltered)	Metals (Zinc, Iron)

If groundwater taken during construction will be discharged to the land surface, it must typically meet PWQO guidelines. The metals exceedances to PWQO guidelines are likely naturally occurring as there are no nearby industries or other likely sources of contamination. Treatment options such as a filtration system or decantation tanks and silt bags will be required prior to discharging groundwater to the land surface during construction, since metals typically bind to sediments. Collecting and testing field-filtered samples during construction, prior to discharge, could be completed to confirm the suitability of filtering techniques. The dewatering contractor is responsible for ensuring that discharged groundwater is treated to meet the guidelines.

6 Limitations and Conclusion

6.1 Limitations

The investigation and comments are necessarily on-going as new information of underground conditions becomes available. More specific information with respect to the conditions between samples, or the lateral and vertical extent of materials may become apparent during excavation operations. The interpretation of the borehole information must, therefore, be validated during excavation operations. Consequently, during the future development of the property, conditions not observed during this investigation may become apparent. Should this occur, GEI Consultants should be contacted to assess the situation and additional testing and reporting may be required.

GEI Consultants should be retained for a general review of the final design drawings and specifications to verify that this report has been properly interpreted and implemented. If not accorded the privilege of making this review, GEI Consultants will assume no responsibility for interpretation of the recommendations in the report. For example, it should be appreciated that modifications to bearing levels may be required if unforeseen subsoil conditions are revealed after the excavation is exposed to full view or if final design decisions differ from those assumed in this report.

The comments given in this report are intended only for the guidance of the design engineers. The number of boreholes required to determine the localized underground conditions between boreholes affecting construction costs, techniques, sequencing, equipment, scheduling, etc. could be greater than has been carried out for design purposes. Contractors bidding on or undertaking the works should, in this light, decide on their own investigations, as well as their own interpretations of the factual borehole results, so that they may draw their own conclusions as to how the subsurface conditions may affect them.

This report was prepared by GEI Consultants for the account of Pearl Builders. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. GEI Consultants accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.

6.2 Conclusion

It is recognized that municipal/regional governing bodies, in their capacity as the planning and building authority under Provincial statues, will make use of and rely upon this report, cognizant of the limitations thereof, both as are expressed and implied.

We trust this report is complete within our terms of reference, and the information presented is sufficient for your present purposes. If you have any questions, or when we may be of further assistance, please do not hesitate to contact our office.

Yours Truly,

GEI Consultants

Prepared By:

Russell Wiginton, P.Eng.
Senior Geotechnical Engineer

Reviewed By:

Alexander Winkelmann, P.Eng.
Geotechnical and Earth Sciences Manager

Figures –

FIGURE 1 – SITE LOCATION PLAN

FIGURE 2 – BOREHOLE LOCATION PLAN

FIGURES 3A TO 3D – SUBSURFACE PROFILES

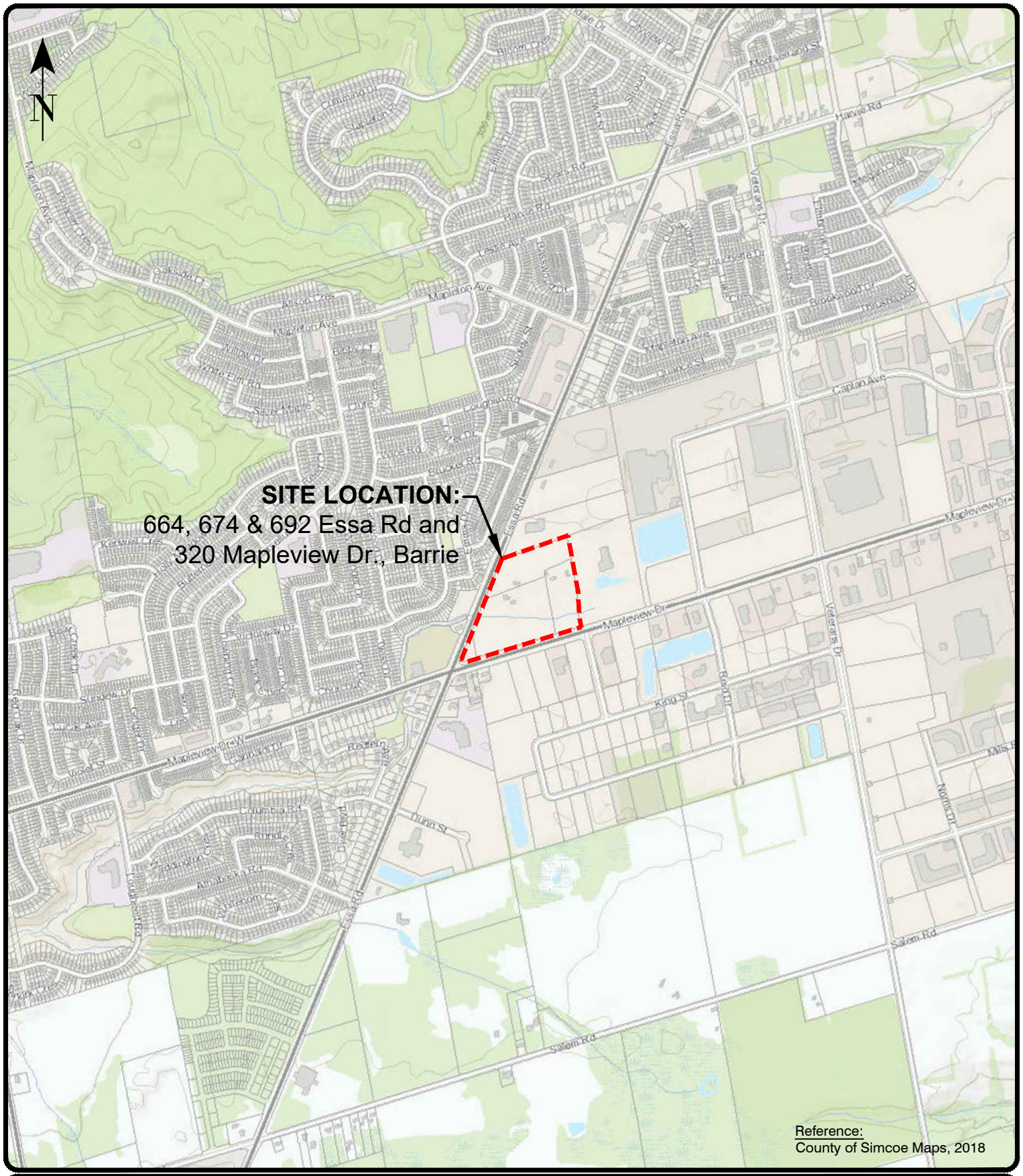
FIGURE 4 – GROUNDWATER ELEVATIONS AND CONTOURS

FIGURE 5 – MECP WELL LOCATIONS

FIGURE 6A – WELLHEAD PROTECTION AREAS

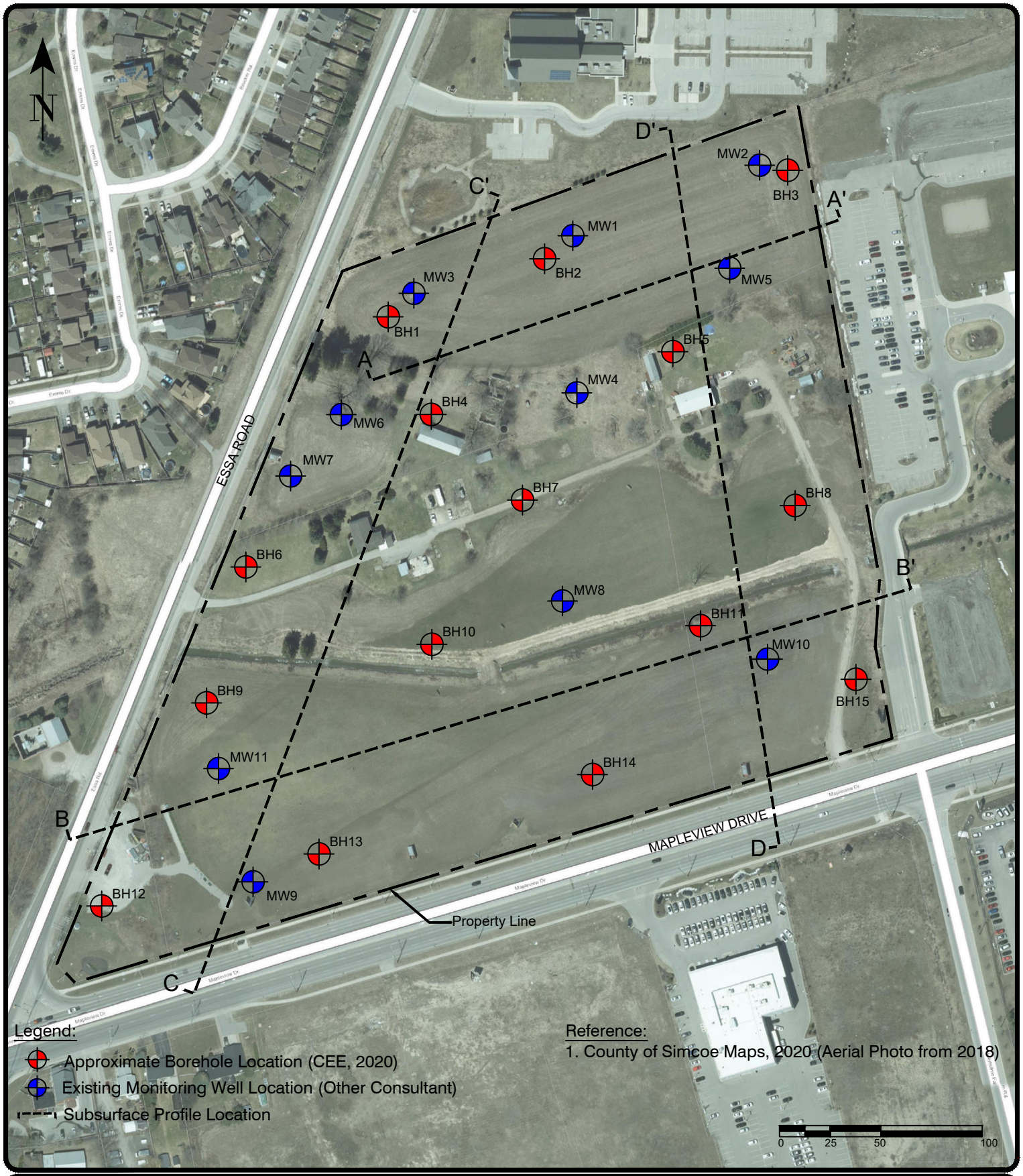
FIGURE 6B – HIGHLY VULNERABLE AQUIFERS

FIGURE 6C – SIGNIFICANT GROUNDWATER RECHARGE AREAS



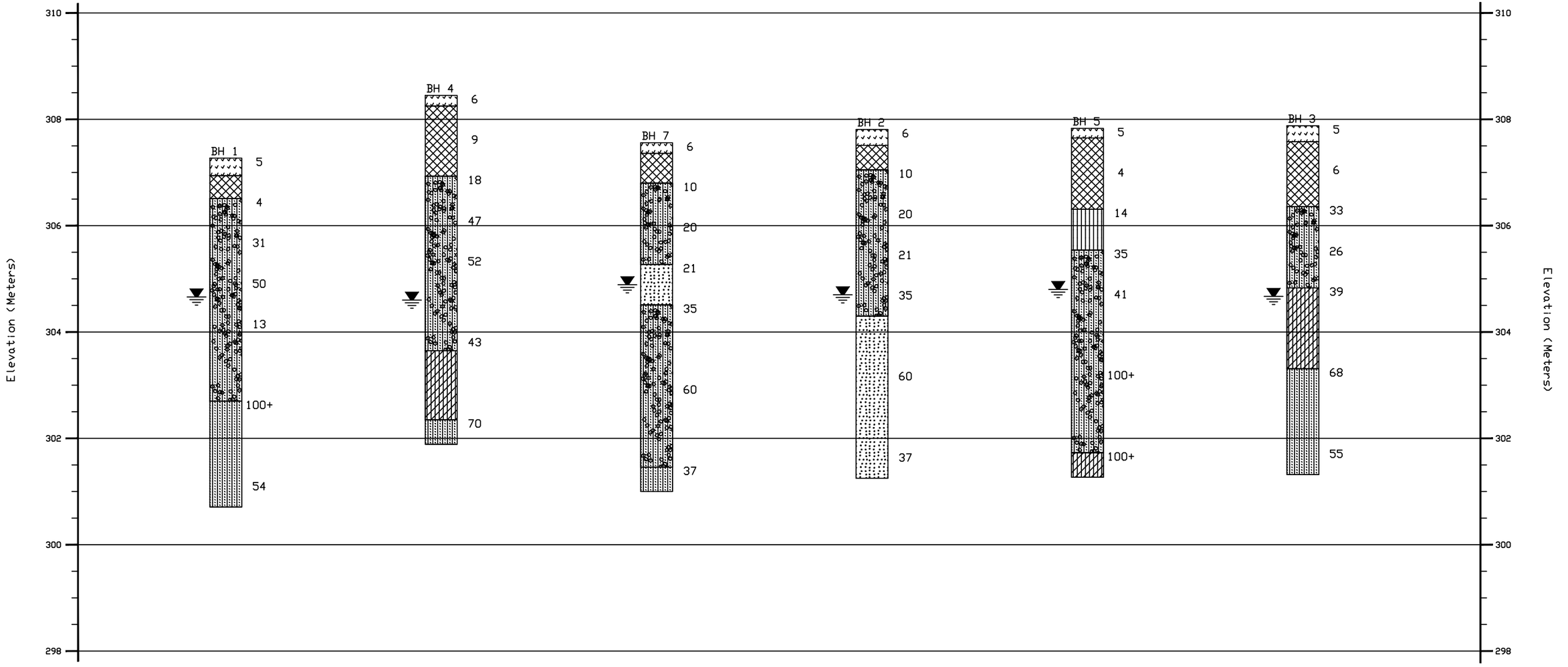
GEI Consultants
647 Welham Rd, Unit 14, Barrie, ON, L4N 0B7
P: (705) 719-7994

Project:	664, 647 & 692 Essa Rd. & 320 Mapleview Dr., Barrie				
Title:	SITE LOCATION PLAN				
Approved by:	A.W.	Date:	March 2020	Project No.:	20-1014A
Drawn by:	B.H.	Scale:	N.T.S.	Figure No.:	1



GEI Consultants
647 Welham Rd, Unit 14, Barrie, ON, L4N 0B7
P: (705) 719-7994

Project: 664, 647 & 692 Essa Rd. & 320 Mapleview Dr., Barrie			
Title: BOREHOLE LOCATION PLAN			
Approved by: A.W.	Date: March 2020	Project No.: 20-1014A	
Drawn by: B.H.	Scale: 1 : 2,500	Figure No.: 2	



Legend:

- Water Level in Monitoring Well
- Topsoil
- Earth Fill
- Silty Sand to Sandy Silt to Silt & Sand Glacial Till
- Sandy Silt to Silty Sand to Sand & Silt
- Silt
- Sand
- Gravelly Sand
- Clayey Silt to Clay & Silt

Notes:

1. Numbers shown next to boreholes are SPT "N" Values.
2. Subsurface conditions known only at borehole locations.
3. Horizontal distance between boreholes is not to scale.
4. Water levels measured on April 1, 2020.

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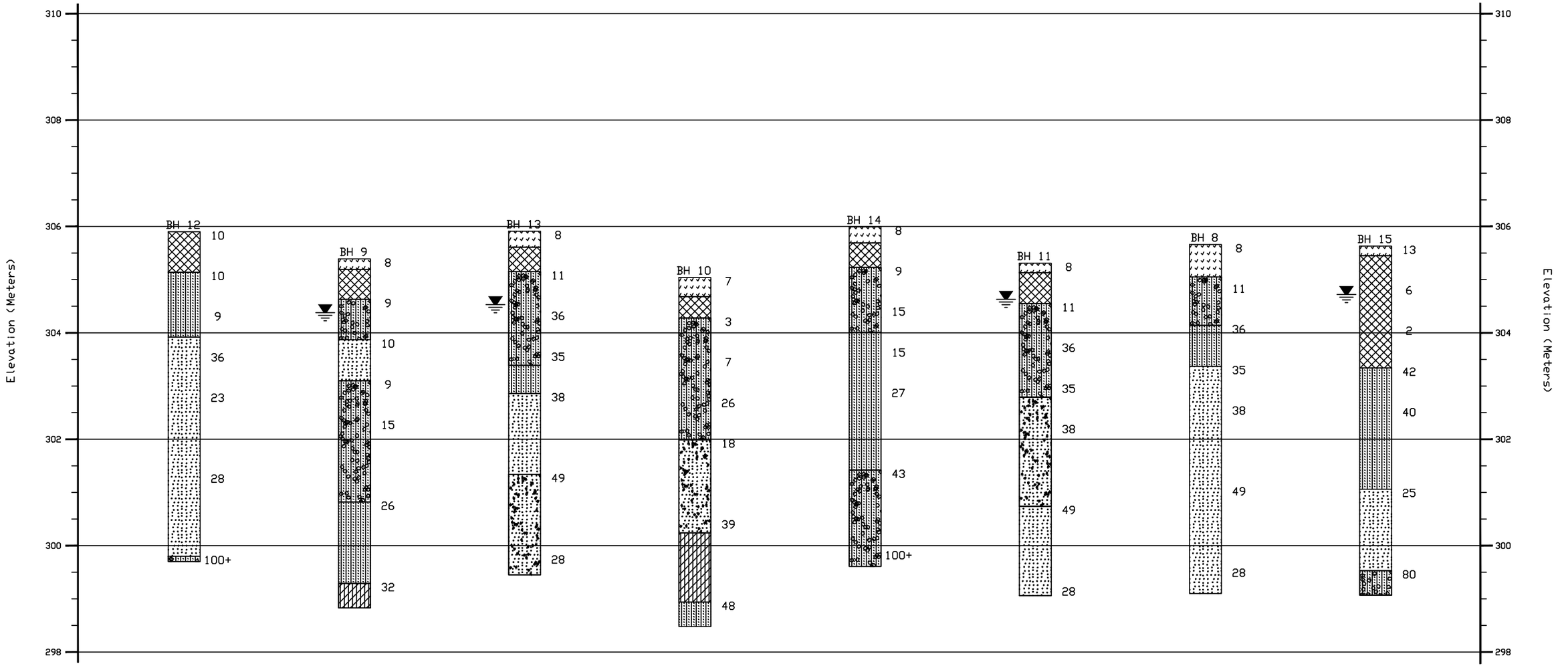
Project: 6275 & 6299 County Road 90, Essa, ON			
Title: SUBSURFACE PROFILE A-A'			
Approved by: A.W.	Date: March 2020	Project No.: 20-1007A	
Drawn by: R.W.	Scale: Vertical: 1:75 Horizontal: N.T.S.	Figure No.: 3A	



Legend:

- Water Level in Monitoring Well
- Topsoil
- Earth Fill
- Silty Sand to Sandy Silt to Silt & Sand Glacial Till
- Sandy Silt to Silty Sand to Sand & Silt
- Silt
- Sand
- Gravelly Sand
- Clayey Silt to Clay & Silt

Notes:

1. Numbers shown next to boreholes are SPT "N" Values.
2. Subsurface conditions known only at borehole locations.
3. Horizontal distance between boreholes is not to scale.
4. Water levels measured on April 1, 2020.

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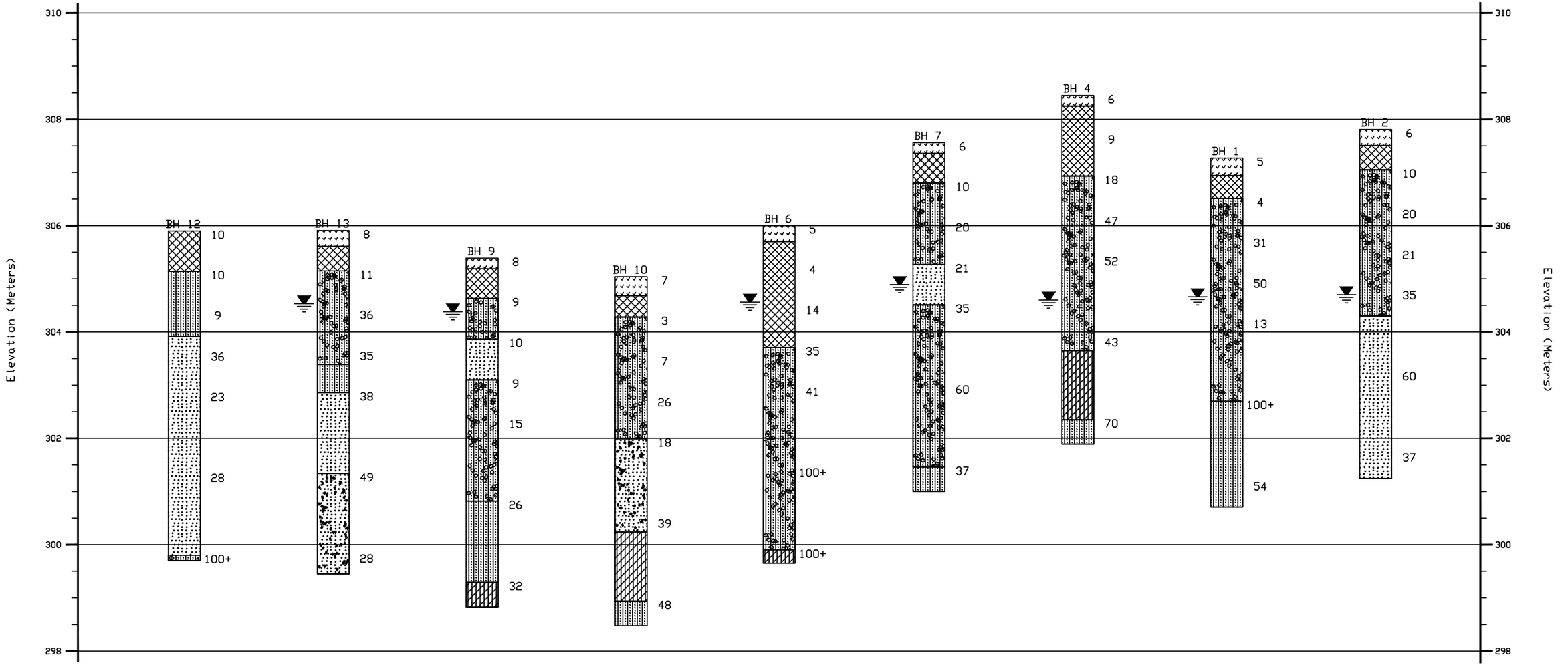
Project: 6275 & 6299 County Road 90, Essa, ON			
Title: SUBSURFACE PROFILE B-B'			
Approved by: A.W.	Date: March 2020	Project No.: 20-1007A	
Drawn by: R.W.	Scale: Vertical: 1:75 Horizontal: N.T.S.	Figure No.: 3B	



Legend:

- Water Level in Monitoring Well
- Topsoil
- Earth Fill
- Silty Sand to Sandy Silt to Silt & Sand Glacial Till
- Sandy Silt to Silty Sand to Sand & Silt
- Silt
- Sand
- Gravelly Sand
- Clayey Silt to Clay & Silt

Notes:

1. Numbers shown next to boreholes are SPT "N" Values.
2. Subsurface conditions known only at borehole locations.
3. Horizontal distance between boreholes is not to scale.
4. Water levels measured on April 1, 2020.

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647 Welham Rd, Unit 14, Barrie, ON, L4N 0B7
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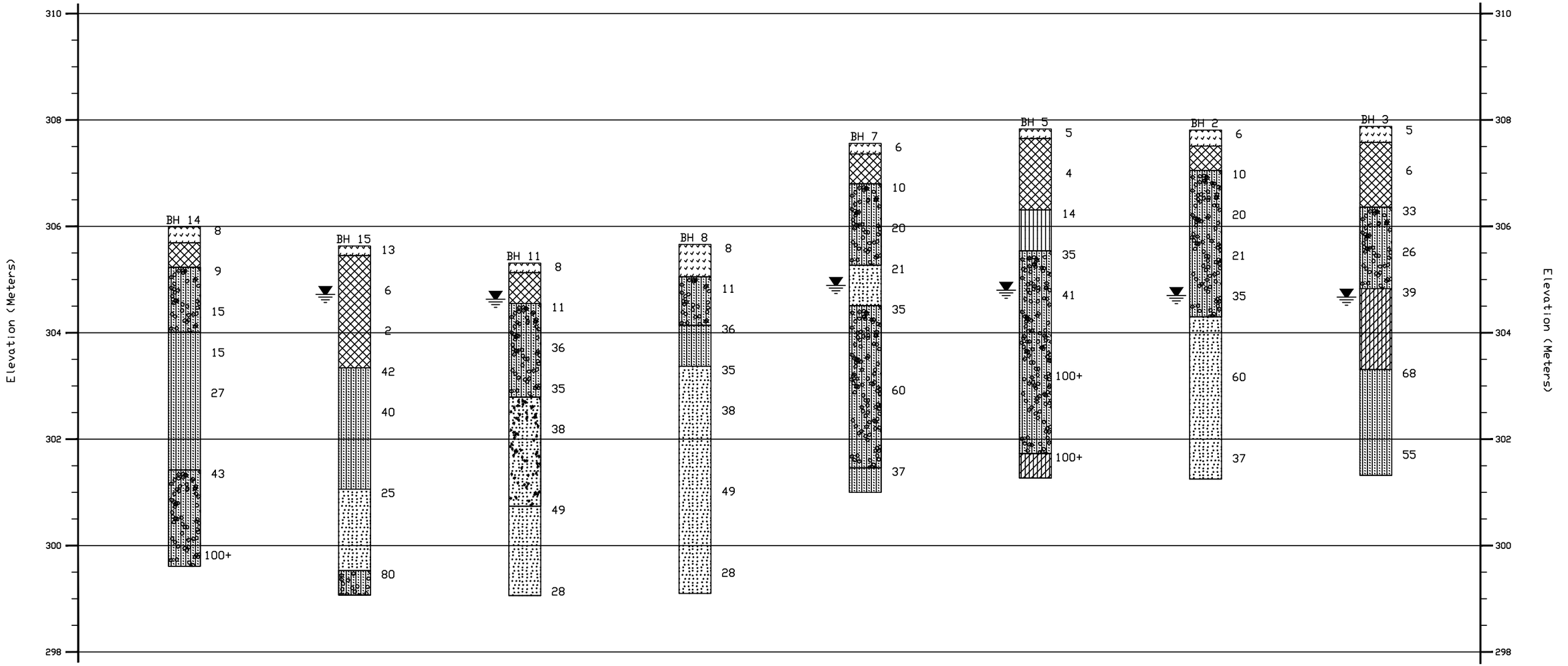
Project: 6275 & 6299 County Road 90, Essa, ON

Title: SUBSURFACE PROFILE C-C'

Approved by:	Date:	Project No.:
A.W.	March 2020	20-1007A
Drawn by:	Scale:	Figure No.:
R.W.	Vertical: 1:75 Horizontal: N.T.S.	3C



Legend:

- Water Level in Monitoring Well
- Topsoil
- Earth Fill
- Silty Sand to Sandy Silt to Silt & Sand Glacial Till
- Sandy Silt to Silty Sand to Sand & Silt
- Silt
- Sand
- Gravelly Sand
- Clayey Silt to Clay & Silt

Notes:

1. Numbers shown next to boreholes are SPT "N" Values.
2. Subsurface conditions known only at borehole locations.
3. Horizontal distance between boreholes is not to scale.
4. Water levels measured on April 1, 2020.

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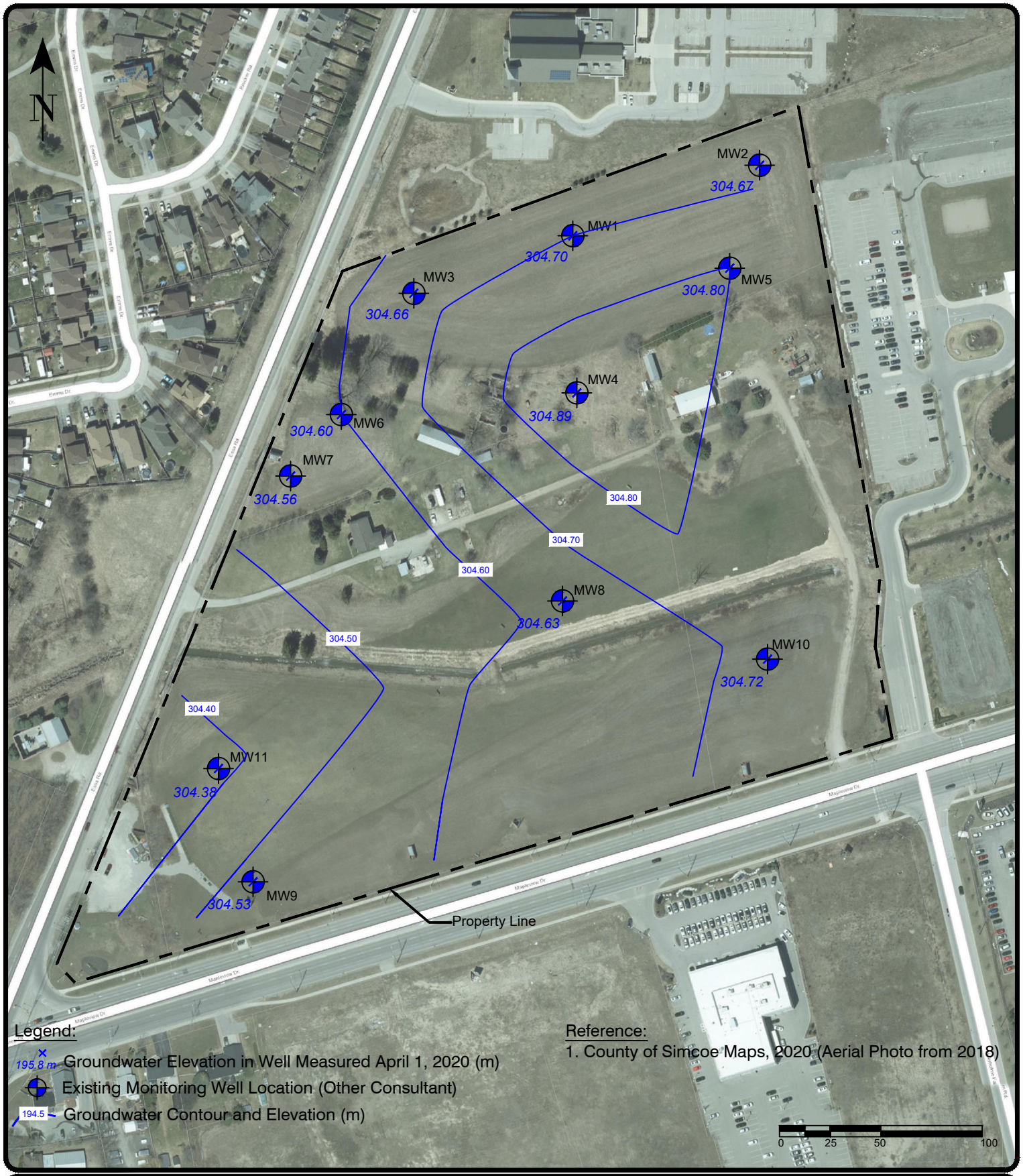
P: (705) 719-7994

Project: 6275 & 6299 County Road 90, Essa, ON			
Title: SUBSURFACE PROFILE D-D'			
Approved by: A.W.	Date: March 2020	Project No.: 20-1007A	
Drawn by: R.W.	Scale: Vertical: 1:75 Horizontal: N.T.S.	Figure No.: 3D	



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647 Welham Rd, Unit 14, Barrie, ON, L4N 0B7
P: (705) 719-7994

Project: 664, 647 & 692 Essa Rd. & 320 Mapleview Dr., Barrie			
Title: GROUNDWATER ELEVATIONS			
Approved by: A.W.	Date: August 2020	Project No.: 20-1014A	
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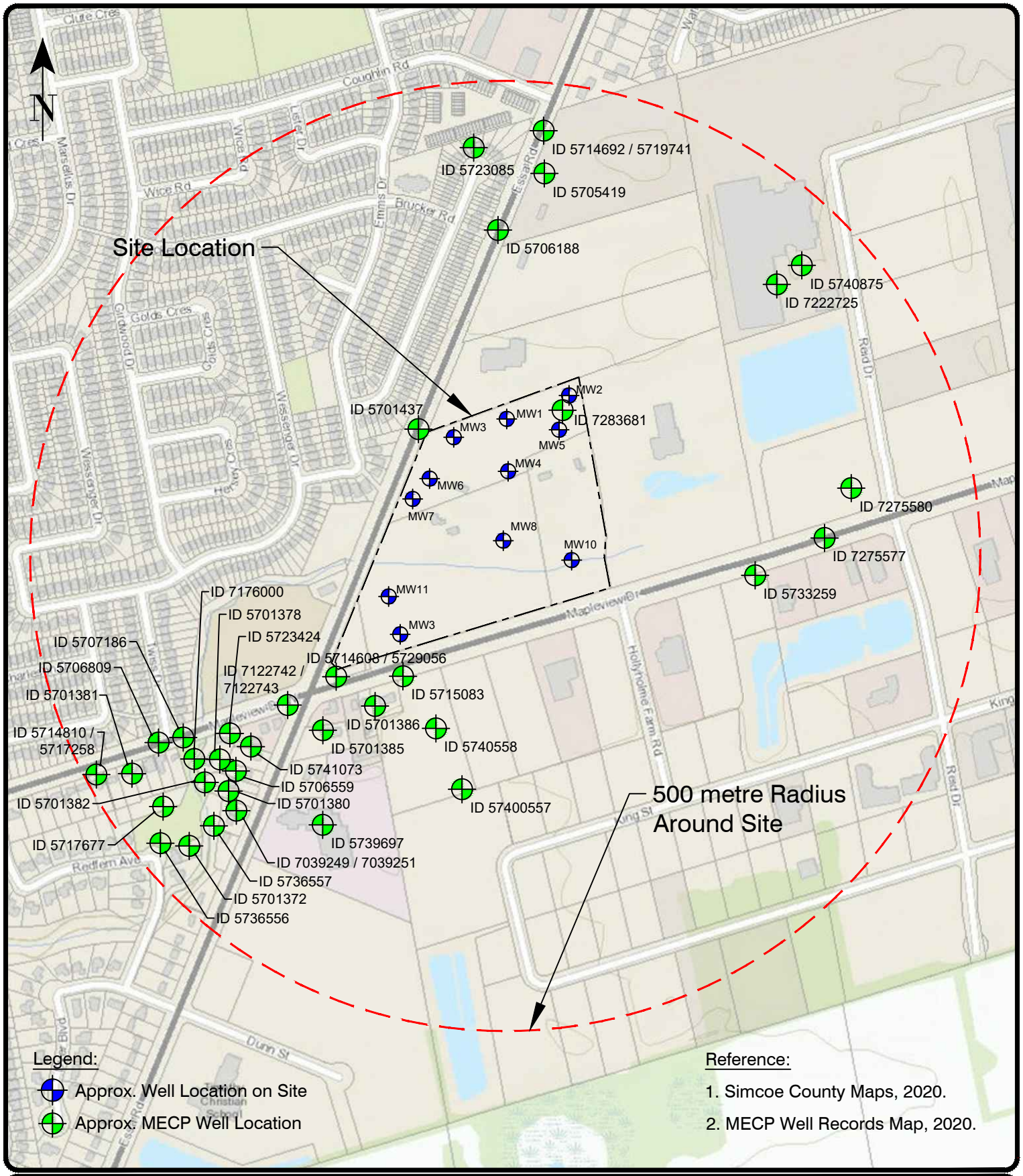

GEI Consultants

647 Welham Rd, Unit 14, Barrie, ON, L4N 0B7
P: (705) 719-7994

Project:	664, 647 & 692 Essa Rd. & 320 Mapleview Dr., Barrie		
Title:	MECP WELL LOCATIONS		
Approved by: A.W.	Date: March 2020	Project No.: 20-1014A	
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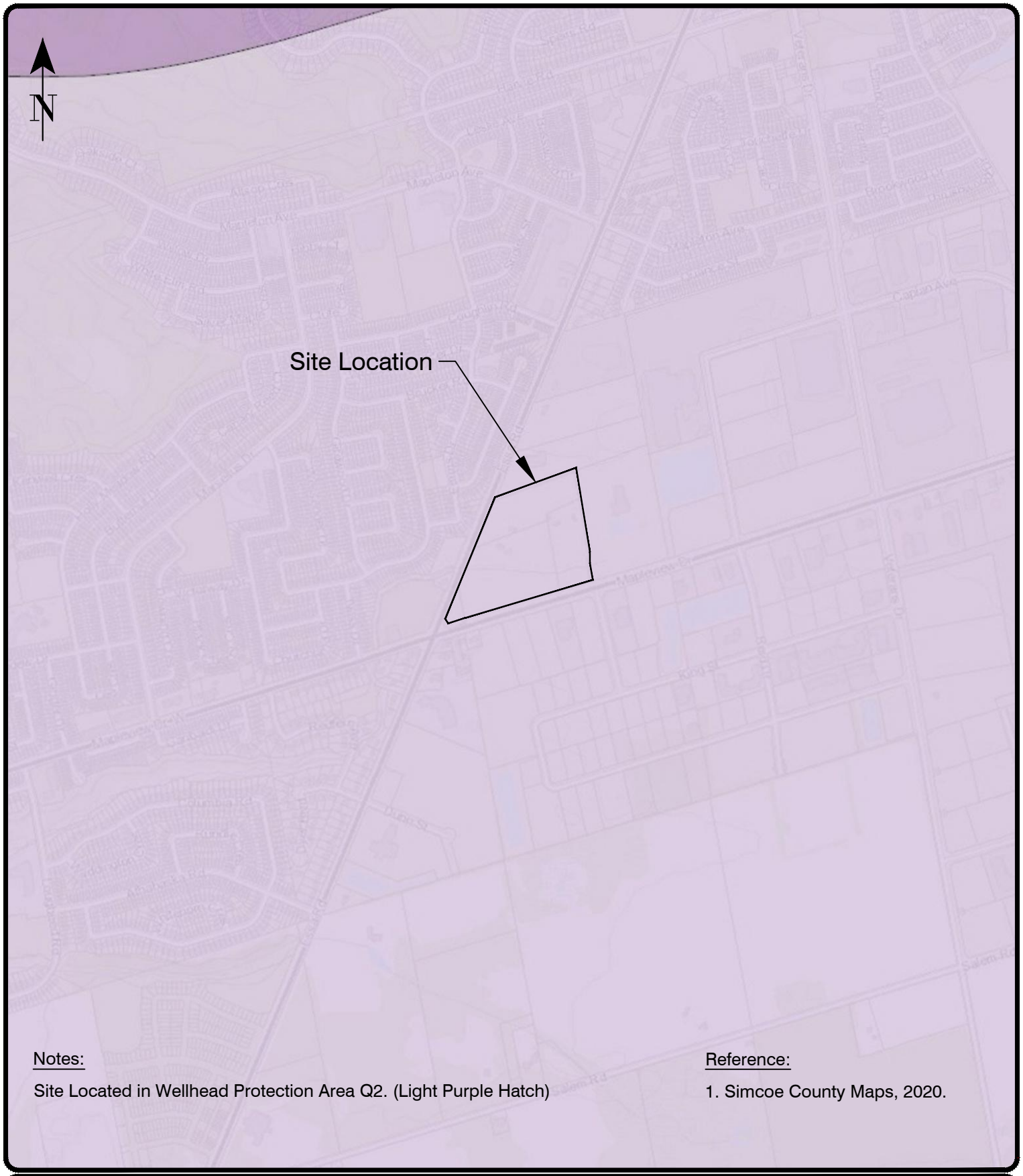

Notes:

Site Located in Wellhead Protection Area Q2. (Light Purple Hatch)

Reference:

1. Simcoe County Maps, 2020.

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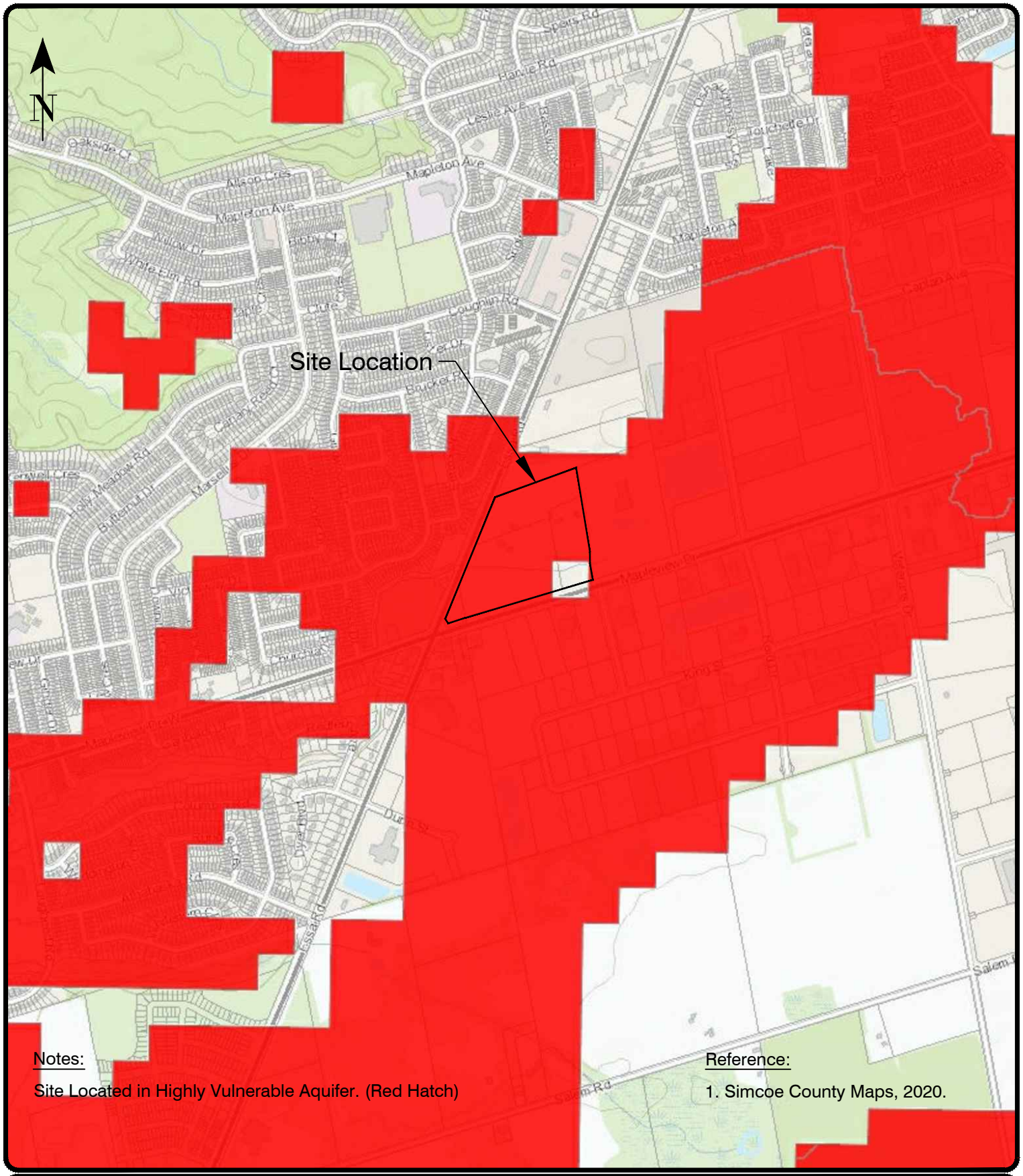
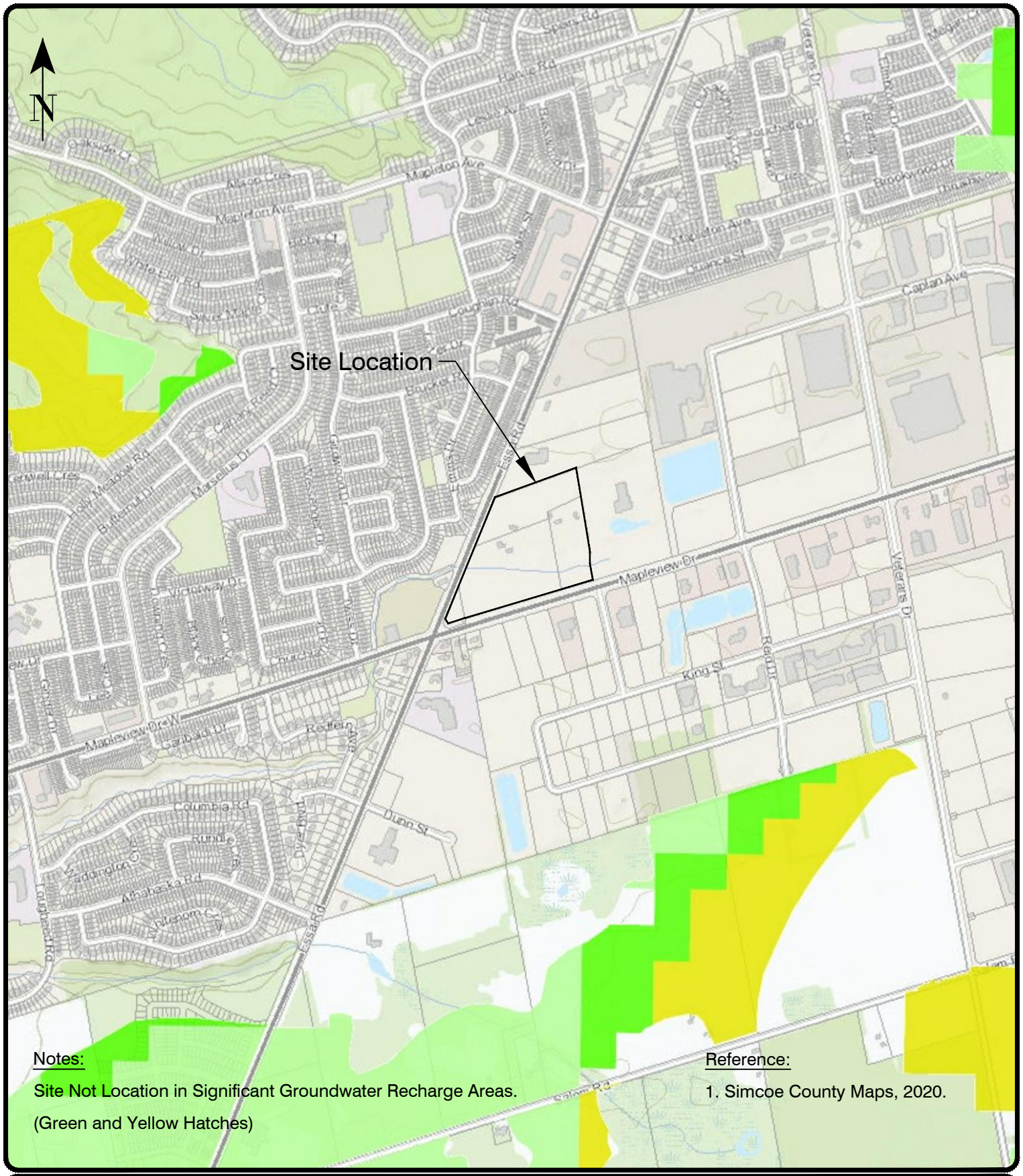
P: (705) 719-7994

Project:	664, 647 & 692 Essa Rd. & 320 Mapleview Dr., Barrie				
Title:	WELLHEAD PROTECTION AREAS				
Approved by:	A.W.	Date:	March 2020	Project No.:	20-1014A
Drawn by:	R.W.	Scale:	N.T.S.	Figure No.:	6A



GEI Consultants
647 Welham Rd, Unit 14, Barrie, ON, L4N 0B7
P: (705) 719-7994

Project:	664, 647 & 692 Essa Rd. & 320 Mapleview Dr., Barrie		
Title:	HIGHLY VULNERABLE AQUIFERS		
Approved by: A.W.	Date: March 2020	Project No.: 20-1014A	
Drawn by: R.W.	Scale: N.T.S.	Figure No.: 6B	



Notes:

Site Not Location in Significant Groundwater Recharge Areas.

(Green and Yellow Hatches)

Reference:

1. Simcoe County Maps, 2020.

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647 Welham Rd, Unit 14, Barrie, ON, L4N 0B7
P: (705) 719-7994

Project:	664, 647 & 692 Essa Rd. & 320 Mapleview Dr., Barrie				
Title:	SIGNIFICANT GROUNDWATER RECHARGE AREAS				
Approved by:	A.W.	Date:	March 2020	Project No.:	20-1014A
Drawn by:	R.W.	Scale:	N.T.S.	Figure No.:	6C

Appendix A –

BOREHOLE LOGS

RECORD OF BOREHOLE No. 1

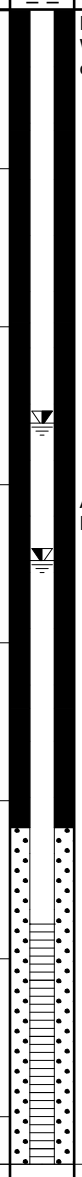
GEI Consultants

Project Number:	**20-1014A**				
Project Client:	**PetromaxX Construction**				
Project Name:	**664, 674 & 692 Essa Rd and 320 Mapleview**	Drilling Method: **Solid Stem**		Drilling Machine: **Track Mount**	
Project Location:	**Barrie, Ontario**	Logged By: **BH**	Northing: **4909557**	Date Started: **2020-03-03**	
Drilling Location:	**See Attached Drawing**	Reviewed By: **AW**	Easting: **602654**	Date Completed: **2020-03-03**	

Lithology Plot	DESCRIPTION	Geodetic 307.27m	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)
	Topsoil = 330mm	0.3 306.9	SS	1	75	5	0	307
	FILL: Silty & Sand, Some Clay, Trace Gravel, Loose, Dark Brown, Moist	0.8 306.5						
	SILTY SAND GLACIAL TILL, Trace Clay, Trace Gravel, Loose, Brown, Moist to Wet		SS	2	100	4	1	306
	- - - Dense, Moist - - -		SS	3	100	31	2	305
			SS	4	100	50	3	304
	- - - Compact - - -		SS	5	100	13	4	303
		4.6 302.7					5	302
	SILTY SAND, Very Dense, Brown, Wet		SS	6	67	100+	6	301
		6.6 300.7	SS	7	100	54	7	300
	End of BH @ 6.6m Monitoring Well Extends Past End of Sampled Borehole Depth	7.3 300.0						

FIELD TESTING
Shear Strength Testing (kPa)
× Other Test; + Pocket Penetrometer; ▲ Field Vane (Intact); △ Field Vane (Remolded)
40 80 120 160
Penetration Testing
○ SPT ● DCPT
10 20 30 40

LAB TESTING
△ Combustible Organic Vapour (ppm)
▲ Combustible Organic Vapour (%LEL)
✳ Total Organic Vapour (ppm)
100 200 300 400
Atterberg Limits
PL ——— LL
○ Water Content (%)
10 20 30 40



COMMENTS & GRAIN SIZE DISTRIBUTION (%)

GR	SA	SI	CL

MW3 Inferred Well Details Shown on this BH Log

Auger Grinding On Boulder

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647 Welham Road, Unit 14
Barrie, Ontario L4N 0B8
T : (705) 719-7994
E: info.com
W: centralearth.com

Groundwater depth encountered on completion of drilling: **4.9m**

Cave depth after auger removal: **5.2m**

Groundwater depth observed on **Mar. 5/20** at a depth of: **3.48m**

Observed on **Apr. 1/20** at a depth of: **2.61m**

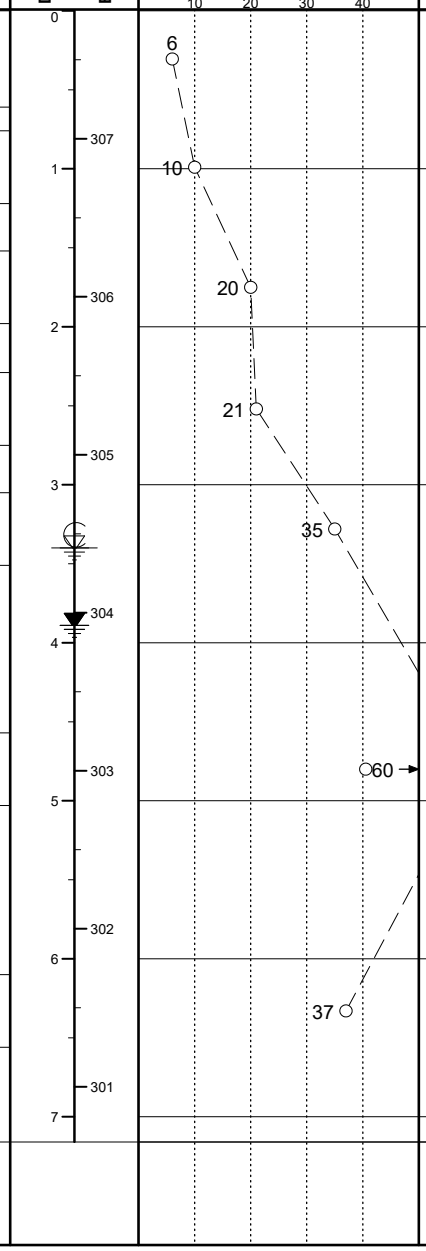
Scale: **1 :50**

RECORD OF BOREHOLE No. 2

GEI Consultants

Project Number:	**20-1014A**				
Project Client:	**PetromaxX Construction**				
Project Name:	**664, 674 & 692 Essa Rd and 320 Mapleview**	Drilling Method: **Solid Stem**		Drilling Machine: **Track Mount**	
Project Location:	**Barrie, Ontario**	Logged By: **BH**	Northing: **4909588**	Date Started: **2020-03-03**	
Drilling Location:	**See Attached Drawing**	Reviewed By: **AW**	Easting: **602742**	Date Completed: **2020-03-03**	

Lithology Plot	DESCRIPTION	Geodetic 307.81m	Sample Type	Sample Number	Recovery (%)	SPT "N" Value
	Topsoil = 300mm	0.3 / 307.5	SS	1	100	6
	FILL: Silty Sand, Trace Rootlets, Loose, Brown, Moist	0.8 / 307.1				
	SILTY SAND GLACIAL TILL, Some Clay, Trace Gravel, Compact, Brown, Moist		SS	2	100	10
			SS	3	100	20
			SS	4	100	21
	- - - Dense, Moist to Wet - - -	3.5 / 304.3	SS	5	100	35
	SAND, Some Silt, Very Dense, Brown, Wet		SS	6	100	60
	- - - Silty - - -	6.6 / 301.3	SS	7	100	37
	End of BH @ 6.6m Monitoring Well Extends Past End of Sampled Borehole Depth	7.2 / 300.7				



FIELD TESTING
Shear Strength Testing (kPa)
× Other Test
+ Pocket Penetrometer
▲ Field Vane (Intact)
△ Field Vane (Remolded)
40 80 120 160
Penetration Testing
○ SPT ● DCPT
10 20 30 40

LAB TESTING
△ Combustible Organic Vapour (ppm)
▲ Combustible Organic Vapour (%LEL)
✳ Total Organic Vapour (ppm)
100 200 300 400
Atterberg Limits
PL ○ Water Content (%) LL
10 20 30 40

Instrumentation Installation

COMMENTS & GRAIN SIZE DISTRIBUTION (%)

GR	SA	SI	CL

MW1 Inferred Well Details Shown on this BH Log

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T : (705) 719-7994
E: info.com
W: centralearth.com

Groundwater depth encountered on completion of drilling: **3.4m**

Cave depth after auger removal: **3.4m**

Groundwater depth observed on **Mar. 5/20** at a depth of: **3.89m**

Observed on **Apr. 1/20** at a depth of: **3.11m**

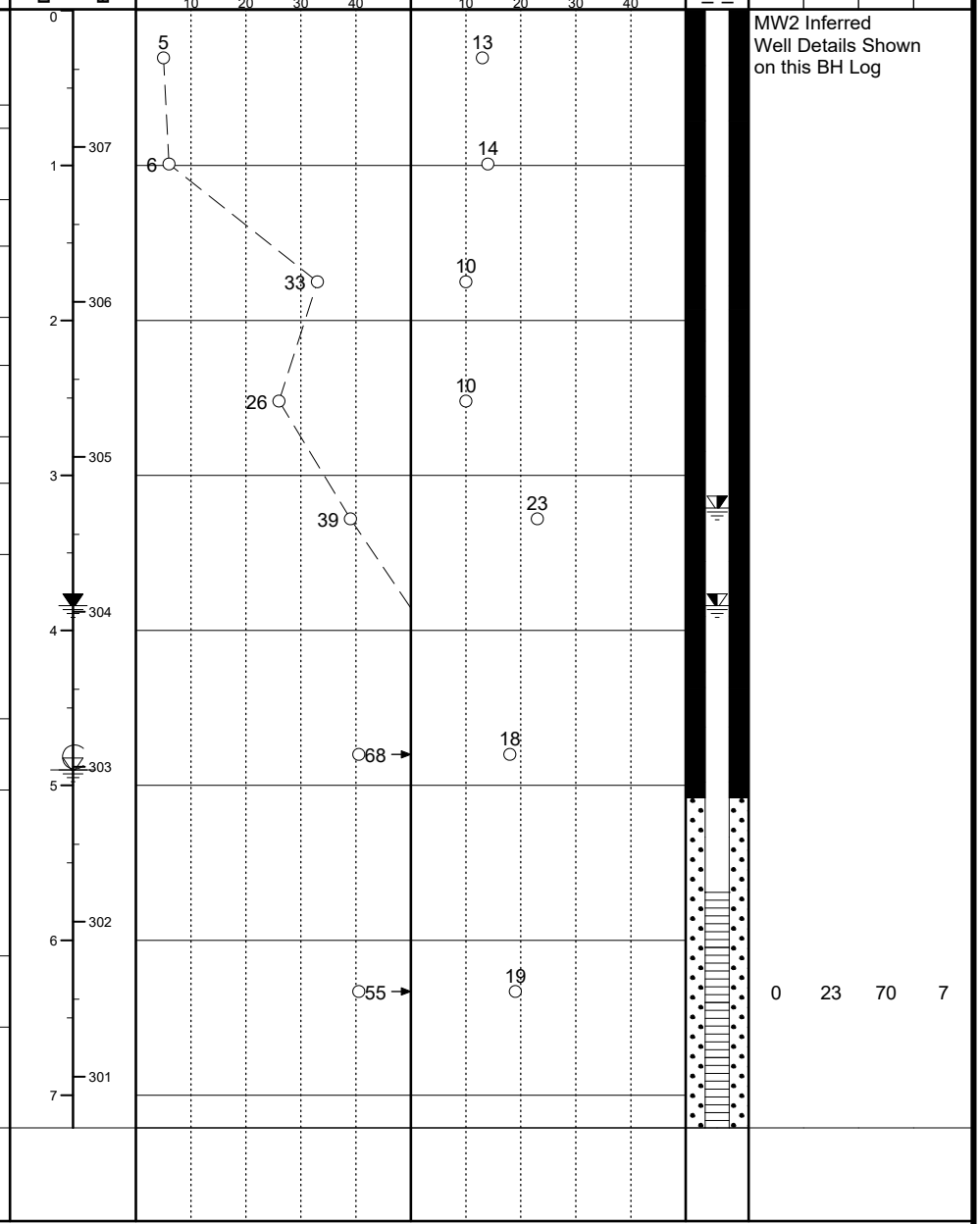
Scale: **1 :50**

RECORD OF BOREHOLE No. 3

GEI Consultants

Project Number:	**20-1014A**				
Project Client:	**PetromaxX Construction**				
Project Name:	**664, 674 & 692 Essa Rd and 320 Mapleview**	Drilling Method: **Solid Stem**		Drilling Machine: **Track Mount**	
Project Location:	**Barrie, Ontario**	Logged By: **BH**	Northing: **4909634**	Date Started: **2020-03-03**	
Drilling Location:	**See Attached Drawing**	Reviewed By: **AW**	Easting: **602853**	Date Completed: **2020-03-03**	

Lithology Plot	DESCRIPTION	Geodetic	Sample Type	Sample Number	Recovery (%)	SPT "N" Value
	Topsoil = 300mm	307.88m				
		0.3 / 307.6	SS	1	100	5
	FILL: Sand & Silt, Trace Clay, Trace Gravel, Trace Rootlets, Loose, Dark Brown, Moist		SS	2	100	6
		1.5 / 306.4				
	SILTY SAND GLACIAL TILL, Some Clay, Trace Gravel, Dense, Brown, Moist		SS	3	100	33
	- - - Compact - - -		SS	4	100	26
		3.1 / 304.8				
	SILT & CLAY, Trace Sand, Frequent Silt Partings, Hard, Brown, Moist		SS	5	100	39
		4.6 / 303.3				
	SILTY SAND, Very Dense, Brown, Wet		SS	6	100	68
		6.1 / 301.8				
	SANDY SILT, Trace Clay, Very Dense, Brown, Moist to Wet		SS	7	100	55
		6.6 / 301.3				
	End of BH @ 6.6m Monitoring Well Extends Past End of Sampled Borehole Depth	7.2 / 300.7				



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Groundwater depth encountered on completion of drilling: **4.9m**

Cave depth after auger removal: **4.9m**

Groundwater depth observed on **Mar. 5/20** at a depth of: **3.84m**

Observed on **Apr. 1/20** at a depth of: **3.21m**

Scale: **1 :50**

RECORD OF BOREHOLE No. 4

Project Number:	**20-1014A**				
Project Client:	**PetromaxX Construction**				
Project Name:	**664, 674 & 692 Essa Rd and 320 Mapleview**	Drilling Method: **Solid Stem**		Drilling Machine: **Track Mount**	
Project Location:	**Barrie, Ontario**	Logged By: **BH**	Northing: **4909497**	Date Started: **2020-03-03**	
Drilling Location:	**See Attached Drawing**	Reviewed By: **AW**	Easting: **602680**	Date Completed: **2020-03-03**	

Lithology Plot	DESCRIPTION	Geodetic 308.45m	Sample Type	Sample Number	Recovery (%)	SPT "N" Value
	Topsoil = 200mm	0.2 / 308.3				
	FILL: Sand & Silt, Trace Clay, Trace Gravel, Trace Rootlets, Loose, Dark Brown, Moist		SS	1	100	6
			SS	2	100	9
		1.5 / 306.9				
	SILTY SAND GLACIAL TILL, Some Clay, Trace Gravel, Compact, Brown, Moist		SS	3	100	18
	- - - Dense - - -		SS	4	100	47
			SS	5	100	52
		4.8 / 303.7	SS	6A / 6B	100	43
	SILT & CLAY, Trace Sand, Frequent Silt Partings, Hard, Brown, Moist	6.1 / 302.4				
	SILTY SAND, Very Dense, Brown, Wet	6.6 / 301.9	SS	7	100	70
	End of BH @ 6.6m Monitoring Well Extends Past End of Sampled Borehole Depth					

FIELD TESTING — Shear Strength Testing (kPa): Other Test, Pocket Penetrometer, Field Vane (Intact), Field Vane (Remolded); Penetration Testing: SPT, DCPT

LAB TESTING — Combustible Organic Vapour (ppm), Combustible Organic Vapour (%LEL), Total Organic Vapour (ppm); Atterberg Limits (PL, LL); Water Content (%)

COMMENTS & GRAIN SIZE DISTRIBUTION (%)

MW6 Inferred Well Details Shown on this BH Log

GR	SA	SI	CL
5	57	25	13

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Groundwater depth encountered on completion of drilling: **4.9m**

Cave depth after auger removal: **5.8m**

Groundwater depth observed on **Mar. 5/20** at a depth of: **4.72m**

Observed on **Apr. 1/20** at a depth of: **3.85m**

RECORD OF BOREHOLE No. 4

GEI Consultants

Project Number:	**20-1014A**						
Project Client:	**PetromaxX Construction**						
Project Name:	**664, 674 & 692 Essa Rd and 320 Mapleview**	Drilling Method:	**Solid Stem**	Drilling Machine:	**Track Mount**		
Project Location:	**Barrie, Ontario**	Logged By:	**BH**	Northing:	**4909497**	Date Started:	**2020-03-03**
Drilling Location:	**See Attached Drawing**	Reviewed By:	**AW**	Easting:	**602680**	Date Completed:	**2020-03-03**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS & GRAIN SIZE DISTRIBUTION (%)			
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)	Shear Strength Testing (kPa): Other Test, Pocket Penetrometer, Field Vane (Intact), Field Vane (Remolded); 40 80 120 160; Penetration Testing: SPT, DCPT; 10 20 30 40	Combustible Organic Vapour (ppm), Combustible Organic Vapour (%LEL), Total Organic Vapour (ppm); 100 200 300 400; Atterberg Limits: PL, LL, Water Content (%); 10 20 30 40	Instrumentation Installation	GR	SA	SI	CL
	10.9 297.6					8 9 10	300 299 298							

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Groundwater depth encountered on completion of drilling: **4.9m**

Cave depth after auger removal: **5.8m**

Groundwater depth observed on **Mar. 5/20** at a depth of: **4.72m**

Observed on **Apr. 1/20** at a depth of: **3.85m**

Scale: **1 :50**

RECORD OF BOREHOLE No. 5

GEI Consultants

Project Number:	**20-1014A**				
Project Client:	**PetromaxX Construction**				
Project Name:	**664, 674 & 692 Essa Rd and 320 Mapleview**	Drilling Method: **Solid Stem**		Drilling Machine: **Track Mount**	
Project Location:	**Barrie, Ontario**	Logged By: **BH**	Northing: **4909539**	Date Started: **2020-03-03**	
Drilling Location:	**See Attached Drawing**	Reviewed By: **AW**	Easting: **602808**	Date Completed: **2020-03-03**	

Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)
	Geodetic 307.83m						
	0.2 Topsoil = 180mm 307.7						
	FILL: Sand & Silt, Trace Clay, Trace Gravel, Trace Rootlets, Loose, Dark Brown, Moist	SS	1	100	5		
	- - - Brown - - -	SS	2	100	4	1	307
	1.5 306.3						
	SILT, Some Sand, Trace Clay, Compact, Brown, Moist	SS	3	100	14	2	306
	2.3 305.5						
	SILTY SAND GLACIAL TILL, Some Clay, Trace Gravel, Dense, Brown, Moist	SS	4	100	35	3	305
		SS	5	100	41		
	- - - Very Dense - - -	SS	6	56	100+	4	304
	6.1 301.7					5	303
	CLAYEY SILT, Trace Sand, Frequent Silt Partings, Hard, Brown, Moist	SS	7	56	100+	6	302
	6.6 301.3					7	301
	End of BH @ 6.6m Monitoring Well Extends Past End of Sampled Borehole Depth						

FIELD TESTING
Shear Strength Testing (kPa): Other Test; Pocket Penetrometer; Field Vane (Intact); Field Vane (Remolded) — 40 80 120 160
Penetration Testing: SPT; DCPT — 10 20 30 40
Values: 5, 4, 14, 35, 41, 100+, 100+

LAB TESTING
Combustible Organic Vapour (ppm); Combustible Organic Vapour (%LEL); Total Organic Vapour (ppm) — 100 200 300 400
Atterberg Limits: PL — LL
Water Content (%) — 10 20 30 40
Values: 21, 19, 27, 8, 8, 7, 24

Instrumentation Installation

COMMENTS & GRAIN SIZE DISTRIBUTION (%)

MW5 Inferred Well Details Shown on this BH Log

GR	SA	SI	CL

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T : (705) 719-7994
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Groundwater depth encountered on completion of drilling: **5.5m**

Cave depth after auger removal: **Open**

Groundwater depth observed on **Mar. 5/20** at a depth of: **3.82m**

Observed on **Apr. 1/20** at a depth of: **3.03m**

Scale: **1 :50**

RECORD OF BOREHOLE No. 5

GEI Consultants

Project Number:	**20-1014A**						
Project Client:	**PetromaxX Construction**						
Project Name:	**664, 674 & 692 Essa Rd and 320 Mapleview**	Drilling Method:	**Solid Stem**	Drilling Machine:	**Track Mount**		
Project Location:	**Barrie, Ontario**	Logged By:	**BH**	Northing:	**4909539**	Date Started:	**2020-03-03**
Drilling Location:	**See Attached Drawing**	Reviewed By:	**AW**	Easting:	**602808**	Date Completed:	**2020-03-03**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS & GRAIN SIZE DISTRIBUTION (%)			
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)	Shear Strength Testing (kPa): Other Test; Pocket Penetrometer; Field Vane (Intact); Field Vane (Remolded); 40 80 120 160; Penetration Testing: SPT DCPT; 10 20 30 40	Combustible Organic Vapour (ppm); Combustible Organic Vapour (%LEL); Total Organic Vapour (ppm); 100 200 300 400; Atterberg Limits: PL LL; Water Content (%); 10 20 30 40	Instrumentation Installation	GR	SA	SI	CL
	10.9 296.9					8 9 10	300 299 298 297							

CENTRAL EARTH ENGINEERING

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Groundwater depth encountered on completion of drilling: **5.5m**

Cave depth after auger removal: **Open**

Groundwater depth observed on **Mar. 5/20** at a depth of: **3.82m**

Observed on **Apr. 1/20** at a depth of: **3.03m**

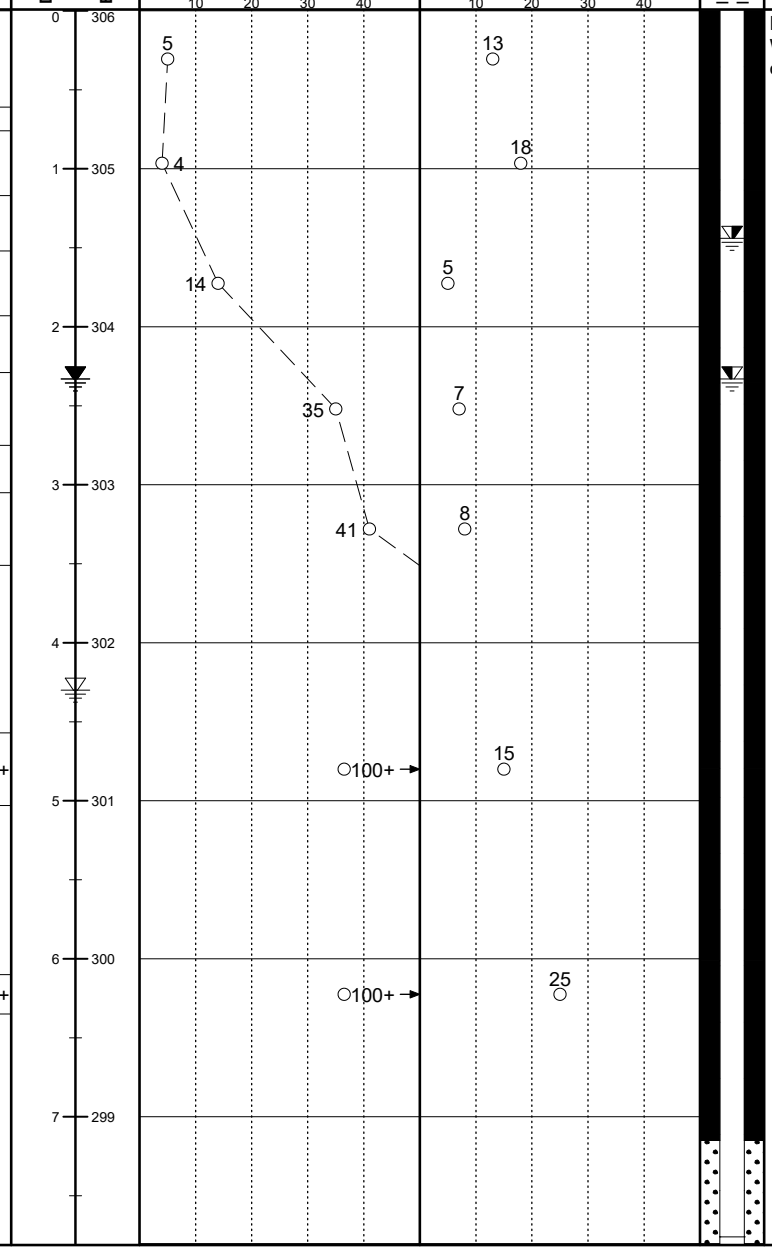
Scale: **1 :50**

RECORD OF BOREHOLE No. 6

Project Number:	**20-1014A**				
Project Client:	**PetromaxX Construction**				
Project Name:	**664, 674 & 692 Essa Rd and 320 Mapleview**	Drilling Method: **Solid Stem**		Drilling Machine: **Track Mount**	
Project Location:	**Barrie, Ontario**	Logged By: **BH**	Northing: **4909434**	Date Started: **2020-03-03**	
Drilling Location:	**See Attached Drawing**	Reviewed By: **AW**	Easting: **602602**	Date Completed: **2020-03-03**	

GEI Consultants

Lithology Plot	DESCRIPTION (Geodetic 306.00m)	Sample Type	Sample Number	Recovery (%)	SPT "N" Value
	Topsoil = 300mm (0.3 / 305.7)	SS	1	100	5
	FILL: Silty Sand, Trace Clay, Trace Gravel, Trace Rootlets, Loose, Dark Brown, Moist (0.8 / 305.2)	SS	2	89	4
	FILL: Gravelly Sand, Trace Silt, Loose, Brown, Moist (1.5 / 304.5)	SS	3	89	14
	FILL: Sand & Silt, Trace Gravel, Compact, Reddish Brown, Moist (2.3 / 303.7)	SS	4	100	35
	SILTY SAND GLACIAL TILL, Some Clay, Trace Gravel, Dense, Brown, Moist	SS	5	100	41
	(4.6 / 301.4) Frequent Sand Layers, Wet (6.1 / 299.9)	SS	6	100	100+
	CLAYEY SILT, Trace Sand, Frequent Silt Partings, Hard, Brown, Moist (6.4 / 299.7)	SS	7	56	100+
	End of BH @ 6.4m				
	Monitoring Well Extends Past End of Sampled Borehole Depth				



COMMENTS & GRAIN SIZE DISTRIBUTION (%)

MW7 Inferred Well Details Shown on this BH Log

GR	SA	SI	CL

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647 Welham Road, Unit 14
Barrie, Ontario L4N 0B8
T : (705) 719-7994
E: info.com
W: centralearth.com

Groundwater depth encountered on completion of drilling: **4.3m**

Cave depth after auger removal: **Open**

Groundwater depth observed on **Mar. 5/20** at a depth of: **2.33m**

Observed on **Apr. 1/20** at a depth of: **1.44m**

Scale: **1 :50**

RECORD OF BOREHOLE No. 6

GEI Consultants

Project Number:	**20-1014A**						
Project Client:	**PetromaxX Construction**						
Project Name:	**664, 674 & 692 Essa Rd and 320 Mapleview**	Drilling Method:	**Solid Stem**	Drilling Machine:	**Track Mount**		
Project Location:	**Barrie, Ontario**	Logged By:	**BH**	Northing:	**4909434**	Date Started:	**2020-03-03**
Drilling Location:	**See Attached Drawing**	Reviewed By:	**AW**	Easting:	**602602**	Date Completed:	**2020-03-03**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS & GRAIN SIZE DISTRIBUTION (%)			
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)	Shear Strength Testing (kPa): Other Test; Pocket Penetrometer; Field Vane (Intact); Field Vane (Remolded) — 40 80 120 160; Penetration Testing: SPT DCPT — 10 20 30 40	Combustible Organic Vapour (ppm); Combustible Organic Vapour (%LEL); Total Organic Vapour (ppm) — 100 200 300 400; Atterberg Limits: PL LL; Water Content (%) — 10 20 30 40	Instrumentation Installation	GR	SA	SI	CL
						8	298							
						9	297							
	9.3 296.7													

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Groundwater depth encountered on completion of drilling: **4.3m**

Cave depth after auger removal: **Open**

Groundwater depth observed on **Mar. 5/20** at a depth of: **2.33m**

Observed on **Apr. 1/20** at a depth of: **1.44m**

Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

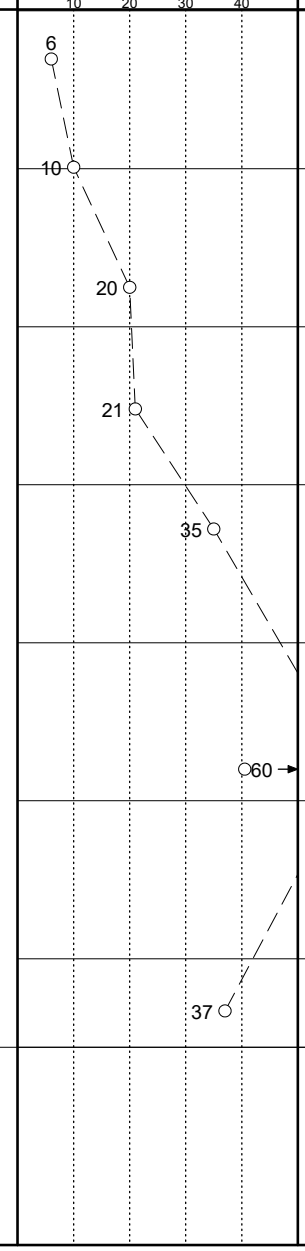
Scale: **1 :50**

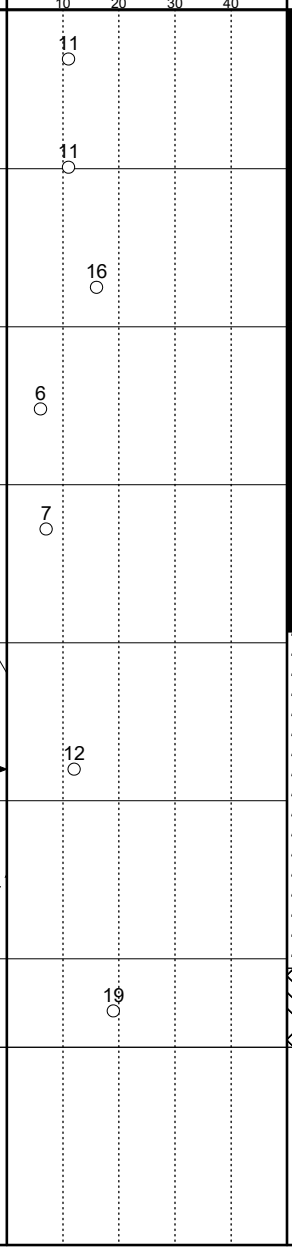
RECORD OF BOREHOLE No. 7

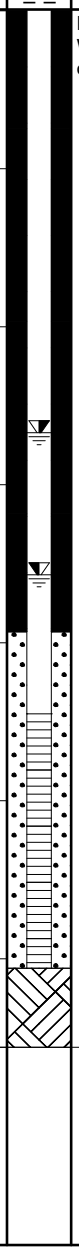
Project Number:	**20-1014A**				
Project Client:	**PetromaxX Construction**				
Project Name:	**664, 674 & 692 Essa Rd and 320 Mapleview**	Drilling Method: **Solid Stem**		Drilling Machine: **Track Mount**	
Project Location:	**Barrie, Ontario**	Logged By: **BH**	Northing: **4909472**	Date Started: **2020-03-03**	
Drilling Location:	**See Attached Drawing**	Reviewed By: **AW**	Easting: **602753**	Date Completed: **2020-03-03**	

GEI Consultants

Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)
	Geodetic 307.56m						
	0.2 307.4 Topsoil = 200mm						
	FILL: Silty Sand, Trace Gravel, Trace Rootlets, Loose, Dark Brown, Moist	SS	1	100	6		
	0.8 306.8						
	SILTY SAND GLACIAL TILL, Some Clay, Trace Gravel, Comapct, Brown, Moist	SS	2	100	10		
	- - - Occasional Sand Pockets - - -	SS	3	100	20		
	2.3 305.3						
	FINE SAND, Some Silt, Compact, Light Brown, Damp to Moist	SS	4	100	21		
	3.1 304.5						
	SILTY SAND GLACIAL TILL, Some Clay, Trace Gravel, Dense, Brown, Moist	SS	5	100	35		
		SS	6	100	60		
	6.1 301.5						
	SILTY FINE SAND, Dense, Brown, Wet	SS	7	100	37		
	6.6 301.0						
	End of BH @ 6.6m						







COMMENTS & GRAIN SIZE DISTRIBUTION (%)

MW4 Inferred Well Details Shown on this BH Log

GR	SA	SI	CL

CENTRAL EARTH ENGINEERING

647 Welham Road, Unit 14
Barrie, Ontario L4N 0B8
T : (705) 719-7994
E: info.com
W: centralearth.com

Groundwater depth encountered on completion of drilling: **5.2m**

Cave depth after auger removal: **5.8m**

Groundwater depth observed on **Mar. 5/20** at a depth of: **3.57m**

Observed on **Apr. 1/20** at a depth of: **2.67m**

Scale: **1 :50**

RECORD OF BOREHOLE No. 8

Project Number:	**20-1014A**				
Project Client:	**PetromaxX Construction**				
Project Name:	**664, 674 & 692 Essa Rd and 320 Mapleview**	Drilling Method: **Solid Stem**		Drilling Machine: **Track Mount**	
Project Location:	**Barrie, Ontario**	Logged By: **BH**	Northing: **4909467**	Date Started: **2020-03-04**	
Drilling Location:	**See Attached Drawing**	Reviewed By: **AW**	Easting: **602868**	Date Completed: **2020-03-04**	

Lithology Plot	DESCRIPTION (Geodetic 305.66m)	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)
	Topsoil = 610mm	SS	1	100	8	0	305
	0.6 / 305.1						
	SILTY SAND GLACIAL TILL, Some Clay, Trace Gravel, Compact, Brown, Moist	SS	2	100	11	1	304
	1.5 / 304.1						
	SILTY SAND, Trace Clay, Dense, Brown, Wet	SS	3	100	36	2	303
	2.3 / 303.4						
	SAND, Some Gravel, Trace Silt, Dense, Brown, Wet	SS	4	100	35	3	302
	- - - Trace to Some Silt, Trace Gravel, Greyish Brown - - -	SS	5	100	38	4	301
	- - - Grey - - -	SS	6	100	49	5	300
	6.6 / 299.1	SS	7	100	28	6	
	End of BH @ 6.6m						

FIELD TESTING — Shear Strength Testing (kPa): Other Test, Pocket Penetrometer, Field Vane (Intact), Field Vane (Remolded); Penetration Testing: SPT, DCPT

LAB TESTING — Combustible Organic Vapour (ppm), Combustible Organic Vapour (%LEL), Total Organic Vapour (ppm); Atterberg Limits (PL, LL); Water Content (%)

Instrumentation Installation

COMMENTS & GRAIN SIZE DISTRIBUTION (%)

GR	SA	SI	CL
11	82	(7)	

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Groundwater depth encountered on completion of drilling: **2.7m**

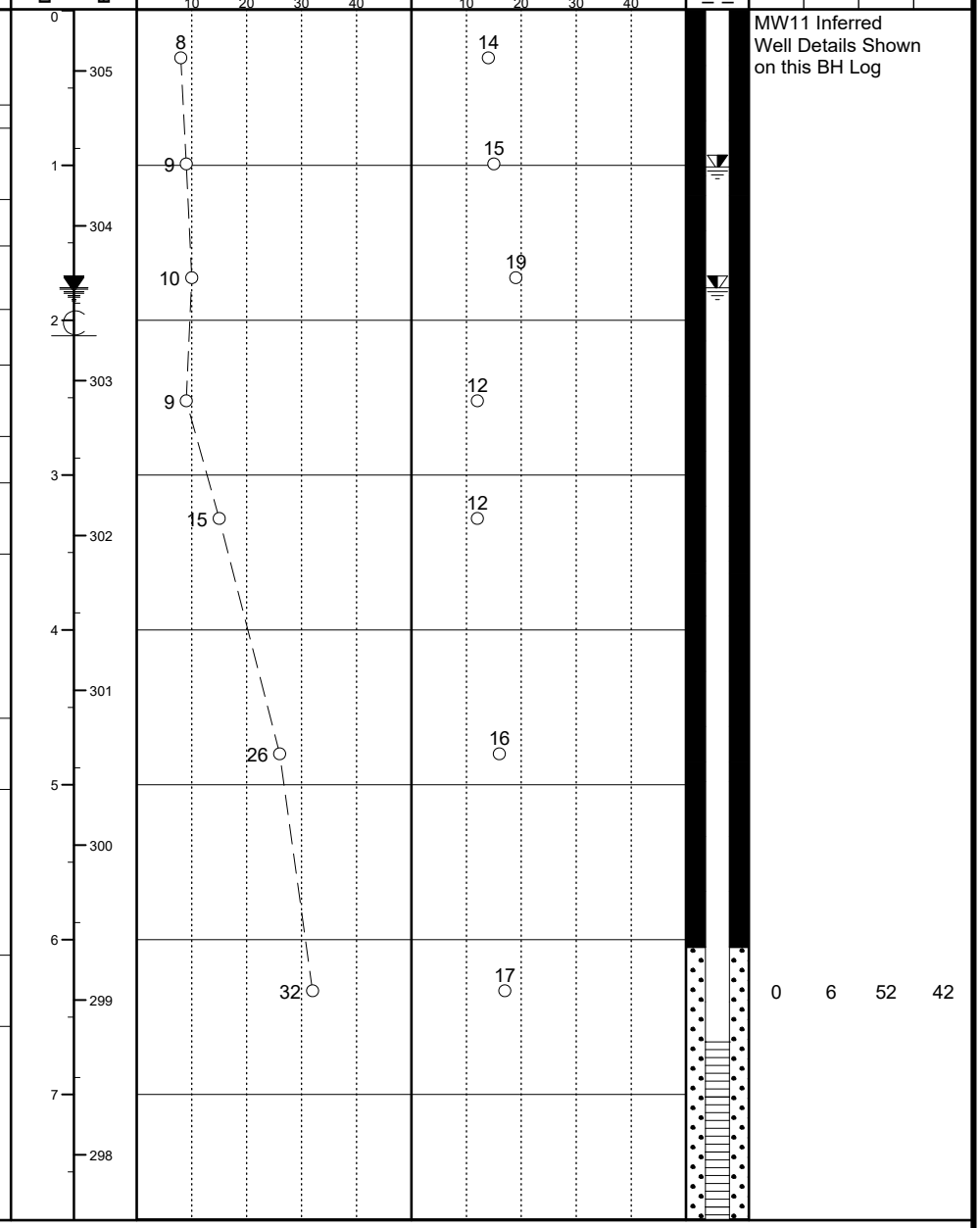
Cave depth after auger removal: **3.1m**

RECORD OF BOREHOLE No. 9

GEI Consultants

Project Number:	**20-1014A**				
Project Client:	**PetromaxX Construction**				
Project Name:	**664, 674 & 692 Essa Rd and 320 Mapleview**	Drilling Method: **Solid Stem**		Drilling Machine: **Track Mount**	
Project Location:	**Barrie, Ontario**	Logged By: **BH**	Northing: **4909361**	Date Started: **2020-03-05**	
Drilling Location:	**See Attached Drawing**	Reviewed By: **AW**	Easting: **602576**	Date Completed: **2020-03-05**	

Lithology Plot	DESCRIPTION	Geodetic	Sample Type	Sample Number	Recovery (%)	SPT "N" Value
	Topsoil = 200mm	0.2 / 305.2				
	FILL: Silty Sand, Trace Gravel, Trace Rootlets, Loose, Dark Brown, Moist	0.8 / 304.6	SS	1	100	8
	SILTY SAND GLACIAL TILL, Some Clay, Trace Gravel, Loose, Brown, Moist	1.5 / 303.9	SS	2	100	9
	SAND, Some Silt, Compact, Brown, Wet	2.3 / 303.1	SS	3	89	10
	SILTY SAND GLACIAL TILL, Some Clay, Trace Gravel, Loose, Brown, Moist to Wet		SS	4	100	9
	- - - Compact, Wet - - -		SS	5	100	15
	FINE SAND & SILT, Compact, Grey, Wet	4.6 / 300.8	SS	6	100	26
	SILT & CLAY, Trace Sand, Frequent Silt Partings, Hard, Grey, Moist	6.1 / 299.3	SS	7	100	32
	End of BH @ 6.6m Monitoring Well Extends Past End of Sampled Borehole Depth	6.6 / 298.8				



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Groundwater depth encountered on completion of drilling: **1.8m**

Cave depth after auger removal: **2.1m**

Groundwater depth observed on **Mar. 5/20** at a depth of: **1.79m**

Observed on **Apr. 1/20** at a depth of: **1.01m**

Scale: **1 :50**

RECORD OF BOREHOLE No. 9

GEI Consultants

Project Number:	**20-1014A**						
Project Client:	**PetromaxX Construction**						
Project Name:	**664, 674 & 692 Essa Rd and 320 Mapleview**	Drilling Method:	**Solid Stem**	Drilling Machine:	**Track Mount**		
Project Location:	**Barrie, Ontario**	Logged By:	**BH**	Northing:	**4909361**	Date Started:	**2020-03-05**
Drilling Location:	**See Attached Drawing**	Reviewed By:	**AW**	Easting:	**602576**	Date Completed:	**2020-03-05**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS & GRAIN SIZE DISTRIBUTION (%)			
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)	Shear Strength Testing (kPa): Other Test; Pocket Penetrometer; Field Vane (Intact); Field Vane (Remolded); 40 80 120 160; Penetration Testing: SPT DCPT; 10 20 30 40	Combustible Organic Vapour (ppm); Combustible Organic Vapour (%LEL); Total Organic Vapour (ppm); 100 200 300 400; Atterberg Limits: PL LL; Water Content (%); 10 20 30 40	Instrumentation Installation	GR	SA	SI	CL
	8.2 297.2					8								

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Groundwater depth encountered on completion of drilling: **1.8m**

Cave depth after auger removal: **2.1m**

Groundwater depth observed on **Mar. 5/20** at a depth of: **1.79m**

Observed on **Apr. 1/20** at a depth of: **1.01m**

Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

Scale: **1 :50**

RECORD OF BOREHOLE No. 10

Project Number:	**20-1014A**				
Project Client:	**PetromaxX Construction**				
Project Name:	**664, 674 & 692 Essa Rd and 320 Mapleview**	Drilling Method:	**Solid Stem**	Drilling Machine:	**Track Mount**
Project Location:	**Barrie, Ontario**	Logged By:	**BH**	Northing: **4909395**	Date Started: **2020-03-04**
Drilling Location:	**See Attached Drawing**	Reviewed By:	**AW**	Easting: **602683**	Date Completed: **2020-03-04**

Lithology Plot	DESCRIPTION (Geodetic 305.04m)	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)
	Topsoil = 360mm (0.4 / 304.7)	SS	1	100	7	0	305
	FILL: Silty Sand, Trace Clay, Trace Gravel, Loose, Brown, Moist (0.8 / 304.3)						
	SILTY SAND GLACIAL TILL, Some Clay, Trace Gravel, Very Loose, Brown, Moist	SS	2	100	3	1	304
	- - - Loose, Moist to Wet - - -	SS	3	100	7	2	303
	(2.3 / 302.8) SILT & SAND GLACIAL TILL, Some Clay, Trace Gravel, Compact, Grey, Moist	SS	4	100	26		
	(3.1 / 302.0) GRAVELLY SAND, Some Silt, Compact, Brownish Grey, Wet	SS	5	100	18	3	302
	- - - Grey - - - (4.8 / 300.2)	SS	6A	100	39	4	301
	SILT & CLAY, Trace Sand, Frequeny Silt Partings, Hard, Grey, Moist		6B			5	300
	(6.1 / 298.9) SILTY SAND, Dense, Grey, Wet	SS	7	100	48	6	299
	(6.6 / 298.5) End of BH @ 6.6m						

FIELD TESTING — Shear Strength Testing (kPa): Other Test, Pocket Penetrometer, Field Vane (Intact), Field Vane (Remolded); Penetration Testing: SPT, DCPT

LAB TESTING — Combustible Organic Vapour (ppm), Combustible Organic Vapour (%LEL), Total Organic Vapour (ppm); Atterberg Limits (PL, LL); Water Content (%)

Instrumentation Installation

COMMENTS & GRAIN SIZE DISTRIBUTION (%): GR, SA, SI, CL

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Groundwater depth encountered on completion of drilling: **4.9m**

Cave depth after auger removal: **4.9m**

RECORD OF BOREHOLE No. 11

GEI Consultants

Project Number:	**20-1014A**				
Project Client:	**PetromaxX Construction**				
Project Name:	**664, 674 & 692 Essa Rd and 320 Mapleview**	Drilling Method: **Solid Stem**		Drilling Machine: **Track Mount**	
Project Location:	**Barrie, Ontario**	Logged By: **BH**	Northing: **4909403**	Date Started: **2020-03-04**	
Drilling Location:	**See Attached Drawing**	Reviewed By: **AW**	Easting: **602804**	Date Completed: **2020-03-04**	

Depth (m)	Description	Geodetic Elevation	Sample Type	Sample Number	Recovery (%)	SPT "N" Value
0.0	Topsoil = 180mm	305.1				
0.2	FILL: Sandy Silt, Some Clay to Clayey, Trace Gravel, Trace Silty Sand Nodules, Loose, Brown, Moist		SS	1	100	8
0.8		304.6				
	SILTY SAND GLACIAL TILL, Some Clay, Trace Gravel, Compact, Brown, Moist to Wet		SS	2	100	11
	- - - Dense - - -		SS	3	100	36
2.0		303.3				
	SAND & SILT GLACIAL TILL, Some Clay, Trace Gravel, Hard, Brownish Grey, Moist to Wet					
2.5		302.8	SS	4A	100	35
	GRAVELLY SAND, Some Silt to Silty, Dense, Brownish Grey, Wet			4B		
	- - - Grey - - -		SS	5	100	38
4.6		300.7				
	SAND, Trace Silt, Trace Grave, Dense to Compact, Brownish Grey, Wet		SS	6	89	49
6.3	- - - Some Silt to Silty - - -	299.1	SS	7	33	28
	End of BH @ 6.3m					
	Monitoring Well Extends Past End of Sampled Borehole Depth					
7.2		298.1				

FIELD TESTING — Shear Strength Testing (kPa): Other Test, Pocket Penetrometer, Field Vane (Intact), Field Vane (Remolded); Penetration Testing: SPT, DCPT

LAB TESTING — Combustible Organic Vapour (ppm), Combustible Organic Vapour (%LEL), Total Organic Vapour (ppm); Atterberg Limits: PL, LL, Water Content (%)

COMMENTS & GRAIN SIZE DISTRIBUTION (%): GR, SA, SI, CL

MW8 Inferred Well Details Shown on this BH Log

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Groundwater depth encountered on completion of drilling: **2.1m**

Cave depth after auger removal: **3.4m**

Groundwater depth observed on **Mar. 5/20** at a depth of: **1.47m**

Observed on **Apr. 1/20** at a depth of: **0.68m**

RECORD OF BOREHOLE No. 12

GEI Consultants

Project Number:	**20-1014A**				
Project Client:	**PetromaxX Construction**				
Project Name:	**664, 674 & 692 Essa Rd and 320 Mapleview**	Drilling Method:	**Solid Stem**	Drilling Machine:	**Track Mount**
Project Location:	**Barrie, Ontario**	Logged By:	**BH**	Northing: **4909261**	Date Started: **2020-03-05**
Drilling Location:	**See Attached Drawing**	Reviewed By:	**AW**	Easting: **602533**	Date Completed: **2020-03-05**

Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)
	Geodetic 305.90m						
	FILL: Gravelly Sand, Trace Silt, Compact, Brown, Damp to Moist	SS	1	83	10	0	
	0.8 305.1						
	SAND & SILT, Trace Clay, Loose, Mottled Brown, Moist	SS	2	100	10	1	305
	- - - Silty, Moist to Wet - - -	SS	3	100	9		
	2.0 303.9					2	304
	SAND, Some Silt, Trace Gravel, Dense, Brown, Wet	SS	4	100	36		
	- - - Trace Silt - - -	SS	5	89	23	3	303
	- - - Some Gravel - - -	SS	6	78	28	4	302
	6.1 299.8					5	301
	6.2 299.7 SAND & SILT GLACIAL TILL, Some Clay, Trace Gravel, Hard, Grey, Moist to Wet	SS	7	22	100+	6	300
	End of BH @ 6.2m						

FIELD TESTING

Shear Strength Testing (kPa)

× Other Test
\+ Pocket Penetrometer
▲ Field Vane (Intact)
△ Field Vane (Remolded)

40 80 120 160

Penetration Testing

○ SPT ● DCPT

10 20 30 40

SPT "N" Values: 10, 10, 9, 36, 23, 28, 100+

LAB TESTING

△ Combustible Organic Vapour (ppm)
▲ Combustible Organic Vapour (%LEL)
✳ Total Organic Vapour (ppm)

100 200 300 400

Atterberg Limits

PL ○ Water Content (%) LL

10 20 30 40

Water Content Values: 17, 15, 14, 16, 13, 9, 9

Instrumentation Installation

COMMENTS & GRAIN SIZE DISTRIBUTION (%)

GR	SA	SI	CL
20	76	(4)	

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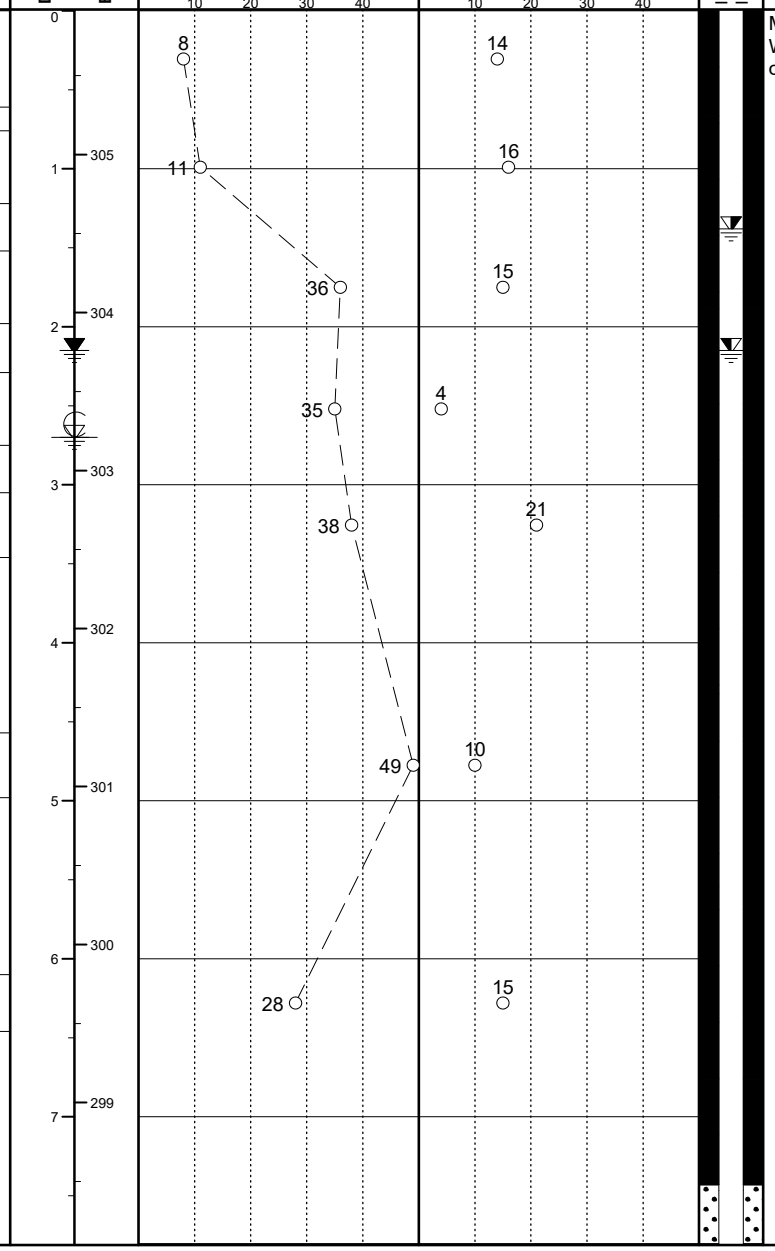
Groundwater depth encountered on completion of drilling: **2.7m**

Cave depth after auger removal: **2.7m**

RECORD OF BOREHOLE No. 13

Project Number:	**20-1014A**				
Project Client:	**PetromaxX Construction**				
Project Name:	**664, 674 & 692 Essa Rd and 320 Mapleview**	Drilling Method: **Solid Stem**		Drilling Machine: **Track Mount**	
Project Location:	**Barrie, Ontario**	Logged By: **BH**	Northing: **4909296**	Date Started: **2020-03-05**	
Drilling Location:	**See Attached Drawing**	Reviewed By: **AW**	Easting: **602655**	Date Completed: **2020-03-05**	

Lithology Plot	DESCRIPTION	Geodetic	Sample Type	Sample Number	Recovery (%)	SPT "N" Value
	Topsoil = 300mm	0.3 / 305.6	SS	1	100	8
	FILL: Silty Sand, Some Gravel, Loose, Dark Brown, Moist	0.8 / 305.2				
	SAND & SILT GLACIAL TILL, Trace Clay, Comapct, Brown, Moist to Wet		SS	2	100	11
	- - - Dense, Wet - - -		SS	3	100	36
		2.5 / 303.4	SS	4	100	35
	FINE SAND & SILT, Dense, Brown, Wet	3.1 / 302.9				
	SAND, Some Silt, Dense, Brown, Wet	4.6 / 301.3	SS	5	89	38
	GRAVELLY SAND, Trace Silt, Dense, Brown, Wet		SS	6	89	49
	- - Some Silt, Trace Gravel, Compact - -	6.5 / 299.5	SS	7	-	28
	End of BH @ 6.5m Monitoring Well Extends Past End of Sampled Borehole Depth					



COMMENTS & GRAIN SIZE DISTRIBUTION (%)

GR | SA | SI | CL

MW9 Inferred Well Details Shown on this BH Log

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Groundwater depth encountered on completion of drilling: **2.7m**

Cave depth after auger removal: **2.7m**

Groundwater depth observed on **Mar. 5/20** at a depth of: **2.15m**

Observed on **Apr. 1/20** at a depth of: **1.38m**

Scale: **1 :50**

RECORD OF BOREHOLE No. 13

GEI Consultants

Project Number:	**20-1014A**						
Project Client:	**PetromaxX Construction**						
Project Name:	**664, 674 & 692 Essa Rd and 320 Mapleview**	Drilling Method:	**Solid Stem**	Drilling Machine:	**Track Mount**		
Project Location:	**Barrie, Ontario**	Logged By:	**BH**	Northing:	**4909296**	Date Started:	**2020-03-05**
Drilling Location:	**See Attached Drawing**	Reviewed By:	**AW**	Easting:	**602655**	Date Completed:	**2020-03-05**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS & GRAIN SIZE DISTRIBUTION (%)			
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)	Shear Strength Testing (kPa): Other Test, Pocket Penetrometer, Field Vane (Intact), Field Vane (Remolded); 40 80 120 160; Penetration Testing: SPT, DCPT; 10 20 30 40	Combustible Organic Vapour (ppm), Combustible Organic Vapour (%LEL), Total Organic Vapour (ppm); 100 200 300 400; Atterberg Limits: PL, LL, Water Content (%); 10 20 30 40	Instrumentation Installation	GR	SA	SI	CL
	9.6 296.4					8 9	298 297							

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Groundwater depth encountered on completion of drilling: **2.7m**

Cave depth after auger removal: **2.7m**

Groundwater depth observed on **Mar. 5/20** at a depth of: **2.15m**

Observed on **Apr. 1/20** at a depth of: **1.38m**

Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

Scale: **1 :50**

RECORD OF BOREHOLE No. 14

GEI Consultants

Project Number: **20-1014A**
Project Client: **PetromaxX Construction**
Project Name: **664, 674 & 692 Essa Rd and 320 Mapleview**
Project Location: **Barrie, Ontario**
Drilling Location: **See Attached Drawing**

Drilling Method: **Solid Stem** Drilling Machine: **Track Mount**
Logged By: **BH** Northing: **4909333** Date Started: **2020-03-05**
Reviewed By: **AW** Easting: **602771** Date Completed: **2020-03-05**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS & GRAIN SIZE DISTRIBUTION (%)			
Lithology Plot	DESCRIPTION Geodetic 305.99m	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)	Shear Strength Testing (kPa): × Other Test, + Pocket Penetrometer, ▲ Field Vane (Intact), △ Field Vane (Remolded); 40 80 120 160 Penetration Testing: ○ SPT ● DCPT; 10 20 30 40	△ Combustible Organic Vapour (ppm), ▲ Combustible Organic Vapour (%LEL), ✳ Total Organic Vapour (ppm); 100 200 300 400 Atterberg Limits: PL ○ Water Content (%) LL; 10 20 30 40	Instrumentation Installation	GR	SA	SI	CL
	Topsoil = 300mm 0.3 305.7	SS	1	100	8	0		8	10					
	FILL: Sand & Silt, Some Gravel, Trace to Some Clay, Loose, Dark Brown, Moist 0.8 305.2													
	SAND & SILT to SILTY SAND GLACIAL TILL, Trace Clay, Loose, Brown, Moist to Wet	SS	2	100	9	1	305	9	14					
	- - - Compact, Wet - - -	SS	3	100	15			15	17					
	2.0 304.0 SILTY SAND, Trace Clay, Compact, Greyish Brown, Wet					2	304							
		SS	4	100	15			15	21		0	69	27	4
	- - - Some Gravel, Compact, Wet - - -	SS	5	100	27	3	303	27	24					
	4.6 301.4 SAND & SILT GLACIAL TILL, Some Clay, Trace Gravel, Hard, Grey, Moist	SS	6	100	43	4	302	43	9					
						5	301							
	- - - Moist to Wet - - -	SS	7	61	100+	6	300	100+	9					
	6.4 299.6 End of BH @ 6.4m													

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Groundwater depth encountered on completion of drilling: **2.4m**

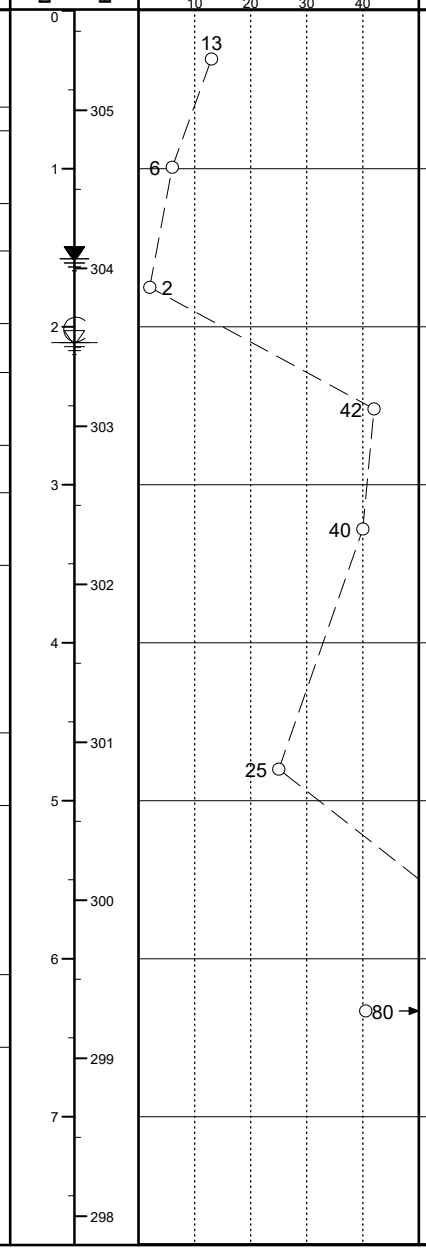
Cave depth after auger removal: **2.4m**

Scale: **1 :50**

RECORD OF BOREHOLE No. 15

Project Number:	**20-1014A**				
Project Client:	**PetromaxX Construction**				
Project Name:	**664, 674 & 692 Essa Rd and 320 Mapleview**	Drilling Method: **Solid Stem**		Drilling Machine: **Track Mount**	
Project Location:	**Barrie, Ontario**	Logged By: **BH**	Northing: **4909368**	Date Started: **2020-03-04**	
Drilling Location:	**See Attached Drawing**	Reviewed By: **AW**	Easting: **602891**	Date Completed: **2020-03-04**	

Lithology Plot	DESCRIPTION	Geodetic	Sample Type	Sample Number	Recovery (%)	SPT "N" Value
	Topsoil = 180mm	0.2 / 305.5				
	FILL: Silty Sand, Compact, Dark Brown, Moist		SS	1	100	13
		0.8 / 304.9				
	FILL: Sandy Silt, Some Clay to Clayey, Loose, Greyish Brown, Moist to Wet		SS	2	100	6
	- - - Very Loose, Wet - - -		SS	3	100	2
		2.3 / 303.3				
	FINE SAND & SILT, Trace Clay, Dense, Brown, Wet		SS	4	100	42
			SS	5	100	40
		4.6 / 301.1				
	SAND, Some Silt to Silty, Trace Gravel, Compact, Greyish Brown, Wet		SS	6	100	25
		6.1 / 299.5				
	SAND & SILT GLACIAL TILL, Some Clay, Trace Gravel, Hard, Grey, Moist		SS	7	100	80
		6.6 / 299.1				
	End of BH @ 6.6m Monitoring Well Extends Past End of Sampled Borehole Depth					



FIELD TESTING
Shear Strength Testing (kPa)
× Other Test
+ Pocket Penetrometer
▲ Field Vane (Intact)
△ Field Vane (Remolded)
40 80 120 160
Penetration Testing
○ SPT ● DCPT
10 20 30 40

LAB TESTING
△ Combustible Organic Vapour (ppm)
▲ Combustible Organic Vapour (%LEL)
✳ Total Organic Vapour (ppm)
100 200 300 400
Atterberg Limits
PL ○ Water Content (%) LL
10 20 30 40

Instrumentation Installation

COMMENTS & GRAIN SIZE DISTRIBUTION (%)

MW10 Inferred Well Details Shown on this BH Log

GR	SA	SI	CL

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Groundwater depth encountered on completion of drilling: **2.1m**

Cave depth after auger removal: **2.1m**

Groundwater depth observed on **Mar. 5/20** at a depth of: **1.57m**

Observed on **Apr. 1/20** at a depth of: **0.91m**

Scale: **1 :50**

RECORD OF BOREHOLE No. 15

GEI Consultants

Project Number: **20-1014A**
Project Client: **PetromaxX Construction**
Project Name: **664, 674 & 692 Essa Rd and 320 Mapleview**
Project Location: **Barrie, Ontario**
Drilling Location: **See Attached Drawing**

Drilling Method: **Solid Stem** Drilling Machine: **Track Mount**
Logged By: **BH** Northing: **4909368** Date Started: **2020-03-04**
Reviewed By: **AW** Easting: **602891** Date Completed: **2020-03-04**

LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS & GRAIN SIZE DISTRIBUTION (%)			
Lithology Plot	DESCRIPTION	Sample Type	Sample Number	Recovery (%)	SPT "N" Value	DEPTH (m)	ELEVATION (m)	Shear Strength Testing (kPa): Other Test, Pocket Penetrometer, Field Vane (Intact), Field Vane (Remolded); 40 80 120 160; Penetration Testing: SPT, DCPT; 10 20 30 40	Combustible Organic Vapour (ppm), Combustible Organic Vapour (%LEL), Total Organic Vapour (ppm); 100 200 300 400; Atterberg Limits: PL, LL, Water Content (%); 10 20 30 40	Instrumentation Installation	GR	SA	SI	CL
	8.9 296.8					8 297								

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W: centralearth.com

Groundwater depth encountered on completion of drilling: **2.1m**
Cave depth after auger removal: **2.1m**
Groundwater depth observed on **Mar. 5/20** at a depth of: **1.57m**
Observed on **Apr. 1/20** at a depth of: **0.91m**

Borehole details presented do not constitute a thorough understanding of all potential conditions present and require interpretative assistance from a qualified geotechnical engineer. Also, borehole information should be read in conjunction with the geotechnical report for which it was commissioned and the accompanying 'Explanation of Boring Log'.

Scale: **1 :50**

Appendix B –

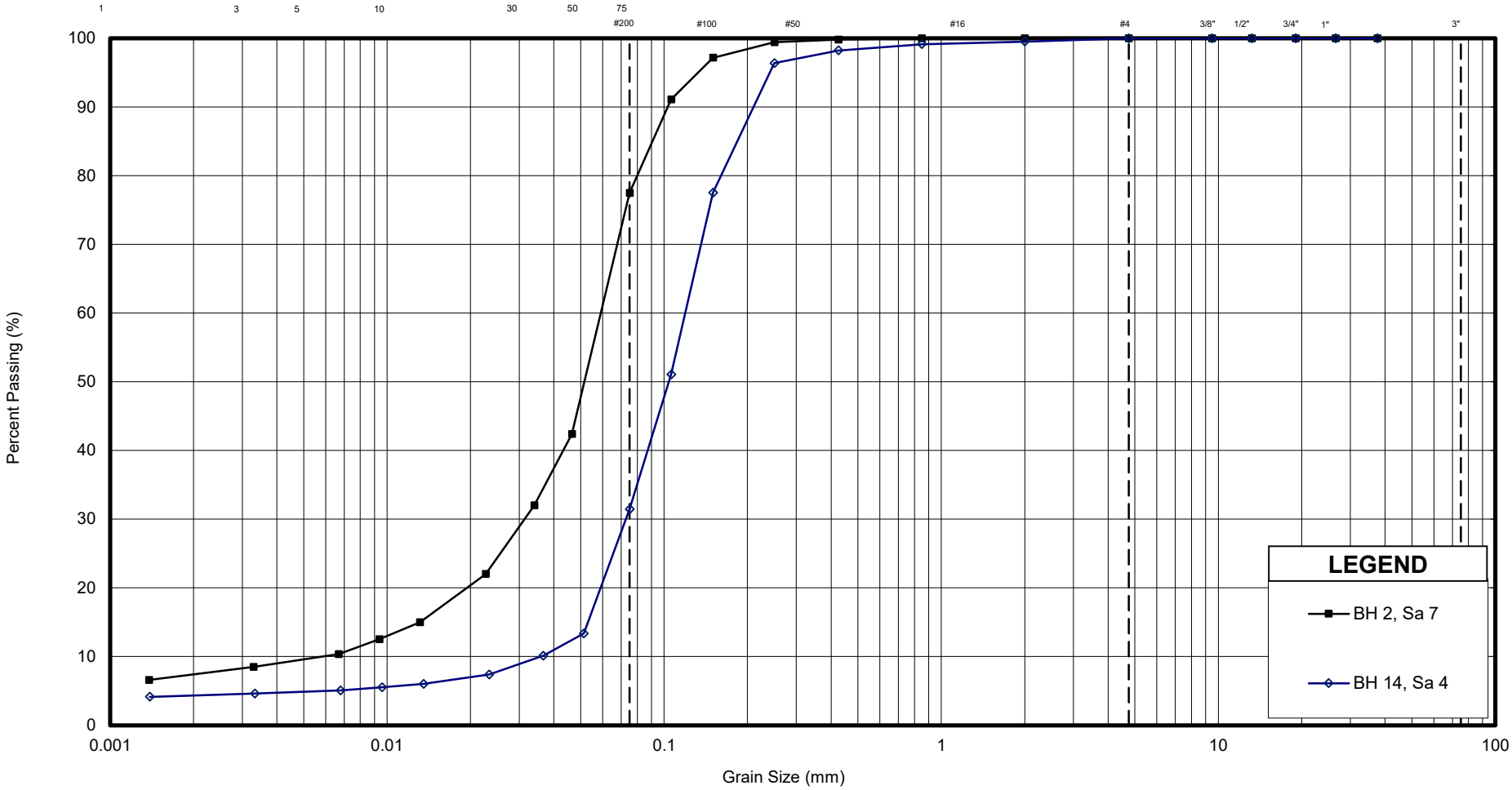
GEOTECHNICAL LABORATORY DATA

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY AND SILT	SAND			GRAVEL	
	Fine	Medium	Coarse	Fine	Coarse

GRAIN SIZE IN MICROMETERS

SIEVE DESIGNATION (IMPERIAL)



Sample	Description	Gr.	Sa.	Si.	Cl.	D_{10}	D_{30}	D_{60}	C_u	C_c
BH 3, Sa 7	SANDY SILT, trace clay	0	23	70	7	0.006	0.032	0.059	10.11	2.9
BH 14, Sa 4	SILTY SAND, trace clay	0	69	27	4	0.036	0.073	0.119	3.3	1.12

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GRAIN SIZE DISTRIBUTION

SANDY SILT TO SILTY SAND

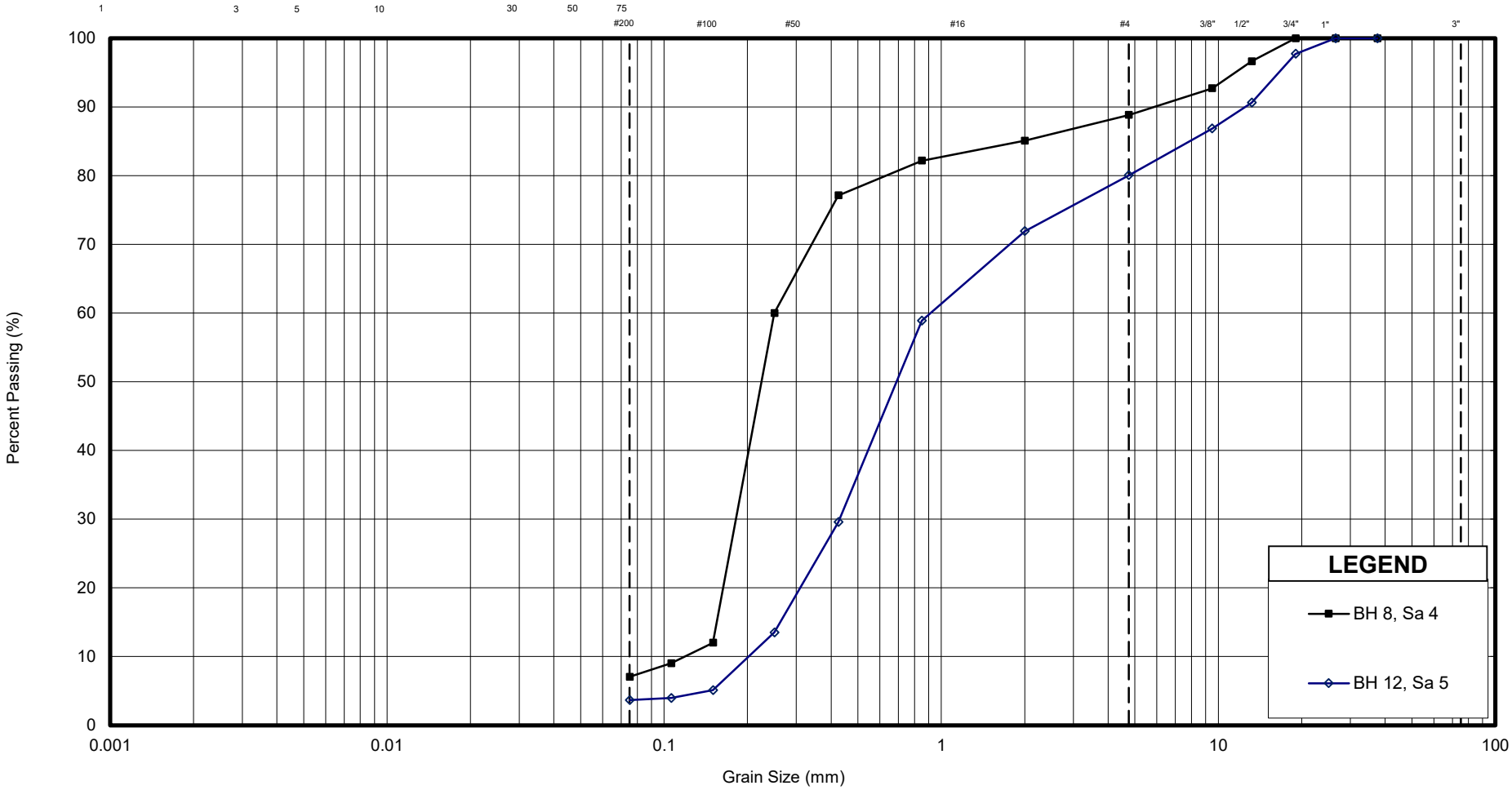
FIGURE No.	B1
REF. No.	20-1014A
DATE	April 2020

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY AND SILT	SAND			GRAVEL	
	Fine	Medium	Coarse	Fine	Coarse

GRAIN SIZE IN MICROMETERS

SIEVE DESIGNATION (IMPERIAL)



Sample	Description	Gr.	Sa.	Si.	Cl.	D_{10}	D_{30}	D_{60}	C_u	C_c
BH 8, Sa 4	SAND, some gravel, trace fines	11	82	7		0.12	0.18	0.25	2.1	1.1
BH 12, Sa 5	GRAVELLY SAND, trace fines	20	76	4		0.20	0.429	0.914	4.5	1.0

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GRAIN SIZE DISTRIBUTION

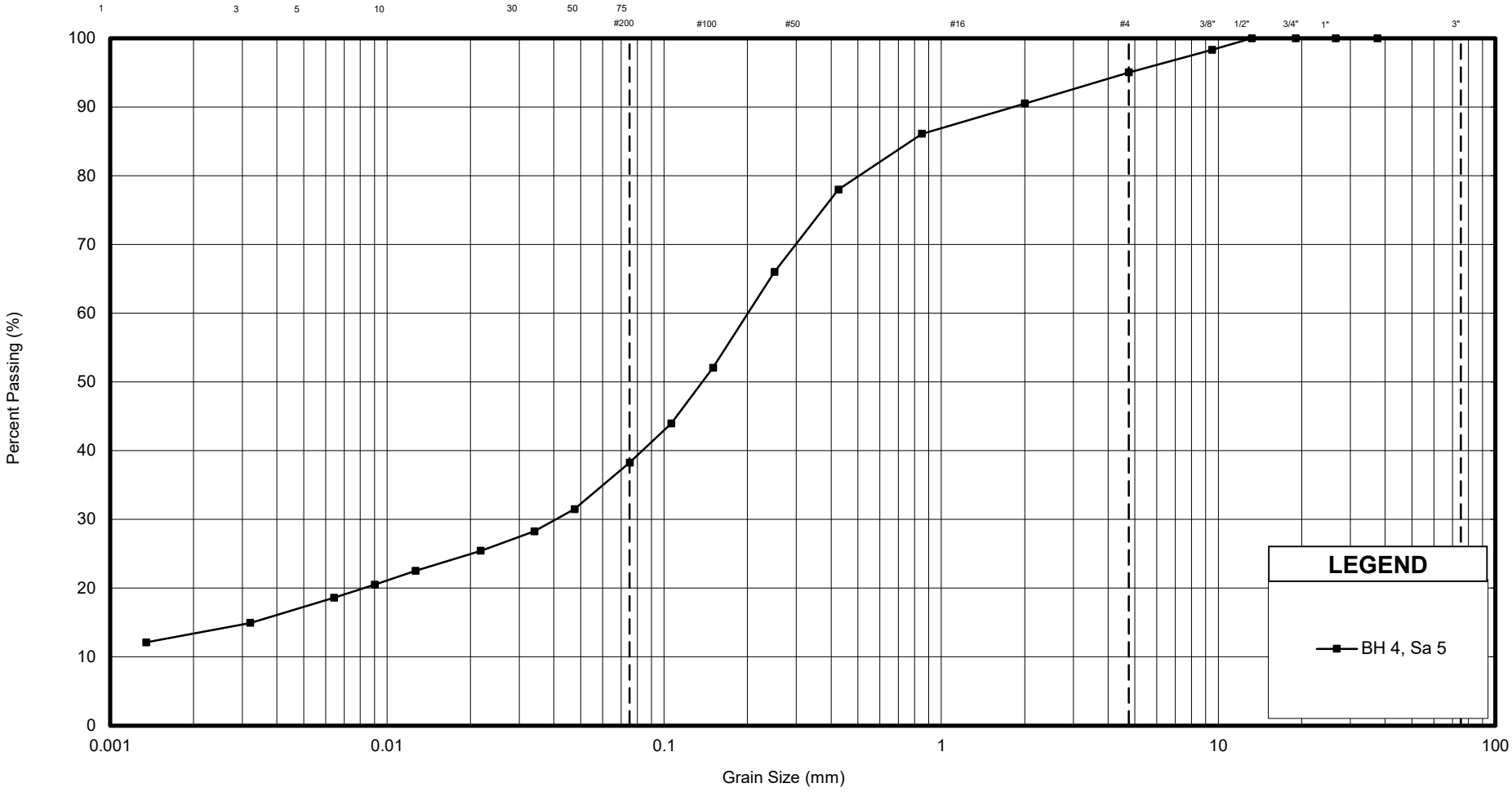
SAND TO GRAVELLY SAND

FIGURE No.	B2
REF. No.	20-1014A
DATE	April 2020

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY AND SILT	SAND			GRAVEL	
	Fine	Medium	Coarse	Fine	Coarse

GRAIN SIZE IN MICROMETERS — SIEVE DESIGNATION (IMPERIAL)



Sample	Description	Gr.	Sa.	Si.	Cl.	D_{10}	D_{30}	D_{60}	C_u	C_c
BH 4, Sa 5	SILTY SAND GLACIAL TILL, some clay, trace gravel	5	57	25	13	-	0.041	0.20	-	-

GEI Consultants

GRAIN SIZE DISTRIBUTION

SILTY SAND GLACIAL TILL

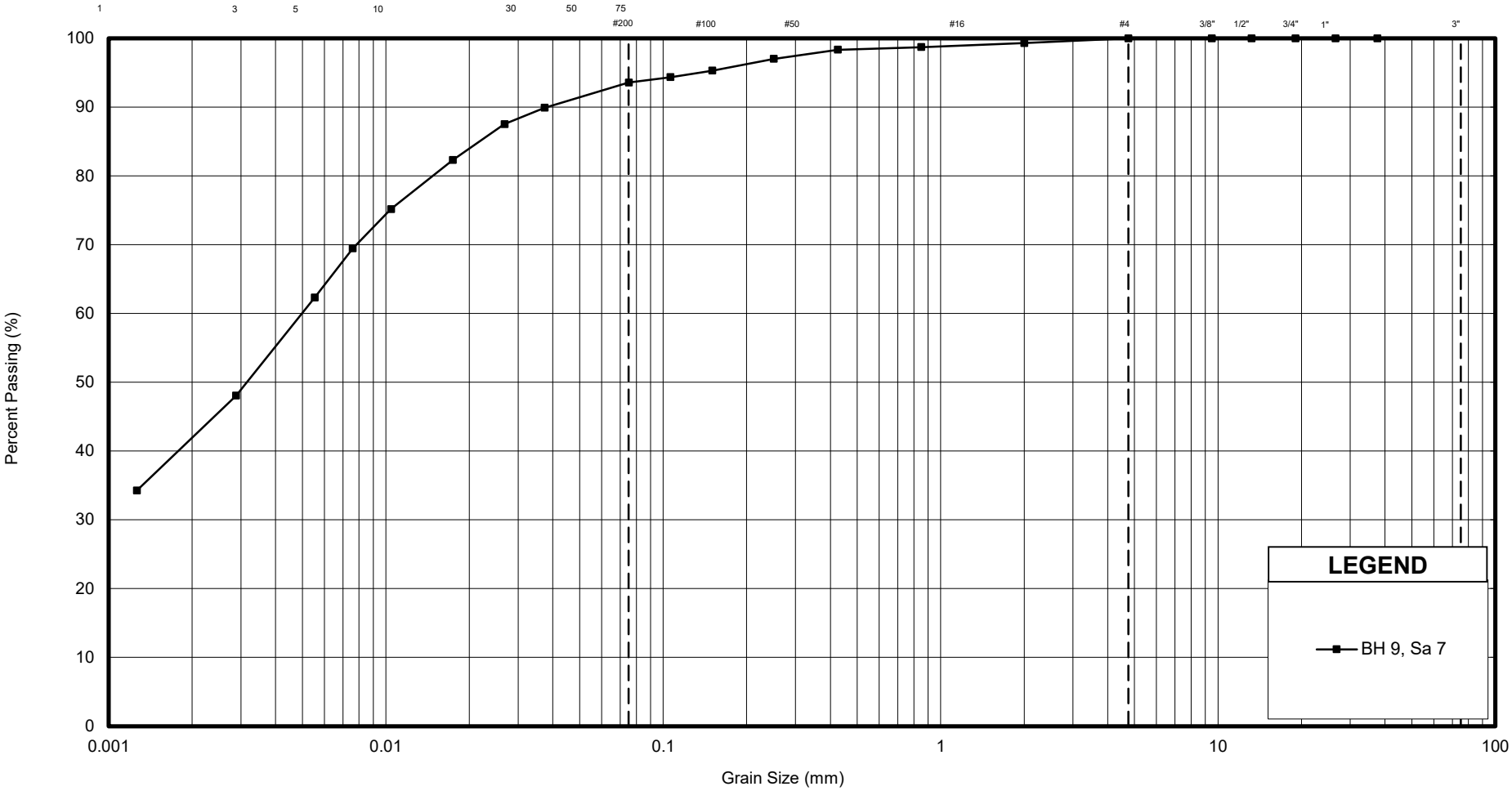
FIGURE No.	B3
REF. No.	20-1014A
DATE	April 2020

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY AND SILT	SAND			GRAVEL	
	Fine	Medium	Coarse	Fine	Coarse

GRAIN SIZE IN MICROMETERS

SIEVE DESIGNATION (IMPERIAL)



Sample	Description	Gr.	Sa.	Si.	Cl.	D_{10}	D_{30}	D_{60}	C_u	C_c
BH 9, Sa 7	SILT AND CLAY, trace sand	0	6	52	42	-	-	0.005	-	-

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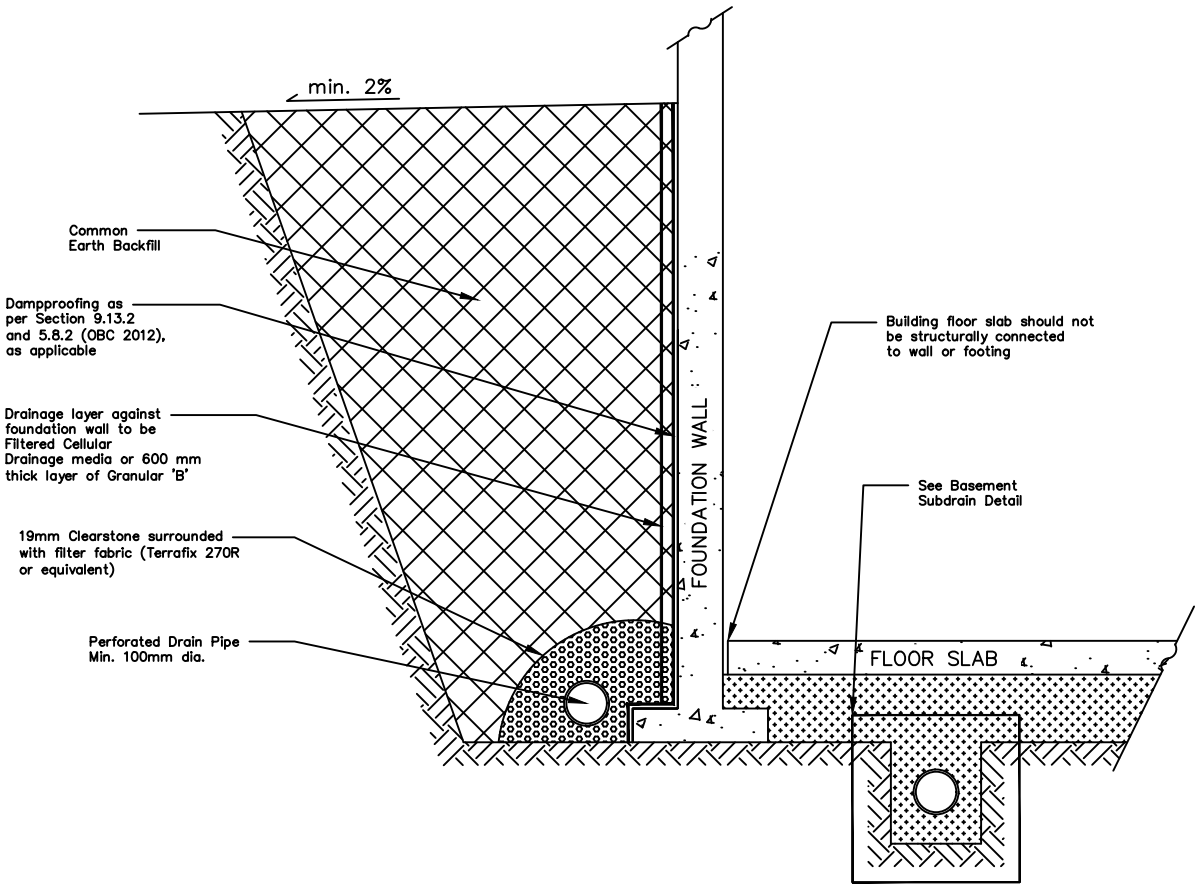
GRAIN SIZE DISTRIBUTION

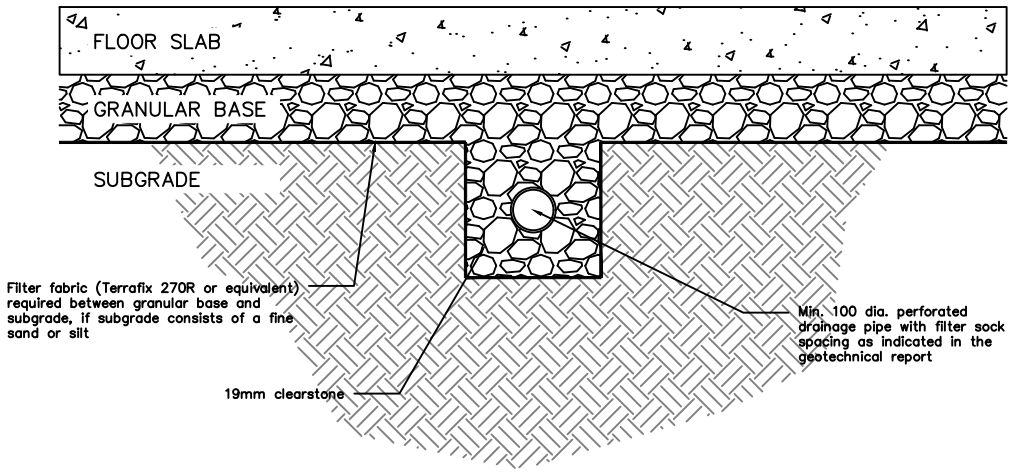
SILT & CLAY

FIGURE No.	B4
REF. No.	20-1014A
DATE	April 2020

Appendix C –

TYPICAL DETAILS





GEI Consultants
647 Welham Rd, Unit 14, Barrie, ON, L4N 0B7
P: (705) 719-7994

BASEMENT FOUNDATION WALL & SUBFLOOR DRAINAGE TYPICAL DETAIL

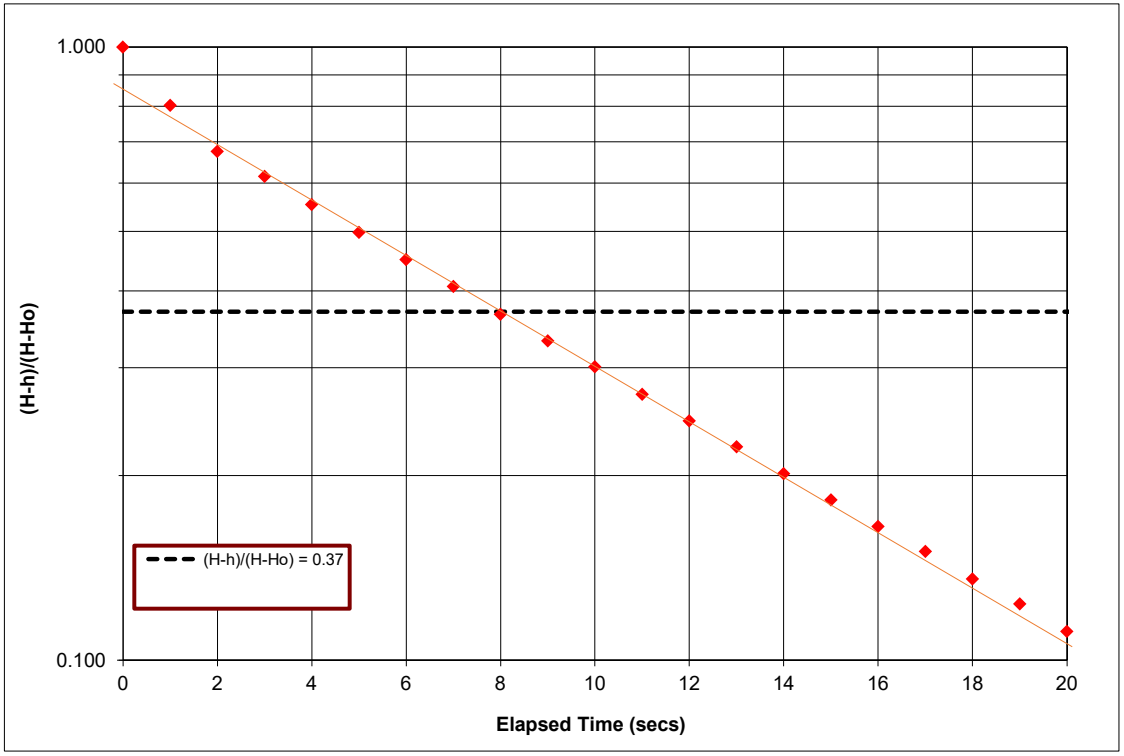
Appendix D –

RISING HEAD TEST DATA

Recovery Testing - Hvorslev Method (1951)

BOREHOLE 1 - MONITORING WELL 3

Time	Elapsed Time (mins)	Elapsed Time (sec)	Water Level (m)	H-h	(H-h)/(H-Ho)
			3.520		
2:03:49 PM	0.00	0	5.752	2.232	1.000
2:03:50 PM	0.02	1	5.314	1.794	0.804
2:03:51 PM	0.03	2	5.029	1.509	0.676
2:03:52 PM	0.05	3	4.894	1.374	0.616
2:03:53 PM	0.07	4	4.756	1.236	0.554
2:03:54 PM	0.08	5	4.633	1.113	0.499
2:03:55 PM	0.10	6	4.525	1.005	0.450
2:03:56 PM	0.12	7	4.429	0.909	0.407
2:03:57 PM	0.13	8	4.339	0.819	0.367
2:03:58 PM	0.15	9	4.261	0.741	0.332
2:03:59 PM	0.17	10	4.192	0.672	0.301
2:04:00 PM	0.18	11	4.126	0.606	0.272
2:04:01 PM	0.20	12	4.069	0.549	0.246
2:04:02 PM	0.22	13	4.018	0.498	0.223
2:04:03 PM	0.23	14	3.970	0.450	0.202
2:04:04 PM	0.25	15	3.928	0.408	0.183
2:04:05 PM	0.27	16	3.889	0.369	0.165
2:04:06 PM	0.28	17	3.856	0.336	0.151
2:04:07 PM	0.30	18	3.823	0.303	0.136
2:04:08 PM	0.32	19	3.796	0.276	0.124
2:04:09 PM	0.33	20	3.769	0.249	0.112
2:04:10 PM	0.35	21	3.745	0.225	0.101
2:04:11 PM	0.37	22	3.724	0.204	0.091
2:04:12 PM	0.38	23	3.664	0.144	0.065
2:04:13 PM	0.40	24	3.670	0.150	0.067



K = Hydraulic Conductivity
r = radius of well casing
R = Radius of well screen or filter pack
L = Length of the well screen (in Slug Test) or the length of submerged portion of the well screen (in Rising Head)
T_0 = time for water level to rise or fall to 37% of the initial change

Notes:
1 - All water levels are in metres from ground surface
1 - R is radius of sand pack
2 - T_o is determined from plots where (H-h)/(H-Ho) = 0.37
3 - Analysis based off of Horslev (1951)

r (m) =	0.016
L (m) =	1.5
R (m) =	0.075
T_o (sec) =	8
K (m/s) =	**3E-05**

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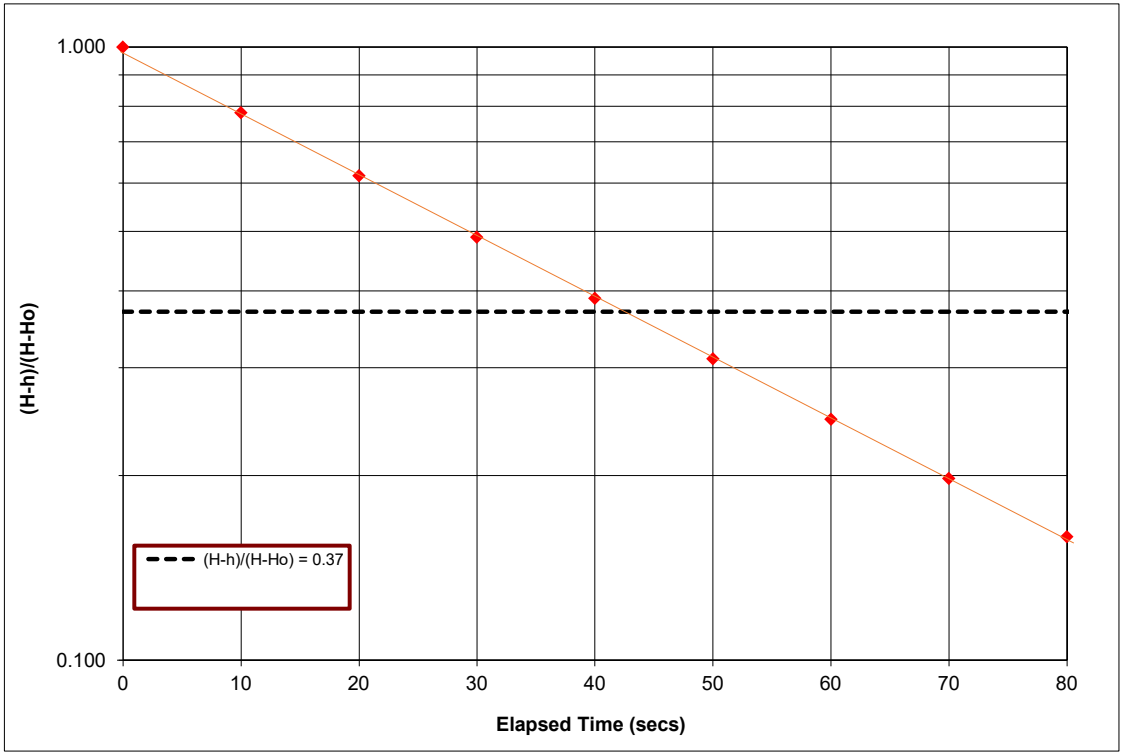
RISING HEAD TEST - BOREHOLE 1, MONITORING WELL 3

APPENDIX:	D
REF. No.:	20-1014A
DATE:	April 2020

Recovery Testing - Hvorslev Method (1951)

BOREHOLE 2 - MONITORING WELL 1

Time	Elapsed Time (mins)	Elapsed Time (sec)	Water Level (m)	H-h	(H-h)/(H-Ho)
			3.900		
1:28:42 PM	0.00	0	6.519	2.619	1.000
1:28:52 PM	0.17	10	5.949	2.049	0.782
1:29:02 PM	0.33	20	5.517	1.617	0.617
1:29:12 PM	0.50	30	5.184	1.284	0.490
1:29:22 PM	0.67	40	4.920	1.020	0.389
1:29:32 PM	0.83	50	4.713	0.813	0.310
1:29:42 PM	1.00	60	4.548	0.648	0.247
1:29:52 PM	1.17	70	4.419	0.519	0.198
1:30:02 PM	1.33	80	4.317	0.417	0.159
1:30:12 PM	1.50	90	4.233	0.333	0.127
1:30:22 PM	1.67	100	4.155	0.255	0.097
1:30:32 PM	1.83	110	4.116	0.216	0.082
1:30:42 PM	2.00	120	4.074	0.174	0.066
1:30:52 PM	2.17	130	4.041	0.141	0.054
1:31:02 PM	2.33	140	4.014	0.114	0.044
1:31:12 PM	2.50	150	3.993	0.093	0.036
1:31:22 PM	2.67	160	3.978	0.078	0.030
1:31:32 PM	2.83	170	3.966	0.066	0.025
1:31:42 PM	3.00	180	3.954	0.054	0.021
1:31:52 PM	3.17	190	3.945	0.045	0.017
1:32:02 PM	3.33	200	3.939	0.039	0.015
1:32:12 PM	3.50	210	3.933	0.033	0.013
1:32:22 PM	3.67	220	3.927	0.027	0.010
1:32:32 PM	3.83	230	3.924	0.024	0.009
1:32:42 PM	4.00	240	3.918	0.018	0.007



K = Hydraulic Conductivity
r = radius of well casing
R = Radius of well screen or filter pack
L = Length of the well screen (in Slug Test) or the length of submerged portion of the well screen (in Rising Head)
T_0 = time for water level to rise or fall to 37% of the initial change

Notes:
1 - All water levels are in metres from ground surface
1 - R is radius of sand pack
2 - T_o is determined from plots where (H-h)/(H-Ho) = 0.37
3 - Analysis based off of Horslev (1951)

r (m) =	0.016
L (m) =	1.5
R (m) =	0.075
T_o (sec) =	43
K (m/s) =	**6E-06**

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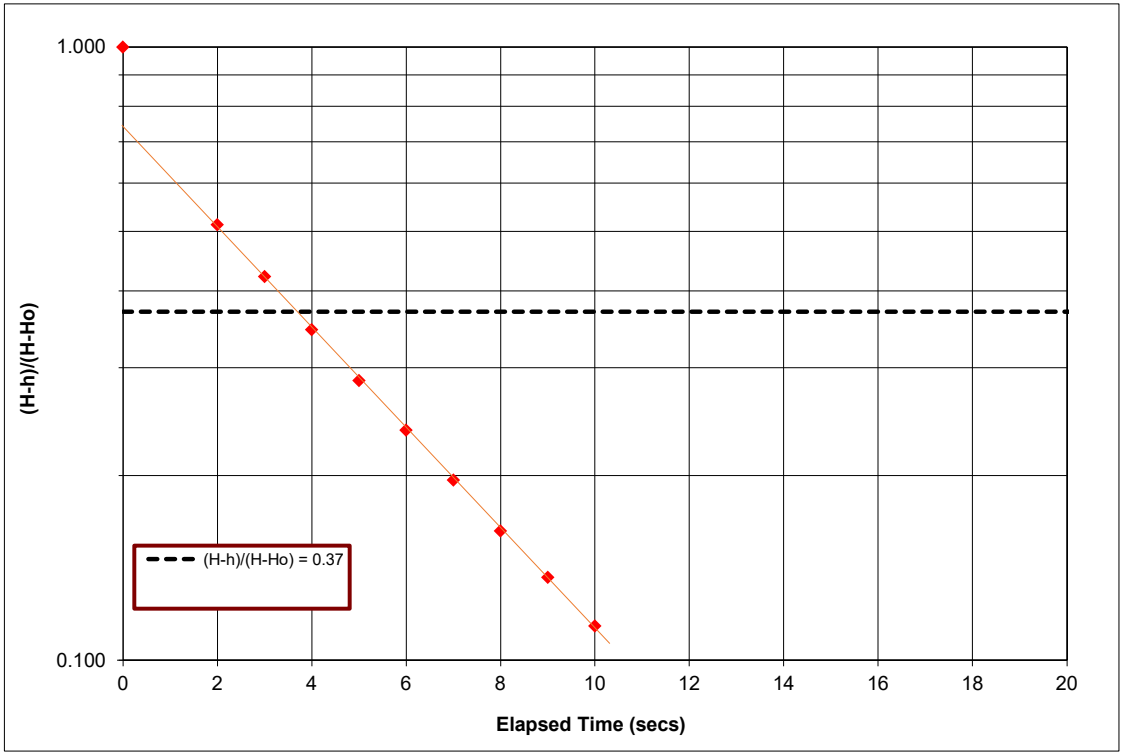
RISING HEAD TEST - BOREHOLE 2, MONITORING WELL 1

APPENDIX:	D
REF. No.:	20-1014A
DATE:	April 2020

Recovery Testing - Hvorslev Method (1951)

BOREHOLE 3 - MONITORING WELL 2

Time	Elapsed Time (mins)	Elapsed Time (sec)	Water Level (m)	H-h	(H-h)/(H-Ho)
			4.020		
1:17:58 PM	0.00	0	5.865	1.845	1.000
1:18:00 PM	0.03	2	4.968	0.948	0.514
1:18:01 PM	0.05	3	4.800	0.780	0.423
1:18:02 PM	0.07	4	4.659	0.639	0.346
1:18:03 PM	0.08	5	4.548	0.528	0.286
1:18:04 PM	0.10	6	4.458	0.438	0.237
1:18:05 PM	0.12	7	4.383	0.363	0.197
1:18:06 PM	0.13	8	4.320	0.300	0.163
1:18:07 PM	0.15	9	4.272	0.252	0.137
1:18:08 PM	0.17	10	4.230	0.210	0.114
1:18:09 PM	0.18	11	4.197	0.177	0.096
1:18:10 PM	0.20	12	4.170	0.150	0.081
1:18:11 PM	0.22	13	4.149	0.129	0.070
1:18:12 PM	0.23	14	4.128	0.108	0.059
1:18:13 PM	0.25	15	4.113	0.093	0.050
1:18:14 PM	0.27	16	4.101	0.081	0.044
1:18:15 PM	0.28	17	4.089	0.069	0.037
1:18:16 PM	0.30	18	4.080	0.060	0.033
1:18:17 PM	0.32	19	4.074	0.054	0.029
1:18:18 PM	0.33	20	4.068	0.048	0.026
1:18:19 PM	0.35	21	4.062	0.042	0.023
1:18:20 PM	0.37	22	4.059	0.039	0.021
1:18:21 PM	0.38	23	4.053	0.033	0.018
1:18:22 PM	0.40	24	4.050	0.030	0.016
1:18:23 PM	0.42	25	4.050	0.030	0.016
1:18:24 PM	0.43	26	4.047	0.027	0.015



K = Hydraulic Conductivity
r = radius of well casing
R = Radius of well screen or filter pack
L = Length of the well screen (in Slug Test) or the length of submerged portion of the well screen (in Rising Head)
T_0 = time for water level to rise or fall to 37% of the initial change

Notes:
1 - All water levels are in metres from ground surface
1 - R is radius of sand pack
2 - T_o is determined from plots where (H-h)/(H-Ho) = 0.37
3 - Analysis based off of Horslev (1951)

r (m) =	0.016
L (m) =	1.5
R (m) =	0.075
T_o (sec) =	3.8
K (m/s) =	**7E-05**

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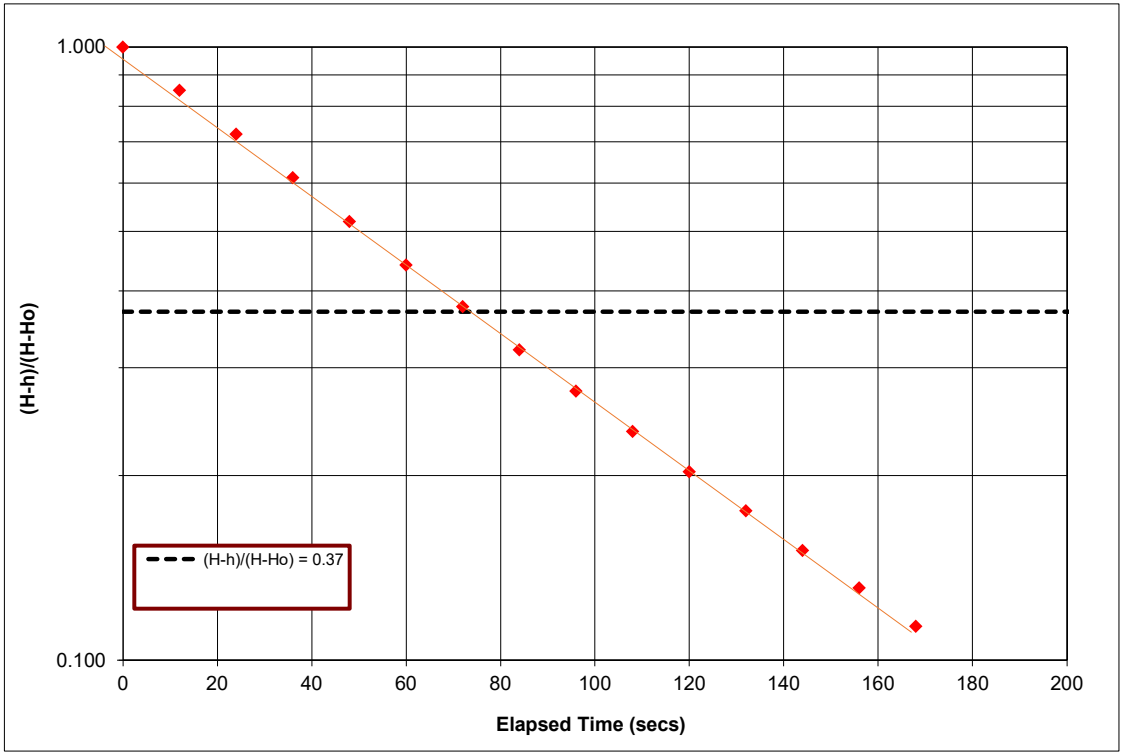
RISING HEAD TEST - BOREHOLE 3, MONITORING WELL 2

APPENDIX:	D
REF. No.:	20-1014A
DATE:	April 2020

Recovery Testing - Hvorslev Method (1951)

BOREHOLE 6 - MONITORING WELL 7

Time	Elapsed Time (mins)	Elapsed Time (sec)	Water Level (m)	H-h	(H-h)/(H-Ho)
			3.520		
2:14:49 PM	0.00	0	6.238	2.718	1.000
2:15:01 PM	0.20	12	5.833	2.313	0.851
2:15:13 PM	0.40	24	5.482	1.962	0.722
2:15:25 PM	0.60	36	5.185	1.665	0.613
2:15:37 PM	0.80	48	4.933	1.413	0.520
2:15:49 PM	1.00	60	4.720	1.200	0.442
2:16:01 PM	1.20	72	4.546	1.026	0.377
2:16:13 PM	1.40	84	4.393	0.873	0.321
2:16:25 PM	1.60	96	4.267	0.747	0.275
2:16:37 PM	1.80	108	4.162	0.642	0.236
2:16:49 PM	2.00	120	4.072	0.552	0.203
2:17:01 PM	2.20	132	3.997	0.477	0.175
2:17:13 PM	2.40	144	3.931	0.411	0.151
2:17:25 PM	2.60	156	3.877	0.357	0.131
2:17:37 PM	2.80	168	3.829	0.309	0.114
2:17:49 PM	3.00	180	3.787	0.267	0.098
2:18:01 PM	3.20	192	3.754	0.234	0.086
2:18:13 PM	3.40	204	3.724	0.204	0.075
2:18:25 PM	3.60	216	3.697	0.177	0.065
2:18:37 PM	3.80	228	3.676	0.156	0.057
2:18:49 PM	4.00	240	3.661	0.141	0.052
2:19:01 PM	4.20	252	3.646	0.126	0.046
2:19:13 PM	4.40	264	3.631	0.111	0.041
2:19:25 PM	4.60	276	3.619	0.099	0.036
2:19:37 PM	4.80	288	3.607	0.087	0.032
2:19:49 PM	5.00	300	3.598	0.078	0.029
2:20:01 PM	5.20	312	3.589	0.069	0.025



K = Hydraulic Conductivity
r = radius of well casing
R = Radius of well screen or filter pack
L = Length of the well screen (in Slug Test) or the length of submerged portion of the well screen (in Rising Head)
T_0 = time for water level to rise or fall to 37% of the initial change

Notes:
1 - All water levels are in metres from ground surface
1 - R is radius of sand pack
2 - T_o is determined from plots where (H-h)/(H-Ho) = 0.37
3 - Analysis based off of Horslev (1951)

r (m) =	0.016
L (m) =	1.5
R (m) =	0.075
T_o (sec) =	75
K (m/s) =	**3E-06**

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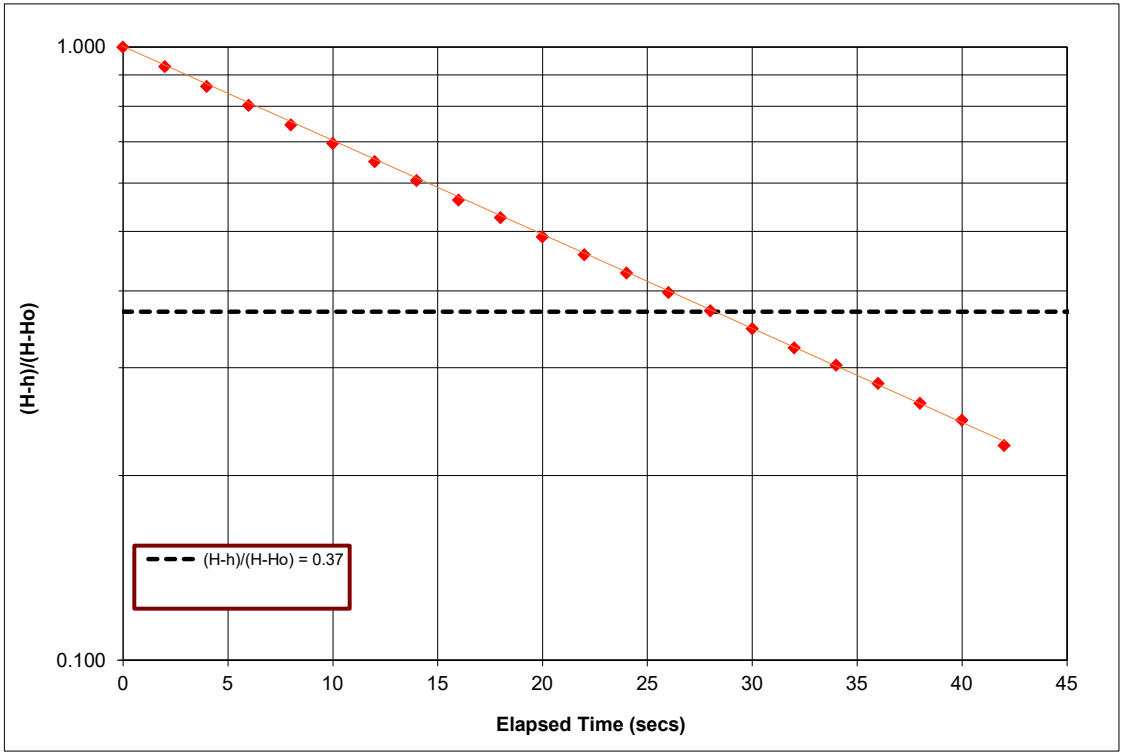
RISING HEAD TEST - BOREHOLE 6, MONITORING WELL 7

APPENDIX:	D
REF. No.:	20-1014A
DATE:	April 2020

Recovery Testing - Hvorslev Method (1951)

BOREHOLE 7 - MONITORING WELL 4

Time	Elapsed Time (mins)	Elapsed Time (sec)	Water Level (m)	H-h	(H-h)/(H-Ho)
			4.450		
12:57:23 PM	0.00	0	5.935	1.485	1.000
12:57:25 PM	0.03	2	5.830	1.380	0.929
12:57:27 PM	0.07	4	5.731	1.281	0.863
12:57:29 PM	0.10	6	5.644	1.194	0.804
12:57:31 PM	0.13	8	5.560	1.110	0.747
12:57:33 PM	0.17	10	5.485	1.035	0.697
12:57:35 PM	0.20	12	5.416	0.966	0.651
12:57:37 PM	0.23	14	5.350	0.900	0.606
12:57:39 PM	0.27	16	5.287	0.837	0.564
12:57:41 PM	0.30	18	5.233	0.783	0.527
12:57:43 PM	0.33	20	5.179	0.729	0.491
12:57:45 PM	0.37	22	5.131	0.681	0.459
12:57:47 PM	0.40	24	5.086	0.636	0.428
12:57:49 PM	0.43	26	5.041	0.591	0.398
12:57:51 PM	0.47	28	5.002	0.552	0.372
12:57:53 PM	0.50	30	4.966	0.516	0.347
12:57:55 PM	0.53	32	4.930	0.480	0.323
12:57:57 PM	0.57	34	4.900	0.450	0.303
12:57:59 PM	0.60	36	4.870	0.420	0.283
12:58:01 PM	0.63	38	4.840	0.390	0.263
12:58:03 PM	0.67	40	4.816	0.366	0.246
12:58:05 PM	0.70	42	4.783	0.333	0.224



K = Hydraulic Conductivity
r = radius of well casing
R = Radius of well screen or filter pack
L = Length of the well screen (in Slug Test) or the length of submerged portion of the well screen (in Rising Head)
T_0 = time for water level to rise or fall to 37% of the initial change

Notes:
1 - All water levels are in metres from ground surface
1 - R is radius of sand pack
2 - T_o is determined from plots where (H-h)/(H-Ho) = 0.37
3 - Analysis based off of Horslev (1951)

r (m) =	0.016
L (m) =	1.5
R (m) =	0.075
T_o (sec) =	28
K (m/s) =	**9E-06**

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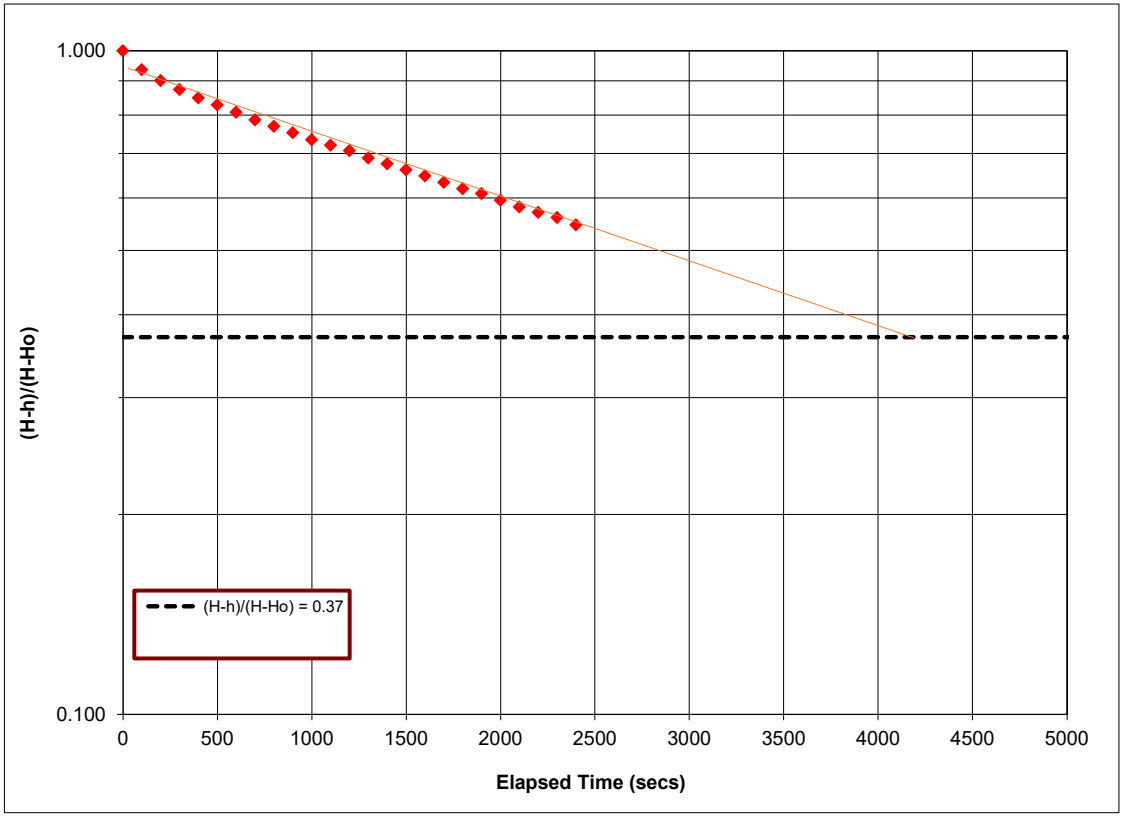
RISING HEAD TEST - BOREHOLE 7, MONITORING WELL 4

APPENDIX:	D
REF. No.:	20-1014A
DATE:	April 2020

Recovery Testing - Hvorslev Method (1951)

BOREHOLE 9 - MONITORING WELL 11

Time	Elapsed Time (mins)	Elapsed Time (sec)	Water Level (m)	H-h	(H-h)/(H-Ho)
			1.610		
10:17:08 AM	0.00	0	0.749	-0.861	1.000
10:18:48 AM	1.67	100	0.803	-0.807	0.937
10:20:28 AM	3.33	200	0.833	-0.777	0.902
10:22:08 AM	5.00	300	0.857	-0.753	0.875
10:23:48 AM	6.67	400	0.878	-0.732	0.850
10:25:28 AM	8.33	500	0.896	-0.714	0.829
10:27:08 AM	10.00	600	0.914	-0.696	0.808
10:28:48 AM	11.67	700	0.932	-0.678	0.787
10:30:28 AM	13.33	800	0.947	-0.663	0.770
10:32:08 AM	15.00	900	0.962	-0.648	0.753
10:33:48 AM	16.67	1000	0.977	-0.633	0.735
10:35:28 AM	18.33	1100	0.989	-0.621	0.721
10:37:08 AM	20.00	1200	1.001	-0.609	0.707
10:38:48 AM	21.67	1300	1.016	-0.594	0.690
10:40:28 AM	23.33	1400	1.028	-0.582	0.676
10:42:08 AM	25.00	1500	1.04	-0.570	0.662
10:43:48 AM	26.67	1600	1.052	-0.558	0.648
10:45:28 AM	28.33	1700	1.064	-0.546	0.634
10:47:08 AM	30.00	1800	1.076	-0.534	0.620
10:48:48 AM	31.67	1900	1.085	-0.525	0.610
10:50:28 AM	33.33	2000	1.097	-0.513	0.596
10:52:08 AM	35.00	2100	1.109	-0.501	0.582
10:53:48 AM	36.67	2200	1.118	-0.492	0.571
10:55:28 AM	38.33	2300	1.127	-0.483	0.561
10:57:08 AM	40.00	2400	1.139	-0.471	0.547



K = Hydraulic Conductivity
r = radius of well casing
R = Radius of well screen or filter pack
L = Length of the well screen (in Slug Test) or the length of submerged portion of the well screen (in Rising Head)
T_0 = time for water level to rise or fall to 37% of the initial change

Notes:
1 - All water levels are in metres from ground surface
1 - R is radius of sand pack
2 - T_o is determined from plots where (H-h)/(H-Ho) = 0.37
3 - Analysis based off of Horslev (1951)

r (m) =	0.025
L (m) =	1.5
R (m) =	0.075
T_o (sec) =	4,150
K (m/s) =	**2E-07**

GEI Consultants

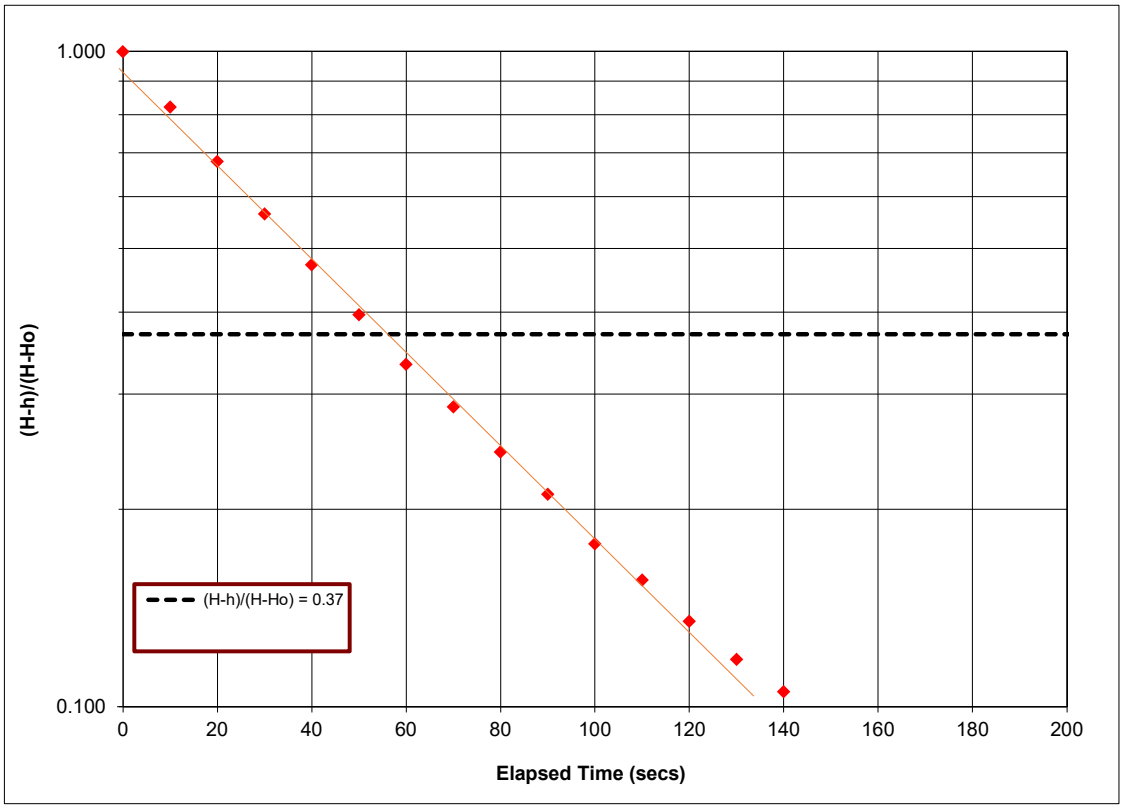
RISING HEAD TEST - BOREHOLE 9, MONITORING WELL 11

APPENDIX:	D
REF. No.:	20-1014A
DATE:	April 2020

Recovery Testing - Hvorslev Method (1951)

BOREHOLE 11 - MONITORING WELL 8

Time	Elapsed Time (mins)	Elapsed Time (sec)	Water Level (m)	H-h	(H-h)/(H-Ho)
			1.460		
11:30:52 AM	0.00	0	2.171	0.711	1.000
11:31:02 AM	0.17	10	2.045	0.585	0.823
11:31:12 AM	0.33	20	1.943	0.483	0.679
11:31:22 AM	0.50	30	1.862	0.402	0.565
11:31:32 AM	0.67	40	1.796	0.336	0.473
11:31:42 AM	0.83	50	1.742	0.282	0.397
11:31:52 AM	1.00	60	1.697	0.237	0.333
11:32:02 AM	1.17	70	1.664	0.204	0.287
11:32:12 AM	1.33	80	1.634	0.174	0.245
11:32:22 AM	1.50	90	1.61	0.150	0.211
11:32:32 AM	1.67	100	1.586	0.126	0.177
11:32:42 AM	1.83	110	1.571	0.111	0.156
11:32:52 AM	2.00	120	1.556	0.096	0.135
11:33:02 AM	2.17	130	1.544	0.084	0.118
11:33:12 AM	2.33	140	1.535	0.075	0.105
11:33:22 AM	2.50	150	1.526	0.066	0.093
11:33:32 AM	2.67	160	1.52	0.060	0.084
11:33:42 AM	2.83	170	1.517	0.057	0.080
11:33:52 AM	3.00	180	1.511	0.051	0.072



K = Hydraulic Conductivity
r = radius of well casing
R = Radius of well screen or filter pack
L = Length of the well screen (in Slug Test) or the length of submerged portion of the well screen (in Rising Head)
T_0 = time for water level to rise or fall to 37% of the initial change

Notes:
1 - All water levels are in metres from ground surface
1 - R is radius of sand pack
2 - T_o is determined from plots where (H-h)/(H-Ho) = 0.37
3 - Analysis based off of Horslev (1951)

r (m) =	0.025
L (m) =	1.5
R (m) =	0.075
T_o (sec) =	55
K (m/s) =	**1E-05**

GEI Consultants

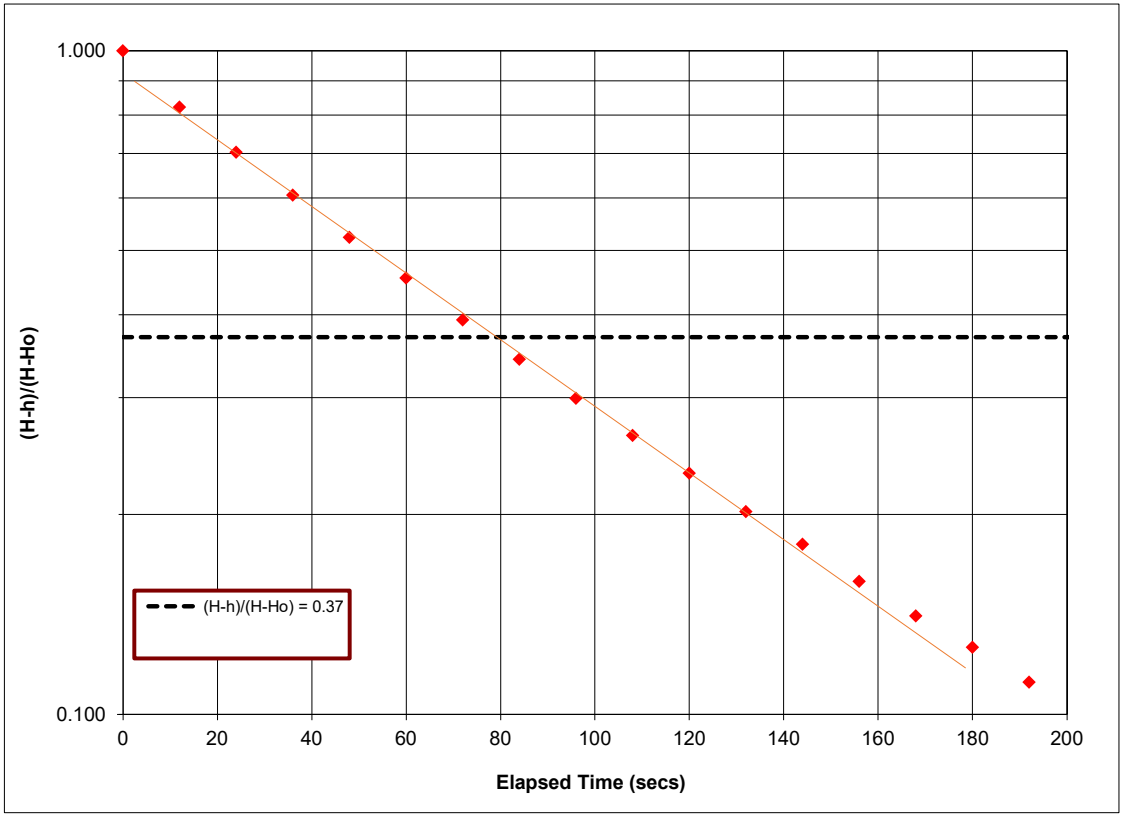
RISING HEAD TEST - BOREHOLE 11, MONITORING WELL 8

APPENDIX:	D
REF. No.:	20-1014A
DATE:	April 2020

Recovery Testing - Hvorslev Method (1951)

BOREHOLE 13 - MONITORING WELL 9

Time	Elapsed Time (mins)	Elapsed Time (sec)	Water Level (m)	H-h	(H-h)/(H-Ho)
			2.070		
9:49:09 AM	0.00	0	2.901	0.831	1.000
9:49:21 AM	0.20	12	2.754	0.684	0.823
9:49:33 AM	0.40	24	2.655	0.585	0.704
9:49:45 AM	0.60	36	2.574	0.504	0.606
9:49:57 AM	0.80	48	2.505	0.435	0.523
9:50:09 AM	1.00	60	2.448	0.378	0.455
9:50:21 AM	1.20	72	2.397	0.327	0.394
9:50:33 AM	1.40	84	2.355	0.285	0.343
9:50:45 AM	1.60	96	2.319	0.249	0.300
9:50:57 AM	1.80	108	2.289	0.219	0.264
9:51:09 AM	2.00	120	2.262	0.192	0.231
9:51:21 AM	2.20	132	2.238	0.168	0.202
9:51:33 AM	2.40	144	2.22	0.150	0.181
9:51:45 AM	2.60	156	2.202	0.132	0.159
9:51:57 AM	2.80	168	2.187	0.117	0.141
9:52:09 AM	3.00	180	2.175	0.105	0.126
9:52:21 AM	3.20	192	2.163	0.093	0.112
9:52:33 AM	3.40	204	2.154	0.084	0.101
9:52:45 AM	3.60	216	2.145	0.075	0.090
9:52:57 AM	3.80	228	2.139	0.069	0.083
9:53:09 AM	4.00	240	2.13	0.060	0.072
9:53:21 AM	4.20	252	2.127	0.057	0.069
9:53:33 AM	4.40	264	2.121	0.051	0.061
9:53:45 AM	4.60	276	2.115	0.045	0.054
9:53:57 AM	4.80	288	2.112	0.042	0.051
9:54:09 AM	5.00	300	2.109	0.039	0.047
9:54:21 AM	5.20	312	2.106	0.036	0.043
9:54:33 AM	5.40	324	2.103	0.033	0.040



K = Hydraulic Conductivity
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R = Radius of well screen or filter pack
L = Length of the well screen (in Slug Test) or the length of submerged portion of the well screen (in Rising Head)
T_0 = time for water level to rise or fall to 37% of the initial change

Notes:
1 - All water levels are in metres from ground surface
1 - R is radius of sand pack
2 - T_o is determined from plots where (H-h)/(H-Ho) = 0.37
3 - Analysis based off of Horslev (1951)

r (m) =	0.025
L (m) =	1.5
R (m) =	0.075
T_o (sec) =	80
K (m/s) =	**8E-06**

GEI Consultants

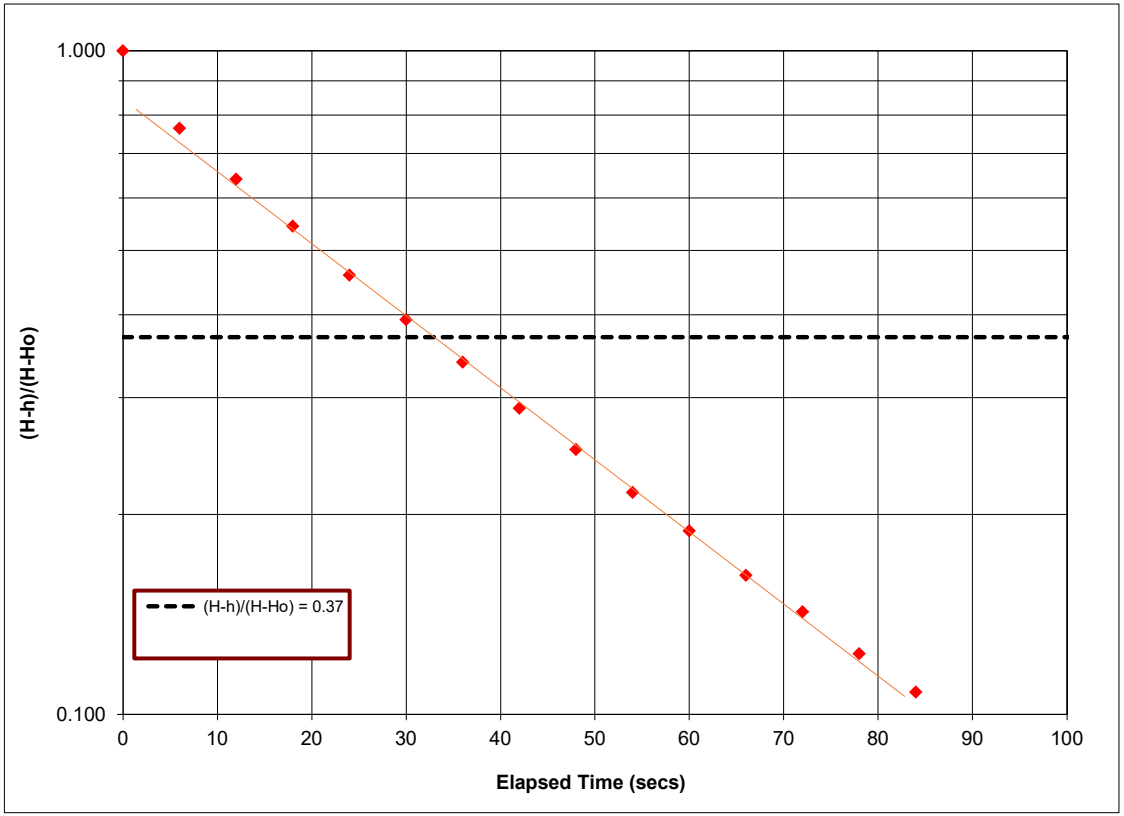
RISING HEAD TEST - BOREHOLE 13, MONITORING WELL 9

APPENDIX:	D
REF. No.:	20-1014A
DATE:	April 2020

Recovery Testing - Hvorslev Method (1951)

BOREHOLE 15 - MONITORING WELL 10

Time	Elapsed Time (mins)	Elapsed Time (sec)	Water Level (m)	H-h	(H-h)/(H-Ho)
			1.680		
12:06:43 PM	0.00	0	2.457	0.777	1.000
12:06:49 PM	0.10	6	2.274	0.594	0.764
12:06:55 PM	0.20	12	2.178	0.498	0.641
12:07:01 PM	0.30	18	2.103	0.423	0.544
12:07:07 PM	0.40	24	2.037	0.357	0.459
12:07:13 PM	0.50	30	1.986	0.306	0.394
12:07:19 PM	0.60	36	1.944	0.264	0.340
12:07:25 PM	0.70	42	1.905	0.225	0.290
12:07:31 PM	0.80	48	1.875	0.195	0.251
12:07:37 PM	0.90	54	1.848	0.168	0.216
12:07:43 PM	1.00	60	1.827	0.147	0.189
12:07:49 PM	1.10	66	1.806	0.126	0.162
12:07:55 PM	1.20	72	1.791	0.111	0.143
12:08:01 PM	1.30	78	1.776	0.096	0.124
12:08:07 PM	1.40	84	1.764	0.084	0.108
12:08:13 PM	1.50	90	1.755	0.075	0.097
12:08:19 PM	1.60	96	1.746	0.066	0.085
12:08:25 PM	1.70	102	1.74	0.060	0.077
12:08:31 PM	1.80	108	1.734	0.054	0.069
12:08:37 PM	1.90	114	1.731	0.051	0.066
12:08:43 PM	2.00	120	1.725	0.045	0.058
12:08:49 PM	2.10	126	1.725	0.045	0.058
12:08:55 PM	2.20	132	1.722	0.042	0.054
12:09:01 PM	2.30	138	1.722	0.042	0.054



K = Hydraulic Conductivity
r = radius of well casing
R = Radius of well screen or filter pack
L = Length of the well screen (in Slug Test) or the length of submerged portion of the well screen (in Rising Head)
T_0 = time for water level to rise or fall to 37% of the initial change

Notes:
1 - All water levels are in metres from ground surface
1 - R is radius of sand pack
2 - T_o is determined from plots where (H-h)/(H-Ho) = 0.37
3 - Analysis based off of Horslev (1951)

r (m) =	0.025
L (m) =	1.5
R (m) =	0.075
T_o (sec) =	35
K (m/s) =	**2E-05**

GEI Consultants

RISING HEAD TEST - BOREHOLE 15, MONITORING WELL 10

APPENDIX:	D
REF. No.:	20-1014A
DATE:	April 2020

Appendix E –

MECP WELL RECORDS

APPENDIX E - MECP Well Record Summary Table

20-2014A
664, 674 & 692 Essa Rd. & 320 Mapleview Dr. W.

Well ID	Date Installed	Well Use	Depth to Top of Screen (m)	Water Level (m)	Stratigraphy Summary (Depth in m)
5701372	19-May-53	Domestic Water Supply	12.2	12.2	0 to 14.6 - Sand
5701378	19-Nov-65	Domestic Water Supply	10.4	9.1	0 to 11.6 - Sands
5701380	17-Oct-66	Domestic Water Supply	10.7	10.4	0 to 7.3 - Clay 7.3 to 11.6 - Silty Sand to Sand
5701381	23-Jan-67	Domestic Water Supply	Unknown	6.1	0 to 6.1 - Gravel 6.1 to 9.1 - Sand
5701382	20-Apr-67	Domestic Water Supply	10.4	7.9	0 to 2.4 - Sand 2.4 to 7.9 - Sandy Clay 7.9 to 10.4 - Sands
5701385	07-May-65	Domestic Water Supply	Unknown	6.7	0 to 3.0 - Clay 3.0 to 9.8 - Sand and Gravel
5701386	24-Nov-65	Farm Suply	39.3	41.2	0 to 10.4 - Clay 10.4 to 19.8 - Sand 19.8 to 24.4 - Clay 24.4 to 41.8 - Sand and Gravel
5701437	15-May-66	Farm Suply	40.9	38.7	0 to 9.1 - Clays 9.1 to 14.6 - Sand 14.6 to 22.6 - Clays 22.6 to 42.1 - Sands
5705419	20-Nov-68	Domestic Water Supply	Unknown	9.1	0 to 4.6 - Clay 4.6 to 9.1 - Sand
5706188	15-Feb-69	Domestic Water Supply	56.1	42.7	0 to 7.3 - Clay 7.3 to 58.5 - Sands
5706559	05-Aug-69	Domestic Water Supply	Unknown	4.3	0 to 4.3 - Clay 4.3 to 8.5 - Sand
5706809	03-Oct-69	Domestic Water Supply	Unknown	6.1	0 to 6.1 - Clay 6.1 to 9.1 - Sand
5707186	30-May-70	Domestic Water Supply	39	35.1	0 to 6.4 - Clay 6.4 to 18.0 - Silt 18.0 to 24.4 - Clay 24.4 to 39.9 - Sand
5714608	02-Sep-77	Domestic Water Supply	46	45.7	0 to 24.4 - Clays 24.4 to 48.2 - Sands
5714810	17-Oct-77	Domestic Water Supply	59.5	Unknown	Unknown
5714810	14-Nov-77	Domestic Water Supply	39.6	38.4	0 to 6.1 - Clay 6.1 to 15.2 - Silty Sand 15.2 to 18.3 - Clay 18.3 to 41.2 - Silty Sands
5715083	08-Oct-77	Domestic Water Supply	41.5	41.2	0 to 13.7 - Clay 13.7 to 27.4 - Sand 27.4 to 41.2 - Clay 41.2 to 43.6 - Sand
5717258	25-Jul-80	Domestic Water Supply	Unknown	6.1	0 to 10.7 - Sand
5717677	01-Sep-81	Municipal Water Supply	34.1	31.4	0 to 5.8 - Clay 5.8 to 17.4 - Sand 17.4 to 18.9 - Clay 18.9 to 39.0 - Sands and Gravel
5719741	03-Oct-84	Domestic Water Supply	23.2	22.9	0 to 22.9 - Clay with Sand 22.9 to 23.8 - Fine Sand
5723085	31-Oct-87	Domestic Water Supply	Unknown	50	0 to 12.8 - Clay 12.8 to 15.2 - Silt 15.2 to 17.7 - Clay 17.7 to 50.0 - Sand
5723424	24-Jun-88	Domestic Water Supply	11.0	11.0	0 to 1.8 - Sand 1.8 to 7.9 - Clay 7.9 to 12.2 - Sand 12.2 to 15.2 - Clay
5733259	03-Dec-97	Well Abandonment Record	n/a	n/a	n/a
5736556	23-Oct-01	Well Abandonment Record for 5717676	n/a	n/a	n/a
5736557	23-Oct-01	Well Abandonment Record for 5717677	n/a	n/a	n/a
5739697	13-May-05	Well Abandonment Record for 5714608	n/a	n/a	n/a
5740557	14-Mar-06	Well Abandonment Record	n/a	n/a	n/a
5740558	14-Mar-06	Well Abandonment Record for 5701386	n/a	n/a	n/a
5740875	06-Jul-06	Cooling and Air Conditioning	62.5	37.2	0 to 3.7 - Gravel 3.7 to 7.3 - Clay 7.3 to 17.7 - Sand 17.7 to 23.3 - Clay 23.3 to 43.3 - Gravel with Sand 43.3 to 51.8 - Clay 51.8 to 73.8 - Gravels and Sands
5741073	08-Sep-06	Well Abandonment Record	n/a	n/a	n/a
7039249	16-Jan-07	Domestic Water Supply	8.8	9.9	0 to 6.7 - Silt 6.7 to 8.8 - Clay 8.8 to 11.9 - Sand
7039251	16-Jan-07	Well Abandonment Record for 571372	n/a	n/a	n/a
7122742	07-May-09	Monitoring Well	1.5	Unknown	0 to 4.6 - Sand
7122743	07-May-09	Monitoring Well	1.5	Unknown	0 to 4.6 - Sand
7176000	31-Jan-12	Well Abandonment Record	n/a	n/a	n/a
7222725	27-Jun-14	Monitoring Well	1.8	Unknown	0 to 4.9 - Sand
7275577	24-Nov-16	Monitoring Well	3.0	Unknown	Unknown
7275580	24-Nov-16	Monitoring Well	2.4	Unknown	Unknown

UTM 17 | 6 0 2 2 8 2 E
9 R | 4 9 0 8 7 5 2 N
Elev. 9 R | 1 0 0 0
Basin 22 |

CON XI
L 7 8

57 No 1372

ONTARIO

The Well Drillers Act
Department of Mines, Province of Ontario

Water Well Record

[redacted] ~~Village, Town or~~ City ..... INNISFIL ~~ESSA~~
[redacted]own or City) .....
[redacted] ..... HOLLY
Owner ..... [redacted]
Date Completed ..... 29 (day) MAY (month) '53 (year) Cost of Well (excluding pump) 308.00

Pipe and Casing Record

Casing diameter(s) ..... 4" O.D.
Length(s) of casing(s) ..... 40'
Type of screen ..... SLOTTED
Length of screen ..... 8'
Distance from top of screen to ground level ..... 40'
Is well a gravel-wall type? ..... —

Pumping Test

Date ..... MAY 29/53
Static level ..... 32'
Pumping level ..... 36'
Pumping rate ..... 5 G.P.M.
Duration of test ..... ½ HR.
Distance from cylinder or bowls to ground level ..... —

Water Record

Kind (fresh or mineral) ..... FRESH
Quality (hard, soft, contains iron, sulphur, etc.) ..... HARD
Appearance (clear, cloudy, coloured) ..... CLEAR
For what purpose(s) is the water to be used? ..... DOMESTIC
..... —
How far is well from possible source of contamination? ..... —
What is the source of contamination? .....
Enclose a copy of any mineral analysis that has been made of water ..... —

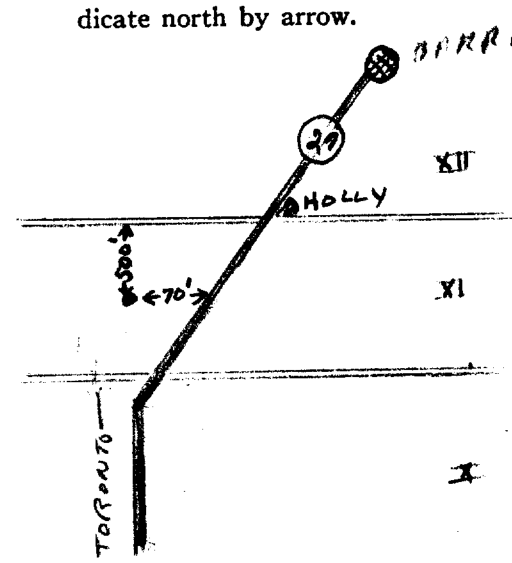
Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
40'	FRESH	8'

Well Log

Overburden and Bedrock Record	From	To
TOPSOIL	0 ft.	1 ft.
SAND	1	40
SAND	40	48

Location of Well

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



Situation: Is well on upland, in valley, or on hillside? ..... UPLAND
Drilling Firm ..... F. WRIGHT & SON
Address ..... 633 HURONTARIO ST. COLLINGWOOD, ONT.
Name of Driller ..... G. R. WRIGHT Address ..... " "
Date ..... SEPT. 4/53 Licence Number 250
..... G. R. Wright
Signature of Licensee

FORM 5

CSS.S8

UTM 17 Z 6|0|2|3|3|1 E

Con 5 R 4|9|0|8|8|7|3 N

Elev. 4 R 3|0|0|0

Basin 21

57 № 1378 B

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District Simcoe   Township, Village, Town or City INNISFIL

Con. ~~XI~~ XI   Lot ~~4~~ 3   Date completed 19 (day) NOV. (month) 1965 (year)

[redacted]ess R-R-S' BARRIE

Casing and Screen Record

Inside diameter of casing 4"

Total length of casing 34'

Type of screen JOHNSON # ~~8~~ 6 SLOT

Length of screen 4'

Depth to top of screen 34'

Diameter of finished hole 4"

Pumping Test

Static level 18'

Test-pumping rate 2 G.P.M.

Pumping level 33'

Duration of test pumping 5 HRS.

Water clear or cloudy at end of test CLEAR

Recommended pumping rate 2 G.P.M.

with pump setting of 34' feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
Dirty Sand	0'	30'		
Fine ~~Sand~~ and Coarse Sand	30'	38'	30	FRESH

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

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

Drilling or Boring Firm Scott Wells

Address R.R. #1 Oro Station.

Licence Number 1680

Name of Driller or Borer G.R. Scott

Address R.R. #1 Oro Station.

Date Dec. 9/65 G.R. Scott

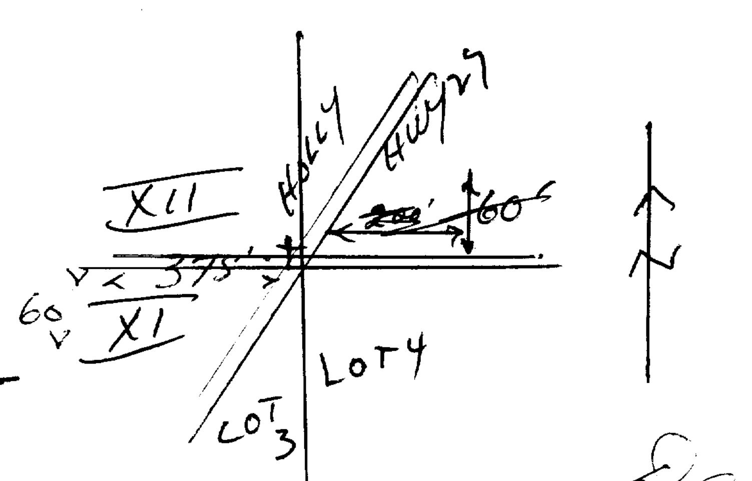
(Signature of Licensed Drilling or Boring Contractor)

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

B

57 No 1380

UTM 17 602342 E

5 R 4908823 N

Elev. 5 R 1005

The Ontario Water Resources Commission Act

WATER WELL RECORD

Basin 22A STANDOE

County or District ..... Township, Village, Town or City INNISFIL

Con. 11 Lot PART 23 Date completed 17 (day) OCT (month) 66 (year)

[redacted] ess 419 ESSARD HOLLY

Casing and Screen Record

Inside diameter of casing 4"

Total length of casing 35'

Type of screen STAINLESS STEEL 85 SLOT

Length of screen 3'

Depth to top of screen 35'

Diameter of finished hole 4"

Pumping Test

Static level 19-X

Test-pumping rate 3' G.P.M.

Pumping level 26'

Duration of test pumping 2 HRS

Water clear or cloudy at end of test CLEAR

Recommended pumping rate 3 G.P.M.

with pump setting of 30 feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	Water Record: Kind of water (fresh, salty, sulphur)
TOP SOIL	0	1		
SANDY CLAY	1	24		
SILTY SAND	24	34		
FINE SAND	34	38	34	FRESH

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

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

Drilling or Boring Firm SCOTT WELLS

Address RR #1 ORO STATION

Licence Number 2166

Name of Driller or Borer O ANDERSON

Address 58 CAMP BELLAVE BARRIE

Date OCT 19/66

S. R. Scott

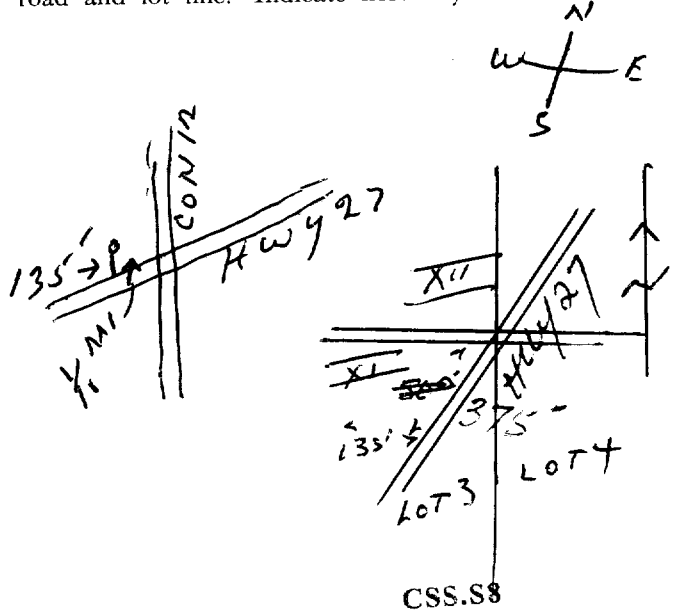
(Signature of Licensed Drilling or Boring Contractor)

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.



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UTM 17 Z 6 0 2 2 0 1 E

15 R 4 9 0 8 8 4 2 N

Elev. 15 R 1 0 0 5

Basin 22I

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District Simcoe .... Township, Village, Town or City INNISFIL ~~Holly~~

Con. ~~Wellington~~ XI Lot ~~Holly~~ 3 .... Date completed 23 (day) Jan (month) 1967 (year)

[redacted]ess RR4 Barrie

Casing and Screen Record

Inside diameter of casing 30

Total length of casing 30

Type of screen Tiled Well

Length of screen

Depth to top of screen

Diameter of finished hole 30

Pumping Test

Static level 20

Test-pumping rate 2 G.P.M.

Pumping level

Duration of test pumping

Water clear or cloudy at end of test Clear

Recommended pumping rate 2 G.P.M.

with pump setting of 28 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	20	
Gravel	1	20		Fresh
Sand	20	30		

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

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

Drilling or Boring Firm Roth Well Digging

Address RR4 Cookstown

Licence Number 61

Name of Driller or Borer B Roth

Address Same

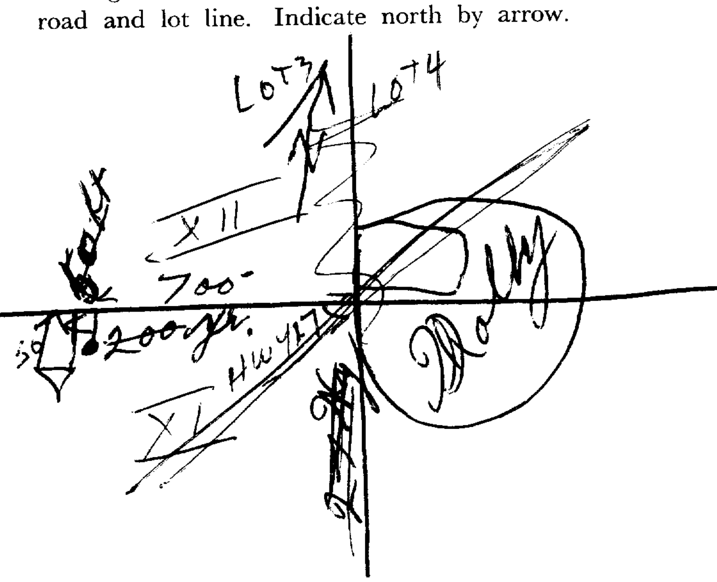
Date Jan 23/67

B Roth

(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.



7 15M-60-4138

CSS.S8

COPY

- 58

UTM | 17 | Z | 602312 | E
| 5 | R | 4910814 | 3 | N

Elev. | 5 | R | 1 | 1 | 0 | 0 | 1

Basin 22 | SIMCOE

County or District

Con. 11 Lot 2 3 NCS

[redacted]

57 No. 1382

The Ontario Water Resources Commission Act

WATER WELL RECORD

Township, Village, Town or City INNISFIL

Date completed APRIL 20 1967 (day / month / year)

Address RR#5 BARRIE

Casing and Screen Record

Inside diameter of casing 4"

Total length of casing 34

Type of screen STAINLESS STEEL #10 SLOT

Length of screen 3'

Depth to top of screen 34'

Diameter of finished hole 4"

Pumping Test

Static level 8'-10"

Test-pumping rate 2½ G.P.M.

Pumping level 24'-6"

Duration of test pumping 2 HRS

Water clear or cloudy at end of test CLEAR

Recommended pumping rate 2½ G.P.M.

with pump setting of 32' feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	Water Record: Kind of water (fresh, salty, sulphur)
TOP SOIL	0	1		
DIRTY SAND	1	8		
SANDY CLAY	8	26	26	FRESH
DIRTY FINE SAND	26	30		
FINE SAND	30	37		

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

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

Drilling or Boring Firm ANDERSON DRILLING

Address 58 CAMPBELL AVE BARRIE ONT

Licence Number 2565

Name of Driller or Borer O ANDERSON

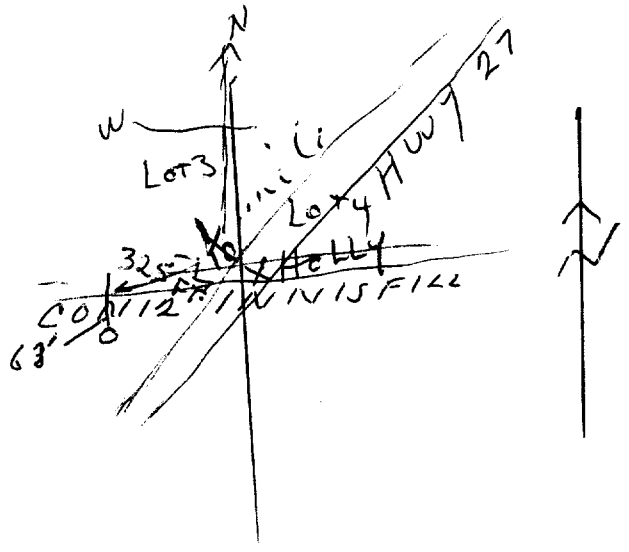
Address 58 CAMPBELL AVE

Date APRIL 20/67

Oscar Anderson
(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

UTM | 1 | 7 | Z | 6 | 0 | 2 | 4 | 8 | 1 | E

C 05 R 49 0 8 9 1 4 N

Elev. 9 R 4 0 1 0 1

WATER RESOURCES DIVISION

57 No 1385

MAY 25 1965

ONTARIO WATER RESOURCES COMMISSION

The Ontario Water Resources Commission Act

WATER WELL RECORD

Basin 12 County or District Simcoe Township, Village, Town or City INNISFIL

Con. XI Lot 4 Date completed 7 (day) May (month) 1965 (year)

[redacted] Address RR # 5 Barrie

Casing and Screen Record

Inside diameter of casing 30 in

Total length of casing 32 feet

Type of screen Tiled Well

Length of screen

Depth to top of screen

Diameter of finished hole 36 in

Pumping Test

Static level 23

Test-pumping rate 2 G.P.M.

Pumping level

Duration of test pumping

Water clear or cloudy at end of test Clear

Recommended pumping rate 2 G.P.M.

with pump setting of 30 feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
Brown Clay	0	10	22	Fresh
Sand and Gravel	10	32		

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

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

Drilling or Boring Firm Roth Well Digging

Address RR # 4 Cookstown

Licence Number 61

Name of Driller or Borer B. Roth

Address RR # 4 Cookstown

Date May 7 - 1965

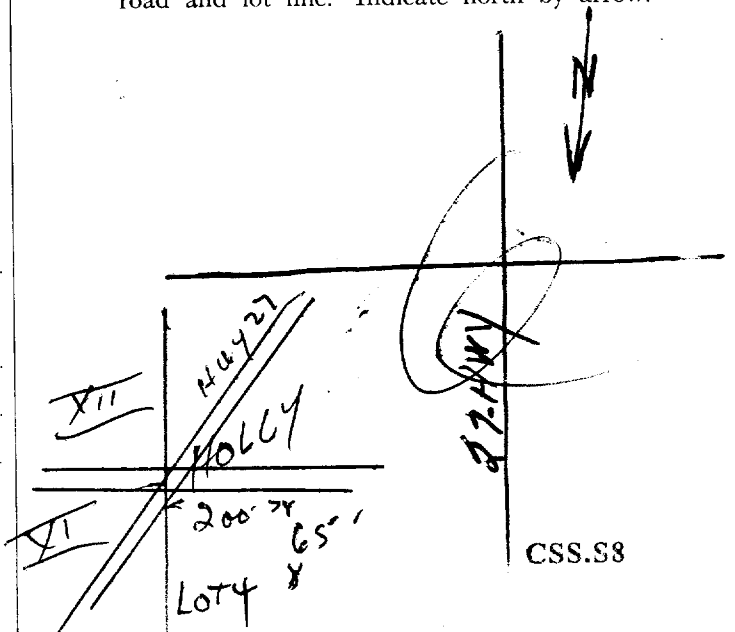
B. Roth

(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M-60-4138

Location of Well

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



CSS.S8

OWRC COPY

UTM 17 Z 602561 E
4908955 N
Elev Lot 4 R 410101

The Ontario Water Resources Commission Act

WATER WELL RECORD

57 No. 1386

Basin 7W Simcoe
County or District

Township, Village, Town or City Innisfil

Con. XI Lot 4

Date completed 24 (day) Nov (month) 65 (year)

[redacted] ress R.R. 5 BARRIE

Casing and Screen Record

Inside diameter of casing 6 1/4"
Total length of casing 129
Type of screen 6"x4"x20 4 6"x3"x18 slot stainless
Length of screen 7'
Depth to top of screen 129
Diameter of finished hole 6"

Pumping Test

Static level 124
Test-pumping rate 8 G.P.M.
Pumping level 131
Duration of test pumping 16 hrs.
Water clear or cloudy at end of test clear
Recommended pumping rate 8 G.P.M.
with pump setting of 136 feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	Water Record: Kind of water (fresh, salty, sulphur)
Top soil & brown clay	0	22	135	fresh
blue clay	22	34		
fine sand & blue clay	34	65		
fine gravel	65	80		
medium sand	80	95		
	95	131		

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

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

Drilling or Boring Firm H. HAMMERS.

Address R.R.3 BARRIE

Licence Number 1662

Name of Driller or Borer P. Snider

Address Craighurst

Date Nov 25/65

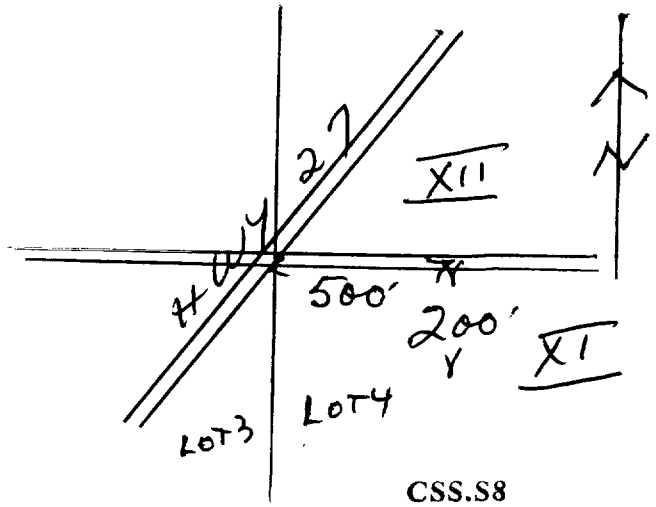
Henry Hammers
(Signature of Licensed Drilling or Boring Contractor)

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

JD

UTM 17 Z 601261 3 E
5 R 4909637 N
Elev. 5 R 1101 15

B

WATER RESOURCES DIVISION
JUL 5 1966
ONTARIO WATER RESOURCES COMMISSION

No 1437

The Ontario Water Resources Commission Act

WATER WELL RECORD

Basin 22 County or District Simcoe Township, Village, Town or City Innisfil.

Con. ~~XX~~ XII Lot ~~3~~ 4 Date completed 15 (day) May (month) 1966 (year)

[redacted] ess Holly

Casing and Screen Record

Inside diameter of casing 4"
Total length of casing 134'
Type of screen Stainless Steel Slot 12.
Length of screen 4'
Depth to top of screen 134'
Diameter of finished hole 4"

Pumping Test

Static level 125'
Test-pumping rate 5 G.P.M.
Pumping level 128'
Duration of test pumping 2 hours.
Water clear or cloudy at end of test Clear
Recommended pumping rate 5 G.P.M.
with pump setting of 130' feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	Water Record: Kind of water (fresh, salty, sulphur)
Dug Well.	0'	25'	127'	~~Clear~~
Sandy Clay	25'	30'		FRESH
Dirty Sand	30'	48'		
Silty Clay	48'	68'		
Grey Clay	68'	70'		
Clay and Gravel	70'	74'		
Dirty, Dry Sand.	74'	128'		
Sand.	127'	138'		

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

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

Drilling or Boring Firm Scott Wells.

Address RR. #1 Ora Station.

Licence Number 2166.

Name of Driller or Borer G.R. Scott.

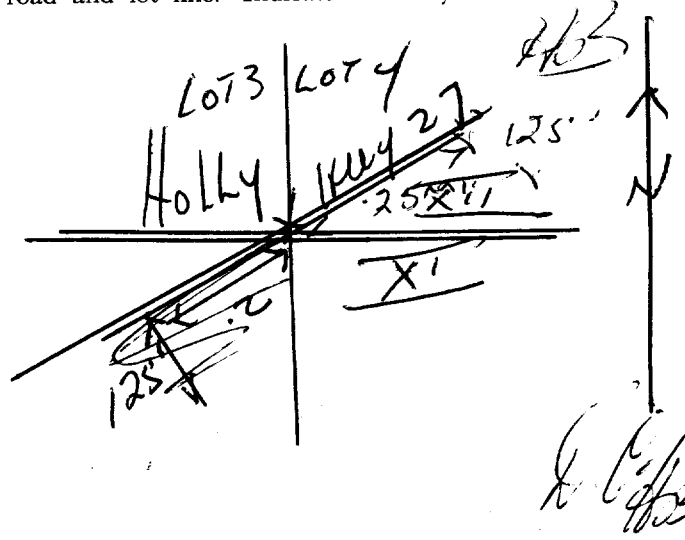
Address RR #1 Ora Station.

Date June 28/66

(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

J.B

UTM 17 | 602810 | 5R | 4901975 | Elev. 5R | 1025 | Basin 22 SB

CODED

Con XII Lot 4

5705419

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District Simcoe — Township, ~~Village, Town or City~~ Nunicipal

Con. XII ~~12~~ — Lot 4 — Date completed 20 (day) Nov. (month) 65 (year)

[redacted] ress RR#5 Barrie

Casing and Screen Record

Inside diameter of casing 30in

Total length of casing 45ft.

Type of screen —

Length of screen —

Depth to top of screen —

Diameter of finished hole 36in

Pumping Test

Static level 33 ~~ft~~

~~Test-pumping~~ Recovery rate 2 G.P.M.

Pumping level —

Duration of test pumping —

Water clear or cloudy at end of test

Recommended pumping rate 2 G.P.M.

with pump setting of 43 feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	Water Record: Kind of water (fresh, salty, sulphur)
Brown Clay	0	15	30ft.	fresh.
Sand.	15	30		
"		45		

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 Roth Well Digging

Address RR#5 Barrie Ont.

Licence Number 125

Name of Driller or Borer B. Roth.

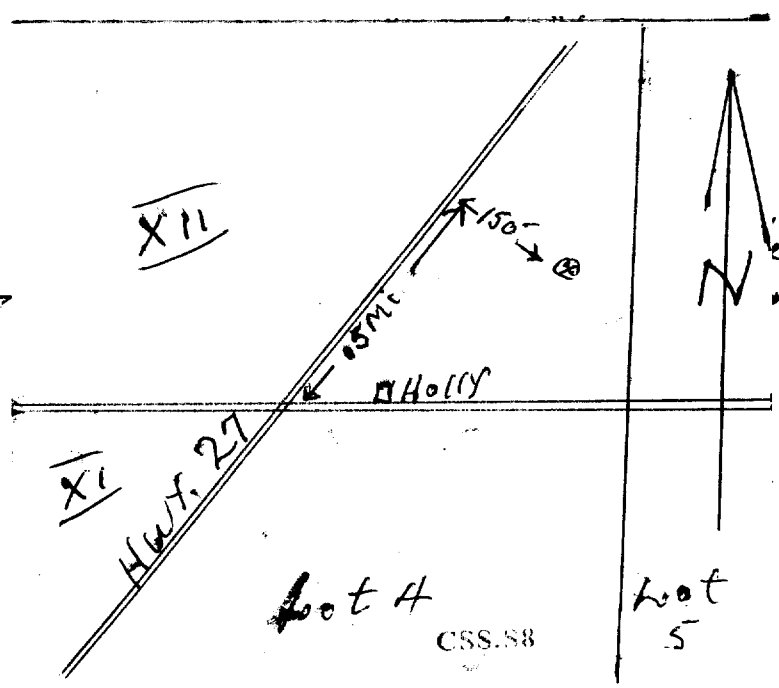
Address Same

Date Nov. 22/65

B Roth

(Signature of Licensed Drilling or Boring Contractor)

Location of Well



Form 7

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CSS.88

Form 7

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5

J.B.

5706188

DIVISION OF WATER RESOURCES
APR 11 1969
ONTARIO WATER RESOURCES COMMISSION

The Ontario Water Resources Commission

WATER WELL RECORD

County or District Simcoe — Township, Village, Town or City INNISFIL

Con. XII — Lot 4 — Date completed 15 (day) Feb (month) 1969 (year)

[redacted] ress 32 Dennis Dr. Appt. 201 Don Mills ONT

Casing and Screen Record

Inside diameter of casing 6 IN

Total length of casing 180 FT

Type of screen JOHNSONS SLOT 12

Length of screen 3 FT

Depth to top of screen 184

Diameter of finished hole 6 1/4

Pumping Test

Static level 140 FT

Test-pumping rate 13 G.P.M.

Pumping level 164 FT

Duration of test pumping 4 HOURS

Water clear or cloudy at end of test CLEAR

Recommended pumping rate 13 G.P.M.

with pump setting of 164 feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	Water Record: Kind of water (fresh, salty, sulphur)
TOPSOIL	0	2		
BROWN CLAY	2	27		
SAND CLAY & GRAVEL	27	64		
FINE SAND	64	94		
DRY SAND	94	140		
FINE SAND WITH SOME CLAY	140	185	185	FRESH
MEDIUM GRAIN SAND.	185	192		

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

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

Drilling or Boring Firm HENRY HAMMERS

Address RR# 3 BARRIE

Licence Number 3187

Name of Driller or Borer John Zuiderveld.

Address 101 Hulcaster St BARRIE

Date Feb 17/69

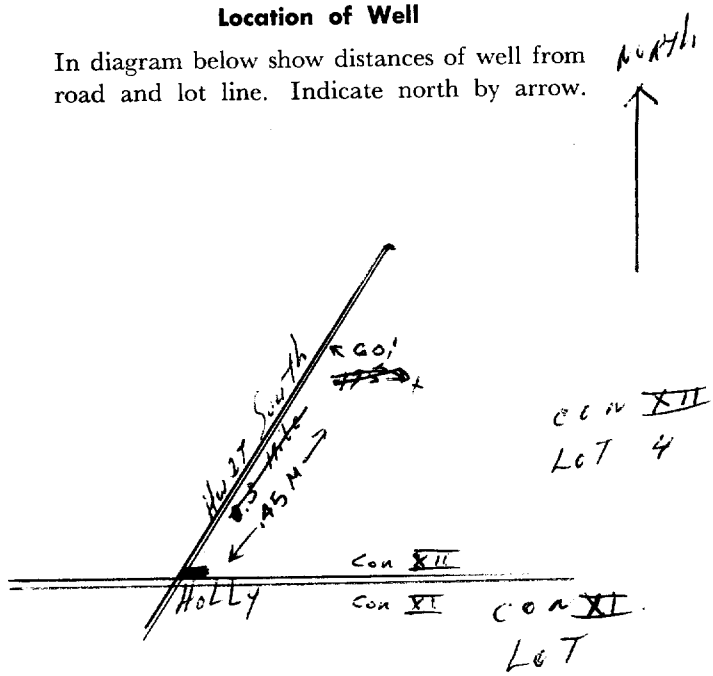
Henry Hammers.
(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M-60-4138

OWRC COPY Lot 5 and from Highway-Ferry

Location of Well

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



The Ontario Water Resources Commission Act

WATER WELL RECORD

Water management in Ontario

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

11 | 5706559 | MUNICIP. 57005 | CON. GON | 11

COUNTY OR DISTRICT: Simcoe
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Innisfil Holly.
CON., BLOCK, TRACT, SURVEY, ETC.: # XI
LOT: 003
DATE COMPLETED: DA 05 MO 08 YR 69
[redacted] RR#5 Barrie Ont.
08850 | RC. 4 | ELEVATION 1000 | RC. ST | BASIN CODE 22

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	stony	hard	0	14
Grey	sand		Pourous.	14	28

31 | 00146051 2 | 0028209

32

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
0014	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
0028	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
30 ~~Dug~~	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☒ CONCRETE 4 ☐ OPEN HOLE	2½ inc	0	~~28~~ 0028
	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
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST

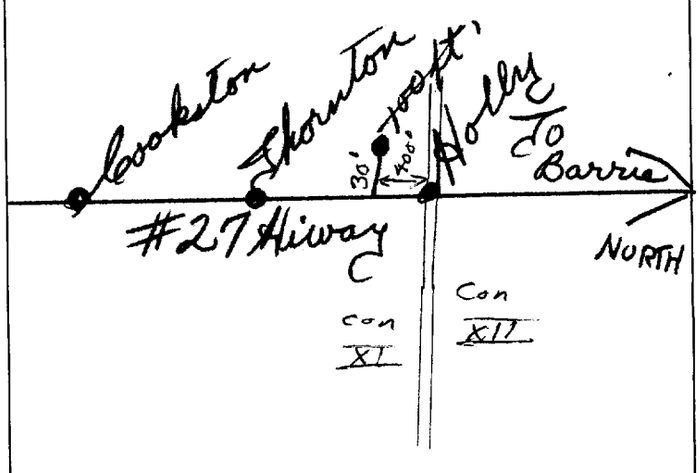
PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER
PUMPING RATE: 0003 ~~Recovery~~ GPM
DURATION OF PUMPING: 01 HOURS ~~00~~ MINS.

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☐ PUMPING 2 ☒ RECOVERY			
		15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
014 FEET	024 FEET	~~02~~ FEET	020 FEET	019 FEET	018 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: ~~026~~ ~~062~~ FEET
RECOMMENDED PUMPING RATE: 0002 GPM.
0003 GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

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



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

WATER USE 01
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 DRILLING
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: Both Well Digging — LICENCE NUMBER: 162
ADDRESS: RR#5 Barrie Ont
NAME OF DRILLER OR BORER: B Both — LICENCE NUMBER: 162
SIGNATURE OF CONTRACTOR: B Both — SUBMISSION DATE: DAY 15 MO 8 YR 69

OFFICE USE ONLY

DATA SOURCE: 1 — CONTRACTOR: 4608 — DATE RECEIVED: 02 09 69
DATE OF INSPECTION: 3/7/70 — INSPECTOR:
REMARKS: CSS.58 P/L J.B.

OWRC COPY

The Ontario Water Resources Commission Act

WATER WELL RECORD

Water management in Ontario

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

11 | 5706809 | MUNICIP. 5710051 | CON. 6pN | 11

COUNTY OR DISTRICT: Simcoe | TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Innisfil | CON., BLOCK, TRACT, SURVEY, ETC.: Plan 1031 # XI | LOT: 003

[redacted] 44 Bradford St Barrie | DATE COMPLETED: DA 03 MO 10 YR 69

10 8890 | ELEVATION: 1000 | RC: 5 | BASIN CODE: 22 Ont

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		Stony	0	20
Grey	gravel	mixed with soil. Packed.		20	30

31: 0020 0030 0032 0033

32:

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
0020	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
30"	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☒ CONCRETE 4 ☐ OPEN HOLE	2½"	0	~~30~~ 0030
	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
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN 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: 0002 GPM | DURATION OF PUMPING: 01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☐ PUMPING 2 ☑ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
~~020~~ 010 FEET	~~020~~ 018 FEET		~~014~~ 014 FEET	~~016~~ 016 FEET	~~018~~ 018 FEET	~~020~~ 020 FEET

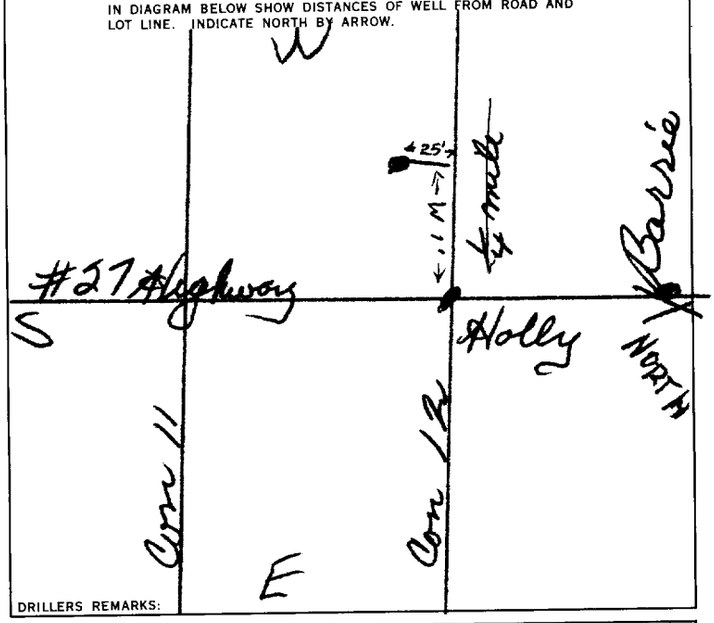
IF FLOWING, GIVE RATE: GPM | PUMP INTAKE SET AT: FEET | WATER AT END OF TEST: 1 ☐ CLEAR 2 ☑ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☑ DEEP | RECOMMENDED PUMP SETTING: 029 FEET | RECOMMENDED PUMPING RATE: 0002 GPM

50-53 0001 GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

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



DRILLERS REMARKS:

FINAL STATUS OF WELL (54)
1 ☑ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE (55-56) 01
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 DRILLING (57)
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: Rothwell Digging | LICENCE NUMBER: 162
ADDRESS: RR#5 Barrie Ont
NAME OF DRILLER OR BORER: B. Roth. | LICENCE NUMBER: 162
SIGNATURE OF CONTRACTOR: B Roth. | SUBMISSION DATE: DAY 15 MO 10 YR 69

OFFICE USE ONLY

DATA SOURCE (58): 1 | CONTRACTOR (59-62): 4608 | DATE RECEIVED (63-68): 041169
DATE OF INSPECTION: 3/7/70 | INSPECTOR:
REMARKS: CSS.S8 P/L J.B.

OWRC COPY

The Ontario Water Resources Commission Act

WATER WELL RECORD

Water management in Ontario

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

11 | 5707186 | MUNICIP. 5705 | CON. CON | 1 1

COUNTY OR DISTRICT: SIMCOE

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: INNISFIL

CON., BLOCK, TRACT, SURVEY, ETC.: 11 XI

LOT: 2 003

DATE COMPLETED: DAY 30 MO. 05 YR. 70

[redacted] HS BARRIE

98890 | RC. 4 | ELEVATION 1000 | RC. 5 | BASIN CODE 22

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	SAND BOULDERS		0	21
BROWN	SALT			21	59
GREY	CLAY			59	80
BROWN	SAND			80	131

31 | 0021 | 0059 | 0080 | 0131

32

41 WATER RECORD

WATER FOUND AT FEET	KIND OF WATER	
0115	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
4	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	0	~~128~~ 0128
04	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	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	LENGTH
012	04.000 INCHES	03 FEET

MATERIAL AND TYPE: ~~STAINLESS STEEL~~ | DEPTH TO TOP OF SCREEN: 0128 FEET

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST

PUMPING TEST METHOD: ☐ PUMP 2 ☒ BAILER | PUMPING RATE: 0005 GPM | DURATION OF PUMPING: 01 HOURS 00 MINS.

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
100 ~~106~~ FEET	106 ~~100~~ FEET		106 FEET	106 FEET	106 FEET	106 FEET

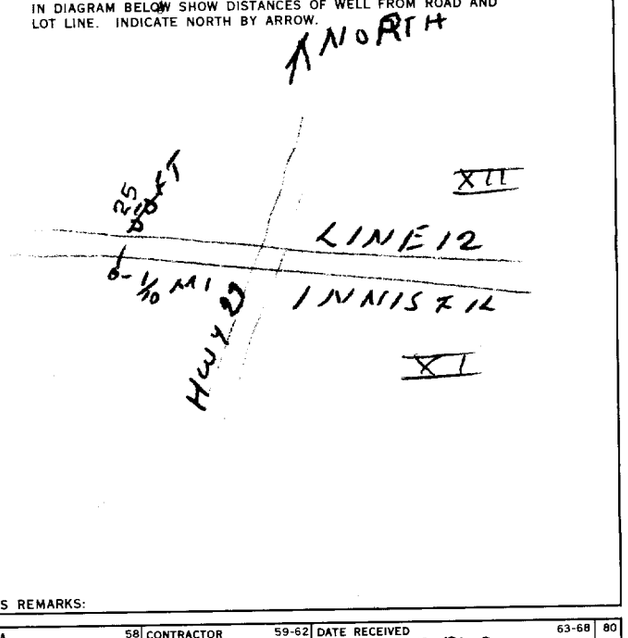
IF FLOWING, GIVE RATE: GPM | PUMP INTAKE SET AT: FEET | WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP | RECOMMENDED PUMP SETTING: 125 FEET | RECOMMENDED PUMPING RATE: 0005 GPM

50-53 0008 GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

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



DRILLERS REMARKS:

FINAL STATUS OF WELL (54): 1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE (55-56): 01 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 DRILLING (57): 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: ANDERSON DRILLING | LICENCE NUMBER: 1204

ADDRESS: 58 CAMPBELL AVE BARRIE

NAME OF DRILLER OR BORER: ANDERSON | LICENCE NUMBER: 1204

SIGNATURE OF CONTRACTOR: Oscar Anderson | SUBMISSION DATE: DAY 1 MO. 6 YR. 70

OWRC COPY

OFFICE USE ONLY

DATA SOURCE 58: 1 | CONTRACTOR 59-62: 1204 | DATE RECEIVED 63-68: 150670

DATE OF INSPECTION: 3/7/70 | INSPECTOR:

REMARKS: CSS.S3 P/L J.B.

Ministry of the Environment

Ontario

The Ontario Water Resources Act

WATER WELL RECORD

31D/5E

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

11 | 5714608 | MUNICIP. 57005 | CON. CON 12

COUNTY OR DISTRICT: SIMCOE

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: INNISFIL

CON., BLOCK, TRACT, SURVEY, ETC.: XII

LOT: 003

[redacted]

HOLLEX

DATE COMPLETED: DAY 02 MO [illegible] YR 77

G 09000 | RC 5 | ELEVATION 1010 | RC 5 | BASIN CODE 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
BROWN	TOP SOIL			0	1
"	CLAY		MEDIUM.	1	10
"	"	STONES	STONEY CLAY	10	80
"	SAND	CLAY	SANDY CLAY	80	100
"	"	"	RUNNY CLAY	100	120
"	"	"	SANDY CLAY	120	150
"	"	CLAY RIDGES.	WATER BEARING.	150	158

31 | 000 1602 | 0010 605 | 0080 605 12 | 0100 628 058 | 0120 628 0585 | 0150 628 0581 | 1

32 | 0158 628 0591

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0150	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERAL
158	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
06 64	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	.188	0	0151
	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.): 004 | DIAMETER: 04000 | LENGTH: 07 FEET

MATERIAL AND TYPE: Stainless steel | DEPTH TO TOP OF SCREEN: 0151 FEET

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☒ PUMP 2 ☐ BAILER

PUMPING RATE: 0007 GPM

DURATION OF PUMPING: 20 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
112. FEET	140 FEET		140 FEET	140 FEET	140 FEET	140 FEET

IF FLOWING, GIVE RATE: GPM

PUMP INTAKE SET AT: FEET

WATER AT END OF TEST: 1 ☐ CLEAR 2 ☐ CLOUDY

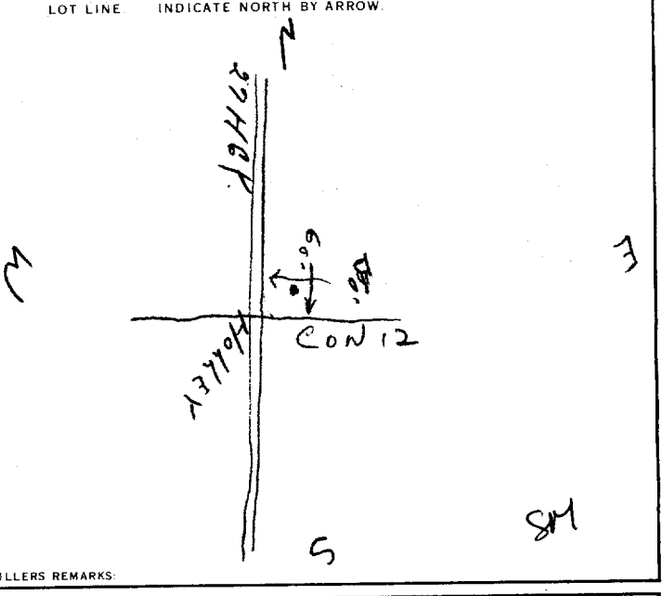
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP

RECOMMENDED PUMP SETTING: 145' FEET

RECOMMENDED PUMPING RATE: 0007 GPM

LOCATION OF WELL

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



DRILLERS REMARKS:

FINAL STATUS OF WELL 54: 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 55-56: 01

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 DRILLING 57: 1

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: Mighton Well Drilling Ltd | LICENCE NUMBER: 3602

ADDRESS: #3 Stayner

NAME OF DRILLER OR BORER: Terry Mighton | LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: Kenneth A. Mighton | SUBMISSION DATE: DAY 26 MO. 9 YR. 77

OFFICE USE ONLY

DATA SOURCE 58: 1 | CONTRACTOR 59-62: 3602 | DATE RECEIVED 63-68: 290977

DATE OF INSPECTION | INSPECTOR | May 19 78

REMARKS: CSS.S8

FORM NO. 0506—4—77

MINISTRY OF THE ENVIRONMENT COPY

Ontario

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act
WATER WELL RECORD

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

(11) 5714692

MUNICIP. 57005 CON. CON 12

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT 25-27
8	UNWSFIL Tp Innis	Lot 16 — Con 12	004

DATE COMPLETED 48-53: DAY 17 MO. 10 YR. 77

[redacted]

ELEVATION 1030 RC 5 BASIN CODE 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
		Top soil		0	1
		clay		1	130
		sand and clay		130	140
		fine gravel		140	170
		dirty sand		170	180
		sand		180	200
		finish for		201	

(31) 0001 02 | 0130 05 | 0140 28 05 | 0170 11 68 | 0180 28 68 | 0201 28

32

(41) WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
15-18	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
20-23	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
25-28	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL
30-33	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERAL

(51) CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
10-11	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			13-16
17-18	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			20-23
24-25	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			27-30

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
010	06000 INCHES	57 FEET

MATERIAL AND TYPE: sand — DEPTH TO TOP OF SCREEN: 0195 FEET

(61) PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
10-13	14-17	
18-21	22-25	
26-29	30-33	

(71) PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☐ PUMP 2 ☒ BAILER	0006 GPM	03 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING (1 ☒ PUMPING 2 ☐ RECOVERY) 15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
120 FEET	FEET	FEET	FEET	FEET	150 FEET

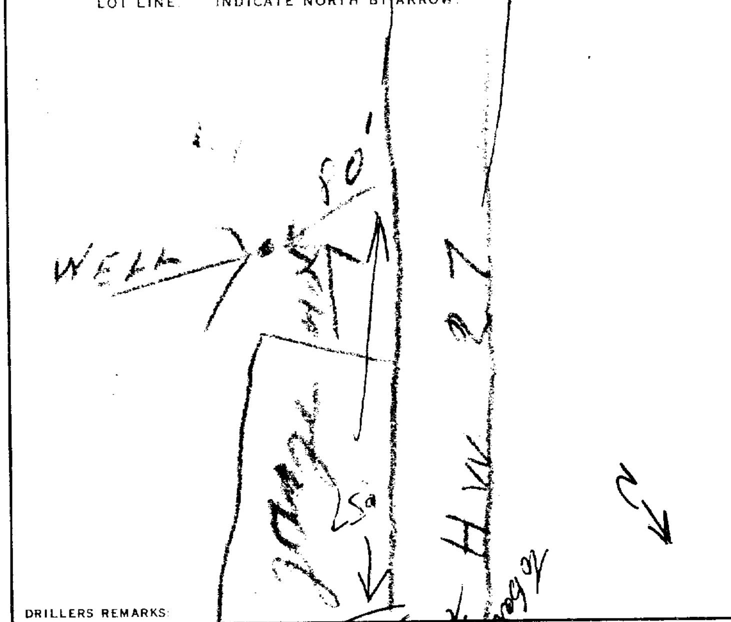
IF FLOWING, GIVE RATE: GPM — PUMP INTAKE SET AT: FEET — WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP — RECOMMENDED PUMP SETTING: 190 FEET — RECOMMENDED PUMPING RATE: 0005 GPM

50-53 GPM./FT. SPECIFIC CAPACITY

LOCATION OF WELL

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 ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF DRILLING 1
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: H. Worms Ltd — LICENCE NUMBER: 4004
ADDRESS: Angus
NAME OF DRILLER OR BORER: 424-5657 — LICENCE NUMBER: 4004
SIGNATURE OF CONTRACTOR — SUBMISSION DATE: DAY 17 MO. 10 YR. 77

OFFICE USE ONLY

DATA SOURCE 1 — CONTRACTOR 4004 — DATE RECEIVED 61177
DATE OF INSPECTION — INSPECTOR
REMARKS: loc only owner updated SS

P
WI

FORM 7 MOE 07-091

MINISTRY OF THE ENVIRONMENT COPY

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 | 5714810 | MUNICIP 57005 | CON. CON 11 (31DSE)

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Simcoe	Innisfil	XI plan lot	003

[redacted] R.#1 Barrie

DATE COMPLETED: DAY 14 MO. 11 YR. 72

08850 | 5 | ELEVATION 1010 | RC 5 | BASIN CODE 23

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Black	Top soil			0	1'
Brown	Clay	Small stones		1'	20
Grey	Sand	silty	wet	20	50
Grey	Clay			50	60
Grey	Sand	silty	wet	60	75
Yellow	Sand	Coarse		75	110
Grey	Sand	silty	wet	110	126
Yellow	Sand		fine to med	126	135

31 | 0001802 | 0020605 12 | 0050228 84 | 0060205 | 0075228 84 | 0110510 | 1
32 | 0126228 84 | 0135508

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0039	5
0060	5
0126	☒ FRESH

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
05"		.188	0	0131

SCREEN

SIZE(S) OF OPENING (SLOT NO.): 008
DIAMETER: 05000 INCHES
LENGTH: 03 FEET
MATERIAL AND TYPE: Johnson Stainless Super
DEPTH TO TOP OF SCREEN: 0130 FEET

61 PLUGGING & SEALING RECORD

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

71 PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER
PUMPING RATE: 0005 GPM
DURATION OF PUMPING: 01 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
109 FEET	119 FEET	115 FEET		109 FEET	

WATER LEVELS DURING: 1 ☐ PUMPING 2 ☒ RECOVERY
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: 128 FEET
RECOMMENDED PUMPING RATE: 0005 GPM

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

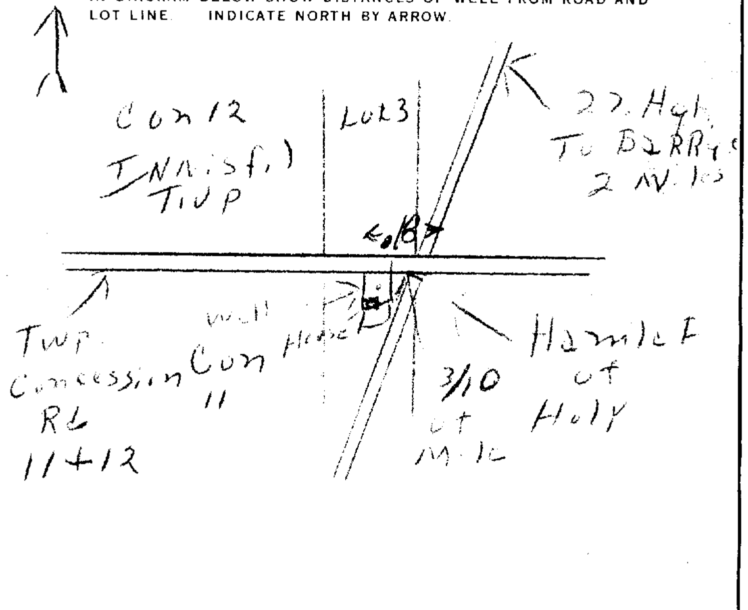
1 ☒ DOMESTIC
2 ☐ STOCK
3 ☐ IRRIGATION
4 ☐ INDUSTRIAL
☐ OTHER
5 ☐ COMMERCIAL
6 ☐ MUNICIPAL
7 ☐ PUBLIC SUPPLY
8 ☐ COOLING OR AIR CONDITIONING
9 ☐ NOT USED

METHOD OF DRILLING: 1

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

LOCATION OF WELL

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



DRILLERS REMARKS:

CONTRACTOR

NAME OF WELL CONTRACTOR: George M. Buie
LICENCE NUMBER: 1452
ADDRESS: 75 McDonald St. Barrie
NAME OF DRILLER OR BORER:
LICENCE NUMBER:
SIGNATURE OF CONTRACTOR: George M Buie
SUBMISSION DATE: DAY 13 MO. 12 YR. 72

OFFICE USE ONLY

DATA SOURCE: 1
CONTRACTOR: 1452
DATE RECEIVED: 211272
DATE OF INSPECTION:
INSPECTOR:
REMARKS: no ong. locate only / selects. sried / Newmarket

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506-4-7

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

WATER WELL RECORD

Ontario

31D/5E

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

(11) 5715083 MUNICIP 57005 CON. GIN 11

COUNTY OR DISTRICT: SIMCOE
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: INNISFIL
CON., BLOCK, TRACT, SURVEY, ETC.: XI
LOT: 004
DATE COMPLETED: DAY 08 MO OCT YR 77
ADDRESS OF WELL: RR5 BARRIE ONT
UTM: 909000 RC 5 ELEVATION 1010 RC 5 BASIN CODE 23

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		0	45
BROWN	SAND	GRAVEL		45	90
GREY	CLAY	PEBBLES		90	135
BROWN	SAND		MED.	135	143

(31) 00456052 | 00906281 | 01352052 | 01436281
(32)

(41) WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0135 ~~143~~	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
	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	188	+1	0135
~~4~~ 5	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	5'	~~below~~ screen	139
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE(S) OF OPENING (SLOT NO.): 010
DIAMETER: 060 00s
LENGTH: 03 FEET
MATERIAL AND TYPE: STAINLESS STEEL
DEPTH TO TOP OF SCREEN: 136 FEET

(61) PLUGGING & SEALING RECORD

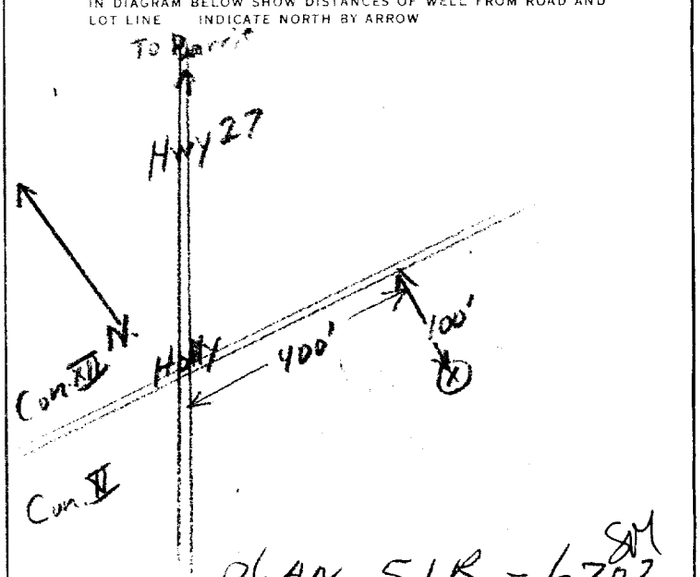
DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

(71) PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER
PUMPING RATE: 0007 GPM
DURATION OF PUMPING: 01 HOURS 30 MINS
STATIC LEVEL: 121 FEET
WATER LEVEL END OF PUMPING: 137 FEET
WATER LEVELS DURING: 1 ☐ PUMPING 2 ☒ RECOVERY
15 MINUTES: 137 FEET
30 MINUTES: 137 FEET
45 MINUTES: 137 FEET
60 MINUTES: 137 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: 137 FEET
RECOMMENDED PUMPING RATE: 0006 GPM
GPM./FT. SPECIFIC CAPACITY:

LOCATION OF WELL

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



DRILLERS REMARKS: PLAN 51R-6702 SM

FINAL STATUS OF WELL 54: 1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED

WATER USE 55-56: 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 57: 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: HENRY HAMMERS — LICENCE NUMBER: 2514
ADDRESS: RR 3 BARRIE ONT
NAME OF DRILLER OR BORER: SAYE — LICENCE NUMBER:
SIGNATURE OF CONTRACTOR: Henry Hammers — SUBMISSION DATE: DAY ____ MO ____ YR ____

OFFICE USE ONLY

DATA SOURCE 58: 1 — CONTRACTOR 59-62: 2514 — DATE RECEIVED 63-68: 150578 — 80
DATE OF INSPECTION: July 7/8 81 — INSPECTOR:
REMARKS: CSS.S8 — P — WI

MINISTRY OF THE ENVIRONMENT COPY

FORM 7 MOE 07-091

3 LD/SE

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) 5717258 ✓ MUNICIP 57005 CON CON

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
[redacted]	INNISFIL (Barrie)	12 (XI)	005 120

ADDRESS OF WELL LOCATION (STREET AND NUMBER) 405 Mapleview D West
DATE COMPLETED DAY 25 MO JULY YR 80
UTM/GRID NORTHING 4908850 ZONE 5 ELEVATION 1,000 ZONE 5 BASIN CODE 22

405 Mapleview D W

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
BROWN	TOP SOIL		HARD	0	1
BROWN	SAND		PACKED	1	35
			Plan 1274 Pt Block St (ST)		
			FEB 12 1980		

(31) 0001602273 0035428779
(32)

(41) WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13: 0020	1 ☐ FRESH 3 ☐ SULPHUR 14; 2 ☐ SALTY 4 ☐ MINERAL
15-18	1 ☐ FRESH 3 ☐ SULPHUR 19; 2 ☐ SALTY 4 ☐ MINERAL
20-23	1 ☐ FRESH 3 ☐ SULPHUR 24; 2 ☐ SALTY 4 ☐ MINERAL
25-28	1 ☐ FRESH 3 ☐ SULPHUR 29; 2 ☐ SALTY 4 ☐ MINERAL
30-33	1 ☐ FRESH 3 ☐ SULPHUR 34; 2 ☐ SALTY 4 ☐ MINERAL 80

(51) CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
10-11: 30	1 ☐ STEEL 12; 2 ☐ GALVANIZED; 3 ☒ CONCRETE; 4 ☐ OPEN HOLE	2½	0	0015 13-16
17-18: 30	1 ☐ STEEL 19; 2 ☒ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE		15	0035 20-23
24-25	1 ☐ STEEL 26; 2 ☐ GALVANIZED; 3 ☐ CONCRETE; 4 ☐ OPEN HOLE			27-30

SCREEN

SIZE(S) OF OPENING (SLOT NO.) 31-33	DIAMETER 34-38 INCHES	LENGTH 39-40 FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN 41-44 FEET	10

(61) PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
10-13	14-17	
18-21	22-25	
26-29	30-33 80	

(71) PUMPING TEST

PUMPING TEST METHOD 10	PUMPING RATE 11-14 GPM	DURATION OF PUMPING 15-16 HOURS 00 17-18 MINS 30
1 ☐ PUMP 2 ☒ BAILER		

STATIC LEVEL 19-21 FEET	WATER LEVEL END OF PUMPING 22-24 FEET	25 WATER LEVELS DURING: 1 ☐ PUMPING 2 ☒ RECOVERY
020	032	15 MINUTES 26-28 FEET: 031; 30 MINUTES 29-31 FEET: 030; 45 MINUTES 32-34 FEET: 029; 60 MINUTES 35-37 FEET: 028

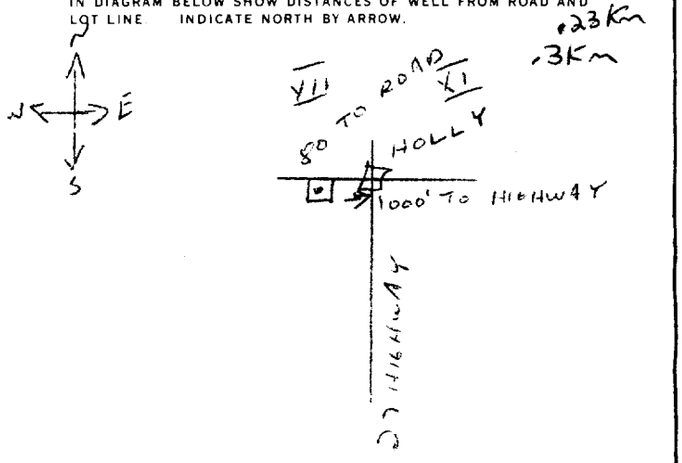
IF FLOWING GIVE RATE 38-41 GPM	PUMP INTAKE SET AT FEET	WATER AT END OF TEST 42: 1 ☐ CLEAR 2 ☒ CLOUDY
—	—	

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING 43-45 FEET	RECOMMENDED PUMP RATE 46-49 GPM
☐ SHALLOW ☒ DEEP	028	0001

50-53

LOCATION OF WELL

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



Front House ~25' from road.
920Ft

DRILLERS REMARKS: 040-017-053

FINAL STATUS OF WELL 54	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 55-56	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 DRILLING 6 57	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	LICENCE NUMBER
Ed B Mel Diggin	4919
ADDRESS: Alliston	
NAME OF DRILLER OR BORER: Norm Hare	LICENCE NUMBER: 4919
SIGNATURE OF CONTRACTOR: Norm Hare	SUBMISSION DATE DAY ____ MO. ____ YR. ____

OFFICE USE ONLY

DATA SOURCE 58: L	CONTRACTOR 59-62: 4919	DATE RECEIVED 63-68: 060281
DATE OF INSPECTION	INSPECTOR: JK	
REMARKS: CSS.ES		

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506—4—77 FORM 7

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

31058

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK [X] CORRECT BOX WHERE APPLICABLE

11 5717677 MUNICIP 57005 CON. CON 11

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON.	BLOCK, TRACT, SURVEY, ETC.	LOT
Simcoe	Innisfil (formerly) Barrie	XI		003

[redacted] R.#2, Stroud, L0L 2M0

DATE COMPLETED: DAY 01 MO 09 YR 81

UTM ZONE | NORTHING 08800 | RC 5 | EASTING 0975 | RC 5 | BASIN CODE 22

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
	clay	sand gravel		0	19
	sand	gravel, silt		19	57
	clay			57	62
	sand	gravel, clay		62	68
	gravel	sand, streaks of clay		68	95
	sand	clay		95	103
	fine sand			103	118
	medium sand			118	128

31 0019 052811 0057 281106 0062 05 0095 112805 0103 2805 0118 08 1

32 0128 09

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0103 ~~128~~	1 [X] 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
06 ~~6¼~~	1 [X] STEEL 2 [ ] GALVANIZED 3 [ ] CONCRETE 4 [ ] OPEN HOLE	0.188	+1	0115
	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.) 012 ~~0.012~~ | DIAMETER 06000 INCHES | LENGTH 10 FEET

MATERIAL AND TYPE: stainless steel wire wound | DEPTH TO TOP OF ~~SCREEN~~ packer: 0112 FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD, PACKER, ETC.)
0	20	cement grout

71 PUMPING TEST

PUMPING TEST METHOD: 1 [X] PUMP 2 [ ] BAILER

PUMPING RATE: 0030 ~~20.6~~ GPM | DURATION OF PUMPING: 08 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 [X] PUMPING 2 [ ] RECOVERY			
101 FEET	105 ~~100.86~~ ~~104.70~~ FEET	15 MINUTES 104 ~~104.06~~	30 MINUTES 105 ~~105.25~~	45 MINUTES ~~104.83~~	60 MINUTES ~~104.83~~

IF FLOWING GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	FEET	1 [X] CLEAR 2 [ ] CLOUDY
RECOMMENDED PUMP TYPE: [ ] SHALLOW [ ] DEEP	RECOMMENDED PUMP SETTING FEET	RECOMMENDED PUMPING RATE GPM

LOCATION OF WELL

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

DRILLERS REMARKS: Well #2

FINAL STATUS OF WELL 1
1 [X] WATER SUPPLY 2 [ ] OBSERVATION WELL 3 [ ] TEST HOLE 4 [ ] RECHARGE WELL 5 [ ] ABANDONED, INSUFFICIENT SUPPLY 6 [ ] ABANDONED, POOR QUALITY 7 [ ] UNFINISHED

WATER USE 06
1 [ ] DOMESTIC 2 [ ] STOCK 3 [ ] IRRIGATION 4 [ ] INDUSTRIAL [ ] OTHER 5 [ ] COMMERCIAL 6 [X] MUNICIPAL 7 [ ] PUBLIC SUPPLY 8 [ ] COOLING OR AIR CONDITIONING 9 [ ] NOT USED

METHOD OF DRILLING 2
1 [ ] CABLE TOOL 2 [X] ROTARY (CONVENTIONAL) 3 [ ] ROTARY (REVERSE) 4 [ ] ROTARY (AIR) 5 [ ] AIR PERCUSSION 6 [ ] BORING 7 [ ] DIAMOND 8 [ ] JETTING 9 [ ] DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Snider Drilling and Equipment Ltd., | LICENCE NUMBER: 4816

ADDRESS: R.R.#1, (Craighurst), BARRIE, Ont. L4M 4Y8

NAME OF DRILLER OR BORER: Bruce Greenlaw | LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: Snider Drilling and Equipment Ltd. | SUBMISSION DATE: DAY ____ MO ____ YR ____

OFFICE USE ONLY

DATA SOURCE 1 | CONTRACTOR 4816 | DATE RECEIVED 03 11 81

DATE OF INSPECTION | INSPECTOR

REMARKS: CSS.ES

FORM NO. 0506—4—77 FORM 7

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29

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

3LD/SE

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

(11) 5719741 ✓ MUNICIP 57005 CON CON 12

COUNTY OR DISTRICT: SIMCOE
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: ~~Ellen~~ INNISFIL Barrie
CON, BLOCK, TRACT, SURVEY, ETC: XII
LOT 4 09
DATE COMPLETED: DAY 03 MO ~~Oct~~ 10 YR 84
[redacted] 76 ESSA Rd. BARRIE ONT
UTM 09800 5 ELEVATION 1025 5 BASIN CODE 22

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
BLACK	Topsoil			0	1/2
BROWN	CLAY	SAND, GRAVEL		1/2	75
yellow	SAND		Fine	75	79 1/2
		Con 12 Plan 1101 Lot 15			

FEB 13 1987

(31) 0091802 0075605281 0080508
(32)

(41) WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER	
0075 79½	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
~~4~~ 6	1 ☒ STEEL 2 ☐ GALVANIZED 1 ☐ CONCRETE 4 ☐ OPEN HOLE	.188 + 1/0075		
	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	LENGTH
008	6000 INCHES	04 FEET
MATERIAL AND TYPE: Stainless Steel	DEPTH TO TOP OF SCREEN ~~75~~ 0076 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	PUMPING RATE	DURATION OF PUMPING
1 ☐ PUMP 2 ☒ BAILER	0014 GPM	01 HOURS 30 MINS

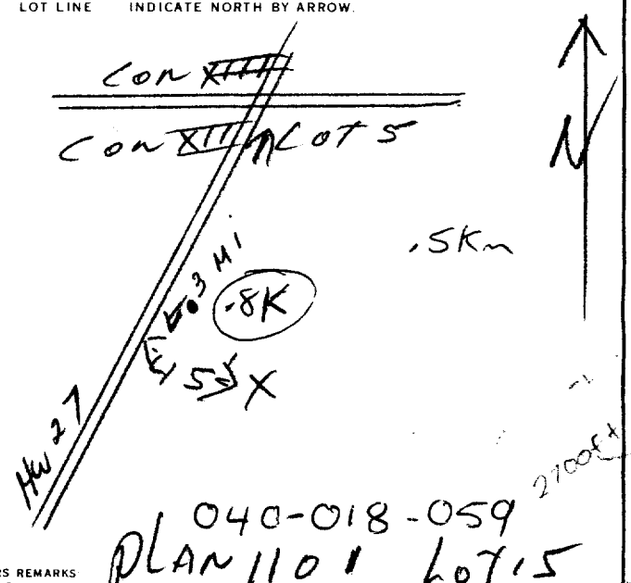
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
036 FEET	065 FEET	1 ☐ PUMPING 2 ☒ RECOVERY	036 FEET	036 FEET	036 FEET	036 FEET

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

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☒ DEEP	065 FEET	0010 GPM

LOCATION OF WELL

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



DRILLERS REMARKS: 040-018-059 PLAN 1101 Lot 15

FINAL STATUS OF WELL	WATER USE	METHOD OF DRILLING
1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED POOR QUALITY 7 ☐ UNFINISHED	1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED	1 ☐ CABLE TOOL 2 ☒ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING
1	01	2

CONTRACTOR

NAME OF WELL CONTRACTOR: HENRY HAMMERS — LICENCE NUMBER: 2514
ADDRESS: RR#3 BARRIE ONTARIO
NAME OF DRILLER OR BORER: SAME. — LICENCE NUMBER:
SIGNATURE OF CONTRACTOR: Henry Hammers — SUBMISSION DATE: DAY ____ MO. ____ YR. ____

OFFICE USE ONLY

DATA SOURCE: 1 — CONTRACTOR: 2514 — DATE RECEIVED: 010485
DATE OF INSPECTION — INSPECTOR
REMARKS: CSS.ES

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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 — 5723085 — MUNICIP — CON.

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC	LOT
[redacted]	TINISFIL	12	4
	ARRIE	DATE COMPLETED DAY 31 MO 10 YR 87	

G — 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	SAND		0	42
	SILT	CLAY		42	50
	CLAY			50	58
	SAND			58	164

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
164	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
5"	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188		
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
8	5" INCHES	4 FEET

MATERIAL AND TYPE: Johnson SS

DEPTH TO TOP OF SCREEN: FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	DEPTH SET AT - FEET TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
10-13	14-17	
18-21	22-25	
26-29	30-33	

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☐ PUMP 2 ☐ BAILER	8 GPM	1 HOURS 30 MINS

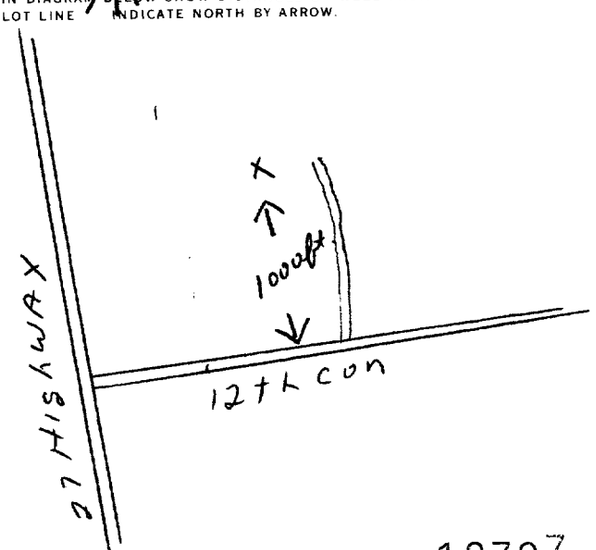
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
112 FEET	118 FEET	1 ☐ PUMPING 2 ☐ RECOVERY	118 FEET	118 FEET	118 FEET	118 FEET

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

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☐ SHALLOW ☑ DEEP	130 FEET	8 GPM

LOCATION OF WELL

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



DRILLERS REMARKS: 18727

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 — 9 ☐ 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: Kent Well Drilling — WELL CONTRACTOR'S LICENCE NUMBER: 3135

ADDRESS: R.R.1 Barrie

NAME OF WELL TECHNICIAN: TED WESTRA — WELL TECHNICIAN'S LICENCE NUMBER: T0340

SIGNATURE OF TECHNICIAN/CONTRACTOR: [signature] — SUBMISSION DATE: DAY ____ MO. ____ YR. ____

OFFICE USE ONLY

DATA SOURCE — CONTRACTOR: 3135 — DATE RECEIVED: APR 22 1988

DATE OF INSPECTION — INSPECTOR

REMARKS

CSS.ES

FORM NO. 0506 (11/86) FORM 9

MINISTRY OF THE ENVIRONMENT COPY

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 | 5723424 | MUNICIP 5 7 5 0 1 | CON.

COUNTY OR DISTRICT: Simcoe
TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Barrie
CON: XI | BLOCK, TRACT, SURVEY, ETC.: Formerly Innisfil Twp | LOT: 3
[redacted] 87 Maplevieu Dr. Barrie
DATE COMPLETED: DAY 24 MO 6 YR 88
RC | ELEVATION | 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
dark	top soil			0	1
yellow	sand			1	6
brown	clay	sand		6	26
yellow	sand		fine	26	40
grey	clay	sand		40	50

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
36 to 40	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	+1	36
5⅛	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.188	40	50
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
6	6 INCHES	4 FEET

MATERIAL AND TYPE: Stainless steel
DEPTH TO TOP OF SCREEN: 36 FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
0	8	sand
8	10	clay

71 PUMPING TEST

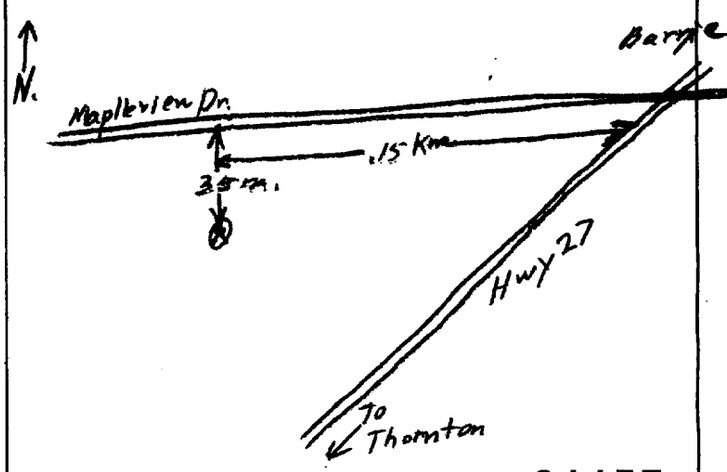
PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER
PUMPING RATE: 8 GPM
DURATION OF PUMPING: 1 HOURS 0 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY			
FEET	40 FEET	15 MINUTES: 40 FEET	30 MINUTES: 40 FEET	45 MINUTES: 40 FEET	60 MINUTES: 40 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: 23 FEET
RECOMMENDED PUMPING RATE: 5 GPM

LOCATION OF WELL

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



DRILLERS REMARKS: 389 Maplevieu Dr. 34457

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 9 ☐ 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: Al Hammers
WELL CONTRACTOR'S LICENCE NUMBER: 2513
ADDRESS: 737 Essa Rd. Barrie
NAME OF WELL TECHNICIAN: Sam
WELL TECHNICIAN'S LICENCE NUMBER: T-0229
SIGNATURE OF TECHNICIAN/CONTRACTOR: A. Hammers
SUBMISSION DATE: DAY 4 MO. 7 YR 88

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR: 2513 | DATE RECEIVED: JUL 07 1988
DATE OF INSPECTION | INSPECTOR
REMARKS: CSS.ES

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

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 | 5733259 | Municipality 57005 | Con CON | Lot 4

County or District: [redacted]

Township/Borough/City/Town/Village: Barrie (formerly Innisfil) | Con block tract survey, etc.: XI

Address: 371 Mapleview Dr W, Barrie

Date completed: 3 day 12 month 97 year

21 | T M | Northing | 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
			Abandoned previously dug well (30") X 28ft. Top three cement tiles removed.		

31

32

41 WATER RECORD

Water found at – feet	Kind of water
	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
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter inches	Length feet

Material and type:

Depth at top of screen feet:

61 PLUGGING & SEALING RECORD

☐ Annular space ☐ Abandonment

Depth set at – feet From	Depth set at – feet To	Material and type (Cement grout, bentonite, etc.)
0	26	clay fill
26	[illegible]	cement grout

71 PUMPING TEST

Pumping test method: 1 ☐ Pump 2 ☐ Bailer

Pumping rate: GPM

Duration of pumping: Hours Mins

Static level: feet

Water level end of pumping: feet

Water levels during: 1 ☐ Pumping 2 ☐ Recovery

15 minutes	30 minutes	45 minutes	60 minutes
feet	feet	feet	feet

If flowing give rate: GPM

Pump intake set at: feet

Water at end of test: ☐ Clear ☐ Cloudy

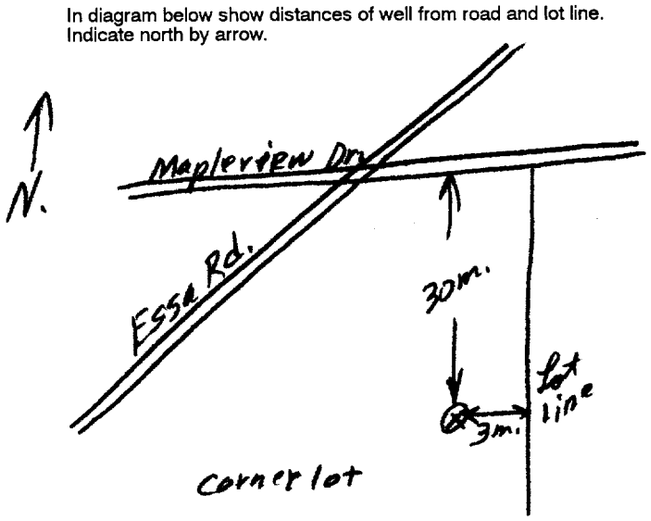
Recommended pump type: ☐ Shallow ☐ Deep

Recommended pump setting: feet

Recommended pump rate: GPM

LOCATION OF WELL

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



184105

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 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

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

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

Name of Well Contractor: A Hammers Well Drilling Inc. | Well Contractor's Licence No.: 2513

Address: 737 Essa Rd Barrie

Name of Well Technician: A. Hammers | Well Technician's Licence No.: T-0229

Signature of Technician/Contractor: A Hammers | Submission date: day 16 mo 2 98

MINISTRY USE ONLY

Data source | Contractor: 2513 | Date received: FEB 19 1998

Date of inspection | Inspector

Remarks: CSS.S8

0506 (07/94) Front Form 9

2 - MINISTER OF ENVIRONMENT & ENERGY COPY

Ontario **Ministry of the Environment**

The Ontario Water Resources Act
WATER WELL RECORD

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

11 (1 2) **5736556** Municipality 57005 (10 14) Con. CON (15 22 23 24)

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot (25-27)
SIMCOE	INNISFIL	XT	3

Owner's surname (28-47)	First Name	Address	Date completed (48-53)
CITY OF BARRIE		BOX 400 BARRIE ON L4M4T5	23 day 10 month 01 year

21 (1 2) UTM Zone (10) Easting (12 17) Northing (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
	ABANDONMENT	OF MOE	~~GRAVEL~~ PEA STONE	124	109
	WELL # 5717676		BENTONITE	109	18
			CONCRETE	18	2
	"Pine Mtn No.1"		NATIVE MATERIAL	2	0
		CASING ENDS 2 FT			
		BELOW GROUND LEVEL			

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

32

41 WATER RECORD

Water found at - feet	Kind of water
10-13	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) (60)

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
10-11	6	1 ☒ Steel (12) 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic		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) inches	Length (39-40) feet
Material and type	**Depth at top of screen (41-44) feet**	(30)

61 PLUGGING & SEALING RECORD

☐ Annular space ☒ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
10-13	14-17	
18-21	22-25	
26-29	30-33 (80)	

71 PUMPING TEST

Pumping test method (10) 1 ☐ Pump 2 ☐ Bailer | Pumping rate (11-14) GPM | Duration of pumping (15-16) Hours (17-18) Mins

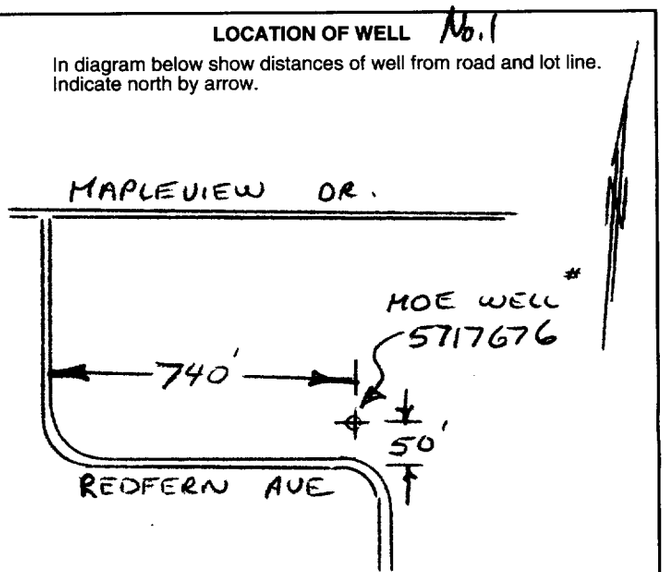
Static level (19-21) feet	Water level end of pumping (22-24) feet	25 Water levels during 1 ☐ Pumping 2 ☐ Recovery			
		15 minutes (26-28) feet	30 minutes (29-31) feet	45 minutes (32-34) feet	60 minutes (35-37) feet

If flowing give rate (38-41) GPM	Pump intake set at feet	Water at end of test (42) ☐ Clear ☐ Cloudy
Recommended pump type ☐ Shallow ☐ Deep	Recommended pump setting (43-45) feet	Recommended pump rate (46-49) GPM

(50-53)

LOCATION OF WELL No.1

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



232038

FINAL STATUS OF WELL (54)

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)

1 ☐ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☒ Not use 10 ☐ Other

METHOD OF CONSTRUCTION (57)

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 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.
INTERNATIONAL WATER SUPPLY	2801
Address	
PO BOX 310 BARRIE ON L4M 4T5	
Name of Well Technician	**Well Technician's Licence No.**
WAYNE OUNN	T0118
Signature of Technician/Contractor	**Submission date** day 30 mo 10 yr 01

MINISTRY USE ONLY

Data source (58)	Contractor (59-62)	Date received (63-68) (80)
	2801	JAN 16 2002
Date of inspection	Inspector	
Remarks		

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2 - MINISTRY OF THE ENVIRONMENT COPY

Ontario **Ministry of the Environment**

The Ontario Water Resources Act
WATER WELL RECORD

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

11 (1 2) **5736557** Municipality 57005 (10 14) Con. CON (15 22 23 24)

County or District	Township/Borough/City/Town/Village	Con ~~block, tract, survey, etc.~~	Lot (25-27)
SIMCOE	INNISFIL	XI	3

Owner's surname (28-47)	First Name	Address	Date completed (48-53)
CITY OF BARRIE		BOX 400 BARRIE ON L4M4T5	23 day / 10 month / 01 year

21 (1 2) UTM: Zone (10) Easting (12 17) Northing (18 24) RC (25) Elevation (26) RC (30) Basin Code (31 47) i 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
	ABANDONMENT OF	MOE	PEA STONE	124	107
	WELL # 5717677		BENTONITE	107	18
			CONCRETE	18	2
	"		NATIVE MATERIAL	2	0
	Pinic Mtn No. 2	"			

31

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

41 WATER RECORD

Water found at - feet	Kind of water
10-13	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) (60)

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth - feet From	Depth - feet To
10-11	6	1 ☒ Steel (12) 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic		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) inches	Length (39-40) feet

Material and type	Depth at top of screen (41-44) feet	(30)

61 PLUGGING & SEALING RECORD

☐ Annular space ☒ Abandonment

Depth set at - feet From	Depth set at - feet To	Material and type (Cement grout, bentonite, etc.)
10-13	14-17	
18-21	22-25	
26-29	30-33 (80)	

71 PUMPING TEST

Pumping test method (10) 1 ☐ Pump 2 ☐ Bailer | Pumping rate (11-14) GPM | Duration of pumping (15-16) Hours (17-18) Mins

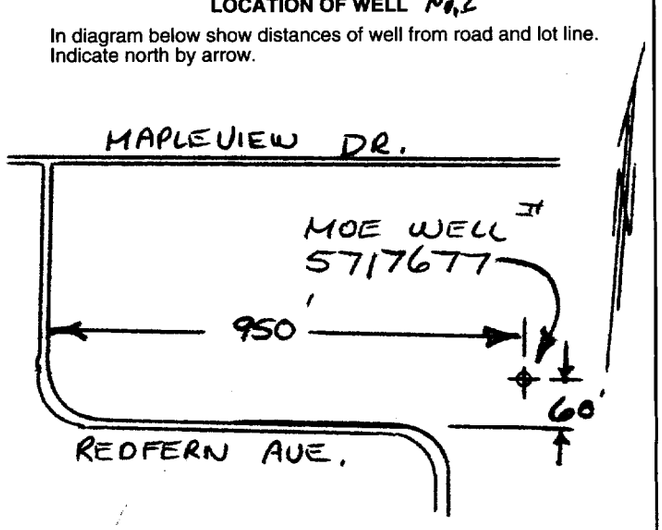
Static level (19-21) feet	Water level end of pumping (22-24) feet	(25) Water levels during 1 ☐ Pumping 2 ☐ Recovery	15 minutes (26-28) feet	30 minutes (29-31) feet	45 minutes (32-34) feet	60 minutes (35-37) feet

If flowing give rate (38-41) GPM	Pump intake set at feet	Water at end of test (42) ☐ Clear ☐ Cloudy
Recommended pump type ☐ Shallow ☐ Deep	Recommended pump setting (43-45) feet	Recommended pump rate (46-49) GPM

(50-53)

LOCATION OF WELL No. 2

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



232039

FINAL STATUS OF WELL (54)

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)

1 ☐ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☒ Not use 10 ☐ Other

METHOD OF CONSTRUCTION (57)

1 ☐ Cable tool 2 ☐ Rotary (conventional) 3 ☐ Rotary (reverse) 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.
INTERNATIONAL WATER SUPPLY	2801
Address	
BOX 310 BARRIE ON L4M4T5	
Name of Well Technician	**Well Technician's Licence No.**
WAYNE DUNN	T0118
Signature of Technician/Contractor	**Submission date** day 30 mo 10 yr 01

MINISTRY USE ONLY

Data source (58)	Contractor (59-62)	Date received (63-68) (80)
	2801	JAN 16 2002
Date of inspection	Inspector	
Remarks		

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Ontario | Ministry of the Environment

Well Tag Number (Place sticker and print number below)

Well Record

Regulation 903 Ontario Water Resources Act

page 1 of 1

Instructions for Completing Form

- For use in the **Province of Ontario** only. This document is a permanent **legal** document. Please retain for future reference.
- All Sections **must** be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
- Questions regarding completing this application can be directed to the Water Well Management Coordinator at 416-235-6203.
- **All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Ministry Use Only

MUN | CON | LOT

Well Owner's Information and Location of Well Information

[redacted]

Address of Well Location (County/District/Municipality): SIMCOE

Township: INNISFIL | Lot: 4 | Concession: XII

RR#/Street Number/Name: MAPLEVIEW

City/Town/Village: BARRIE

Site/Compartment/Block/Tract etc.

GPS Reading: NAD 83 | Zone 17 | Easting 602498 | Northing 4909000

Unit Make/Model: MAGELLAN

Mode of Operation: ☐ Undifferentiated ☒ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From	Depth To
	ABANDONMENT OF MOE WELL # 57-14608				
	CASING CUT OFF 2.3 m BELOW GROUND LEVEL				

Hole Diameter

Depth From	Depth To	Diameter Centimetres

Water Record

Water found at ___ Metres / Kind of Water

___ m ☐ Fresh ☐ Sulphur ☐ Gas ☒ Salty ☐ Minerals ☐ Other:

___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

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

Chlorinated ☐ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Depth To
Casing				
16	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen				
Outside diam	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		
No Casing or Screen				
	☐ Open hole			

Test of Well Yield

Pumping test method	Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Pump intake set at - (metres)	Static Level			
Pumping rate - (litres/min)	1		1	
Duration of pumping ____hrs + ____ min	2		2	
Final water level end of pumping ____metres	3		3	
Recommended pump type. ☐ Shallow ☐ Deep	4		4	
Recommended pump depth. ____metres	5		5	
Recommended pump rate. (litres/min)	10		10	
	15		15	
If flowing give rate - (litres/min)	20		20	
	25		25	
If pumping discontinued, give reason.	30		30	
	40		40	
	50		50	
	60		60	

Plugging and Sealing Record

☐ Annular space ☒ Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
48.5	43.0	WELL GRAVEL	0.08
43.0	1.7	BENTONITE	0.8
1.7	0	NATIVE MATERIAL	

Method of Construction

☐ Cable Tool ☐ Rotary (air) ☐ Diamond ☐ Digging
☐ Rotary (conventional) ☐ Air percussion ☐ Jetting ☐ Other
☐ Rotary (reverse) ☐ Boring ☐ Driving

Water Use

☐ Domestic ☐ Industrial ☐ Public Supply ☐ Other
☐ Stock ☐ Commercial ☐ Not used
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

☐ Water Supply ☐ Recharge well ☐ Unfinished ☒ Abandoned, (Other)
☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering
☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

Well Contractor/Technician Information

Name of Well Contractor: INTERNATIONAL WATER SUPPLY | Well Contractor's Licence No.: 2801

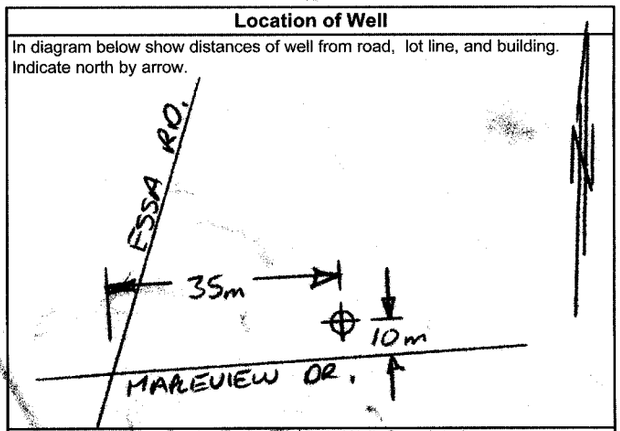
Business Address (street name, number, city etc.): PO BOX 310 BARRIE ON L4M 4T5

Name of Well Technician (last name, first name): ROBERT COULOMBE | Well Technician's Licence No.: T01782

Signature of Technician/Contractor: X [signature] | Date Submitted YYYY MM DD: 2005 04 13

Location of Well

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



Audit No. Z 11287 | Date Well Completed YYYY MM DD: 2005 04 13

Was the well owner's information package delivered? ☐ Yes ☒ No | Date Delivered YYYY MM DD

Ministry Use Only

Data Source	Contractor
	2801
Date Received YYYY MM DD: MAY 25 2005	Date of Inspection YYYY MM DD
Remarks	Well Record Number

0506E (09/03) Contractor's Copy ☐ Ministry's Copy ☒ Well Owner's Copy ☐

Cette formule est disponible en français

Ontario Ministry of the Environment

Well Tag No. (Number below) A 032082 / A032082.

Well Record

Regulation 903 Ontario Water Resources Act

page ___ of ___

Instructions for Completing Form

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- **All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Ministry Use Only

MUN | CON | LOT

Well Owner's Information and Location of Well Information

[redacted]

Simcoe. Innisfil. 7 11

RR#/Street Number/Name: 323 Mapleview Drive West. | City/Town/Village: Barrie. | Site/Compartment/Block/Tract etc.:

GPS Reading: NAD 83 | Zone 17 | Easting 602704 | Northing 4909050 | Unit Make/Model: Meridian | Mode of Operation: ☐ Undifferentiated ☑ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From	Depth To (Metres)
			Dug Well.	0	3.66.
			Original Owner Lougheed, T R.		
			note: Entire Well Dug out with excavator and sealed.		

Hole Diameter

Depth From	Depth To (Metres)	Diameter (Centimetres)

Water Record

Water found at ___ Metres / Kind of Water

- ___ m ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas ☐ Other:
- ___ m ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas ☐ Other:
- ___ m ☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas ☐ Other:

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

Chlorinated ☐ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Depth To (Metres)
Casing				
91	☐ Steel ☐ Fibreglass ☐ Plastic ☑ Concrete ☐ Galvanized		0	3.66. Removed.
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen				
Outside diam	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		

No Casing or Screen

☐ Open hole

Test of Well Yield

Pumping test method	Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Pump intake set at - (metres)	Static Level			
Pumping rate - (litres/min)	1		1	
Duration of pumping ____hrs +____ min	2		2	
Final water level end of pumping ____metres	3		3	
Recommended pump type. ☐ Shallow ☐ Deep	4		4	
Recommended pump depth. ____metres	5		5	
Recommended pump rate. (litres/min)	10		10	
If flowing give rate - (litres/min)	15		15	
If pumping discontinued, give reason.	20		20	
	25		25	
	30		30	
	40		40	
	50		50	
	60		60	

Plugging and Sealing Record ☐ Annular space ☑ Abandonment

Depth set at - Metres From	Depth set at - Metres To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
3.30	3.66	Bentonite (Bottom Seal). 4.2 cu ft	

Method of Construction

☐ Cable Tool ☐ Rotary (air) ☑ Diamond ☐ Digging
☐ Rotary (conventional) ☐ Air percussion ☐ Jetting ☐ Other
☐ Rotary (reverse) ☐ Boring ☐ Driving

Water Use

☐ Domestic ☐ Industrial ☐ Public Supply ☐ Other
☐ Stock ☐ Commercial ☐ Not used
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

☐ Water Supply ☐ Recharge well ☐ Unfinished ☑ Abandoned, (Other) Demolition.
☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering
☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

Well Contractor/Technician Information

Name of Well Contractor: Mike Hammers Well Drilling Ltd | Well Contractor's Licence No.: 2514

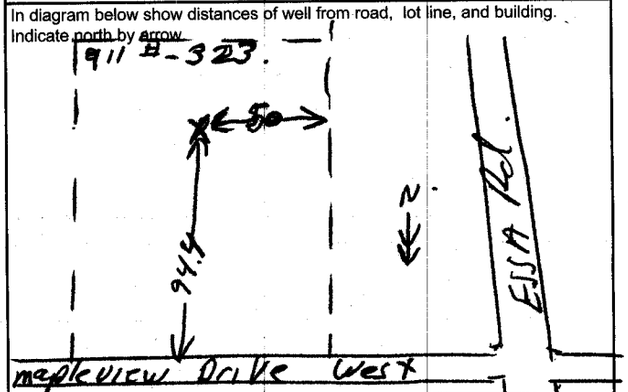
Business Address (street name, number, city etc.): 2091 Dwyer Rd Midhurst On L0L 1X0.

Name of Well Technician (last name, first name): Mike Hammers. | Well Technician's Licence No.: T0527

Signature of Technician/Contractor: X Mike Hammers | Date Submitted YYYY MM DD

Location of Well

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



Audit No. Z 34736 | Date Well Completed YYYY MM DD: 2006 01 16

Was the well owner's information package delivered? ☑ Yes ☐ No | Date Delivered YYYY MM DD: 2006 01 14

Ministry Use Only

Data Source | Contractor: 2514

Date Received YYYY MM DD: MAR 14 2006 | Date of Inspection YYYY MM DD

Remarks | Well Record Number

0506E (09/03) Contractor's Copy ☐ Ministry's Copy ☐ Well Owner's Copy ☐ *Cette formule est disponible en français*

Ontario Ministry of the Environment

Well T A032083 (number below)

A032083.

Well Record

Regulation 903 Ontario Water Resources Act

page ___ of ___

Instructions for Completing Form

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Ministry Use Only

MUN | CON | LOT

Well Owner's Information and Location of Well Information

Fi [redacted]

C [redacted] ode)

Address of Well Location (County/District/Municipality): Simcoe.

Township: Innisfil.

Lot: 4.

Concession: E 11

RR#/Street Number/Name: 323 Maple View Drive West.

City/Town/Village: Barrie

Site/Compartment/Block/Tract etc.: 323.

GPS Reading: NAD 83 | Zone 17 | Easting 602665 | Northing 4909144

Unit Make/Model: meridian.

Mode of Operation: ☐ Undifferentiated ☑ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From	Depth Metres To
			Drilled well.	0	137ft.
				0	41.76m.
			original owner [redacted]		
note: Entire Well Sealed With Bentonite and Top Bed. - Top Bed located. 3.96m Below ground Surface.			Drilled 1965/11.		
			Well no 57-01386		

Hole Diameter

Depth From	Depth To	Diameter centimetres

Water Record

Water found at ___ Metres / Kind of Water

- ___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other: ___
- ___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other: ___
- ___ m ☑ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other: ___

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

Chlorinated ☐ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Depth Metres To
Casing				
15.88	☑ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.48.	3.96	39.31
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen				
Outside diam	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		
No Casing or Screen				
	☐ Open hole			

Test of Well Yield

Pumping test method	Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Pump intake set at - (metres)	Static Level			
Pumping rate - (litres/min)	1		1	
Duration of pumping ___hrs +___ min	2		2	
Final water level end of pumping ___metres	3		3	
Recommended pump type. ☐ Shallow ☐ Deep	4		4	
Recommended pump depth. ___metres	5		5	
Recommended pump rate. (litres/min)	10		10	
	15		15	
If flowing give rate - (litres/min)	20		20	
	25		25	
If pumping discontinued, give reason.	30		30	
	40		40	
	50		50	
	60		60	

Plugging and Sealing Record

☐ Annular space ☑ Abandonment

Depth set at - Metres From	Depth set at - Metres To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed ~~(cubic metres)~~
0	41.76	Bentonite	50 Bags. 35 cu/ft.

Method of Construction

☐ Cable Tool ☐ Rotary (air) ☐ Diamond ☐ Digging
☐ Rotary (conventional) ☐ Air percussion ☐ Jetting ☐ Other
☐ Rotary (reverse) ☐ Boring ☐ Driving

Water Use

☑ Domestic ☐ Industrial ☐ Public Supply ☐ Other
☐ Stock ☐ Commercial ☐ Not used
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

☐ Water Supply ☐ Recharge well ☐ Unfinished ☑ Abandoned, (Other)
☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering
☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

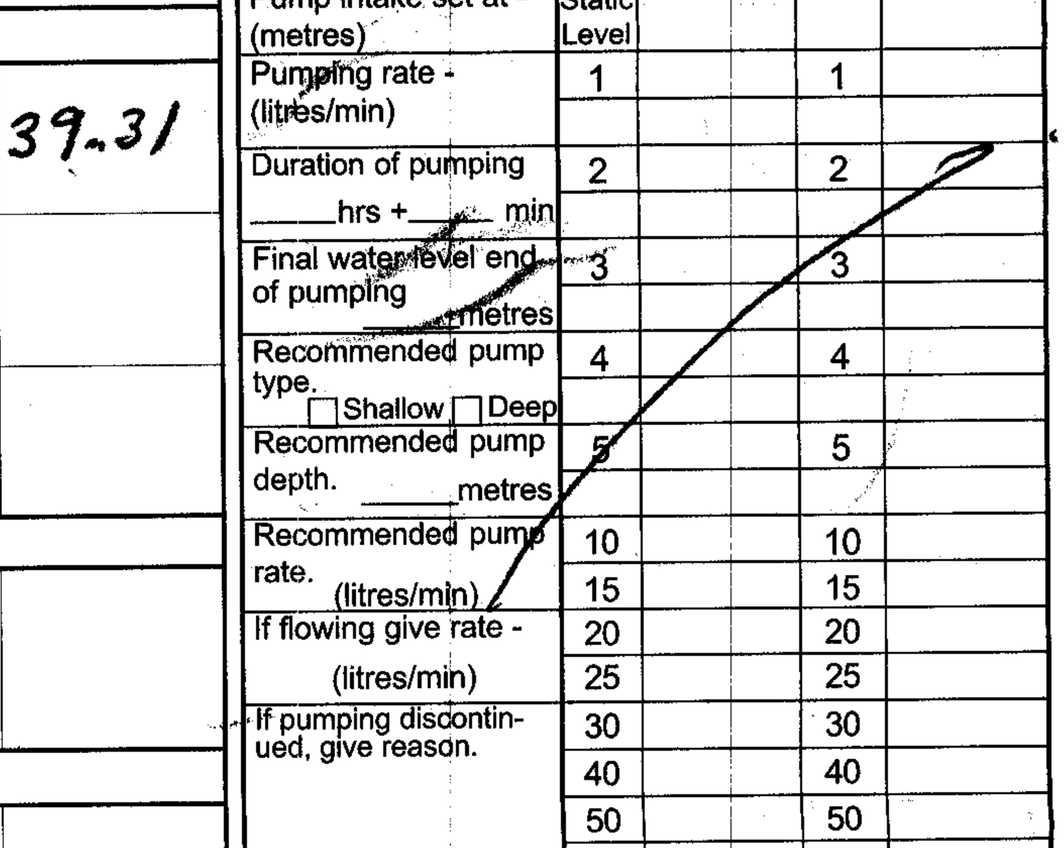
Demolition

Well Contractor/Technician Information

Name of Well Contractor: Mike Hammers Well Drill Ltd	Well Contractor's Licence No.: 2514
Business Address (street name, number, city etc.): 2091 Dayer Rd Midhurst On L0L 1X0.	
Name of Well Technician (last name, first name): Mike Hammers.	Well Technician's Licence No.: T-0527.
Signature of Technician/Contractor: X Mike Hammers.	Date Submitted YYYY MM DD

Location of Well

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



Audit No. Z 34735

Date Well Completed YYYY MM DD: 2006 01 16

Was the well owner's information package delivered? ☑ Yes ☐ No

Date Delivered YYYY MM DD: 2006 01 14

Ministry Use Only

Data Source	Contractor 2514
Date Received MAR 14 2006 YYYY MM DD	Date of Inspection YYYY MM DD
Remarks	Well Record Number

0506E (09/03)

Contractor's Copy ☐ Ministry's Copy ☐ Well Owner's Copy ☐

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Ontario Ministry of the Environment

Well Tag Num: A011228

A011228

Well Record

Regulation 903 Ontario Water Resources Act

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Well Owner's Information and Location of Well Information

[redacted]

SIMCOE — XII

RR#/Street Number/Name: 50 REID DRIVE

City/Town/Village: BARRIE

Site/Compartment/Block/Tract etc.

GPS Reading: NAD 83 | Zone 17 | Easting 603184 | Northing 4909825

Unit Make/Model: MAGELLAN

Mode of Operation: ☐ Undifferentiated ☒ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From	Depth To
BROWN	GRAVEL	SOME CLAY		0	3.7
GREY	CLAY		HARD	3.7	7.3
	SAND	FINE		7.3	17.7
GREY	CLAY		HARD	17.7	23.2
	GRAVEL	SAND	FINE	23.2	43.3
	CLAY	GRAVEL		43.3	51.8
	GRAVEL	SAND	PACKED, FINE	51.8	54.6
	GRAVEL	SOME CLAY	PACKED	54.6	56.1
	SAND	SOME GRAVEL	FINE PACKED	56.1	73.8

Hole Diameter

Depth From	Depth To (Metres)	Diameter (Centimetres)
0	73.8	38.1

Water Record

Water found at ___ Metres / Kind of Water

___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

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

Chlorinated ☐ Yes ☐ No

Construction Record

Casing

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Depth To (Metres)
20	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	0.8	0.7	62.5
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			

Screen

Outside diam		Slot No.		
19	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	15	62.5	71.6

No Casing or Screen

☐ Open hole

Test of Well Yield

Pumping test method: PUMP

	Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Pump intake set at - (metres)	Static Level	37.17		
Pumping rate - (litres/min)	1		1	
Duration of pumping 72 hrs + 0 min	2	52.45	2	37.71
Final water level end of pumping 53.78 metres	3		3	
Recommended pump type. ☐ Shallow ☐ Deep	4	53.79	4	37.67
Recommended pump depth. ___ metres	5		5	
Recommended pump rate. (litres/min)	10	55.54	10	37.27
	15	55.54	15	37.26
If flowing give rate - (litres/min)	20	55.53	20	37.25
	25	55.55	25	37.24
If pumping discontinued, give reason.	30	55.57	30	37.23
	40	55.58	40	37.23
	50	55.59	50	37.23
	60	55.59	60	37.24

Plugging and Sealing Record ☒ Annular space ☐ Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	7.0	BENTONITE	1.6
7.0	49.4	NEAT CEMENT SLURRY	3.5

Method of Construction

☐ Cable Tool ☐ Rotary (air) ☐ Diamond ☐ Digging
☒ Rotary (conventional) ☐ Air percussion ☐ Jetting ☐ Other
☐ Rotary (reverse) ☐ Boring ☐ Driving

Water Use

☐ Domestic ☐ Industrial ☐ Public Supply ☐ Other
☐ Stock ☐ Commercial ☐ Not used
☐ Irrigation ☐ Municipal ☒ Cooling & air conditioning

Final Status of Well

☒ Water Supply ☐ Recharge well ☐ Unfinished ☐ Abandoned, (Other)
☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering
☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

Well Contractor/Technician Information

Name of Well Contractor: INTERNATIONAL WATER SUPPLY — Well Contractor's Licence No.: 2801

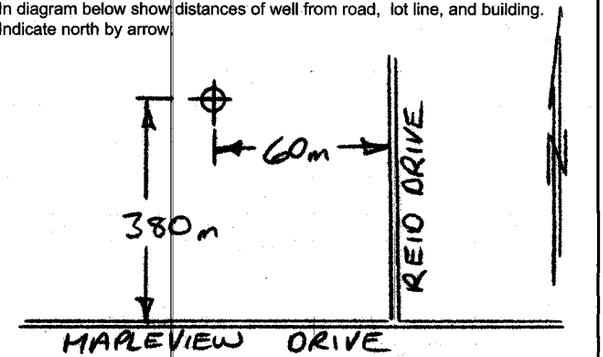
Business Address (street name, number, city etc.): PO BOX 310 BARRIE ON L4M 4T5

Name of Well Technician (last name, first name): RC MAGEE — Well Technician's Licence No.: T0117

Signature of Technician/Contractor: X — Date Submitted: 2006 06 01

Location of Well

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



Audit No. Z 33259

Date Well Completed: 2006 06 01

Was the well owner's information package delivered? ☒ Yes ☐ No

Date Delivered: 2006 06 09

Ministry Use Only

Data Source | Contractor: 2801

Date Received: JUL 05 2006 | Date of Inspection

Remarks | Well Record Number

0506E (09/03) Contractor's Copy ☐ Ministry's Copy ☒ Well Owner's Copy ☐

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Ontario Ministry of the Environment

Well Tag Number (Place sticker and print number below)

Well Record

Regulation 903 Ontario Water Resources Act

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Well Owner's Information and Location of Well Information

[redacted]

SIMCOE | INNISFIL | 3 | 11

RR#/Street Number/Name: 375 Mapleview Dr. W. | City/Town/Village: BARRIE | Site/Compartment/Block/Tract etc.

GPS Reading | NAD: 83 | Zone: 17 | Easting: 602390 | Northing: 4909111 | Unit Make/Model: MAGELLAN | Mode of Operation: ☐ Undifferentiated ☑ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

FEET/INCHES

General Colour	Most common material	Other Materials	General Description	Depth From	Depth To
			DECOMMISSION A 23FT. DEEP, 36 INCH CONCRETE TILED BORED WELL		
			HOLE PLUG	23'	22'
			CLEAN CLAY FILL/GROUT MIX	22	12
			HOLE PLUG / GROUT MIX	12	10
			CLAY FILL/GROUT MIX	10	0

NOTE: STATIC 7FT. CHLORINATE AND PUMP STANDING WATER. REMOVE PUMP LINES AND UPPER CASING.

Hole Diameter

Depth From	Depth To (Metres)	Diameter (Centimetres)

Water Record

Water found at ___ Metres / Kind of Water

- ___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
- ___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
- ___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

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

Chlorinated ☐ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Depth To (Metres)
	Casing			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	Screen			
Outside diam	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		
	No Casing or Screen			
	☐ Open hole			

Test of Well Yield

Pumping test method	Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Pump intake set at - (metres)	Static Level			
Pumping rate - (litres/min)	1		1	
Duration of pumping ___hrs +___min	2		2	
Final water level end of pumping ___metres	3		3	
Recommended pump type. ☐ Shallow ☐ Deep	4		4	
Recommended pump depth. ___metres	5		5	
Recommended pump rate. (litres/min)	10		10	
	15		15	
If flowing give rate - (litres/min)	20		20	
	25		25	
If pumping discontinued, give reason.	30		30	
	40		40	
	50		50	
	60		60	

Plugging and Sealing Record

☐ Annular space ☐ Abandonment

Depth set at - Metres From	Depth set at - Metres To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
		SEE ABOVE	

Method of Construction

☐ Cable Tool ☐ Rotary (air) ☐ Diamond ☐ Digging
☐ Rotary (conventional) ☐ Air percussion ☐ Jetting ☐ Other
☐ Rotary (reverse) ☐ Boring ☐ Driving

Water Use

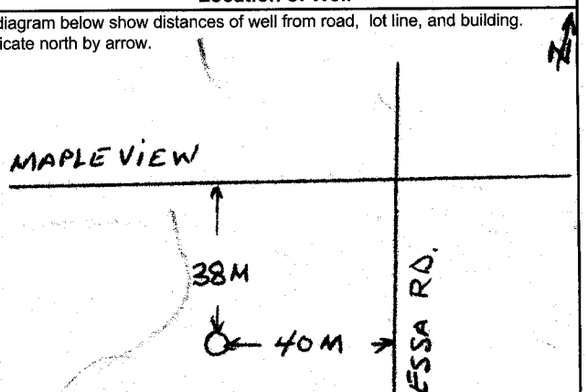
☐ Domestic ☐ Industrial ☐ Public Supply ☐ Other
☐ Stock ☐ Commercial ☐ Not used
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

☐ Water Supply ☐ Recharge well ☐ Unfinished ☑ Abandoned, (Other)
☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering
☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

Location of Well

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



Audit No. Z 36195

Date Well Completed YYYY MM DD: 2006 05 30

Was the well owner's information package delivered? ☐ Yes ☑ No

Date Delivered YYYY MM DD

Well Contractor/Technician Information

Name of Well Contractor: ONTARIO DRILLING | Well Contractor's Licence No.: 4102

Business Address (street name, number, city etc.): 3661 NT ALBERT RD. SHARON

Name of Well Technician (last name, first name): MOORE DAVE | Well Technician's Licence No.: T-2299

Signature of Technician/Contractor: x Dave Moore | Date Submitted YYYY MM DD: 2006 06 30

Ministry Use Only

Data Source | Contractor: 4102

Date Received YYYY MM DD: SEP 08 2006 | Date of Inspection YYYY MM DD

Remarks | Well Record Number

0506E (09/03)

Contractor's Copy ☐ Ministry's Copy ☐ Well Owner's Copy ☑

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Ontario Ministry of the Environment

Well Ta A 045616 (mber below)

A 045616

Well Record

Regulation 903 Ontario Water Resources Act

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Ministry Use Only

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Well Owner's Information and Location of Well Information

[redacted]

RR#/Street Number/Name: 743 Essa Rd.

City/Town/Village: Barrie (formerly Innisfil)

Site/Compartment/Block/Tract etc.: Con XI South ½ Lot 3

GPS Reading: NAD 83 | Zone 17 | Easting 602371 | Northing 4909026

Unit Make/Model: Garmin 201

Mode of Operation: ☐ Undifferentiated ☒ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From	Depth To (Metres)
dark brown	top soil			0	0.15
brown	silt	sand, clay, boulders		0.15	6.70
"	clay	sand		6.70	8.83
yellow brown	sand		very fine	8.83	11.88
	clay	sand		11.88	

Hole Diameter

Depth From	Depth To (Metres)	Diameter (Centimetres)
0	6	20.70

Water Record

Water found at Metres / Kind of Water

- ___ m ☒ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
- ___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
- ___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

After test of well yield, water was ☒ Clear and sediment free ☐ Other, specify

Chlorinated ☒ Yes ☐ No

Construction Record

Casing

Inside diam (centimetres)	Material	Wall thickness (centimetres)	Depth From	Depth To (Metres)
15.87	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	0.48	+0.60	8.83
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			

Screen 3ft. Top – 4' Bottom

Outside diam	Material	Slot No.	Depth From	Depth To (Metres)
14.44	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	10 – 3ft 4 – 4ft.	8.83	11.88

No Casing or Screen

☐ Open hole

Test of Well Yield

Pumping test method: submrs.

Pump intake set at - (metres): 10

Pumping rate - (litres/min): 20.49

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping: 4.64 metres

Recommended pump type: ☐ Shallow ☒ Deep

Recommended pump depth: 9.75 metres

Recommended pump rate: 22.75 (litres/min)

If flowing give rate - (litres/min):

If pumping discontinued, give reason.

Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Static Level	4.57		
1	5.20	1	7.01
2	5.66	2	6.50
3	5.82	3	6.14
4	6.19	4	5.68
5	6.35	5	5.45
10	7.09	10	4.89
15	7.32	15	4.75
20	7.43	20	4.70
25	7.51	25	4.67
30	7.54	30	4.65
40	7.64	40	4.64
50	7.64	50	4.62
60	7.64	60	4.60

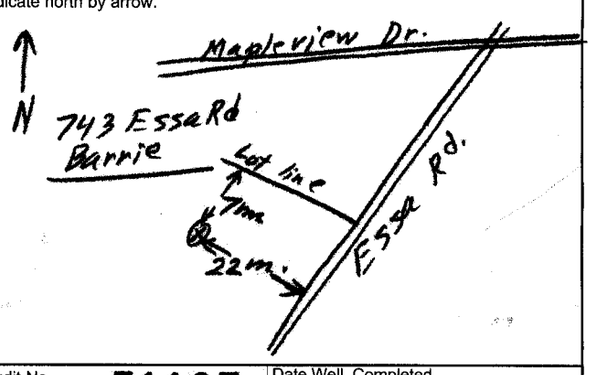
Plugging and Sealing Record

☒ Annular space ☐ Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	6	Bentonite slurry - EZ Seal	2 bags
		Holeplug	2 bags.

Location of Well

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



Method of Construction

☒ Cable Tool ☐ Rotary (air) ☐ Diamond ☐ Digging
☐ Rotary (conventional) ☐ Air percussion ☐ Jetting ☐ Other
☐ Rotary (reverse) ☐ Boring ☐ Driving

Water Use

☒ Domestic ☐ Industrial ☐ Public Supply ☐ Other
☐ Stock ☐ Commercial ☐ Not used
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

☒ Water Supply ☐ Recharge well ☐ Unfinished ☐ Abandoned, (Other)
☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering
☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

Audit No. Z 51137

Date Well Completed: YYYY 2006 MM 09 DD 13

Was the well owner's information package delivered? ☒ Yes ☐ No

Date Delivered: YYYY 2006 MM 09 DD 15

Well Contractor/Technician Information

Name of Well Contractor: Al Hammers Well Drilling Inc.

Well Contractor's Licence No.: 2513

Business Address (street name, number, city etc.): 737 Essa Rd, Barrie, On.

Name of Well Technician (last name, first name): A. Hammers

Well Technician's Licence No.: T-229

Signature of Technician/Contractor: X A. Hammers

Date Submitted: YYYY 2007 MM 1 DD 9

Ministry Use Only

Data Source

Contractor: 2513

Date Received: YYYY JAN 16 2007 MM DD

Date of Inspection: YYYY MM DD

Remarks

Well Record Number

0506E (09/03) Contractor's Copy ☐ Ministry's Copy ☒ Well Owner's Copy ☐ *Cette formule est disponible en français*

Ontario Ministry of the Environment

Well Tag Number (Write in the number below): A 045619

A 045619

Well Record

Regulation 903 Ontario Water Resources Act

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- Please print clearly in blue or black ink only.

Ministry Use Only

MUN | CON | LOT

Well Owner's Information and Location of Well Information

[redacted]

Simcoe | Formerly Innisfil | 3 | XI

RR#/Street Number/Name: 743 Essa Rd.

City/Town/Village: Barrie

Site/Compartment/Block/Tract etc.: Con XI N. ½ Lot 3

GPS Reading: NAD 83 | Zone 17 | Easting | Northing

Unit Make/Model | Mode of Operation: ☐ Undifferentiated ☐ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth From	Depth To (Metres)
	Abandon drilled well believed to be well No. 57-1372 drilled 05/53 by driller No. 5510 for E. Cole		4" OD casing by 45' deep.		

Hole Diameter

Depth From	Depth To (Metres)	Diameter (Centimetres)

Water Record

Water found at ___ Metres / Kind of Water

___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

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

Chlorinated ☐ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Depth To (Metres)
Casing				
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen				
Outside diam	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		
No Casing or Screen				
	☐ Open hole			

Test of Well Yield

Pumping test method	Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Pump intake set at - (metres)	Static Level			
Pumping rate - (litres/min)	1		1	
Duration of pumping ____hrs +____ min	2		2	
Final water level end of pumping ____metres	3		3	
Recommended pump type. ☐ Shallow ☐ Deep	4		4	
Recommended pump depth. ____metres	5		5	
Recommended pump rate. (litres/min)	10		10	
	15		15	
If flowing give rate - (litres/min)	20		20	
	25		25	
If pumping discontinued, give reason.	30		30	
	40		40	
	50		50	
	60		60	

Plugging and Sealing Record

☐ Annular space ☒ Abandonment

Depth set at - Metres From	Depth set at - Metres To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
		Intermittent layers sand and bedding	10ft Bentonite

Method of Construction

☐ Cable Tool ☐ Rotary (air) ☐ Diamond ☐ Digging
☐ Rotary (conventional) ☐ Air percussion ☐ Jetting ☐ Other
☐ Rotary (reverse) ☐ Boring ☐ Driving

Water Use

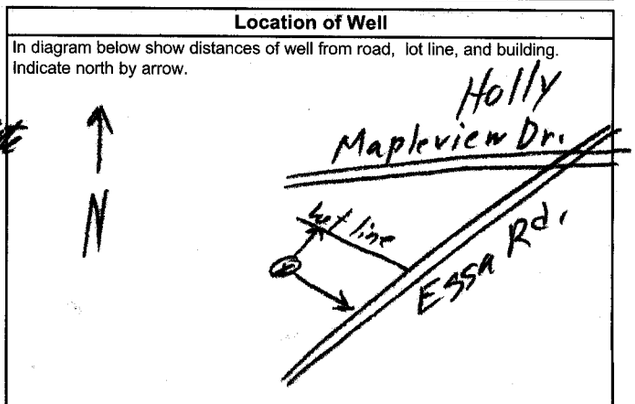
☐ Domestic ☐ Industrial ☐ Public Supply ☐ Other
☐ Stock ☐ Commercial ☒ Not used
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

☐ Water Supply ☐ Recharge well ☐ Unfinished ☐ Abandoned, (Other)
☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering
☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

Location of Well

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



Audit No. z 51140

Date Well Completed: YYYY 2006 | MM 9 | DD 18

Was the well owner's information package delivered? ☒ Yes ☐ No

Date Delivered: YYYY 2006 | MM 9 | DD 15

Well Contractor/Technician Information

Name of Well Contractor: A. Hammers Well Drilling Inc. | Well Contractor's Licence No.: 2513

Business Address (street name, number, city etc.): 737 Essa Rd Barrie, On.

Name of Well Technician (last name, first name): A. Hammers | Well Technician's Licence No.: T-229

Signature of Technician/Contractor: X A. Hammers | Date Submitted: YYYY 2007 | MM 1 | DD 9

Ministry Use Only

Data Source | Contractor 25 1

Date Received: YYYY MM DD JAN 16 2007 | Date of Inspection: YYYY MM DD

Remarks | Well Record Number

0506E (09/03) Contractor's Copy ☐ Ministry's Copy ☒ Well Owner's Copy ☐ *Cette formule est disponible en français*

Ontario — Ministry of the Environment

Measurements recorded in: ☐ Metric ☒ Imperial

Well Tag No. (Place Sticker and/or Print Below) A081082

Well Record

Regulation 903 Ontario Water Resources Act

6264 Page ____ of ____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	Winchurch ENV.		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
80 Cross Squares.	Aurora	Ont.	L4G 5H9	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
375 Mapleview Drive			

County/District/Municipality	City/Town/Village	Province	Postal Code
	Barrie	Ontario	

UTM Coordinates: NAD 83 | Zone 17 | Easting 602449 | Northing 4909172

Municipal Plan and Sublot Number:

Other: WKQ-001187 A 081081 - A 081083

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	To
BRN	SAND	GRAVEL	FILL	0	2
BRN	SAND	SILT	NATIVE	2	15

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
0	1	CONCRETE	
1	4	BENTONITE.	
4	15	SILICA SAND.	

Method of Construction

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

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
1.25	PLASTIC	0.141	0	5

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To
1.4	PLASTIC	10	5	15

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*

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)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery 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	

Water Details

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

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	15	3

Map of Well Location

Please provide a map below following instructions on the back.

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Strata Soil Sampling Inc.	7241

Business Address (Street Number/Name)	Municipality
147-2 West Beaver Creek Road	Richmond Hill

Province	Postal Code	Business E-mail Address
Ontario	L4B 1C6	wrecords@stratasoil.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
905-764-9304	Mair, Mike

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3448		20090415

Comments: General contractor: Winchurch Environmental

Well owner's information package delivered: ☐ Yes ☒ No

Date Package Delivered: ____

Date Work Completed: 20090406

Ministry Use Only

Audit No. Z 096503

Received MAY 07 2009

0506E (12/2007) **Ministry's Copy**

Ontario — Ministry of the Environment

Measurements recorded in: ☐ Metric ☒ Imperial

Well Tag *(Place Sticker and/or Print Below)*: A081083

Well Record

Regulation 903 Ontario Water Resources Act

6264 Page ____ of ____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	WINCHURCH ENVIRONMENTAL		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
80 Cross Square	Aurora	ON	L4G 5H9	

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
375 Mapleview Drive			

County/District/Municipality	City/Town/Village	Province	Postal Code
	Barrie	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	602442	4909168		WKQ-001187 A 081081 - A 081083

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
BRN	BRN SAND	GRAVEL	FILL	0	2
BRN	SAND	SILT	NATIVE	2	15

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
0	1	CONCRETE	
1	4	BENTONITE	
4	15	SILICA SAND	

Method of Construction

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

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
1.25	PLASTIC	0.141	0	5

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To
1.45	PLASTIC	10	5	10

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	Gas	Other, specify
	☐ Fresh ☐ Untested	☐	
	☐ Fresh ☐ Untested	☐	
	☐ Fresh ☐ Untested	☐	

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	15	3

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)*

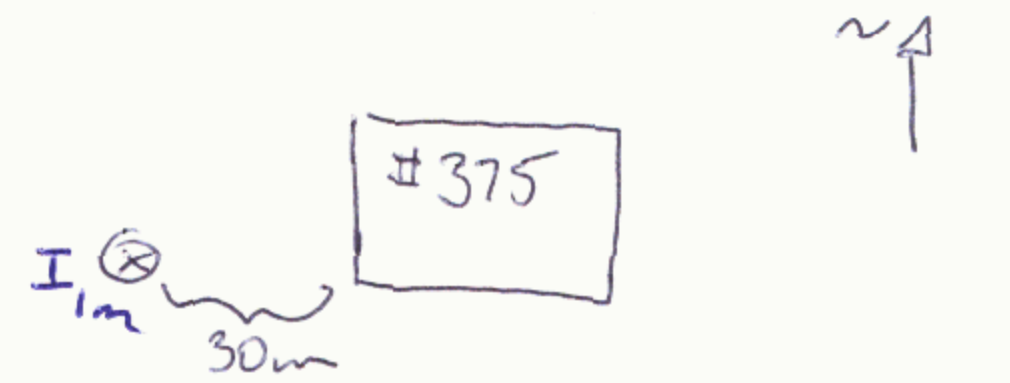
Well production *(l/min / GPM)*

Disinfected? ☐ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery 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.



Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Strata Soil Sampling Inc.	7241

Business Address (Street Number/Name)	Municipality
147-2 West Beaver Creek Road	Richmond Hill

Province	Postal Code	Business E-mail Address
Ontario	L4B 1C6	wrecords@stratasoil.com

Bus. Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)
905-764-9304	Muir, Mike

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3448		20090415

Comments: General contractor: Winchurch Environmental

Well owner's information package delivered: ☐ Yes ☒ No

Date Package Delivered: ____

Date Work Completed: 2009 04 06

Ministry Use Only

Audit No. Z 096504

Received MAY 07 2009

0506E (12/2007) **Ministry's Copy**

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 _____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
ANTHEM	MORTGAGE GROUP	lorraine@anthemmortgage.ca	

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
387 Mapleview Dr. W.	Barrie	On	L4N9G4	7052124509

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
387 Mapleview Dr. W.	Formerly Innisfil	3	XI

County/District/Municipality	City/Town/Village	Province	Postal Code
Simcoe	Barrie	Ontario	L4N9G4

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	602313	4909094	—	—

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
	Abandon previously drilled well 6¼" x 50'				
			Sand	50	38
	Bentonite	holeplug		36	1
			Sand + mulch	1	0
	Casing removed from +2' to 6'				

Annular Space

Depth Set at (m/ft) From	Depth Set at (m/ft) 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	Depth (m/ft) To

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) 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* None Use
☐ 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	Depth (m/ft) To	Diameter (cm/in)

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)*

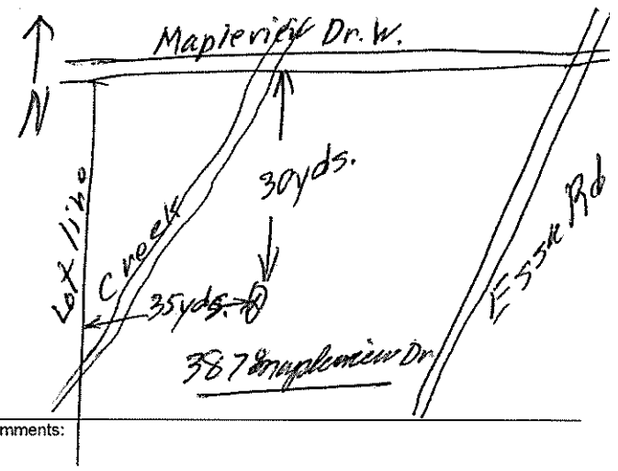
Well production *(l/min / GPM)*

Disinfected? ☒ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery 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.
Al Hammers Well Drilling	2513

Business Address (Street Number/Name)	Municipality
737 Essa Rd.	Barrie

Province	Postal Code	Business E-mail Address
On.	L4N9G1	—

Bus. Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)
7052124166418	Hammers Albert

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
7219	A. Hammers	2012/01/27

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☐ No	Y Y Y Y M M D D	Y Y Y Y M M D D

Ministry Use Only

Audit No. z129221

Received JAN 31 2012

Ontario

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: 7222725
Well Audit Number: *Z188173*
Well Tag Number: *A165728*

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

Well Location

Address of Well Location	120 MAPLEVIEW DR.
Township	INNISFIL TOWNSHIP
Lot	
Concession	
County/District/Municipality	SIMCOE
City/Town/Village	
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 603163.00 Northing: 4909802.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
BRWN	SAND	GRVL	FILL	0 ft	4 ft
BRWN	SAND	TILL		4 ft	16 ft

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed
5 ft	0 ft	HOLEPLUG	
16 ft	15 ft	SAND	

Method of Construction & Well Use

Method of Construction	Well Use
Direct Push	Monitoring and Test Hole

Status of Well

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To
2 inch	PLASTIC	0 ft	6 ft

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To
2 inch	PLASTIC	6 ft	16 ft

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7241

Results of Well Yield Testing

After test of well yield, water was
If pumping discontinued, give reason
Pump intake set at
Pumping Rate
Duration of Pumping
Final water level
If flowing give rate
Recommended pump depth
Recommended pump rate
Well Production
Disinfected?

Draw Down & Recovery

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

Water Details

Water Found at Depth	Kind

Hole Diameter

Depth From	Depth To	Diameter
0 ft	16 ft	6 inch

Audit Number: Z188173

Date Well Completed: May 29, 2014

Date Well Record Received by MOE: June 27, 2014

Updated: January 24, 2020

Ontario

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: 7275577
Well Audit Number: *Z230494*
Well Tag Number: *A210265*

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

Well Location

Address of Well Location	222 MAPLEVIEW DRIVE WEST
Township	INNISFIL TOWNSHIP
Lot	
Concession	
County/District/Municipality	SIMCOE
City/Town/Village	Barrie
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 603230.00 Northing: 4909427.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
BRWN	SAND	CLAY		0 ft	
GREY	CLAY		WBRG		

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed
8 ft	0 ft	BENTONITE	

Method of Construction & Well Use

Method of Construction	Well Use
Boring	
	Monitoring

Status of Well

Observation Wells

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To
2 inch	PLASTIC	0 ft	10 ft

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To
2.5 inch	PLASTIC	10 ft	15 ft

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7360

Results of Well Yield Testing

After test of well yield, water was
If pumping discontinued, give reason
Pump intake set at
Pumping Rate
Duration of Pumping
Final water level
If flowing give rate
Recommended pump depth
Recommended pump rate
Well Production

Disinfected?

Draw Down & Recovery

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

Water Details

Water Found at Depth	Kind

Hole Diameter

Depth From	Depth To	Diameter
0 ft	15 ft	6 inch

Audit Number: Z230494

Date Well Completed: October 25, 2016

Date Well Record Received by MOE: November 24, 2016

Updated: January 24, 2020

Ontario

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: 7275580
Well Audit Number: *Z230495*
Well Tag Number: *A210266*

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

Well Location

Address of Well Location	222 MAPLEVIEW DRIVE WEST
Township	INNISFIL TOWNSHIP
Lot	
Concession	
County/District/Municipality	SIMCOE
City/Town/Village	Barrie
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 603272.00 Northing: 4909511.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
BRWN	SAND	CLAY		0 ft	
GREY	CLAY		WBRG		

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed
6 ft	0 ft	BENTONITE	

Method of Construction & Well Use

Method of Construction	Well Use
Boring	
	Monitoring

Status of Well

Observation Wells

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To
2 inch	PLASTIC	0 ft	8 ft

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To
2.5 inch	PLASTIC	8 ft	18 ft

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7360

Results of Well Yield Testing

After test of well yield, water was
If pumping discontinued, give reason
Pump intake set at
Pumping Rate
Duration of Pumping
Final water level
If flowing give rate
Recommended pump depth
Recommended pump rate
Well Production

Disinfected?

Draw Down & Recovery

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

Water Details

Water Found at Depth	Kind

Hole Diameter

Depth From	Depth To	Diameter
0 ft	20 ft	6 inch

Audit Number: Z230495

Date Well Completed: October 25, 2016

Date Well Record Received by MOE: November 24, 2016

Updated: January 24, 2020

Appendix F –

WATER BALANCE CALCULATIONS

File No. 20-1014A

Water Balance - 664, 674 692 Essa Road 320 Mapleview Drive West

MONTHLY AND YEARLY WATER BALANCE COMPONENTS														
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Potential Evapotranspiration Calculation	Average Temperature: T (^{o}C)	-7.7	-6.6	-2.1	5.6	12.3	17.9	20.8	19.7	15.3	8.7	2.7	-3.5	6.9
	Heat Index: $i=(T/5)^{1.514}$	0.00	0.00	0.00	1.19	3.91	6.90	8.66	7.97	5.44	2.31	0.39	0.00	36.8
	Unadjusted Daily Potential Evapotranspiration: U (mm)	0.0	0.0	0.0	25.2	59.0	88.5	104.1	98.1	74.7	40.6	11.5	0.0	501.7
	Adjusting Factor for U (Latitude 44^{o})	0.81	0.82	1.02	1.12	1.26	1.28	1.29	1.20	1.04	0.95	0.81	0.77	-
	Adjusted Potential Evapotranspiration - PET (mm)	0.0	0.0	0.0	28.2	74.3	113.3	134.3	117.8	77.7	38.6	9.3	0.0	593.4
Pervious Components	Precipitation: P (mm)	82.5	61.8	58.1	62.2	82.4	84.8	77.2	89.9	94.0	77.5	88.9	73.6	932.9
	Adjusted Potential Evapotranspiration: PET (mm)	0.0	0.0	0.0	28.2	74.3	113.3	134.3	117.8	77.7	38.6	9.3	0.0	593.4
	P - PET	82.5	61.8	58.1	34.0	8.1	-28.5	-57.1	-27.9	16.3	38.9	79.6	73.6	339.5
	Change in Soil Moisture Storage (mm)	0.0	0.0	0.0	0.0	0.0	-28.5	-57.1	-27.9	16.3	38.9	0.0	0.0	-
	Water Holding Capacity (max. 100 mm)	100.0	100.0	100.0	100.0	100.0	71.5	14.5	0.0	16.3	55.3	100.0	100.0	-
	Water Surplus Available for Infiltration or Runoff	82.5	61.8	58.1	34.0	8.1	0.0	0.0	0.0	0.0	0.0	34.9	73.6	352.9
	Potential Infiltration based on MOECC Infiltration Factor (mm)	66.0	49.4	46.5	27.2	6.4	0.0	0.0	0.0	0.0	0.0	27.9	58.9	282.3
	Potential Surface Water Runoff (mm)	16.5	12.4	11.6	6.8	1.6	0.0	0.0	0.0	0.0	0.0	7.0	14.7	70.6
Impervious Components	Precipitation: P (mm)	-												932.9
	Potential Evaporation: PE (mm), Assume 15%	-												139.9
	Potential Surface Water Runoff: P - PE (mm)	-												793.0

PRE- AND POST-DEVELOPMENT WATER BALANCE (NO LOW IMPACT DEVELOPMENT MEASURES IN PLACE)							
		Total Land Area (m^2)	Est. Fraction of Land	Est. Land Area (m^2)	Runoff (m^3/annum)	Infiltration (m^3/annum)	**Runoff Increase Pre to Post**
Existing Land Use (Pre-Development)	Pervious Area	102500.0	92%	94300.0	6655.8	26623.0	383%
	Impervious Area		8%	8200.0	6502.3	0.0	**Infiltration Decrease Pre to Post**
	TOTAL	-	100%	102500.0	13158.1	26623.0	-74%
Proposed Land Use (Post-Development)	Pervious Area	102500.0	24%	24600.0	1736.3	6945.1	**Infiltration Required to Meet Pre-Development Conditions (m^3)**
	Impervious Area (Estimated from *"Conceptual Site Plan"*)		76%	77900.0	61772.0	0.0	
	TOTAL	-	100%	102500.0	63508.3	6945.1	19678

Notes

1. Both potential infiltration and surface water runoff are independent of temperature
2. Assumption is in January maximum soil moisture storage value is present (100mm)
3. Water Holding Capacity & Infiltration Factors taken from Table 3.1 of MOE SWMPDM, 2003
4. Average Temp. and Precip. taken from Environment Canada station Barrie WPCC between 1981 and 2010
5. Adjusting Factor for U based on Lorente, 1961

Infiltration Criteria	Site Description	Infiltration Factor
Topography	Flat Land - Average Slope Less Than 0.6 m/km	0.3
Soils	Open Sandy Loam	0.4
Cover	Cultivated Land	0.1
	Sum of Infiltration Factors	**0.8**

Appendix G –

GROUNDWATER CHEMISTRY CERTIFICATES OF ANALYSIS

CADUCEON™ ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G92340 **REPORT No. B20-08573**

Report To:

Central Earth Engineering Inc
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Alex Winkelmann

Caduceon Environmental Laboratories
112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 02-Apr-20
DATE REPORTED: 08-Apr-20
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Mapleview & Essa
P.O. NUMBER: 20-1014A
WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
Cyanide	2	Kingston	TK	07-Apr-20	A-CN-001 (k)	SM 4500CN
Anions	2	Holly Lane	bco	03-Apr-20	A-IC-01 (o)	SM4110C
pH	2	Holly Lane	SYL	03-Apr-20	A-PH-01 (o)	SM 4500H
Sulphide	2	Kingston	TK	03-Apr-20	A-S2	SM4500-S2
A - Wet Chem	2	Kingston	KD	03-Apr-20	A-TPTKN-001 (N)(k)	E3199A.1
A - Wet Chem	2	Kingston	KD	03-Apr-20	A-TPTKN-001 (P)(k)	E3199A.1
Total Suspended Solids	2	Kingston	LSE	03-Apr-20	A-TSS-001 (k)	SM2540D
BOD	2	Kingston	JWF	03-Apr-20	C-BOD-001 (k)	SM 5210B
COD	2	Holly Lane	ST	06-Apr-20	C-COD-01 (o)	SM 5220D
SVOC	2	Kingston	sge	06-Apr-20	C-NAB-W-001 (k)	EPA 8270
Oil & Grease	2	Kingston	MLY	06-Apr-20	C-O&G-001 (k)	SM 5520
Phenolics (4-aap)	2	Kingston	TK	06-Apr-20	C-PHEN-01 (k)	MOEE 3179
VOC's	2	Richmond Hill	JE	03-Apr-20	C-VOC-02 (rh)	EPA 8260
Mercury	2	Holly Lane	PBK	06-Apr-20	D-HG-02 (o)	SM 3112 B
Metals - ICP-OES	2	Holly Lane	AHM	06-Apr-20	D-ICP-01 (o)	SM 3120
Metals-ICP-MS	2	Holly Lane	TPR	07-Apr-20	D-ICPMS Dissolved 7800	EPA 200.8
Metals - ICP-MS	2	Holly Lane	TPR	07-Apr-20	D-ICPMS-01 (o)	EPA 200.8

Barrie Sanitary - Barrie Sanitary & Combined and Storm
Barrie-Sanitary/Combined - Sanitary/Combined Sewer Guidelines
Barrie-Storm Sewer - Storm Sewer Guidelines

Christine Burke
Lab Manager

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

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Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 02-Apr-20
DATE REPORTED: 08-Apr-20
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Mapleview & Essa
P.O. NUMBER: 20-1014A
WATERWORKS NO.

	Client I.D.		MW 3	MW 10			Barrie Sanitary	
	Sample I.D.		B20-08573-1	B20-08573-2			Barrie-Sanitary/Combined	Barrie-Storm Sewer
	Date Collected		01-Apr-20	01-Apr-20				
Parameter	**Units**	**R.L.**						
pH @25°C	pH Units		7.91	7.41			9.5	9.5
BOD(5 day)	mg/L	3	< 3	3			300	15
COD	mg/L	5	< 5	157			600	
Total Kjeldahl Nitrogen	mg/L	0.1	0.4	1.9			100	
Total Suspended Solids	mg/L	3	**2480**	**12100**			350	15
Oil and Grease-Mineral	mg/L	1.0	< 1.0	< 1.0			15	
Oil and Grease-Anim/Veg.	mg/L	1.0	< 1.0	4.9			150	
Phosphorus-Total	mg/L	0.01	0.31	1.47			10	
Cyanide (Total)	mg/L	0.005	< 0.005	< 0.005			1.2	
Chloride	mg/L	0.5	8.9	72.1			1500	
Fluoride	mg/L	0.1	< 0.1	< 0.1			10	
Sulphate	mg/L	1	5	22			1500	
Aluminum (total)	mg/L	0.01	4.51	28.4			50	
Antimony	mg/L	0.0001	0.0003	< 0.0005			5.0	
Arsenic	mg/L	0.0001	0.0007	0.0120			1.0	
Barium	mg/L	0.001	0.082	0.325			5.0	
Benzene	mg/L	0.0005	< 0.0005	< 0.0005			0.01	
Bismuth	mg/L	0.02	< 0.02	< 0.02			5.0	
Cadmium	mg/L	0.000015	0.000032	0.000727			0.7	0.001
Chromium	mg/L	0.002	0.012	0.053			2.0	0.08
Cobalt	mg/L	0.005	< 0.005	0.028			5.0	
Copper	mg/L	0.002	**0.012**	**0.083**			2.0	0.01
Dichlorobenzene,1,2-	mg/L	0.0005	< 0.0005	< 0.0005			0.05	
Dichlorobenzene,1,4-	mg/L	0.0005	< 0.0005	< 0.0005			0.08	

Barrie Sanitary - Barrie Sanitary & Combined and Storm
Barrie-Sanitary/Combined - Sanitary/Combined Sewer Guidelines
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Christine Burke
Lab Manager

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DATE RECEIVED: 02-Apr-20
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SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Mapleview & Essa
P.O. NUMBER: 20-1014A
WATERWORKS NO.

	Client I.D.		MW 3	MW 10			Barrie Sanitary	
	Sample I.D.		B20-08573-1	B20-08573-2			Barrie-Sanitary/Combined	Barrie-Storm Sewer
	Date Collected		01-Apr-20	01-Apr-20				
Parameter	**Units**	**R.L.**						
Ethylbenzene	mg/L	0.0005	< 0.0005	< 0.0005			0.06	
Gold	mg/L	0.0007	< 0.0007	< 0.0007			5.0	
Hexachlorobenzene	mg/L	0.0001	< 0.0001	< 0.0001			0.0001	
Iron	mg/L	0.005	7.06	49.6			50	
Lead	mg/L	0.02	< 0.02	0.02			0.7	0.05
Manganese (Total)	mg/L	0.001	0.224	1.39			5.0	
Mercury	mg/L	0.00002	< 0.00002	< 0.00002			0.01	
Dichloromethane (Methylene Chloride)	mg/L	0.005	< 0.005	< 0.005			0.09	
Molybdenum	mg/L	0.01	< 0.01	< 0.01			5.0	
Nickel	mg/L	0.01	< 0.01	0.05			2.0	0.05
Total PAH	mg/L	0.0001	< 0.0001	< 0.0001			0.005	
Acenaphthene	µg/L	0.05	< 0.05	< 0.05				
Acenaphthylene	µg/L	0.05	< 0.05	< 0.05				
Anthracene	µg/L	0.05	< 0.05	< 0.05				
Benzo(a)anthracene	µg/L	0.05	< 0.05	< 0.05				
Benzo(a)pyrene	µg/L	0.01	< 0.01	< 0.01				
Benzo(b+k)fluoranthene	µg/L	0.1	< 0.1	< 0.1				
Benzo(g,h,i)perylene	µg/L	0.05	< 0.05	< 0.05				
Dibenzo(a,h)anthracene	µg/L	0.05	< 0.05	< 0.05				
Chrysene	µg/L	0.05	< 0.05	< 0.05				
Fluoranthene	µg/L	0.05	< 0.05	< 0.05				
Fluorene	µg/L	0.05	< 0.05	< 0.05				
Indeno(1,2,3,-cd)pyrene	µg/L	0.05	< 0.05	< 0.05				

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SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Mapleview & Essa
P.O. NUMBER: 20-1014A
WATERWORKS NO.

	Client I.D.		MW 3	MW 10			Barrie Sanitary	
	Sample I.D.		B20-08573-1	B20-08573-2			Barrie-Sanitary/Combined	Barrie-Storm Sewer
	Date Collected		01-Apr-20	01-Apr-20				
Parameter	**Units**	**R.L.**						
Methylnaphthalene,1-	µg/L	0.05	< 0.05	< 0.05				
Methylnaphthalene,2-	µg/L	0.08	< 0.08	< 0.08				
Naphthalene	µg/L	0.05	< 0.05	< 0.05				
Phenanthrene	µg/L	0.05	< 0.05	< 0.05				
Pyrene	µg/L	0.05	< 0.05	< 0.05				
Phenolics	mg/L	0.002	< 0.002	< 0.002			0.1	
Platinum	mg/L	0.00004	< 0.00004	< 0.00004			5.0	
Rhodium	mg/L	0.00002	< 0.00002	< 0.00002			5.0	
Selenium	mg/L	0.001	< 0.001	< 0.005			1.0	
Silver	mg/L	0.005	< 0.005	< 0.005			0.4	
Sulphide	mg/L	0.01	< 0.05 [1]	< 0.25 [1]			1.0	
Tetrachloroethane,1,1,2,2-	mg/L	0.0005	< 0.0005	< 0.0005			0.06	
Tetrachloroethylene	mg/L	0.0005	< 0.0005	< 0.0005			0.06	
Toluene	mg/L	0.0005	< 0.0005	< 0.0005			0.02	
Trichloroethylene	mg/L	0.0005	< 0.0005	< 0.0005			0.05	
Xylene, m,p,o-	mg/L	0.0011	< 0.0011	< 0.0011			0.3	
Tin	mg/L	0.05	< 0.05	< 0.05			5.0	
Vanadium	mg/L	0.005	0.010	0.095			5.0	
Zinc	mg/L	0.005	**0.042**	**0.249**			2.0	0.04

1 . Elevated RL due to sample matrix interference

Barrie Sanitary - Barrie Sanitary & Combined and Storm
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Christine Burke
Lab Manager

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G92340 **REPORT No. B20-08573**

Report To:

Central Earth Engineering Inc
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Barrie ON L4N 0B7 Canada
Attention: Alex Winkelmann

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112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
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DATE RECEIVED: 02-Apr-20
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SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Mapleview & Essa
P.O. NUMBER: 20-1014A
WATERWORKS NO.

Summary of Exceedances

Sanitary/Combined Sewer Guidelines

MW 3	Found Value	Limit
Total Suspended Solids (mg/L)	2480	350
MW 10	**Found Value**	**Limit**
Total Suspended Solids (mg/L)	12100	350

Storm Sewer Guidelines

MW 3	Found Value	Limit
Zinc (mg/L)	0.042	0.04
Total Suspended Solids (mg/L)	2480	15
Copper (mg/L)	0.012	0.01
MW 10	**Found Value**	**Limit**
Zinc (mg/L)	0.249	0.04
Total Suspended Solids (mg/L)	12100	15
Copper (mg/L)	0.083	0.01

Barrie Sanitary - Barrie Sanitary & Combined and Storm
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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G92340A **REPORT No. B20-08574 (i)**

Report To:

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647 Welham Rd, Unit 14,
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Attention: Alex Winkelmann

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112 Commerce Park Drive
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DATE RECEIVED: 02-Apr-20
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SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Mapleview & Essa
P.O. NUMBER: 20-1014A
WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
Alkalinity (as CaCO3)	2	Holly Lane	SYL	03-Apr-20	A-ALK-03 (o)	SM 2320B
Calc	2	Default Site	TYP	06-Apr-20	A-CALCS	Calc.
Cyanide	2	Kingston	TK	07-Apr-20	A-CN-001 (k)	SM 4500CN
Colour	2	Holly Lane	LMG	03-Apr-20	A-COL-01 (o)	SM 2120C
Conductivity	2	Holly Lane	SYL	03-Apr-20	A-COND-02 (o)	SM 2510B
Anions	2	Holly Lane	VK	03-Apr-20	A-IC-01 (o)	SM4110C
Nitrogen - Ammonia (N)	2	Kingston	SHU	03-Apr-20	A-NH3-001 (k)	SM4500-NH3-H
o-Phosphorus (P)	2	Kingston	SHU	03-Apr-20	A-o-PO4 K	PE4500-S
pH	2	Holly Lane	SYL	03-Apr-20	A-PH-01 (o)	SM 4500H
Turbidity	2	Holly Lane	LMG	06-Apr-20	A-TURB-01 (o)	SM 2130
Chromium (VI)	2	Holly Lane	LMG	08-Apr-20	D-CRVI-01 (o)	MOE E3056
Mercury	2	Holly Lane	PBK	06-Apr-20	D-HG-02 (o)	SM 3112 B
Metals - ICP-OES	2	Holly Lane	AHM	06-Apr-20	D-ICP-01 (o)	SM 3120
Metals - ICP-MS	2	Holly Lane	TPR	07-Apr-20	D-ICPMS-01 (o)	EPA 200.8

PWQO - Provincial Water Quality Objectives
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Christine Burke
Lab Manager

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SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Mapleview & Essa
P.O. NUMBER: 20-1014A
WATERWORKS NO.

	Client I.D.		MW 2	MW 11			PWQO	
	Sample I.D.		B20-08574-1	B20-08574-2			PWQO	
	Date Collected		01-Apr-20	01-Apr-20				
Parameter	**Units**	**R.L.**						
pH @25°C	pH Units		7.92	8.02			8.5	
Conductivity @25°C	µmho/cm	1	551	411				
Alkalinity(CaCO3) to pH4.5	mg/L	5	254	181				
Hardness (as CaCO3)	mg/L	1	392	196				
Cyanide (Free)	µg/L	5	< 5	< 5			5	
Chloride	mg/L	0.5	9.6	13.2				
Fluoride	mg/L	0.1	< 0.1	< 0.1				
Nitrite (N)	mg/L	0.1	< 0.1	< 0.1				
Nitrate (N)	mg/L	0.1	9.3	0.2				
Sulphate	mg/L	1	5	9				
Colour	TCU	2	< 2	2				
TDS (Calc. from Cond.)	mg/L	1	286	212				
Turbidity	NTU	0.1	2150	50.0				
Ammonia (N)-Total	mg/L	0.01	0.02	0.03				
o-Phosphate (P)	mg/L	0.002	0.259	0.050				
Calcium	µg/L	20	136000	50200				
Magnesium	µg/L	20	12600	17100				
Potassium	µg/L	100	1200	1900				
Sodium	µg/L	200	14700	25500				
Antimony	µg/L	0.1	0.2	0.3			20	
Arsenic	µg/L	0.1	0.6	1.3			5	
Barium	µg/L	1	64	67				
Beryllium	µg/L	2	< 2	< 2			11	

PWQO - Provincial Water Quality Objectives
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Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 02-Apr-20
DATE REPORTED: 08-Apr-20
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Mapleview & Essa
P.O. NUMBER: 20-1014A
WATERWORKS NO.

	Client I.D.		MW 2	MW 11			PWQO	
	Sample I.D.		B20-08574-1	B20-08574-2			PWQO	
	Date Collected		01-Apr-20	01-Apr-20				
Parameter	**Units**	**R.L.**						
Boron	µg/L	5	84	133			200	
Cadmium	µg/L	0.015	0.022	0.016			0.1	
Chromium	µg/L	2	6	2				
Chromium (VI)	µg/L	1	< 1	< 1			1	
Cobalt	µg/L	0.1	**3.4**	0.5			0.9	
Copper	µg/L	2	**9**	3			5	
Iron	µg/L	5	**4160**	**785**			300	
Lead	µg/L	0.02	**2.45**	0.57			1	
Mercury	µg/L	0.02	< 0.02	< 0.02			0.2	
Manganese	µg/L	1	173	47				
Molybdenum	µg/L	10	< 10	< 10			40	
Nickel	µg/L	10	< 10	< 10			25	
Selenium	µg/L	1	< 1	< 1			100	
Silver	µg/L	0.1	< 0.1	< 0.1			0.1	
Thallium	µg/L	0.05	< 0.05	< 0.05			0.3	
Uranium	µg/L	0.05	0.20	0.98			5	
Vanadium	µg/L	0.1	4.7	1.4			6	
Zinc	µg/L	5	**57**	**132**			20	

PWQO - Provincial Water Quality Objectives
PWQO - Provincial Water Quality Objectives

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

Christine Burke
Lab Manager

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G92340A **REPORT No. B20-08574 (i)**

Report To:

Central Earth Engineering Inc
647 Welham Rd, Unit 14,
Barrie ON L4N 0B7 Canada
Attention: Alex Winkelmann

Caduceon Environmental Laboratories
112 Commerce Park Drive
Barrie ON L4N 8W8
Tel: 705-252-5743
Fax: 705-252-5746

DATE RECEIVED: 02-Apr-20
DATE REPORTED: 08-Apr-20
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Mapleview & Essa
P.O. NUMBER: 20-1014A
WATERWORKS NO.

Summary of Exceedances

Provincial Water Quality Objectives		
MW 2	Found Value	Limit
Zinc (µg/L)	57	20
Lead (µg/L)	2.45	1
Iron (µg/L)	4160	300
Copper (µg/L)	9	5
Cobalt (µg/L)	3.4	0.9
MW 11	Found Value	Limit
Zinc (µg/L)	132	20
Iron (µg/L)	785	300

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Christine Burke
Lab Manager

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G92340A **REPORT No. B20-08574 (ii)**

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DATE RECEIVED: 02-Apr-20
DATE REPORTED: 08-Apr-20
SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Mapleview & Essa
P.O. NUMBER: 20-1014A
WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
PHC(F2-F4)	2	Kingston	KPR	03-Apr-20	C-PHC-W-001 (k)	MOE E3421
VOC's	2	Richmond Hill	JE	03-Apr-20	C-VOC-02 (rh)	EPA 8260
PHC(F1)	2	Richmond Hill	JE	03-Apr-20	C-VPHW-01 (rh)	MOE E3421

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Lab Manager

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SAMPLE MATRIX: Groundwater

JOB/PROJECT NO.: Mapleview & Essa
P.O. NUMBER: 20-1014A
WATERWORKS NO.

	Client I.D.		MW 2	MW 11			PWQO	
	Sample I.D.		B20-08574-1	B20-08574-2			PWQO	
	Date Collected		01-Apr-20	01-Apr-20				
Parameter	**Units**	**R.L.**						
Benzene	µg/L	0.5	< 0.5	< 0.5			100	
Toluene	µg/L	0.5	< 0.5	< 0.5			0.8	
Ethylbenzene	µg/L	0.5	< 0.5	< 0.5			8	
Xylene, m,p-	µg/L	1.0	< 1.0	< 1.0				
Xylene, o-	µg/L	0.5	< 0.5	< 0.5			40	
Xylene, m,p,o-	µg/L	1.1	< 1.1	< 1.1				
PHC F1 (C6-C10)	µg/L	50	< 50	< 50				
PHC F2 (>C10-C16)	µg/L	50	< 50	< 50				
PHC F3 (>C16-C34)	µg/L	400	< 400	< 400				
PHC F4 (>C34-C50)	µg/L	400	< 400	< 400				

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Summary of Exceedances

PWQO - Provincial Water Quality Objectives
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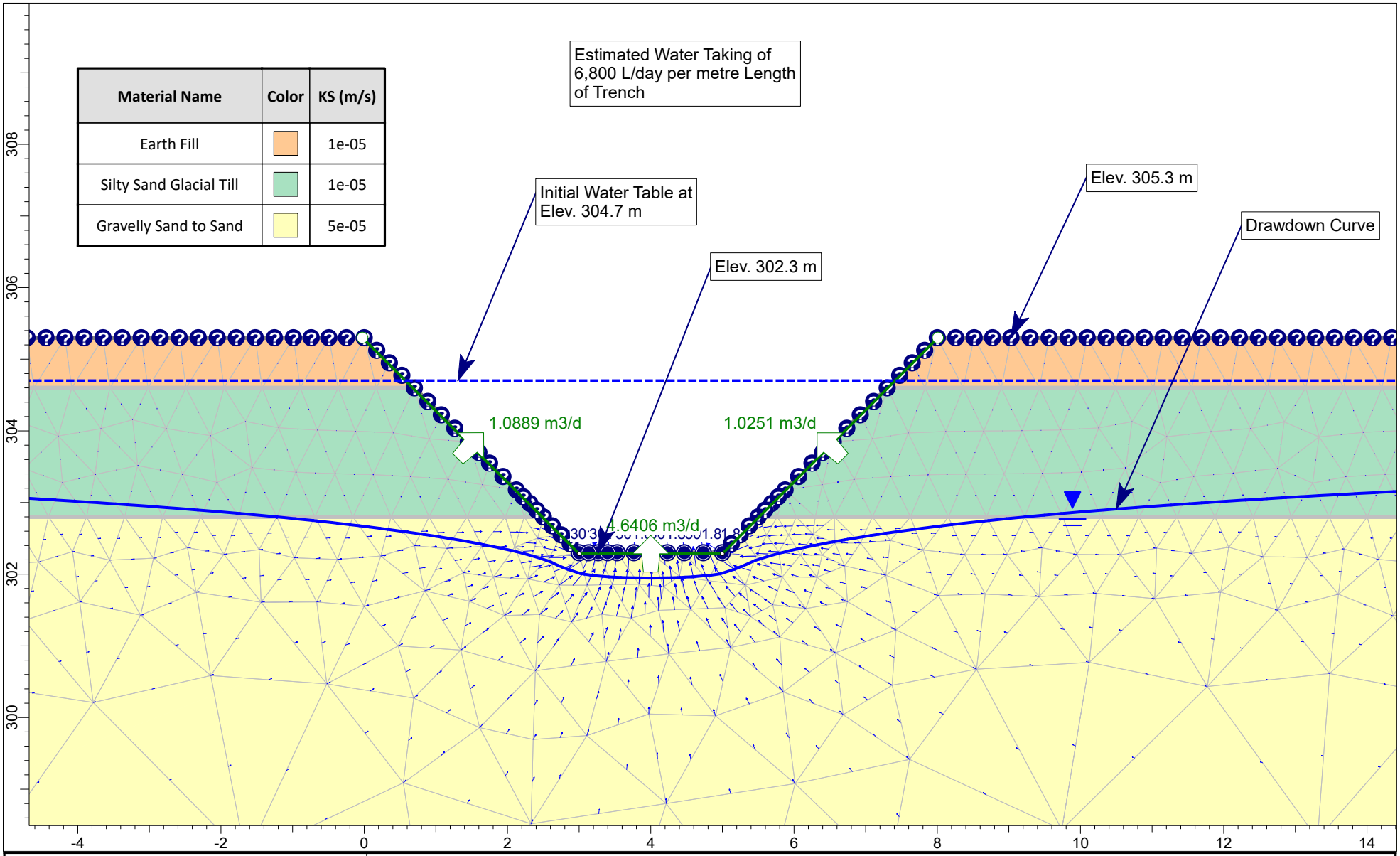
Appendix H –

TEMPORARY CONSTRUCTION DEWATERING FINITE ELEMENT MODEL



GEI Consultants

SLIDEINTERPRET 8.031

Project	20-1014A | 664, 674 & 692 Essa Road & 320 Mapleview Drive West		
Analysis Description	Temporary Construction Dewatering Estimate - Finite Element Model		
Drawn By RW	Scale 1:75	File Name	Dewatering FEM.slmd - Temporary Dewatering Estimate, Master Scenario
Date 2020-04-14		Survey Reference	