Hydrogeological Investigation Report
4 Campbell Drive,
Uxbridge, Ontario

Oak Valley Health

August 29, 2024
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ENGLOBE

Oak Valley Health
Hydrogeological Investigation Report
4 Campbell Drive

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1 Introduction

Englobe Corp. (Englobe) was retained by Oak Valley Health. to complete a Hydrogeological investigation and water balance assessment for the proposed development at 4 Campbell Drive in Uxbridge Ontario (Herein referred to as “the site”). The proposed development will involve an addition of a slab on grade Hospital Building, paved parking surfaces, underground utilities installation and a stormwater management pond (SWMP). Currently the site is occupied by an existing UXMED building, a cottage hospital and paved/landscaped areas. The proposed hospital building addition will be in the central part of the site with an approximate building footprint area of 6300 m^2/0.63 hectares. Currently the property and the immediate neighboring areas are serviced with municipal water and sewage services. The property is surrounded by Service Ontario facility to the east, vacant field to the west, residential subdivisions to the south and residential apartment building to the north.

Terraprobe (now Englobe Corp) previously two Hydrogeological investigations at the site (File No. 1-19-0022-46, dated April 12,2019 and File No. 1-19-0022-46.1 dated May 2020). Geotechnical assessment for the proposed development is presented under a separate cover **File No.: 02310769.002.**

This hydrogeological investigation includes an overview of the existing geological and hydrogeological conditions at the Site and the surrounding area, an assessment of the hydrogeological constraints, impacts of the proposed development on the local groundwater use and provides an estimation of construction dewatering requirements during the proposed development phase.

If needed, the results of this investigation can be used in support of an application for a Category 3 Permit to Take Water (PTTW) or an Environmental Activity Sector Registry (EASR) for construction dewatering from the Ministry of the Environment, Conservation and Parks (MECP).

2 Scope of Work

The following tasks were completed as part of the Hydrogeological Investigation:

- Background Review: A review of available background geological and hydrogeological information utilizing resources such as Ontario Geological survey (OGS), Ministry of Environment Conservation and Parks (MECP), Oak Ridges Moraine Groundwater Program (ORMGP), and Ministry of Natural Resources and Forestry (MNRF) databases.

- Review of Regulatory Mapping: Applicable regulatory authority mapping was reviewed in terms of the location of the site.
- Site Inspection: A visual inspection of the Site and surrounding areas was conducted to determine local topography and drainage, and an assessment of hydrogeologically significant features.
- Groundwater Level Monitoring and Hydraulic Conductivity Testing: Groundwater levels were monitored within the monitoring wells installed by Englobe Corporation. Hydraulic conductivity testing was conducted within the monitoring wells to confirm the hydraulic conductivity of the sub-soil profile within the screened intervals.
- Guelph Permeameter Testing: In-situ infiltration tests were conducted at the location of proposed Low Impact Development (LID) measures.
- Groundwater Quality Testing: Groundwater quality was assessed against applicable sewer use by law or Provincial Water Quality Objectives (PWQO).
- Review of Proposed Site Development Concept: The proposed site development plans were reviewed to confirm the proposed invert elevation for developing underground structures.
- Water Balance Assessment: Water balance assessment for the site was completed for the entire site based on the development plans provided.
- Source Water Impact Assessment: Appropriate mitigation measures to address hydrogeological function following property development.
- Groundwater Control Requirements: Groundwater control requirements (if applicable) during construction (Short Term) and post construction (Long term) were addressed as part of the investigation.

3 Applicable Regulations and Policies

3.1 Lake Simcoe Region Conservation Authority (LSRCA)

Under section 28 of the Conservation Authorities Act, local conservation authorities are mandated to protect the health and integrity of the regional greenspace system and to maintain or improve the hydrological and ecological functions performed by the valley and stream corridors. The site is located within the Uxbridge Brook Creek watershed, within the Lake Simcoe and Couchiching/Black River Source Protection Area. The subject site is partially located within a regulated LSRCA area. A tributary of Uxbridge Brook passes through the northwestern corner of the property, and therefore there are associated hazards (Meander belt erosion, erosion Hazard and flooding). Natural Heritage features (woodland) and Hydrologic features (wetlands) were also identified in the study area. Regulatory and watershed maps are presented **in Appendix A**.

3.2 Clean Water Act 2006

The MECP mandates the protection of existing and future sources of drinking water under the Clean Water Act, 2006 (CWA). Initiatives under the CWA include the delineation of Wellhead Protection Areas (WHPAs), Significant Groundwater Recharge Areas (SGRAs) and Highly Vulnerable Aquifers (HVAs), as well as the assessment of drinking water quality and quantity threats within Source Protection Regions. Source Protection Plans are developed under the CWA and include the restriction and prohibition of certain types of activities and land uses within WHPAs.

Based on the review of MECP's Source Protection Information Atlas and regulation area mapping, the following information was obtained:

Associated Policy Area	Applicability
Conservation Authourity	LSRCA
Source Protection Area	Lakes Simcoe and Couchiching/Black River
Conservation Regulated Area	Yes
Wellhead Protection Area (WHPA)	WHPA-A ; Score : 10 WHPA-Q1 and WHPA-Q2
Significant Groundwater Recharge Area (SGRA).	No
Highly Vulnerable Aquifer (HVA)	Yes. Vulnerability score 6
Intake Protection Zone	Westernmost Portion of the site is located in Intake Protection Zone 3 (Score 4.5)
Oak Ridges Moraine (ORM)	No
Niagara Escarpment Plan Area	No
Greenbelt Protection Act Area	No

3.3 South Georgian Bay Lake Simcoe Source Protection Region Approved Source Protection Plan

The Property is subject to policies LUP-12 and LUP-13. Briefly, it is required that the hydrogeological study demonstrate that the existing water balance can be maintained using best management practices such as low impact development (LID) and the use of these practices to maintain recharge rates is mandatory.

4 Site Description

4.1 Site Location and Description

The site (**Figure 2A**) has a total area of 5.5 hectares and currently is occupied by an existing UXMED building, a cottage hospital and paved/landscaped areas The proposed development (**Figure 2B**) will involve an addition of a slab on grade Hospital Building, paved parking surfaces, underground utilities installation and a stormwater management pond (SWMP). Currently the site is occupied by an existing UXMED building, a cottage hospital and paved/landscaped areas. The proposed hospital building addition will be in the central part of the site with an approximate building footprint area of 6300 m^2/0.63 hectares.

4.2 Topography and Surface Drainage

The topography at the site is relatively flat with surface elevation varying from 274.0-275.8 masl. Grade at the property generally slopes downwards to the northwest except in the eastern portion of the property where it slopes downwards to the southeast. Based on the preliminary existing drainage plans **(Appendix J)** provided to Englobe, the surface water from the eastern part of the property (Existing UXmed center and parking lot and Existing Cottage Hospital and Parking lot) flows to a a storm sewer on Campbell Drive. Surface water from the remaining part of the property including some external catchment areas flows to the Uxbridge Brook creek and the associated wetland in the Northwest corner of the site.

The nearest surface water features are a tributary of Uxbridge Brook that passes through the northwest corner of the site and a tributary of Uxbridge Brook present as a pond and creek approximately 120 m east of the property.

4.3 Physiography and Local Geology

Based on published literature and mapping, the Site is located within the Peterborough Drumlin Field physiographic region characterized by Clay till plains. The overburden in the region consists of coarse textured glaciolacustrine deposits. This material is generally characterized as sand, gravel, minor silt and clay from foreshore and basinal deposits. The bedrock in the vicinity of the property consists of the Blue Mountain Formation comprising of shale and limestone. Physiography and geological maps are presented in **Appendix B**.

4.4 Regional Hydrogeology

The Hydrogeological conditions for the site and the study area are inferred based on available well records and published literature. Oak Ridges Moraine Ground Water online mapping portal was also utilized to study regional hydrostratigraphy. The following hydrostratigraphic units are identified at the site and in the study area:

- <u>Channel Silt Aquitard:</u> Low permeability meltwater channel with an approximate thickness of 13 meters, forms the upper most layer of sediments at the site and in the study area. Limited vertical movement of groundwater is expected thus limiting the recharge to the underlying channel sand aquifer.

- Channel Sand Aquifer: Consists of permeable sand and gravel deposits in meltwater channels. This unit is also exploited for municipal water use.

- Lower Newmarket Till Aquitard: Lower Newmarket till in the study area forms the divide between the upper channel aquifer and the deeper aquifer i.e. Thorncliffe and Scarborough formation. The thickness of this layer is between 16 m -25 m as noted in the ORMGP cross section (**Appendix C**)

- Thorncliffe Formation Aquifer: Comprise of glaciofluvial deposits of sand and silty sand. Municipal well PW6 located approximately 15 meters from the southern boundary of the site is screened in this unit. The layer in the study area and site is approximately 16 meters thick.

At a regional level, groundwater moves through the sub watershed from the elevated areas of the Oak Ridges Moraine south of the site toward Lake Simcoe to the north. Shallow groundwater flow is affected by variations in the surface geological materials, which restrict vertical recharge. Additionally, shallow groundwater is influenced by various watercourses within the sub watershed, which are sustained by groundwater discharge.

4.5 Summary of Well Records

A review of MECP well records was conducted for 500 m surrounding the subject property. A total of 101 well records were identified within the study area. Thirty-nine (39) wells were identified as domestic use waters supply wells. All other wells were noted as test holes/monitoring wells, abandoned or not in use. Municipal water supply well PW6 (1911055) is located approximately 15 meters from the southern boundary of the site. The location of the well records is shown in **Figure 3**, whereas the individual well records are attached as **Appendix D**. Predominantly all water supply wells are screened in overburden with depths ranging from 6.1-68.0 mbgs. Private well users within the study area are anticipated.

5 Results of Subsurface Investigation

A subsurface investigation was completed at the Site by Englobe between June 17-20, 2024. Seventeen (17) boreholes in the vicinity of the proposed development were advanced to depths ranging from 5.2-8.2 mbgs.

The boreholes were drilled by a specialist drilling contractor using a track-mounted drill rig power auger. The borings were advanced using continuous flight solid stem augers and were sampled at 0.75 m (up to 3.0 m depth) and 1.5 m (below 3.0 m depth) intervals with a conventional 50 mm diameter split barrel sampler when the Standard Penetration (SPT) was carried out (ASTM D1586). The field work (drilling, sampling, and testing) was observed and recorded by a member of our field engineering staff, who logged the borings and examined the samples as they were obtained.

Water levels were measured in open boreholes upon completion of drilling. Standpipe piezometers or monitoring wells comprising 50 mm diameter PVC pipes were installed in selected boreholes to facilitate groundwater monitoring and for hydrogeological purposes. The PVC tubing was fitted. Upon installation, an elevation survey of the monitoring wells relative to a local datum was completed so that the relative groundwater flow direction can be assessed.

The borehole and monitoring well locations are outlined in **Figure 2A & 2B**. The soil samples were observed and recorded by a member of our field engineering staff, who logged the borings and examined the samples as they were obtained. All samples obtained during the investigation were sealed into plastic jars and transported to our testing laboratory for detailed inspection and testing.

5.1 Local Site Setting

Based on the review of the geotechnical report **File No. 02310769.002**, the subsurface soil stratigraphy is indicated below. The following stratigraphy is based on the borehole findings, as well as the geotechnical laboratory testing conducted on selected representative soil samples. The stratigraphic boundaries indicated on the Borehole Logs are inferred from non-continuous samples and observations of drilling resistance and typically represent a transition from one soil type to another. These boundaries should not be interpreted to represent exact planes of geological change. The subsurface conditions have been confirmed in a series of widely spaced boreholes and will vary between and beyond the borehole locations.

5.1.1 Surficial Layers

A surficial topsoil layer (about 100 to 300 mm thick) was encountered in Boreholes 24-3, 24-5, 24-7 and 24-9 to 24-16. The topsoil was noted to be dark brown to black in color and predominantly consisted of a silt matrix with organic presence. A layer of asphaltic concrete (about 90 to 150 mm thick) was encountered in Boreholes 24-1, 24-2, 24-4, 24- 6, 24-8 and 24-17) at the ground surface which was underlain by an aggregate layer (about 40 to 310 mm thick). The aggregate material (comprising sand and gravel) was noted to be typically in a compact and damp condition.

5.1.2 Earth Fill

A zone of earth fill was encountered in all boreholes (except Boreholes 24-10 and 24-11) beneath the topsoil layer/pavement structure and extended to depths varying from about 0.8 m (boreholes 24-1, 24-3, 24-4, 24-6, 24-9, 24-13, 24-15, 24-16 and 24-17) to about 2.6 m (Borehole 24-5) below existing grade. The earth fill materials predominantly consisted of sandy silt/sand with trace to some silt/silty sand with trace amounts of clay and gravel as well as organics.

5.1.3 Native Soil

Undisturbed native soil was encountered in all boreholes beneath the zone of earth fill material and extended to the full depth of investigation (up to maximum about 8.2 m depth below existing grade).

Silt with trace to some clay and trace to some sand was encountered in all boreholes (except Boreholes 24-11, 24-12, 24-14 and 24-15) at depths varying from about 0.8 (Boreholes 24-1, 24-3, 24-4, 24-16 and 24-17) to 4.6 m (Borehole 24-10) and extended to depths varying from about 4.6 m (Boreholes 24-13) to 8.2 m (Borehole 24-6) below existing grade.

Sandy silt with trace amount of clay was encountered in Boreholes 24-6 and 24-15 at about 0.8 m depth and extended to depths varying from about 1.5 m (Borehole 24-6) to 3.0 m (Borehole 24-15) below existing grade.

Clayey silt with trace amounts sand was encountered in Borehole 24-8 at about 1.5 m depth and extended to about 2.3 m depth below existing grade.

Sand with trace to some silt/silty sand with trace to some gravel and trace amounts of clay was encountered in Boreholes 24-9 to 24-15 at depts varying from about 0.2 m (Borehole 24-11) to 4.6 m (Borehole 24-13) and extended to depths varying from about 1.8 m (Boreholes 24-9) to 6.7 m (full depth of investigation, Boreholes 24-10 to 24-15) below existing grade.

Sand and gravel with trace amounts silt was encountered in Borehole 24-13 at about 0.8 m depth and extended to about 2.3 m depth below existing grade.

The detailed stratigraphic conditions are presented on the accompanying borehole logs provided in **Appendix E**. A subsurface profile of the Site is provided in **Figure 4**. Characterization of the various soil types, including grain size analysis, was conducted and is presented in **Appendix F**.

5.2 Monitoring Wells Installation

Monitoring wells were installed in selected boreholes for groundwater monitoring and to investigate groundwater quality. The monitoring wells were constructed using 50-mm diameter PVC riser pipes and screens, which were installed in each of the geotechnical boreholes in accordance with Ontario Regulation (O. Reg.) 903. Filter sand was placed around the well screen to approximately 0.6 m above the top of the screen. The wells were then backfilled with bentonite to approximately 0.3 m below the ground surface. All monitoring wells were surveyed using an R10 Trimble GPS relative to a geodetic datum. The details are provided below:

Well ID	Well Diameter (mm)	Ground Surface Elevation (masl)	Top of Screen		Bottom of Screen		Screened Unit
			Depth (mbgs)	Elev. (masl)	Depth (mbgs)	Elev. (masl)	
BH24-1	50	276.6	3.1	273.5	6.1	270.5	Silt
BH24-2	50	277.2	3.1	274.1	6.1	271.1	Silt
BH24-3	50	276.9	3.1	2273.8	6.1	270.8	Silt
BH24-4	50	277.3	3.1	274.2	6.1	271.2	Silt
BH24-5	50	277.2	3.1	274.1	6.1	271.1	Silt
BH24-6	50	276.8	3.7	273.1	6.7	270.1	Silt
BH24-7	50	277.6	3.1	274.5	6.1	271.5	Silt
BH24-8	50	278.0	3.1	275.0	6.1	272.0	Silt
BH24-9	50	275.9	3.1	272.9	6.1	269.9	Silt
BH24-10	50	276.0	3.0	273.0	6.0	270.0	Silt
BH24-11	50	275.7	1.9	273.8	4.9	270.8	Sand
BH24-12	50	275.7	1.6	274.4	4.6	271.1	Sand

Well ID	Well Diameter (mm)	Ground Surface Elevation (masl)	Top of Screen		Bottom of Screen		Screened Unit
			Depth (mbgs)	Elev. (masl)	Depth (mbgs)	Elev. (masl)	
BH24-13	50	276.7	3.0	273.7	4.6	272.1	Silt
BH24-15	50	277.6	3.0	274.6	6.1	271.2	Sand

5.3 Groundwater Elevations

Groundwater levels were recorded manually in all installed monitoring wells on July 03,2024. Groundwater levels varied between 1.6-2.5 mbgs (Elevations: 273.9-276.2 masl) representing the groundwater conditions in overburden at the site. Groundwater levels are currently being monitored in all monitoring wells to assess the seasonal fluctuations in groundwater at the site. The report will be updated with additional data upon completion of the monitoring.

Well ID	Ground Surface Elevation (masl)	July 03,2024	
		Groundwater Depth (mbgs)	Groundwater Elevation (masl)
BH24-1	276.6	1.65	274.95
BH24-2	277.2	2.52	274.74
BH24-3	276.9	2.45	274.47
BH24-4	277.3	2.39	274.92
BH24-5	277.2	2.50	274.73
BH24-6	276.8	2.08	274.77
BH24-7	277.6	1.40	276.22
BH24-8	278.0	2.31	275.74
BH24-9	275.9	1.95	273.99
BH24-10	276.0	1.37	274.72
BH24-11	275.7	1.77	274.01
BH24-12	275.7	1.7	274.04
BH24-13	276.7	1.6	275.13
BH24-15	277.6	1.73	275.83

Based on initial groundwater measurements, shallow groundwater flow is inferred to flow northwest towards Uxbridge Brook Tributary in the western part of the site. The flow in eastern part of the site is inferred southeast hence indicating a groundwater divide trending North-South (approximately). A groundwater flow direction map prepared as part of the last hydrogeological investigation at the site (**File: 1-19-002246.1**) is presented in **Appendix G**. An updated groundwater flow map will be prepared at a later stage.

5.4 Estimation of Hydraulic Conductivity

5.4.1 Estimation from Grain Size Distribution

To estimate the hydraulic conductivity (K) from the grain size distribution curves an excel based tool/program HydrogeoSieveXL (Devlin, J.F. 2015) is used that calculates the hydraulic conductivity from grain size distribution curves using 15 different methods. HydrogeoSieveXL was found to calculate K values essentially identical to those reported in the literature, using the published grain-size distribution curves. The complete report for each sample is provided along with the grain size results in **Appendix F.**

Borehole No./Sample ID	Sampling Depth (mbgs)	Sampling Elevation (masl)	Soil Description	Estimated Hydraulic Conductivity (m/s) (Geomean)
BH24-16, SS3	1.5	278.3	Sandy Silt	2.6×10^{-7}
BH24-15, SS3	1.5	276.1	Sandy Silt	3.4×10^{-8}
BH24-12, SS4	2.3	273.3	Silty Sand	3.4×10^{-8}
BH24-8, SS3	1.5	276.5	Clayey Silt	2.6×10^{-9}
BH24-6, SS4	2.3	274.6	Silt	1.4×10^{-8}
BH24-1, SS3	1.5	275.1	Silt	9.0×10^{-9}

5.4.1 Estimation from In-Situ Hydraulic Conductivity Testing

The hydraulic conductivity was also determined based on single well response/rising head tests in selected wells. The monitoring wells were developed in advance of the testing event, which involves the purging and removal of groundwater from the monitoring wells to remove remnants of clay, silt and other debris introduced into the monitoring well during construction and to induce the flow of formation groundwater through the well screens, thereby improving the transmissivity of the subsoil strata formation at the well screen depths. The Solinst Dataloggers (pressure transducers) were programmed to record the water levels at various intervals throughout the tests. The data from the tests were analyzed using the Hvorslev method included in the Aquifer Test V.7 software package.

The results of the analysis are presented in **Appendix H**. The hydraulic conductivity values calculated from the in-situ tests are as follows:

Monitoring Well ID	Top of Well Screen Elevation (masl)	Bottom of Well Screen Elevation (masl)	Screened Geological Unit	Hydraulic Conductivity (m/s)	Geomean (m/s)
BH24-1	273.5	270.5	Silt	7.0×10^{-7}	4.6×10^{-7}
BH24-2	274.1	271.1	Silt	3.7×10^{-7}	
BH24-6	273.1	270.1	Silt	3.1×10^{-7}	
BH24-8	275.0	272.0	Silt	2.3×10^{-7}	
BH24-10	273.0	270.0	Silt	2.3×10^{-7}	
BH24-11	273.8	270.8	Silt	2.2×10^{-7}	
BH24-15	274.2	271.2	Sand	6.4×10^{-6}	
BH24-13	275.1	272.1	Silt	3.3×10^{-7}	

Based on the single well response tests, the hydraulic conductivity in native soils varied from 6.4×10^{-6} to 7.0×10^{-7}.

5.4.1 Field Saturated Hydraulic Conductivity

The proposed development may include low impact development provision for on-site storm water management. As such an assessment of soil infiltration rates will be required as a component of the storm water management design.

A total of three (3) in-situ infiltration tests (GP1 to GP3) were conducted onsite on June 19, 2024, at approximate locations are shown on **Figures 2A& 2B**. The test was performed using a Guelph Permeameter (Model 2800). The test locations and depths were provided by the client. The soil type, in-situ hydraulic conductivity and infiltration rate measured at the test locations/depths during the field tests are summarized as follows:

Test Location	Soil	Test Depth (mbgs)	Test Depth (masl)	Estimated Hydraulic Conductivity (cm/s)	Infiltration rate (mm/hour)
GP1	Sandy Silt, trace to some clay	1.6	275.0	2.1×10^{-6}	14
GP2	Silty Sand, trace gravel, trace clay	1.6	275.3	8.1×10^{-4}	46
GP3	Sandy Silt, trace to some gravel, trace to some clay	1.6	276.4	4.8×10^{-6}	14

The design infiltration rates should be evaluated based on applicable safety correction factor (s) as per TRCA Low Impact Development Stormwater Management Planning and Design Guide, Table C1.

5.5 On-Site Groundwater Quality

Groundwater sample was collected by Englobe and analyzed by a Canadian laboratory accredited and licensed by the Standards Council of Canada and or the Canadian Association for Laboratory Accreditation. One (1) unfiltered groundwater sample was collected from monitoring well BH24-7 on July 05, 2024. The water sample was analyzed and compared against the parameters listed under the Durham Region Sewer Use By-law and the Provincial Water Quality Objectives (PWQO). The table below presents the summary of exceedances, whereas the certificate of analysis is presented in **Appendix I**.

Parameter	Unit	Durham Storm sewer use by-law	Durham Sanitary sewer use by-law	BH24-7
Total Suspended Solids	mg/L	15	350	**18800**
Total Manganese	mg/L	0.15	5	**1.29**
Total Phosphorous	mg/L	0.4	10	**1.29**
Total Zinc	mg/L	0.04	2	**0.045**
Note **Bold** indicates exceedances for Storm. **Bold** indicates exceedances for both storm and sanitary.				

Parameter	Unit	PWQO Guideline	BH24-7
Total Cobalt	mg/L	0.0009	**0.0086**
Total Copper	mg/L	0.005	**0.020**
Total Iron	mg/L	0.3	**22.3**
Total Vanadium	mg/L	0.006	**0.035**
Total Zinc	mg/L	0.030	**0.056**

Based on analytical results, the groundwater quality is not suitable for discharge into the Durham sewer system or to the environment. Elevated levels of metals in the groundwater might not represent actual groundwater quality due to the high amount to sediment load observed during sampling.

During the previous site investigation, elevated levels of Sodium and Chloride were noted in all shallow boreholes **(See Appendix L)** Furthermore total coliform was also noted in the analytical results. It was concluded that the elevated levels of Sodium and Chloride are due to the de-icing practices at the site.

6 Water Balance Assessment

A water balance assessment was completed to assess rates of infiltration across the site under both the pre-development and post-development scenario. The water balance assessment evaluates water inflow (precipitation) to the subject property and the resulting equal outflow plus change in storage from the Site. For the purposes of the hydrogeological assessment the purpose of the water balance assessment is to quantify the volume of pre-development infiltration across the property in comparison to the post-development volume of infiltration. The development target for the proposed development is for the maintenance of pre-development volumes of infiltration following site development to maintain groundwater systems and functions following site development.

Water balance is the relationship between components of the hydrologic cycle and is expressed as follows.

$$P = S + R + I + R + ET$$

Where:

P	=	Precipitation
S	=	Change in groundwater storage
R	=	Surface water storage
I	=	Infiltration
IT	=	Runoff
ET	=	Evapotranspiration/Evaporation

Over the long-term any change in groundwater and surface water storage is expected to be negligible and for the purposes of the water balance assessment, have not been considered.The water balance depends on site specific conditions including climatic condition, vegetation, land use, coverage area, topography, and soil conditions such as texture, moisture, storage capacity, hydraulic conductivity, porosity and structure. Water balance for the entire site was calculated on based pre and post development drainage areas, and the provided corresponding runoff coefficients under post the existing pre-development and expected post-development conditions provided to Englobe (**Appendix J**).

6.1 Climate

The climate data was obtained from the following document by LSRCA:

- "*Lake Simcoe Climate Data: A reference Document to Support the completion of Water Balance Assessment*", prepared by Lake Simcoe Region Conservation Authority, Version 1.0, dated April 2017

The mean annual precipitation, Actual Evapotranspiration and precipitation surplus for Uxbridge Brook Sub watershed, as indicated in the reference document is summarized as follows:

Uxbridge Brook Sub watershed	Mean Annual (mm/year)
Annual Precipitation	892
Actual Evapotranspiration (AET)	574
Precipitation Surplus	317

The climate is typical for Southern Ontario, consisting of moist, temperate conditions. Precipitation exceeds evaporation and evapotranspiration. The net annual water surplus (comprising of runoff and infiltration) is approximately 318 mm. Based on the soil types present in the area (predominantly silty sand), the total groundwater recharge component, (infiltration rates at the property are estimated as approximately 175 mm/year). This recharge was determined using the MECP Table 2 and Table 3 approach in the Technical Information Requirements for Land Development Applications (1995). The infiltration factor was calculated based on Table 2 as follows:

Criteria	Infiltration Coefficient
Topography	0.2
Soil	0.2
Cover	0.15
Total	**0.55**

Under Table 3, infiltration rates for various soil types are provided. As observed from the completed subsurface investigation shallow soils predominately consist of silty sand fill to native deposits of silty sand. Under Table 3 a range in infiltration is provided for silty sand to sandy silt soils from 150 mm/year to 200 mm/year. Based on both the Table 2 and Table 3 approach a value for infiltration of 175 mm/year was considered representative for the site.

6.2 Water Balance for Pre- and Post-Development Conditions

Based on the results of groundwater monitoring groundwater is expected to range from 1.4 m to 2.5 m below grade (elevations ranging from 276.2 m to 274.0 m) with groundwater flows expected to the northwest. The expected hydrogeological function of the site is as an area of groundwater recharge, as soils at the property are generally of medium permeability with some to primarily fine-grained silt. There are no significant areas of enhanced or localized higher recharge (such as closed depressions, kettle holes or area of high permeability gravel material identified within the property. Limited groundwater baseflow is expected to surface features including Uxbridge Creek and associated wetlands as groundwater is expected to largely infiltrate to deeper groundwater aquifers.

In summary, the total groundwater recharge component for the area is estimated at 175 mm/a (**Appendix J**) for the entire site of area **5.5 ha**. This recharge was determined using the MECP Table 2 and Table 3 approach in the Technical Information Requirements for Land Development Applications (1995).

The water balance for the entire is calculated based on the preliminary pre and development drainage areas and run off co-efficient provided to englobe by *Lea Consultants*, dated May 2024 **(Appendix J**). The drainage areas and the runoff coefficients are given in tables below:

Pre-Development		
Catchement ID	Area (m^2)	Run off Coefficient
EC1 (woodland, landscaped)	31,740	0.26
EC2 (parking lot and minor landscape)	5,520	0.81
EC3 (Existing UXMED)	1,770	0.90
EC4 (Existing cottage Hospital, parking lot and landscaped)	13,900	0.72
EC7 (Woodland and wetland)	2,040	0.25
Post-Development		
Catchement ID	**Area (m^2)**	**Run off Coefficient**
PC1 (woodland, landscaped and SWMP)	31,190	0.56
PC2 (Proposed Hospital and landscaped)	6,280	0.80
PC3 (Existing UXMED)	1,770	0.90
UC1 (Parking and landscaped)	2,680	0.69
PC4 (Parking lot, landscaped)	11,104	0.74
PC7 (Woodland and wetland)	2,040	0.25

Using the site statics, run off coefficients, and climate data the pre and post development water (unmitigated) balance is calculated as follows:

Pre Development	Area (m^2)	Precipitation(m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Run-Off (m^2)
Existing Development	55,000	49,060	17,361	9,531	22,168
Post-Developmetn	**Area (m^2)**	**Precipitation(m^3)**	**Evapotranspiration (m^3)**	**Infiltration (m^3)**	**Run-Off (m^2)**
Proposed Development	55,000	49,060.	11,759	6,427	30,874

In the post-development case, there is decrease in evapotranspiration (5,602 m^3/yr) and infiltration (3,104 m^3/yr) and increase in available surface water run-off (8,705 m^3/yr) from the entire property. Following assumptions are made for the unmitigated post development water balance scenario:

- There will be no infiltration beneath hard-surface areas including buildings and pavements.
- It is assumed that the entire road allowance consists of hard surfaces.
- Infiltration rates in open areas of the property (lawns, landscaped areas and open spaces) will occur at similar to those for pre-development conditions.

6.2.1 Feature-Based Water Balance

A feature-based water balance assessment was completed to assess the predicted change in water balance due to site development for drainage areas draining to Uxbridge Creek and associated wetlands only. Areas of the site draining to the municipal storm sewer under both the pre- and post-development scenarios were not considered as part of the feature-based water balance. Based on pre and post development drainage area plan provided, the creek and the wetland are fed by the following drainage areas:

Pre-Development		
Catchement ID	Area (m^2)	Run off Coefficient
EC1 (woodland, landscaped)	31,740	0.26
EC2 (parking lot and minor landscape)	5,520	0.81
EC3 (Existing UXMED)	1,770	0.90

Pre-Development		
Catchement ID	Area (m^2)	Run off Coefficient
EC5 (Existing External catchment)	580	0.35
EC8 (Existing External Catchment)	1,530	0.25
Post-Development		
Catchement ID	Area (m^2)	Run off Coefficient
PC1 (woodland, landscaped and SWMP)	31,190	0.56
PC2 (Proposed Hospital and landscaped)	6,280	0.80
PC3 (Existing UXMED)	1,770	0.90
PC5 (External Catchment Area)	580	0.35
PC8 (External Catchment Area)	1,530	0.25

Using similar approach as in previous section, the water balance for the feature of interest is calculated as follows (**Appendix J**):

Pre Development	Area (m^2)	Precipitation(m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Run-Off (m^2)
Existing Development	40,390	36,028	14,791	8,107	13,130
Post-Developmetn	Area (m^2)	Precipitation(m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Run-Off (m^2)
Proposed Development	41,350	36,884.	9,631	5,248	22,005

In the post-development case, there is decrease in evapotranspiration (5,160 m^3/yr) and infiltration (2,858 m^3/yr) and increase in available surface water run-off (8,874 m^3/yr) to the feature of interest.

It is expected that the post development infiltration deficit under both the water balance and feature-based water balance assessment will be addressed through stormwater management for the developed property. For the purposes of maintaining pre-development infiltration rates following site development, it is recommended to implement infiltration features to accept rooftop runoff from building areas from the post-development property. It is expected that Low Impact Development (LID) techniques can be implemented as part of the stormwater management approach for the site to maintain volumes of infiltration.

LID features would be implemented under a Best Management Practice approach in areas considered suitable for infiltration based on further in-situ infiltration testing once potential LID features have been identified. LID features are to be implemented in areas where soils are confirmed with rates of infiltration not less than 15 mm/hr, and the proposed LID measures must maintain a 1.0 m clearance from the observed seasonal high groundwater level. Given groundwater depths across the site range from 1.4 to 2.5 m below grade it is expected that LID measures including bio-swales, dry swales, shallow infiltration trenches would be suitable measures to implement as part of the stormwater management plan.

7 Groundwater Control Requirements

As discussed in previous sections, the proposed development will involve installation of underground utilities and LID's, addition of new hospital building and a storm water management pond (SWMP).

Positive dewatering will be required for any excavation below the groundwater level at the site. In addition to potential removal of groundwater, run off from precipitation will also be required to be removed from the excavation. The dewatering rates should be revised after completion of yearly groundwater monitoring at the site. Groundwater control requirements for the proposed developments is discussed in below:

7.1 Groundwater Control Requirement-Underground Utilities

Based on the Site servicing plan and Architectural drawings (**Appendix K**) by Diamond Schmitt dated January 17, 2022, the proposed development will involve installation of underground utilities and LID's. It is anticipated that the proposed storm sewer and watermain would be installed using conventional open cut technique. The following assumptions/considerations were used in calculating the estimated dewatering rates for the section:

- It is assumed that only one excavation of dimensions 20 m long, 3 m wide and 4 m deep is open at any time between.
- The excavation is likely to terminate in low-moderate permeable silt.
- Highest Groundwater depth of 1.4 mbgs recorded in monitoring well BH24-8 on July 03,2024 was used for dewatering estimate. Geomean Hydraulic conductivity calculated during in-situ tests (4.7×10^{-7}) was used for dewatering estimate.
- Steady State conditions were assumed for the dewatering assessment.
- The aquifer is assumed to be unconfined and homogenous. It is also assumed that there is no recharge associated with any surface water body present within the radius of influence.
- Safety Factor of x 2.0 is applied on the calculated flow rate to account for variability in subsurface conditions and to account for infiltration from precipitation events

Dupuit equation (defined below) for flow to a drainage trench in a water table aquifer was used to calculate dewatering rates for excavation required for utilities installation (from Powers et al. 2007).

$$Q = \pi K \left(H^2 - h^2\right) / \, Ln \left(\frac{2R_o + x}{x}\right) + 2LK\left(H^2 - h^2\right)) / 2R_o \quad \textit{(Eq. 1)}$$

$$R_o = 2L \; ; \textit{(Eq.2)}$$

$$\textit{Sichardt Equation: } R_o = 3000 \; * \sqrt{K} \, (H - h); \textit{(Eq.3)}$$

Where.
Q= Groundwater flow rate (m^3/day)
K= Hydraulic Conductivity (m/day)
H= Aquifer thickness/static groundwater level head above the top of the aquitard (m)
h= Groundwater level during pumping. Assumed 1.0 m below the excavation depth (m)
x= Excavation Width (m)
L= Excavation length (m)
R_0=Radius of influence using Sichardt Equation.

The predicted dewatering required was calculated based on the assumptions and equations defined above as follows:

Parameters	Site Servicing

K -Geomean Hydraulic conductivity (m/s)	4.7 x 10^{-7}
H-Distance from water level to the bottom of an aquifer (m)	4.6
h -Depth of water in the well while pumping (m)	1
Dimensions	20 m x 3 m x 4 m
R_0-Radius of Influence from Sichardt (m)	5.3 m
Estimated Flow Rate- L/day (without safety factor)	2800
Estimated Flow Rate- L/day (with safety factor x 2.0)	5600
Storm water removal consideration (25 mm)	2250
Total Construction dewatering Rate- (L/day)	**7850**

7.2 Groundwater Control Requirement-Proposed Hospital Building

Based on Architectural drawings by Diamond Schmitt , the finished floor elevation for the proposed hospital addition will be 278.0 masl. The footings for the building are expected to extend 1.5 meters below to 276.5 masl. The proposed structure will be supported on a conventional spread footing foundation and thus the excavation size will be limited to footings installation and inspection. Trenches required for footing installation are expected to yield minimal amount of free-flowing groundwater at shallow depths. A conservative estimate nonetheless is provided below based on an assumed trench excavation of 10 m long, 3 m wide and 2 m deep. Again, the dewatering calculation presented here assumes that only excavation is open at any time.

Parameters	Site Servicing
K -Hydraulic conductivity (m/s)	4.7 x 10^{-7}
H-Distance from water level to the bottom of an aquifer (m)	2.2
h -Depth of water in the well while pumping (m)	1
Dimensions	10 m x 3 m
R_0-Radius of Influence from Sichardt (m)	4.5
Estimated Flow Rate- L/day (without safety factor)	900
Estimated Flow Rate- L/day (with safety factor x 1.5)	1800
Total Construction dewatering Rate- (L/day)	**1800**

7.3 Permitting Requirements

The Ministry of the Environment, Conservation and Parks (MECP) regulates all surface water and groundwater taking in the Province of Ontario. In general, a Permit to Take Water (PTTW) from the MECP is required for any groundwater taking above the threshold of 50,000 L per day. If groundwater control and dewatering is required to support any construction project in Ontario, then under Ontario Regulation (O. Reg.) 63/16, an Environmental Activity and Sector Registry (EASR) Posting with the MECP can be obtained in lieu of a PTTW Registration, if the cumulative volume of groundwater taking and stormwater requiring control is between 50,000 L/day and 400,000 L/day. Based on the flow rates calculated, **an EASR will not**

be required for short term groundwater control. The permitting requirements should be revised if there is a change in design or grading plan.

8 Source Water Impact Assessment and Mitigation Plan

8.1 Risk Assessment

8.1.1 Identification of Vulnerable Areas

The proposed development includes the Hospital Addition, site servicing and SWMP will within the Well Head Protection Area (WHPA) associated with Municipal Well PW6. Due to the proximity of PW6 (approximately 15 m), no refueling of construction equipment or storage of fuels/chemicals during construction should in the WHPA's. Furthermore, the redevelopment's snow storage area must be located outside of the WHPA.

8.1.2 Identification of Prescribed Drinking Water Threats

The Clean Water Act, 2006, prescribes several land uses that are considered to be drinking water threats. The applicable circumstances for activities and conditions to the Property are listed, along with a qualitative evaluation of the threat level, in the table below. There are three (3) potential drinking water quality threats to consider:

- Use of de-icing salt;
- Operation of sanitary sewers; and
- Activities related to the operation of the Property as a medical facility, including chemical/pathogen handling and storage.

#	WHPA Zone on Property	Intrinsic Vulnerability Score	Identified Prescribed Drinking Water Threat	Short Form Name	Type of Threat (Chemical or Pathogen)	Applicable Circumstances	CWA Rating of the Drinking Water Threat
1	WHPA-A and -B	6	The application of road salt	Road salt	Chemical	Exceedances of Table 2 Site Condition Standards due to past activities (Rule 126). Total impervious area >80% of total area.	Low (2017 Threats Table, Chemical, Line 1634)
2	WHPA-A and -B	6	The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage.	Sewage System Or Sewage Works - Sanitary Sewers and related pipes	Pathogen/Chemical (potential)	Detectable Total Coliform Bacteria due to past activities (Table 2).	Low (2017 Threats Table, Pathogen, Line 166)

8.1.3 Identification of Drinking Water Quantity Threats

Given the modest potential dewatering requirements for the proposed development (Section 7.0), the primary threat to water quantity would be the post-development infiltration deficit of 2898 m^3/yr that would result if mitigative measures were not implemented. However, the maintenance of recharge is required under South Georgian Bay Lake Simcoe Source Protection Region Approved Source Protection Plan Policies LUP-12 and LUP-13.

8.2 Risk Management Plan-Groundwater Quality

8.2.1 Water Quality Threats Management-Road Salt

Impacts associated with current practices related to the application of de-icing salt were documented during previous investigations. The implementation of a salt management plan to reduce the use of de-icing salt and/or replace it with other de-icing agents is strongly recommended.

All salt (or replacement de-icing agent[s]) stored at the Property for later application shall be stored in water-impermeable containers roof-covered areas of the Property that are either asphalt-paved or have a poured concrete floor to minimize entry into the subsurface. Only quantities required for reasonably foreseeable short-term use should be stored on-site.

The Transportation Association of Canada (TAC) has produced a document titled Syntheses of Best Practices Road Salt Management (2013). These should be generally followed at the Property unless prohibited. In addition, best management practices for contractors, residents, and the community are provided by the not-for-profit organization Smart About Salt Council and their recommendations may be of benefit in reducing salt loads.

8.2.2 Sanitary Sewers and Related Piping

The proposed development will be serviced with municipal sewers. No on-site sewage treatment systems are proposed or anticipated. The proposed medical office building will be constructed slab-on-grade. Service connections may be deeper and possibly below the water table, but will be constructed in the low permeability silt, resulting in moderate interception of ground water flow by the utility service trenches. If utility trenches will extend below the water table, trench plugs should be installed at intervals so as to reduce any potential interception of ground water flow.

8.2.2.1 Industry Standards, Regulations and Best Management Practices

Sanitary sewage works for the Property will adhere to all applicable provincial and local regulations. Precise metrics for the sewage works will be provided at the detailed design stage. The following legislation regarding design and approval of the sewage works is applicable to the assessment of the environmental risks related to the works:

- Engineering Standards
    - General standards for construction.
- Sanitary Sewer Commissioning Guidelines

- Physical and visual infiltration, exfiltration and joint tests to ensure that leakage into and/or out of the system is within the acceptable tolerance limits are mandatory prior to use of new sanitary sewer laterals in Durham Region. These tests are required to be carried out prior to commissioning of the on-site sewage works.

- Environmental Protection Act, R.S.O. 1990, Chapter E.19, Part X – Spills

    - Should a spill or leak occur at the Property, property owner (owner of the pollutant) and/or their agents are required to notify the MECP, the Regional Municipality of Durham, and the property owner, immediately upon discovery.

    - Should a spill or leak occur at the Property, the Property owner and/or their agents (persons in control of the pollutant) are required to immediately do everything practicable to prevent, eliminate and ameliorate the adverse effects of the spill.

8.2.2.2 Additional Risk Management Measures

In addition to the regulated management practices and procedures outlined in section above, the Property owner will be responsible for implementing and ensuring the following Risk Management Measures at the Property:

- The Property owner will be responsible for ensuring that Property maintenance staff always have and maintain an adequate and up-to-date emergency response plan at the Property. The emergency response plan will include the information that the Property is located in a Wellhead Protection Area.
- Camera inspections will be conducted every 5 years to confirm the integrity of sanitary sewers at the Property.
- Any spills or leaks related to the sewage works located on the property will be reported to the Spills Action Centre.

Contact information for the Spills Action Centre, as well as information detailing the requirement for reporting any spills which occur, will be available at the Property.

8.2.2.3 Communication and Implementation Plan-Sanitary Sewers and Related Piping

The Property owner will be responsible for implementation of all regulatory and above-listed Risk Management Measures, including communication to all maintenance staff. Information regarding the Property's location within the Wellhead Protection Area and emergency response numbers will be available at the Property. A copy of this report or appropriate summary documentation to be prepared in future should be provided to all purchasers of the Property to ensure compliance with the above-noted Risk Management Measures.

Should a spill or leak occur at the property, the Region of Durham is to be provided with a copy of the Spills Action Centre's report.

8.2.3 Temporary Storage of Fuels and Chemicals during Construction

During construction of the proposed buildings, it may be necessary to temporarily store fuels and/or chemicals at the Property. This represents a potential threat to ground water quality, as a spill of significant size may potentially impact the local water supply. The LSRCA has previously stated that it requires that refueling and the temporary storage of fuels/chemicals during construction must not take place in the WHPAs, particularly WHPA-A. This requirement must be communicated to all parties involved in planning construction activities. The north-central and northeastern portions of the Property are not located in WHPAs; however, there are practical considerations associated with the northeastern portion of the Property due to the presence of the current hospital and associated features.

To further prevent and mitigate any spills at the Property, it is recommended that temporary fuel and chemical storage containers of significant size are placed within secondary containment such that a leak/spill can be contained. There are also refueling services that deliver fuel on-site. On-site storage would not be required if such a service was used. Appropriate spill kits should be maintained at various locations throughout the Property and an emergency response plan should be developed to outline actions to be taken in case of a spill or leak.

The monitoring and emergency response measures recommended to be implemented at the Property include the following:

<u>Monitoring</u>

- It is recommended that temporary fuel and chemical storage locations be inspected on a regular basis to ensure the integrity of storage containers.

<u>Emergency Response</u>

- The property owner will be responsible for ensuring that property maintenance staff have and maintain an adequate and up-to-date emergency response plan at the property at all times. The emergency response plan will include the information that the Property is located in a Wellhead Protection Area.
- Any spills or leaks related to the temporary storage of fuels and chemicals located on the property will be reported to the Spills Action Centre.
- Contact information for the Spills Action Centre, as well as information detailing the requirement for reporting should any spills occur, will be available at the Property.

8.3 Risk Management Plan-Groundwater Quantity

8.3.1 Groundwater Takings for Dewatering

For the proposed development of the additional hospital building, the bulk of the dewatering is to account for the removal of storm water in case of a precipitation event. Furthermore, no long-term dewatering is anticipated. In summary, modest groundwater takings are expected for the proposed development. As there will not be any significant short term ground water control requirements and no long-term requirements, there will be no water quantity threats to the underlying aquifer in which the municipal production and public supply wells are installed in.

8.3.2 Reduction in Aquifer Recharge

There will be no adverse impact from the proposed development on the aquifer in which the water supply wells are screened. Englobe recommends that best management measures are taken to maintain the pre-development water balance to maintain the overall continuity of ground water flow and recharge rates.

9 Conclusion and Recommendations

- The site is located within the Uxbridge Brook Creek watershed, within the Lake Simcoe and Couchiching/Black River Source Protection Area. The subject is partially located within a regulated LSRCA area.
- A tributary of Uxbridge Brook passes through the northwestern corner of the property, and therefore the associated hazards (Meander belt erosion, erosion Hazard and flooding). Natural Heritage features (woodland) and Hydrologic features (wetlands) were also identified in the study area
- According to the Oak Ridges Moraine Conservation Plan, the Property is located approximately 2.3 km north of the Oak Ridges Moraine and is not located within the Oak Ridges Moraine Conservation Plan Area.
- The Property is the site of a Highly Vulnerable Aquifer (score: 6). Aquifer Vulnerability with Vulnerability Score 6 of 10 (low to high). The westernmost portion of the Property is located in an Intake Protection Zone 3 (Score: 4.5). The Property is not located in an area of Significant Groundwater Recharge. Portions of the Property are located within WHPA-A to D due to the presence of the Township of Uxbridge's Well 6 approximately 15 m south of the southern boundary.
- The stratigraphy encountered at the site comprise of Low permeability meltwater channel silt deposits with an approximate thickness of approximately 13 meters, forming the upper most layer of sediments at the site and in the study area. Limited vertical movement of groundwater is expected thus limiting the recharge to the underlying channel sand aquifer.
- Groundwater levels varied between 1.6-2.5 mbgs (Elevations: 273.9-276.2 masl) representing the groundwater conditions in overburden at the site. Groundwater levels are currently being monitored in all monitoring wells to assess the seasonal fluctuations in groundwater at the site.
- Based on initial groundwater measurements, shallow groundwater flow is inferred to flow northwest towards Uxbridge Brook Tributary in the western part of the site. The flow in eastern part of the site is inferred southeast hence indicating a groundwater divide trending North-South (approximately).
- In-situ hydraulic conductivity during field tests was calculated as 4.7×10^{-7} (Geomean). Based on grain size analysis the hydraulic conductivity ranges from 4.7×10^{-7} to $9.0 \times 10^{-9.}$ Infiltration rates (without safety factor) observed ranged from 14-46 mm/hour during the Guelph permeameter testing.
- Based on analytical results, the groundwater quality is not suitable for discharge into the Durham sewer system or to the environment. Elevated levels of metals in the groundwater might not represent actual groundwater quality due to the high amount to sediment load observed during sampling.
- Additional groundwater samples from the shallow wells is recommended to assess the spatial variation of chlorides/Sodium and other contaminants due to the close proximity of municipal Well.
- During the previous site investigation, elevated levels of Sodium and Chloride were noted in all shallow boreholes. Furthermore, total coliform was also noted in the analytical results. It was concluded that the elevated levels of Sodium and Chloride are due to the de-icing practices at the site.

- Based on the water balance assessment for the entire site, In the post-development case, there is decrease in evapotranspiration (5,602 m3/yr) and infiltration (3,104 m3/yr) and increase in available surface water run-off (8,7067987 m3/yr) to the feature of interest.
- Measures to address the infiltration deficit are required under South Georgian Bay Lake Simcoe Source Protection Region Approved Source Protection Plan Policies LUP-12 and LUP-13.
- Based on the water balance assessment for the feature of interest, In the post-development case, there is decrease in evapotranspiration (5,160 m^3/yr) and infiltration (2,858 m^3/yr) and increase in available surface water run-off (8,874 m3/yr) to the feature of interest.
- It is expected that pre-development infiltration volumes can be maintained following development by directing roof runoff from both the proposed and existing hospital buildings to infiltration through various Low Impact Development (LID) techniques, including but not limited to, bio swales, dry swales or shallow infiltration trenches. LID measures should be incorporated in areas where soils are confirmed to have infiltration rates not less than 15 mm/hr, with the LID features maintaining a 1.0 m clearance from the seasonal high groundwater condition.
- Groundwater control requirements were calculated as 158,000 L/day for the proposed hospital addition and 7850 L/day for the site servicing. Based on calculated dewatering rates an EASR will be required for the proposed water taking.

10 Closure

We trust this report meets with your requirements. Should you have any questions regarding the information presented, please do not hesitate to contact our office.

Yours truly,

Abdul Qadir, G.I.T

Project Manager

Muhammad Shahid, P. Geo., QP_{ESA},
Team Lead - Environmental

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Figures

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References:

Bing Maps Aerial-Used for illustrative purposes only.

Notes:

Legend:

Approximate Site Location

Project Title:
Hydrogeological Assessment

Site Location:
Uxbridge community Hospital, Uxbridge, Ontario

Figure Title:
Site Location Plan

Designed By: AQ	*File No.:* 02310769.003
Drawn By: HK	*Scale:* As Shown
Reviewed By: MS	*Figure No.:* 1
Date: August 2024	

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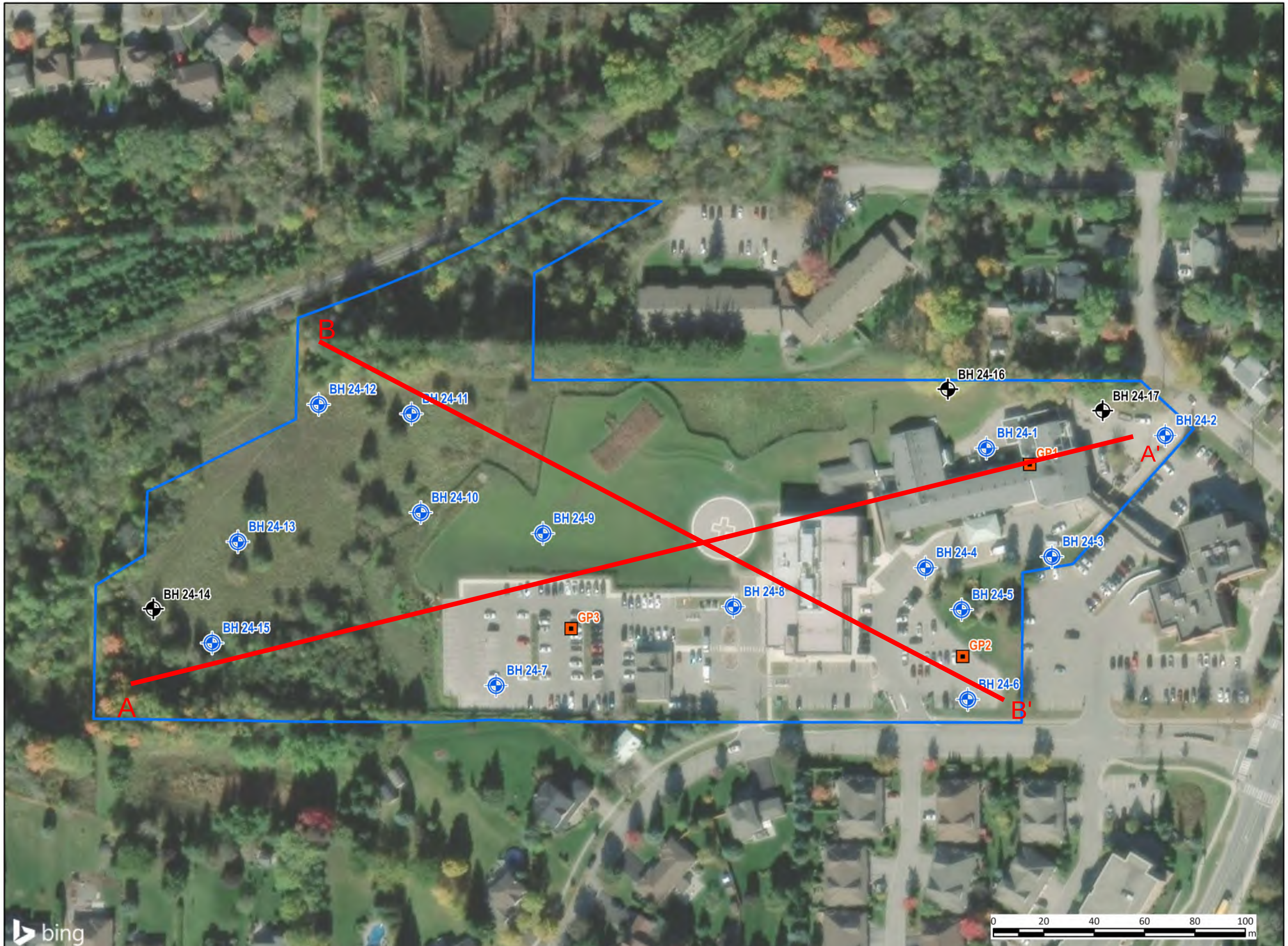


References:

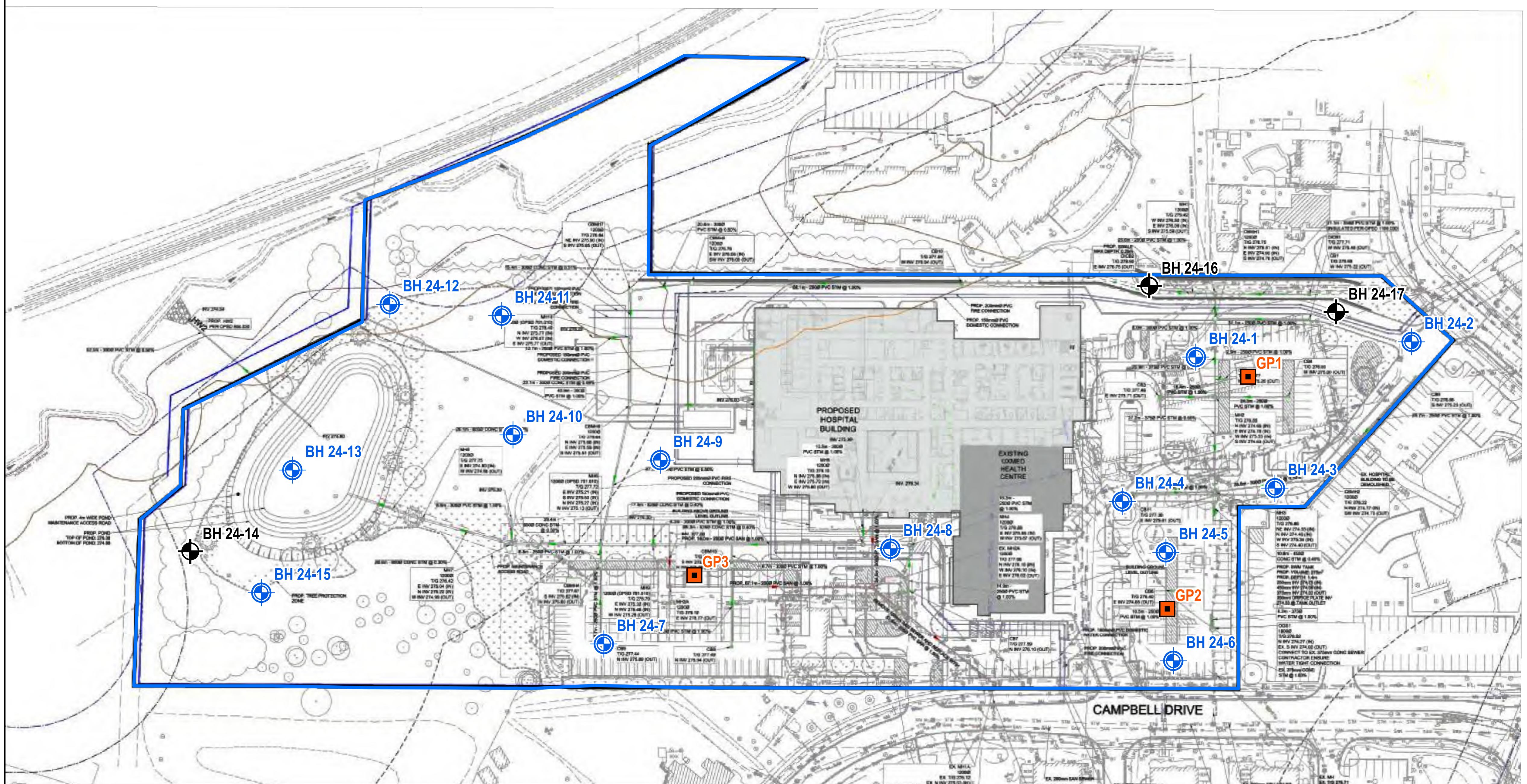
Source: Bing Maps Aerial
(Used for illustrative purposes only)

Notes:

Legend:

- Monitoring Wells
- Boreholes
- Guelph Permeameter
- Approximate Site Location

Project Title: Hydrogeological Investigation	
Site Location: Uxbridge Community Hospital, Uxbridge, Ontario	
Figure Title: Borehole Location Plan (Existing)	
Designed By: AQ	*File No.:* 02310769.003
Drawn By: HK	*Scale:* As Shown
Reviewed By: MS	*Figure No.:* 2A
Date: August 2024	



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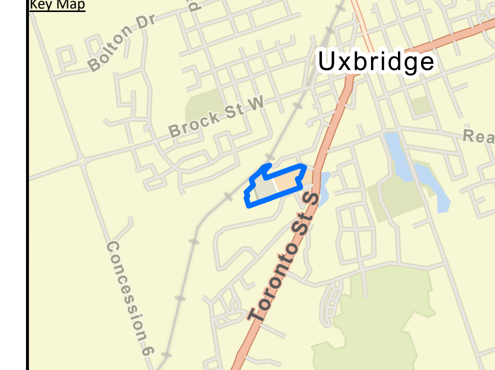
References:

Title: Site Servicing Plan (Final Works)
Proj No: 24163 Date: Jan 17, 2024
Dwg No: C-02, By: LEA

Key Map



Notes:

Legend:

Monitoring Wells

Boreholes

Guelph Permeameter

Approximate Site Location

Project Title:
Hydrogeological Investigation

Site Location:
Uxbridge Community Hospital
Uxbridge, Ontario

Figure Title:
Borehole Location Plan (Proposed)

Designed By: AQ	*File No.:* 02310769.003
Drawn By: HK	*Scale:* As Shown
Reviewed By: MS	*Figure No.:* 2B
Date: August 2024	

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References:
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Key Map

Notes:

Legend:

- Water Supply Wells with Well ID
- Approximate Site Location
- 500 m Study Area

Project Title: Hydrogeological Assessment

Site Location: Uxbridge Community Hospital, Uxbridge, Ontario

Figure Title: MECP Well Records Map

Designed By: AQ	*File No.:* 02310769.003
Drawn By: HK	*Scale:* As Shown
Reviewed By: MS	*Figure No.:* 3
Date: August 2024	

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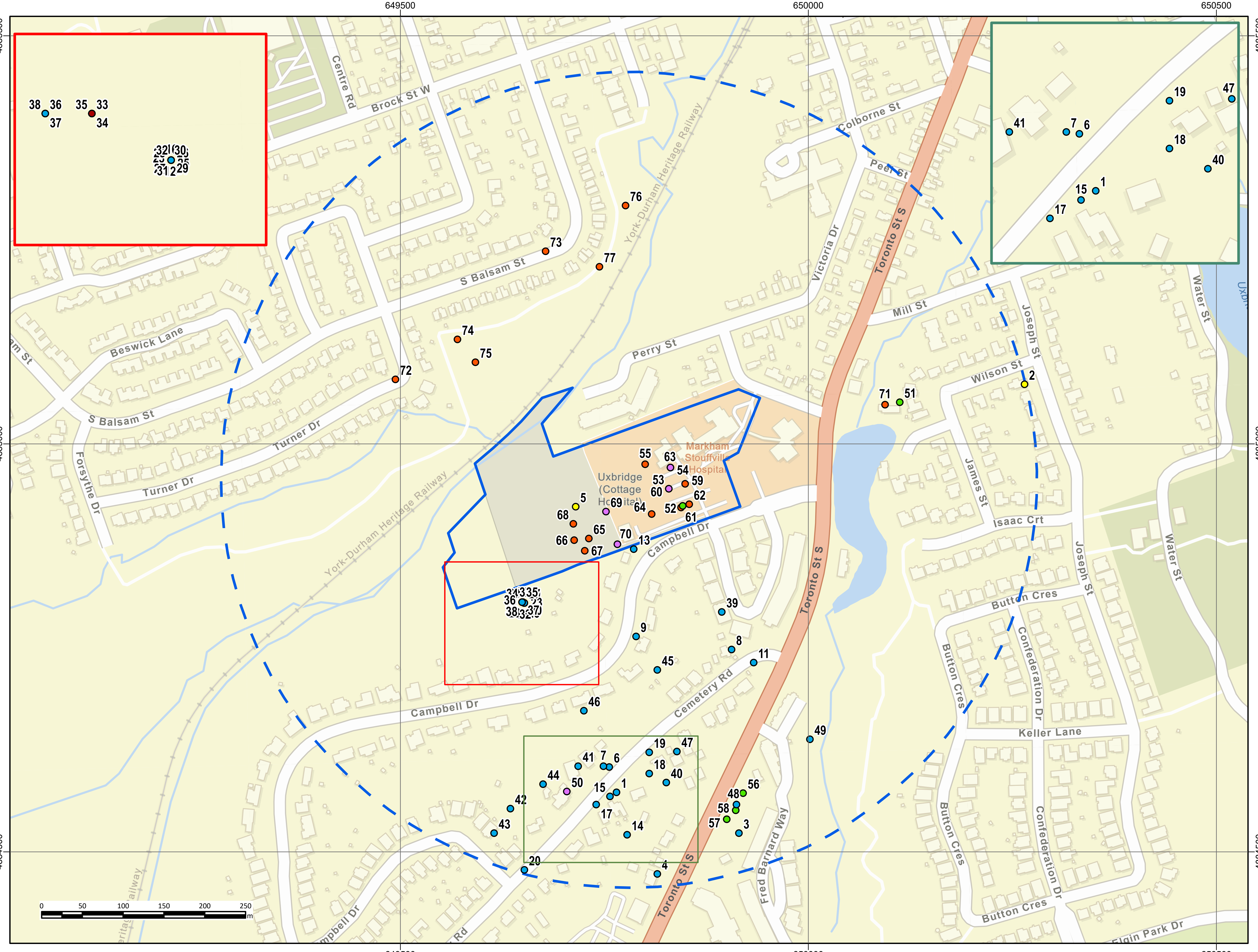

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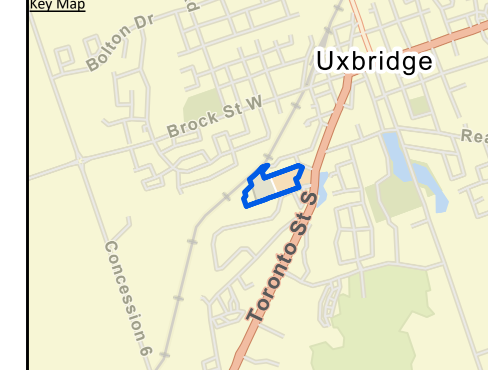
References:
ESRI, DigitalGlobe, GeoEye, EarthstarGeographics, CNES/Airbus Ds, USDA,USGS, AeroGRID, IGN and the GIS User Community produced by Englobe Corp. Copyright (c) King's Printer. Water Well Information System Ministry of the Environment, Conservation and Parks, 2022

Key Map



Notes:

Legend:

- Approximate Site Location
- 500 m Study Area

MECP Wells_Final Status

- Unknown
- Abandoned-Other
- Abandoned-Supply
- Monitoring and Test Hole
- Observation Wells
- Test Hole
- Water Supply

Project Title:
Hydrogeological Assessment

Site Location:
Uxbridge Community Hospital,
Uxbridge, Ontario

Figure Title:
MECP Well Records Map

Designed By: AQ	*File No.:* 02310769.003
Drawn By: HK	*Scale:* As Shown
Reviewed By: MS	*Figure No.:* 3
Date: August 2024	

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References:
ESRI, DigitalGlobe, GeoEye, EarthstarGeographics, CNES/Airbus Ds, USDA,USGS, AeroGRID, IGN and the GIS User Community produced by Englobe Corp. Copyright (c) King's Printer. Water Well Information System Ministry of the Environment, Conservation and Parks, 2022

Notes:

Legend:

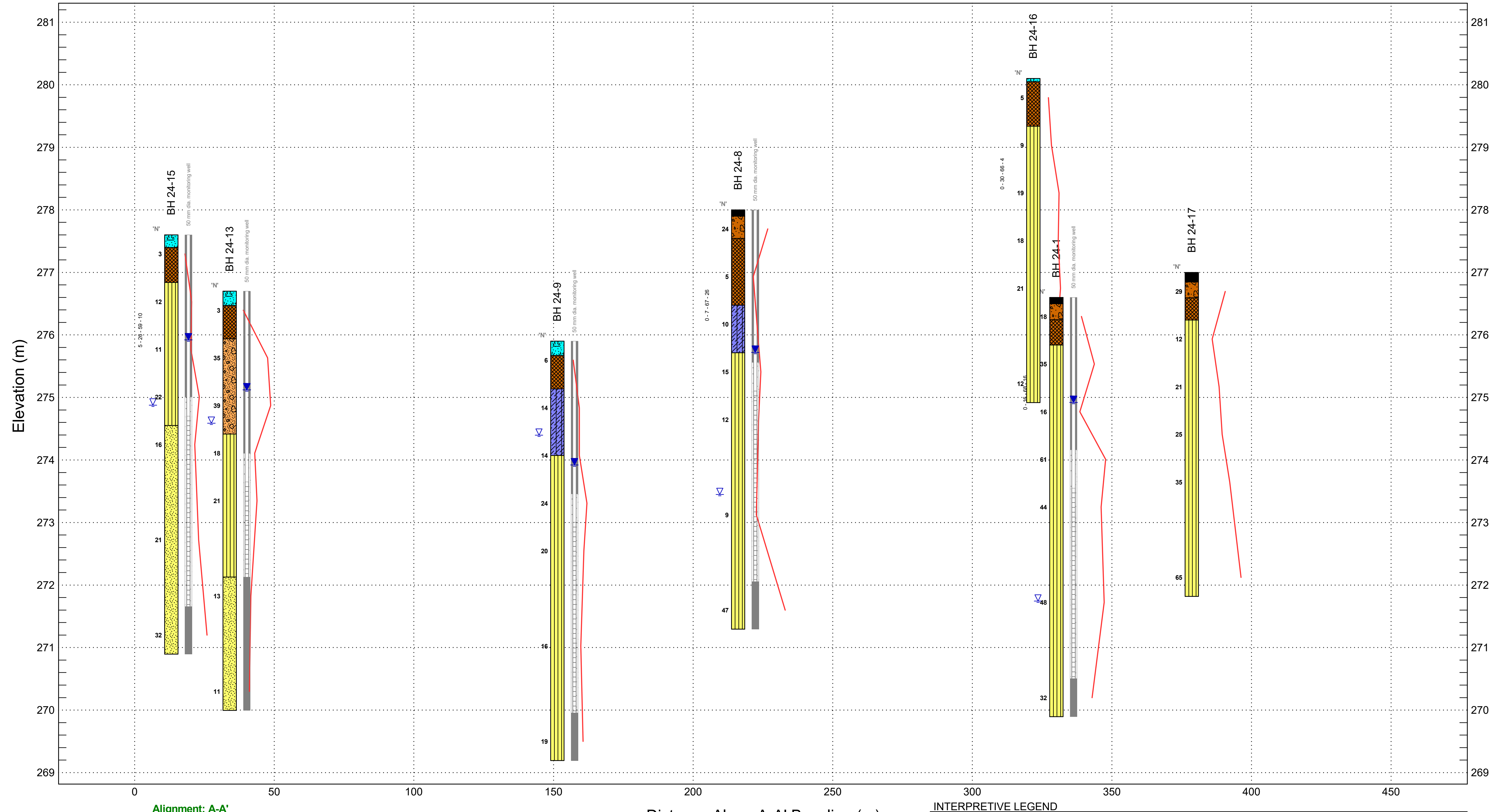
- MECP Wells with Well ID
- Approximate Site Location
- 500 m Study Area

Project Title:
Hydrogeological Assessment

Site Location:
Uxbridge Community Hospital,
Uxbridge, Ontario

Figure Title:
MECP Well Records Map

Designed By: AQ	*File No.:* 02310769.003
Drawn By: HK	*Scale:* As Shown
Reviewed By: MS	
Date: August 2024	*Figure No.:* 3



LITHOLOGY GRAPHIC LEGEND

Asphalt
Clayey Silt
Aggregate
Topsoil
Fill
Sand and Gravel
Silt
Sand

INTERPRETIVE LEGEND

Unstabilized water level on completion of drilling
Stabilized water level, most recent
30 SPT N-Value

FILL
GRAVELS (gravel to gravelly sand)
SILT TO SAND (not till)
COHESIONLESS TILLS
COHESIVE SOILS (clayey silt to clay, incl. tills)

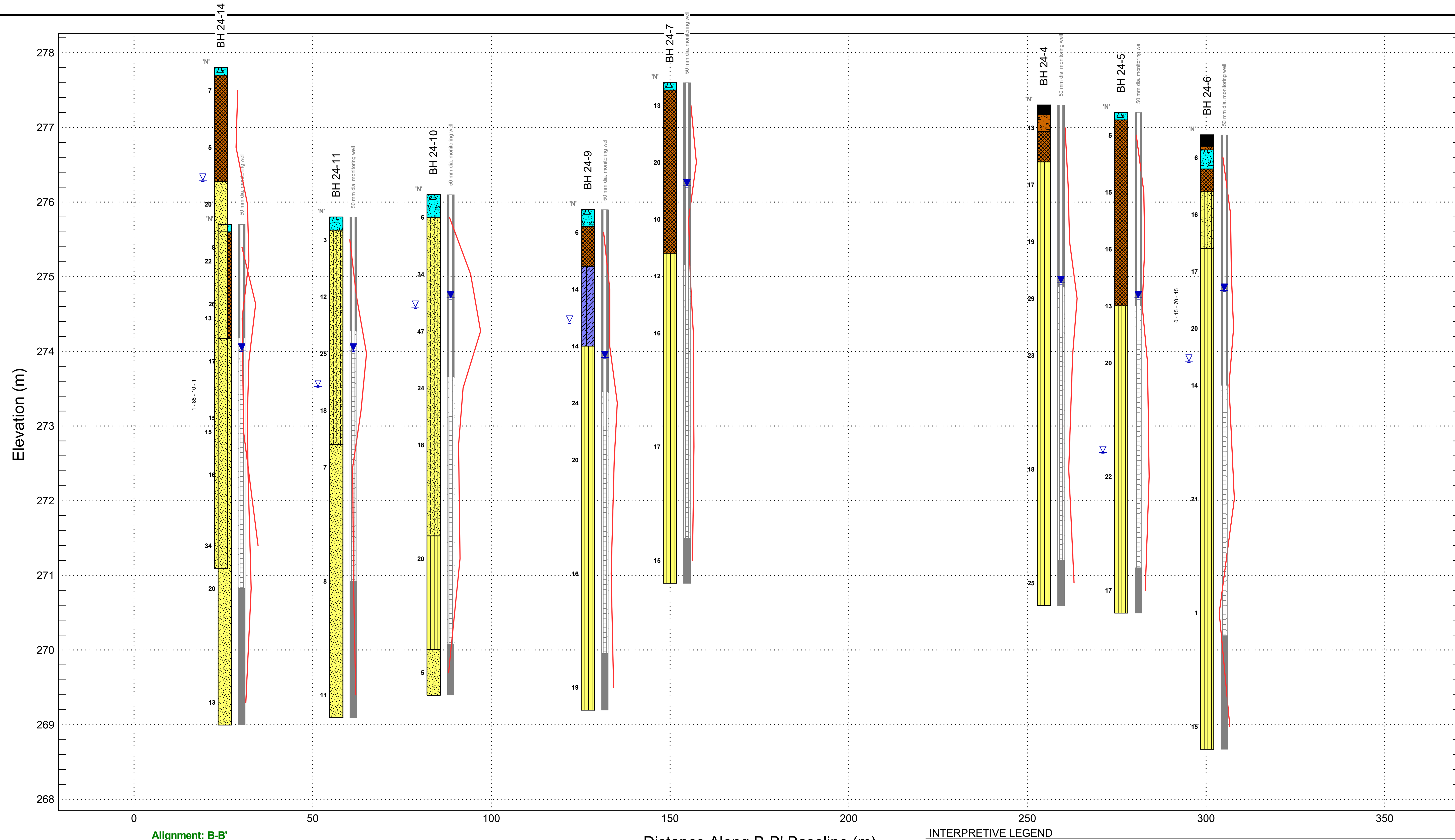
ENGLOBE

Title: **SUBSURFACE PROFILE ALIGNMENT A-A'**

File No.: 02310769.003

MAP 4A

Report: ISECTION - TABLOID - ELEV



INTERPRETIVE LEGEND

- ▽ Unstabilized water level on completion of drilling
- ▼ Stabilized water level, most recent
- 30 SPT N-Value

- FILL
- GRAVELS (gravel to gravelly sand)
- SILT TO SAND (not till)
- COHESIONLESS TILLS
- COHESIVE SOILS (clayey silt to clay, incl. tills)

LITHOLOGY GRAPHIC LEGEND

Asphalt	Topsoil	Sand
Aggregate	Sandy Silt	
Fill	Clayey Silt	
Silt	Silty Sand	

ENGLOBE

Title: **SUBSURFACE PROFILE ALIGNMENT B-B'**

File No.: **02310769.002** **MAP 4B**

Report: ISECTION - TABLOID - ELEV

Appendix A

Regulatory and Natural Heritage Maps

ENGLOBE

LSRCA Regulated Area

Lake Simcoe Region conservation authority

Features

- LSRCA Watershed Boundary
- V_MASK_WATERSHED_1
- Watercourse
- Regulation Limit
- Address Labels
- Road Labels
- LSRCA Watershed Boundary
- Assessment Parcel
- Roads
  - Hwy 400 Series
  - Highway, Arterials
  - Local Road
- Railway

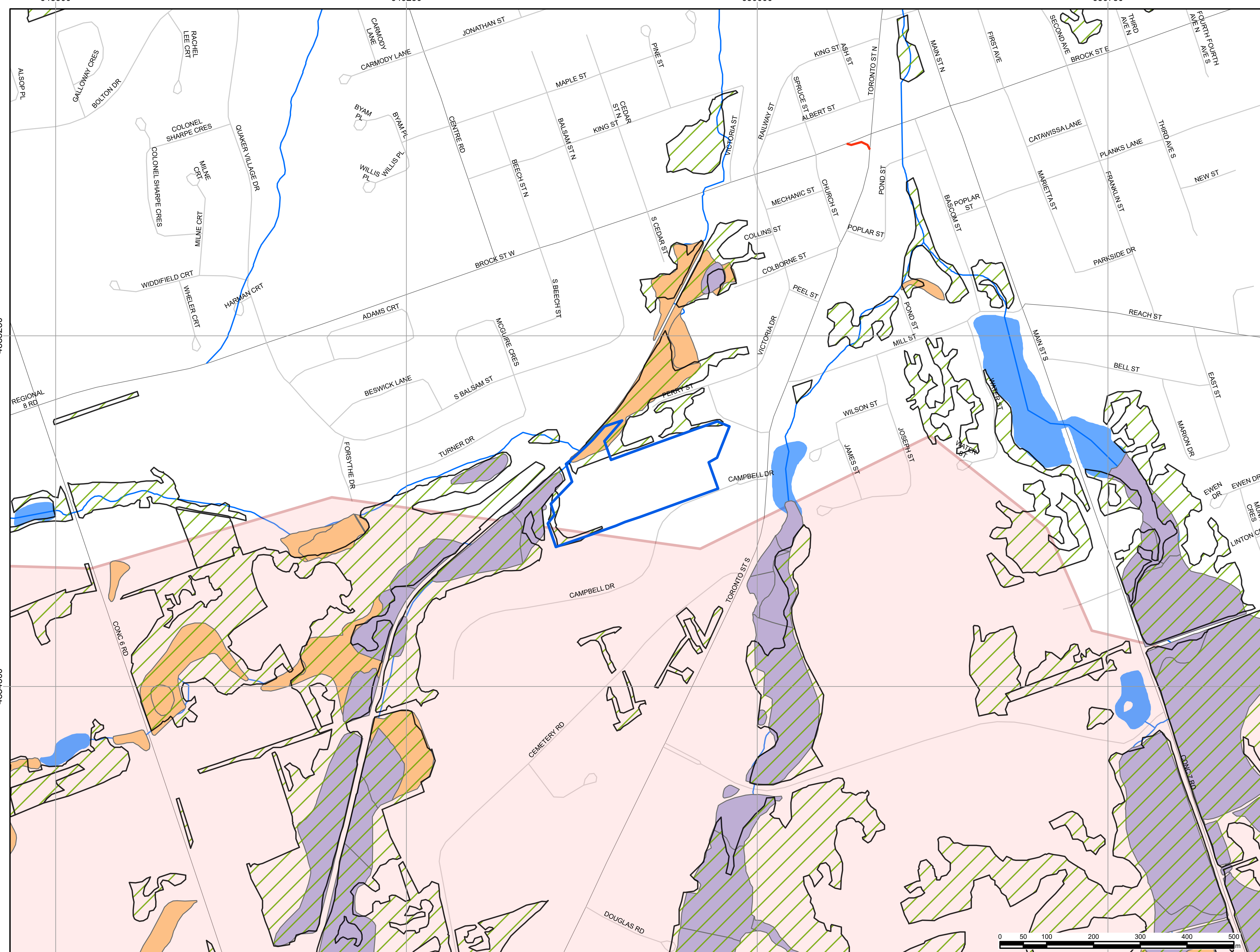
Printed On:
8/24/2024

WGS_1984_Web_Mercator_Auxiliary_Sphere

Mapped By: AQ

Scale 1: 3,539

180 0 90 180 **Meters**



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References:
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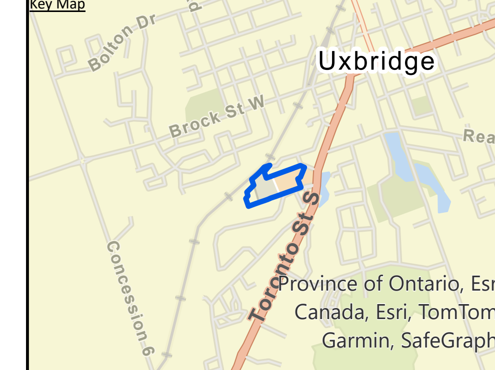
Key Map



Notes:

Legend:

Watercourse

Roads Type

Collector

Local / Street

Ramp

Expressway/Highway

Approximate Site Location

Wooded Area

Wetland Significance

Wetland Features-Not evaluated per OWES

Wetland Features-Evaluated-Provincial

Oak Ridges Moraine Protection Area

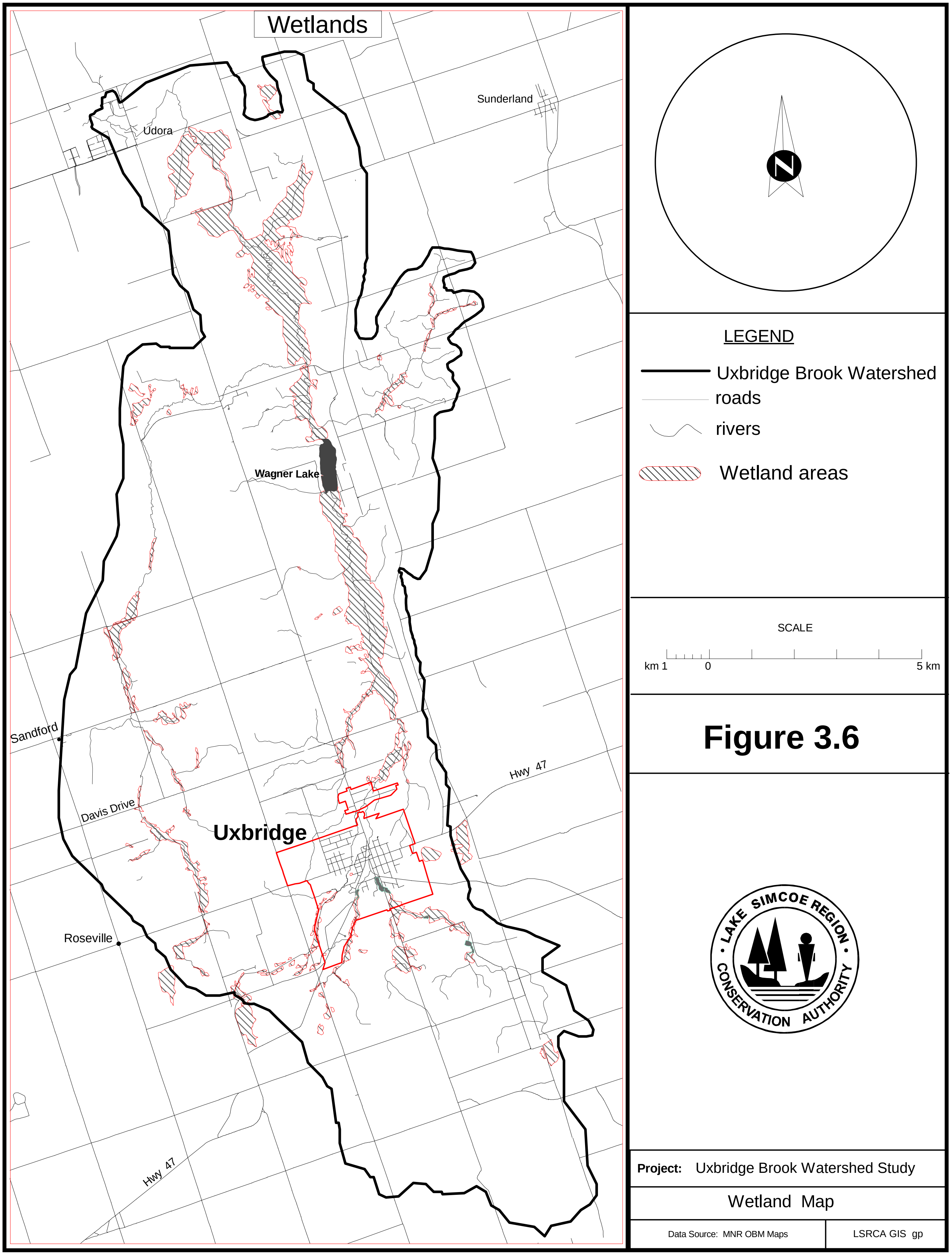
Water Body

Project Title:
Hydrogeological Assessment

Site Location:
Uxbridge Community Hospital, Uxbridge, Ontario

Figure Title:
Natural Heritage Feature Map

Designed By: AQ	*File No.:* 02310769.003
Drawn By: HK	*Scale:* As Shown
Reviewed By: MS	*Figure No.:*
Date: August 2024	


Wetlands
Sunderland
Udora
Wagner Lake
Sandford
Davis Drive
Uxbridge
Hwy 47
Roseville
Hwy 47
LEGEND
Uxbridge Brook Watershed
roads
rivers
Wetland areas
SCALE
km 1
0
5 km
Figure 3.6
LAKE SIMCOE REGION CONSERVATION AUTHORITY
Project: Uxbridge Brook Watershed Study
Wetland Map
Data Source: MNR OBM Maps
LSRCA GIS gp

Ontario

Source Protection Information Atlas

Ministry of the Environment, Conservation and Parks

[Français]

Location Information

Zoom in to confirm your location and results.

Latitude: **44.10256** Longitude: **-79.12758**

UTM Zone: **17** Easting: **649861.32**
Northing: **4884968.12**

Upper Tier Municipality: **REGIONAL MUNICIPALITY OF DURHAM**

Lower/Single Tier Municipality: **TOWNSHIP OF UXBRIDGE**

Township Concession and Lot: **UXBRIDGE CON 6, LOT 29**

Assessment Parcel Address: **4 CAMPBELL DR**

Assessment Roll #: **18290400042360000000**

MECP District: **York-Durham**

MECP Region: **Central**

Source Protection Details for Location

Source Protection Area: **Lakes Simcoe and Couchiching/Black River**

Wellhead Protection Area: **C** ; score is **4**

Wellhead Protection Area E (GUDI): **No**

Intake Protection Zone: **No**

Issue Contributing Area: **No**

Significant Groundwater Recharge Area: **No**

Highly Vulnerable Aquifer: **Yes** ; score is **6**

Event Based Area: **No**

Wellhead Protection Area Q1: **Yes** ; Stress: **Moderate**

Wellhead Protection Area Q2: **Yes** ; Stress: **Moderate**

Intake Protection Zone Q: **No**

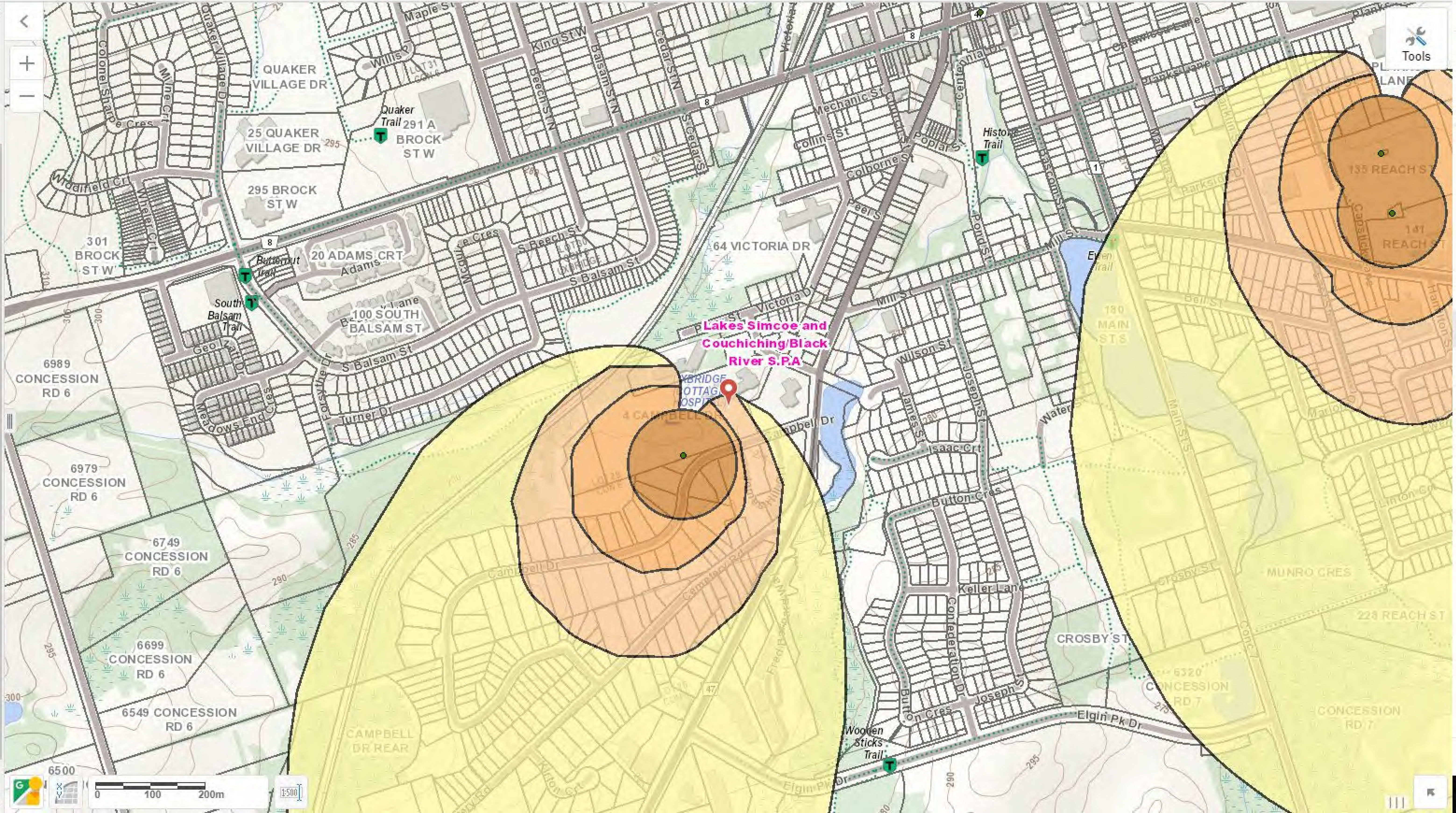
The Significant threats for the vulnerable areas at this location can be found at this link.

Use the Policy search tab to see if any policies apply – for more details see the source protection plan

Information is current as of: **January 31st, 2019**

Map Legend

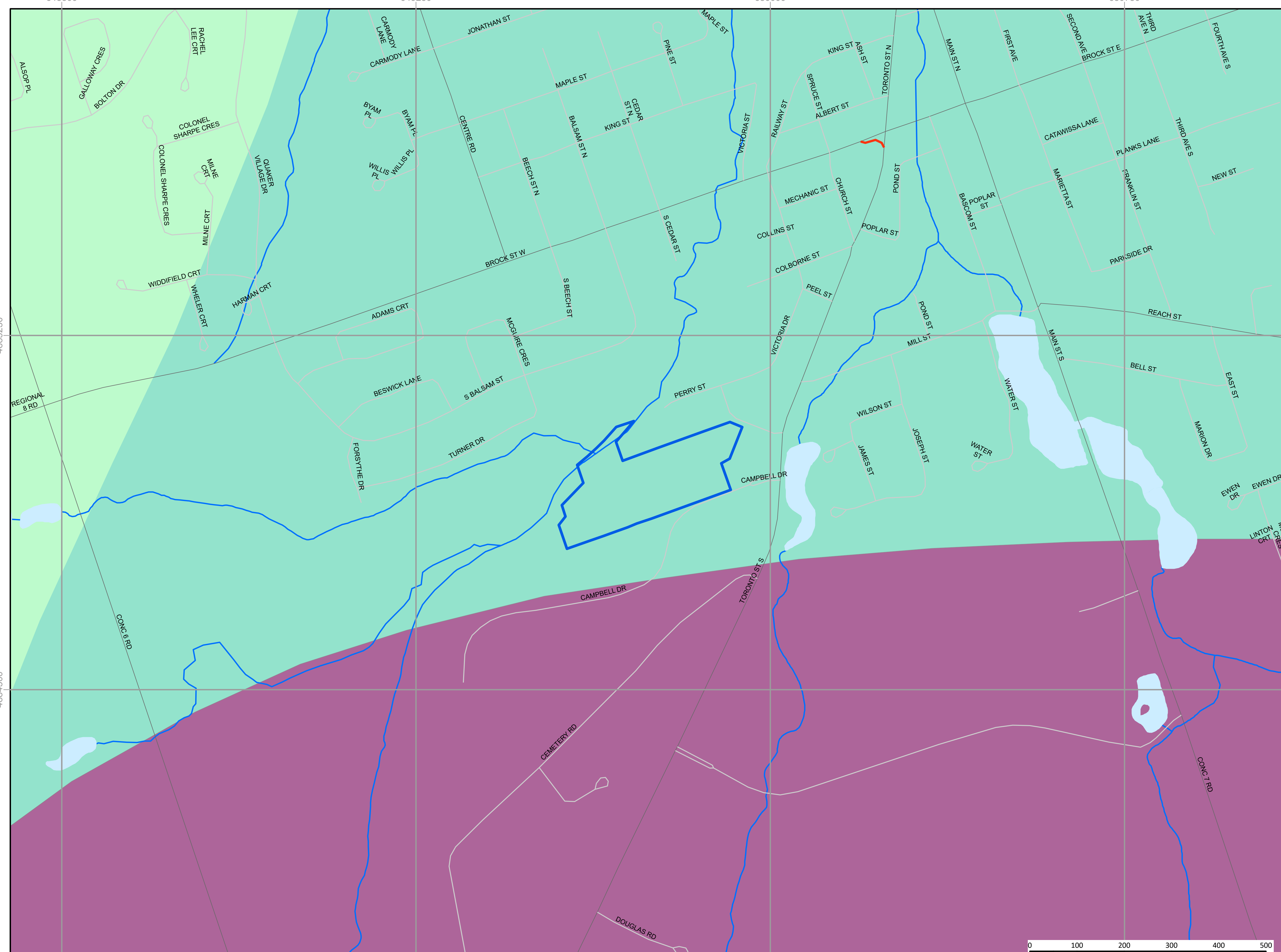
Help and Resources



Appendix B

Surficial Geology, Physiography and Topography

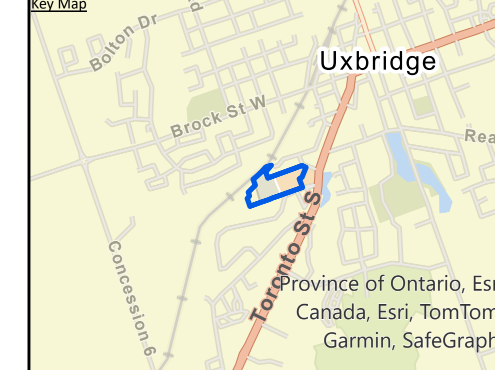
ENGLOBE



References:

Service Layer Credits: © Physiography Map was Produced by Englobe Corp.under license from the Ministry of North Development and Mines (MNDM). Copyright (c) is held by the King's Printer for Ontario. Physiography of Southern Ontario, Ontario, 2007, Ontario Geological Survey, Miscellaneous Release— Data 228.

Key Map



Notes:

Legend:

- Watercourse

ROADS TYPE

- Collector
- Local / Street
- Ramp

UNIT, REGION

- 31, Peterborough Drumlin Field
- 30: Oak Ridges Moraine
- Water Body
- Approximate Site Location

Project Title: Hydrogeological Assessment

Site Location: Uxbridge Community Hospital, Uxbridge, Ontario

Figure Title: Physiography Map

Designed By: AQ	**File No.:** 02310769.003
Drawn By: HK	**Scale:** As Shown
Reviewed By: MS	**Figure No.:**
Date: August 2024	

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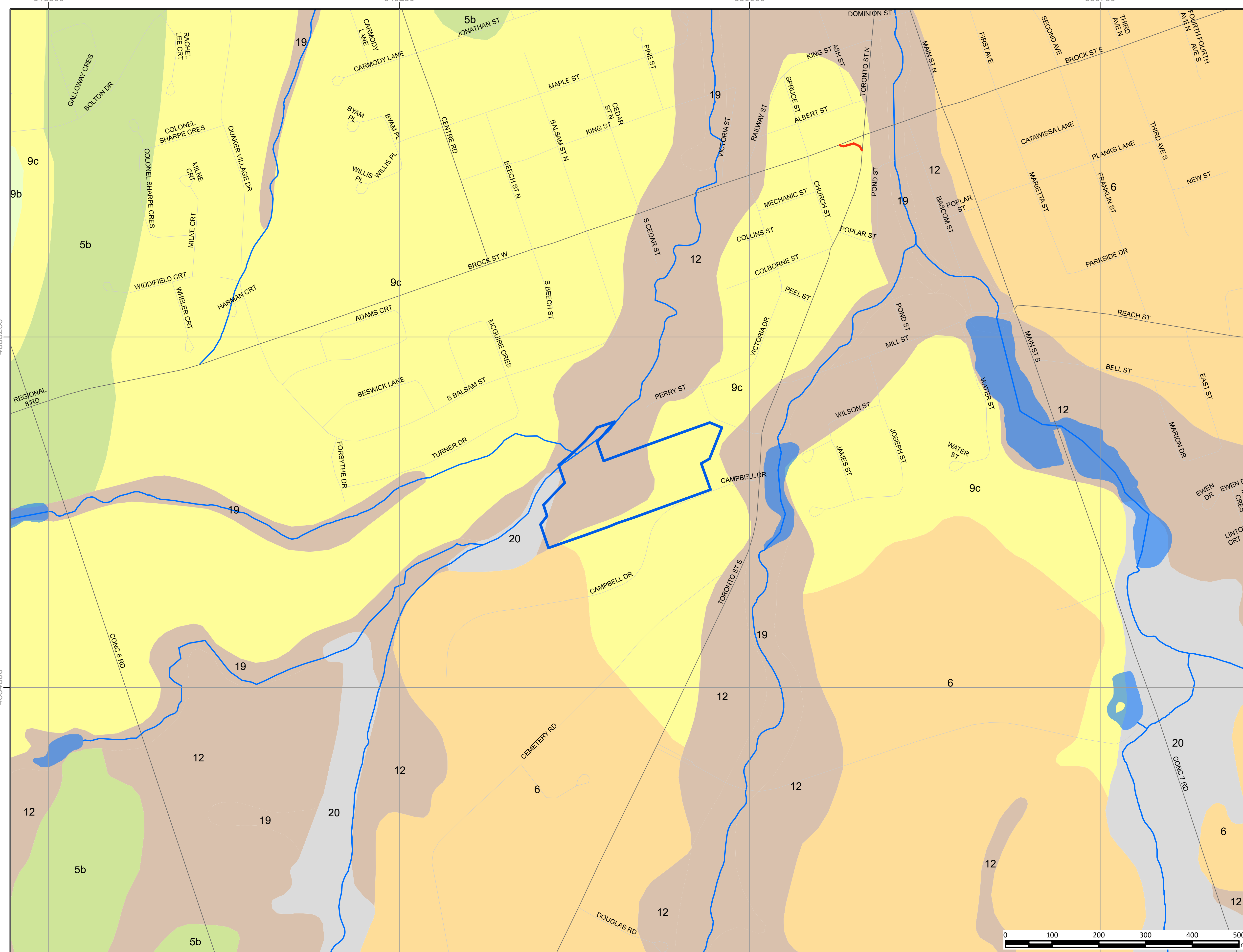

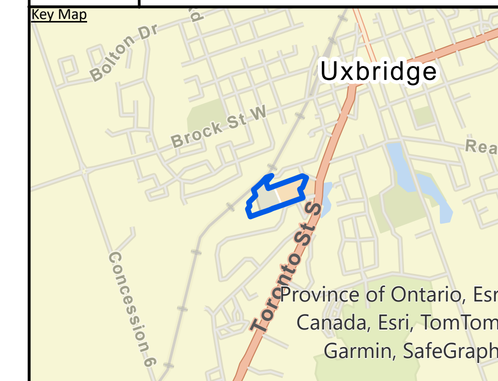

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References:
Service Layer Credits: © Surface Geology Map was Produced by Englobe Corp.under license from the Ministry of Natural Resources and Forestry (MNRF).
Copyright (c) is held by the King's Printer for Ontario.
Surficial geology of southern Ontario, 2003, Ontario Geological Survey, Miscellaneous Release— Data 128 – Revised.

Notes:

Legend:

- Watercourse

Roads Type

- Collector
- Local / Street
- Ramp
- Water Body

Surface Geology

- 5b:Stone-poor,carbonate-derived silty to sandy till
- 6: Ice-contact stratified deposits
- 9b: Littoral-foreshore deposits
- 9c: Foreshore-basinal deposits
- 12: Older alluvial deposits
- 19: Modern alluvial deposits
- 20: Organic deposits
- Approximate Site Location

Project Title:
Hydrogeological Assessment

Site Location:
Uxbridge Community Hospital
Uxbridge, Ontario

Figure Title:
Surficial Geology Map

Designed By: AQ	*File No.:* 02310769.003
Drawn By: HK	*Scale:* As Shown
Reviewed By: MS	*Figure No.:*
Date: August 2024	

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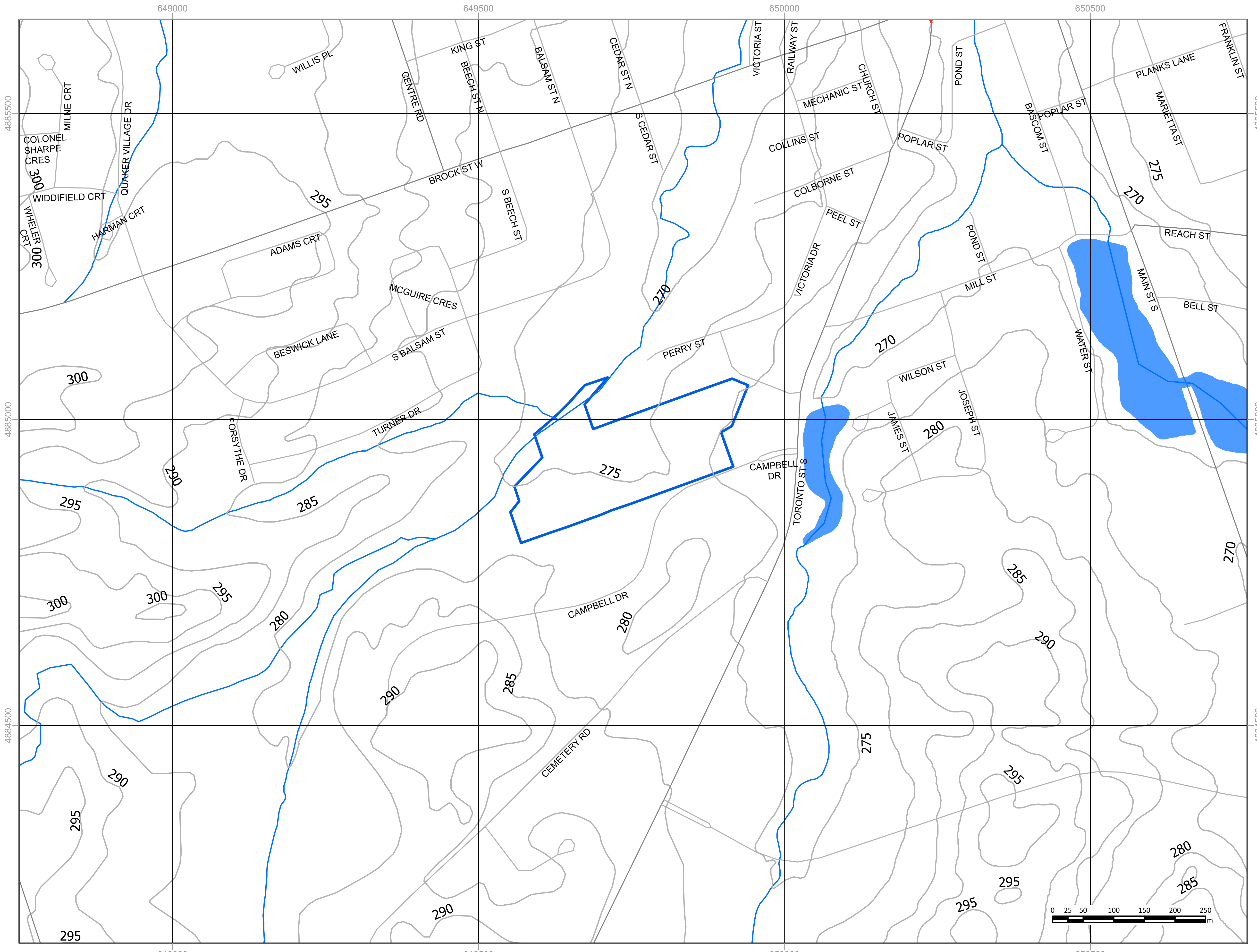

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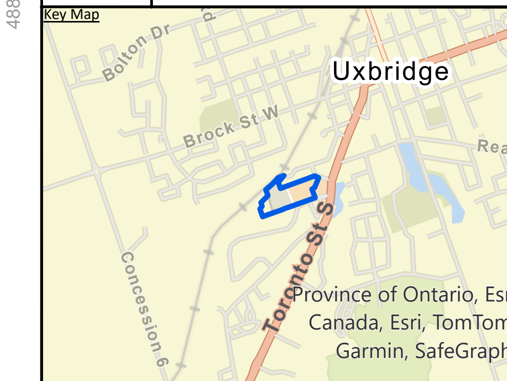
References:
Service Layer Credits: © Topography, Water Body and Watercourse Map was Produced by Englobe Corp. under license from the Ministry of Ministry of Natural Resources and Forestry (MNRF). Copyright (c) is held by the King's Printer for Ontario 2023.

Key Map



Notes:

Legend:

Watercourse

Roads Type

Collector

Local / Street

Ramp

Township of Uxbridge, Topographic Contours

Water Body

Approximate Site Location

Project Title:
Hydrogeological Assessment

Site Location:
Uxbridge Community Hospital, Uxbridge, Ontario

Figure Title:
Topography Map

Designed By: AQ	*File No.:* 02310769.003
Drawn By: HK	*Scale:* As Shown
Reviewed By: MS	*Figure No.:*
Date: August 2024	

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Appendix C

ORMGP Cross-Section

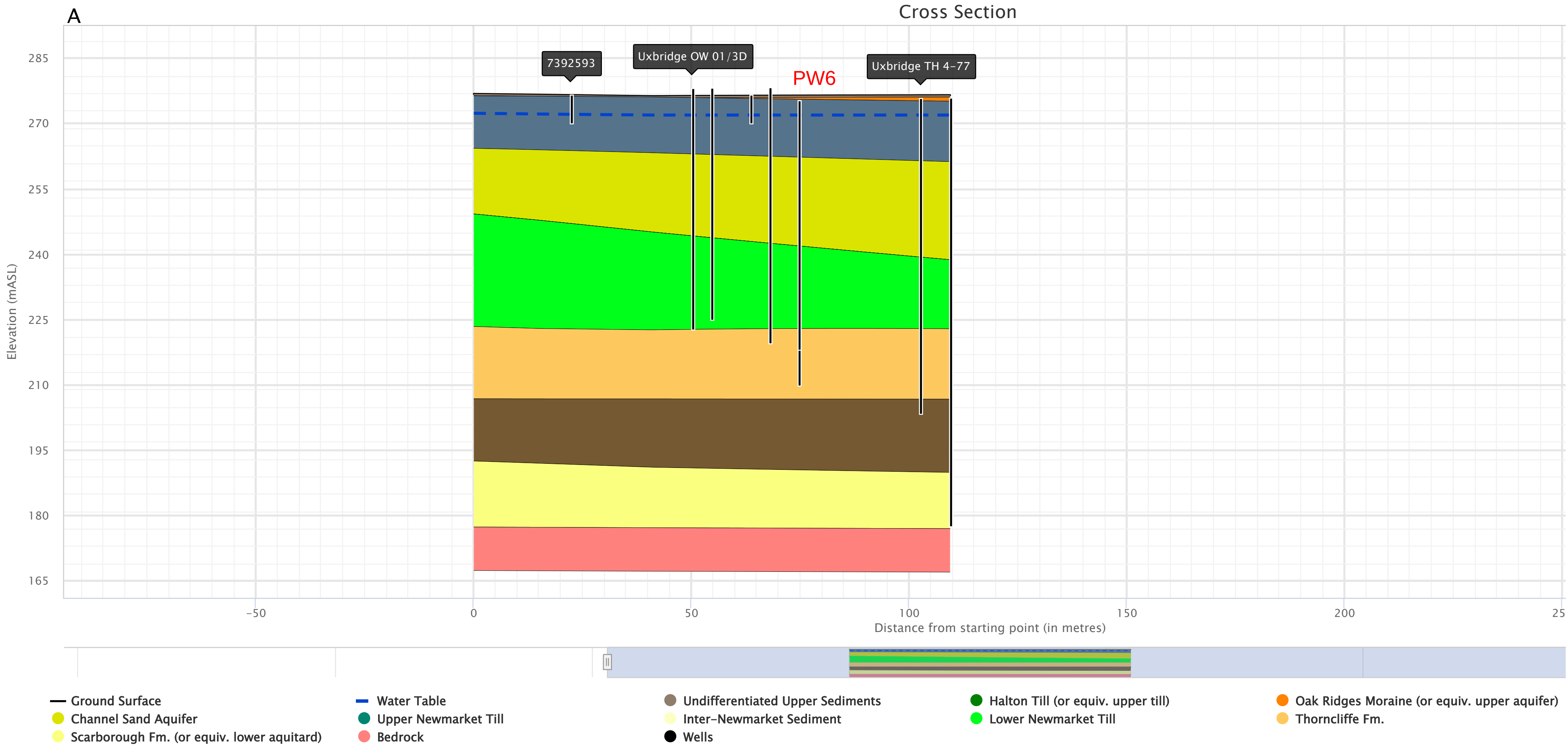
ENGLOBE


A
A'

Cross Section

NOTE: Mouse over a well to see it's properties, and right click it for more info. Double click to reset zoom or hold the Z key to do a zoom preview.

Section / Figure Name: Cross Section | Interval Size X: auto Y: auto | Show: Mouse-over Info, Grid Lines, Well Names, Start/End Label | Vertical Exaggeration: 1 x | Zoom | RESET | Shift By: 100 m



Appendix D

MECP Well Records

WELL ID	BH ID	Northing	Easting	DATE	METHOD	TAG	County	Township	Final Status	Use1	Use 2	Depth (m)	Water_kind
1904518	10073464	649764.9	4884573	15-Sep-76	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		21	FRESH
1904902	10073754	650264.9	4885073	22-Feb-77	Rotary (Convent.)		DURHAM	UXBRIDGE TOWNSHIP	Test Hole	Not Used	Municipal		
1904903	10073755	650314.9	4885123	28-Feb-77	Rotary (Convent.)		DURHAM	UXBRIDGE TOWNSHIP	Test Hole	Not Used	Municipal		
1904966	10073817	649914.9	4884523	6-Jan-78	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		12.2	FRESH
1905323	10074170	649814.9	4884473	11-Apr-79	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		19.2	FRESH
1905440	10074281	649714.9	4884923	13-Aug-79	Rotary (Convent.)		DURHAM	UXBRIDGE TOWNSHIP	Test Hole	Municipal		21.3	FRESH
1905765	10074579	649514.9	4884423	18-Jun-80	Rotary (Convent.)		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Supply	Not Used	Domestic		
1905766	10074580	649514.9	4884473	18-Jun-80	Rotary (Convent.)		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Supply	Not Used			
1907591	10076227	649778.9	4884443	3-Feb-86	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		14.3	FRESH
1907669	10076304	649756	4884604	14-May-86	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		15.8	FRESH
1908083	10076717	649748.9	4884605	19-Dec-86	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		14.6	FRESH
1908683	10077312	649905.9	4884748	31-Oct-87	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		23.2	FRESH
1908850	10077478	649788.9	4884764	7-Dec-87	Rotary (Convent.)		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		68.6	FRESH
1909176	10077803	649651.9	4884805	19-Jul-88	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		61	FRESH
1909390	10078017	649933	4884732	22-Jul-88	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		21	FRESH
1909625	10078252	649651.9	4884805	7-Feb-89	Rotary (Convent.)		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		62.8	FRESH
1911055	10079678	649786	4884871	29-Oct-90	Rotary (Reverse)		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Public			
1911068	10079691	649777.9	4884521	8-May-91	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		20.1	FRESH
1911649	10080272	649756.9	4884568	30-Sep-92	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		15.2	FRESH
1912334	10080954	649778.9	4884443	31-Jan-95	Rotary (Convent.)		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		61.3	FRESH
1912335	10080955	649778.9	4884443	20-Feb-95	Not Known		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Supply	Domestic			
1912475	10081094	649651.9	4884805	29-Jun-95	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		25.3	FRESH
1912653	10081272	649740	4884558	23-Nov-95	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		10.4	FRESH
1912654	10081273	649805	4884596	27-Nov-95	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		16.8	FRESH
1912655	10081274	649805	4884622	2-Dec-95	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		21	FRESH
1912671	10081290	649663	4884421	22-Dec-95	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		23	Not stated
1912672	10081291	649652	4884478	9-Dec-95	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		22.2	Not stated
1912846	10081465	649651.9	4884805	29-May-96	Boring		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other	Not Used			
1912847	10081466	649651.9	4884805	29-May-96	Boring		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other	Not Used			
1912848	10081467	649651.9	4884805	29-May-96	Not Known		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other	Not Used			
1912849	10081468	649651.9	4884805	29-May-96	Not Known		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other	Not Used			
1912850	10081469	649651.9	4884805	29-May-96	Not Known		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other	Not Used			
1913766	10082357	649651.9	4884805	21-Aug-98	Not Known		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other				
1913767	10082358	649651.9	4884805	24-Aug-98	Not Known		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other				
1913768	10082359	649651.9	4884805	24-Aug-98	Not Known		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other				
1913769	10082360	649651.9	4884805	24-Aug-98	Not Known		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other				
1913770	10082361	649651.9	4884805	24-Aug-98	Not Known		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other				
1914163	10082754	649651.9	4884805	10-Aug-99	Air Percussion		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		60.4	FRESH
1914209	10082800	649778.9	4884443	30-Jul-99	Rotary (Air)		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other				
1914210	10082801	649778.9	4884443	4-Aug-99	Rotary (Air)		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Quality				
1914299	10082890	649651.9	4884805	2-Oct-99	Not Known		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other	Not Used			
1914300	10082891	649778.9	4884443	29-Oct-99	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Observation Wells			14.6	Not stated
1914417	10083008	649778.9	4884443	7-Mar-00	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		16.8	FRESH
1914797	10083386	649776.2	4884444	22-Aug-00	Rotary (Convent.)		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Supply				
1914799	10083388	649776.2	4884444	17-Aug-00	Rotary (Convent.)		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Supply				
1914838	10083427	649776.2	4884444	3-Oct-00	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		6.1	FRESH
1915204	10517177	649650.2	4884806	23-Jul-01	Not Known		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other	Not Used			
1915255	10517228	649650.2	4884806	19-Jan-01	Rotary (Convent.)		DURHAM	UXBRIDGE TOWNSHIP	Observation Wells				
1915308	10517281	649650.2	4884806	14-Aug-01	Not Known		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other				
1916658	10543642	649649.2	4884806	18-Aug-03	Rotary (Convent.)		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		33.5	FRESH
1916695	10543679	649649.2	4884806	4-Sep-03	Rotary (Air)		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		35.7	FRESH
1916696	10543680	649649.2	4884806	13-Sep-03	Rotary (Convent.)		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Supply	Not Used			
1917953	11317543	649570.4	4884498	30-Nov-05		A032316	DURHAM	UXBRIDGE TOWNSHIP					
1917954	11317544	649574.5	4884494	7-Dec-05		A032314	DURHAM	UXBRIDGE TOWNSHIP					
4602988	10294351	649893.9	4884794	14-Oct-59	Boring		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		6.1	FRESH
4602989	10294352	649825.9	4884585	25-Aug-61	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		32.3	FRESH
4602991	10294354	649717.9	4884605	13-Oct-67	Boring		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		7.6	FRESH
4603776	10295126	649634.9	4884553	21-Nov-68	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		11.3	FRESH
4604116	10295459	649614.9	4884523	5-Aug-69	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		20.4	FRESH
4604891	10296217	649664.9	4884443	25-Nov-71	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		25.3	FRESH
4604894	10296220	649614.9	4884398	29-Nov-71	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		24.7	FRESH
4605428	10296746	649674.9	4884583	2-Apr-73	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		18.6	FRESH
4605526	10296842	649814.9	4884723	31-Jul-73	Rotary (Convent.)		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		63.4	FRESH
4605641	10296955	649724.9	4884673	23-Nov-73	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		18.2	FRESH
4605933	10297241	649838.9	4884623	11-Jul-74	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		13.7	FRESH
4606386	10297677	649911.9	4884558	11-Dec-75	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		12.2	FRESH
4606390	10297681	650001.9	4884638	15-Dec-75	Cable Tool		DURHAM	UXBRIDGE TOWNSHIP	Water Supply	Domestic		17.1	FRESH
7039920	11762205	649995	4884401	12-Dec-06	Other Method		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other	Not Used			
7039921	11762206	649988	4884419	12-Dec-06	Other Method		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other	Not Used			
7046900	23046900	649769	4884388	26-Jun-07			DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other				
7046901	23046901	649772	4884378	26-Jun-07			DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other				
7046902	23046902	649805	4884447	26-Jun-07			DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other				
7182315	1003886556	649704	4884574	18-May-12			DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other				
7197204	1004253685	650112	4885051	22-Jan-13	Direct Push	A143698	DURHAM	UXBRIDGE TOWNSHIP	Monitoring /Test Hole	Monitoring / Test Hole			
7341715	1007640446	649846	4884924	8-Feb-19	Rotary (Convent.)	A174103	DURHAM	UXBRIDGE TOWNSHIP	Monitoring /Test Hole	Monitoring /Test Hole		5.8	Untested
7356676	1008256509	649829	4884945	6-Apr-20			DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other				
7356677	1008256512	649831	4884971	6-Apr-20			DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other				
7366696	1008470904	649800	4884975	8-Oct-19		A275278	DURHAM	UXBRIDGE TOWNSHIP					
7390084	1008687903	649920	4884572	8-Apr-21	Rotary (Convent.)	A312094	DURHAM	UXBRIDGE TOWNSHIP	Monitoring /Test Hole	Monitoring / Test Hole		3.7	Untested
7390085	1008687906	649900	4884540	8-Apr-21	Rotary (Convent.)	A312095	DURHAM	UXBRIDGE TOWNSHIP	Monitoring / Test Hole	Monitoring / Test Hole		3.7	Untested
7390086	1008687909	649911	4884551	9-Apr-21	Rotary (Convent.)	A312093	DURHAM	UXBRIDGE TOWNSHIP	Monitoring / Test Hole	Monitoring / Test Hole		3.7	Untested
7392585	1008713902	649849	4884951		Auger		DURHAM	UXBRIDGE TOWNSHIP					
7392586	1008713905	649829	4884945		Auger		DURHAM	UXBRIDGE TOWNSHIP					
7392587	1008713908	649844	4884922		Auger		DURHAM	UXBRIDGE TOWNSHIP					
7392588	1008713911	649854	4884926		Auger		DURHAM	UXBRIDGE TOWNSHIP		Monitoring			
7392589	1008713914	649831	4884971		Auger		DURHAM	UXBRIDGE TOWNSHIP					
7392590	1008713917	649808	4884914		Auger		DURHAM	UXBRIDGE TOWNSHIP					
7392591	1008713920	649731	4884884		Auger		DURHAM	UXBRIDGE TOWNSHIP		Monitoring			
7392592	1008713923	649713	4884882		Auger		DURHAM	UXBRIDGE TOWNSHIP		Monitoring			
7392593	1008713926	649726	4884869		Auger		DURHAM	UXBRIDGE TOWNSHIP		Monitoring			

7392594	1008713929	649712	4884902		Auger		DURHAM	UXBRIDGE TOWNSHIP		Monitoring			
7392595	1008713932	649752	4884917		Auger		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other	Monitoring			
7392596	1008713935	649766	4884877		Auger		DURHAM	UXBRIDGE TOWNSHIP	Abandoned-Other	Monitoring			
7393780	1008729026	650094	4885048	29-Apr-21			DURHAM	UXBRIDGE TOWNSHIP					
7429965	1009227278	649494	4885079	16-Sep-22		A362870	DURHAM	UXBRIDGE TOWNSHIP					
7429966	1009227281	649678	4885236	16-Sep-22		A362878	DURHAM	UXBRIDGE TOWNSHIP					
7429967	1009227284	649570	4885128	15-Sep-22		A360901	DURHAM	UXBRIDGE TOWNSHIP					
7429968	1009227287	649592	4885100	15-Sep-22		A360898	DURHAM	UXBRIDGE TOWNSHIP					
7429969	1009227290	649776	4885292	14-Sep-22		A362844	DURHAM	UXBRIDGE TOWNSHIP					
7429970	1009227293	649744	4885217	14-Sep-22		A362843	DURHAM	UXBRIDGE TOWNSHIP					
7433414	1009272618	649629	4884428	18-Oct-22			DURHAM	UXBRIDGE TOWNSHIP					

Appendix E

Borehole Logs

ENGLOBE

LOG OF BOREHOLE 24-1

Project No. : 02310769.002 | Client : Oak Valley Health | Originated by : BR

Date started : June 18, 2024 | Project : Uxbridge Community Hospital | Compiled by : AS

Sheet No. : 1 of 1 | Location : Uxbridge, ON | Checked by : AS

Position : E: 649866, N: 4885021 (UTM 17T) | Elevation Datum : Geodetic

Rig type : Track-mounted | Drilling Method : Solid stem augers

Penetration Test Values (Blows / 0.3m): × Dynamic Cone — 10, 20, 30, 40
Undrained Shear Strength (kPa): ○ Unconfined, + Field Vane, ● Pocket Penetrometer, ■ Lab Vane — 40, 80, 120, 160
Moisture / Plasticity: Plastic Limit (PL), Natural Water Content (MC), Liquid Limit (LL) — 10, 20, 30
Lab Data and Comments: GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL

Elev (m) / Depth (m)	Description	Sample Number	Type	SPT 'N' Value	Headspace Vapour (ppm)	Lab Data and Comments
276.6	GROUND SURFACE					
	100mm ASPHALTIC CONCRETE					
276.2 / 0.4	250mm AGGREGATE	1	SS	18	PID: 0 FID: 0	SS1 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
275.8 / 0.8	FILL, sandy silt, trace to some gravel, trace clay, trace organics, compact, dark brown, moist					
	SILT, trace to some clay, trace to some sand, compact to very dense, brown, moist	2	SS	35	PID: 0 FID: 1	
		3	SS	16	PID: 0 FID: 1	0 16 68 16
	...brownish grey below	4	SS	61	PID: 0 FID: 3	
		5	SS	44	PID: 15 FID: 1	SS5 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
	...dilatent and wet below	6	SS	48	PID: 15 FID: 1	wet sampler
269.9 / 6.7		7	SS	32	PID: 0 FID: 1	

END OF BOREHOLE

Unstabilized water level measured at 4.9 m below ground surface; borehole was open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Jul 3, 2024	1.7	274.9

file: 02310769.000 bh logs.gpj

LOG OF BOREHOLE 24-2

Project No.	: 02310769.002	Client	: Oak Valley Health	Originated by	: BR
Date started	: June 17, 2024	Project	: Uxbridge Community Hospital	Compiled by	: AS
Sheet No.	: 1 of 1	Location	: Uxbridge, ON	Checked by	: AS

Position : E: 649931, N: 4885050 (UTM 17T)
Elevation Datum : Geodetic
Rig type : Track-mounted
Drilling Method : Solid stem augers

SOIL PROFILE

Elev (m)	Depth (m)	Description
277.3	0	GROUND SURFACE
		90mm **ASPHALTIC CONCRETE**
276.9		250mm **AGGREGATE**
	0.4	**FILL**, sand, trace to some silt, trace gravel, trace organics, loose to compact, dark brown, moist
275.8	1.5	**SILT**, trace to some clay, trace to some sand, dilatant, loose to compact, brown, wet
		...dense
270.6	6.7	**END OF BOREHOLE**

SAMPLES

Number	Type	SPT 'N' Value	Headspace Vapour (ppm)	Natural Water Content (%)	Lab Data and Comments
1	SS	13	PID: 0 FID: 0		
2	SS	5	PID: 0 FID: 0		SS2 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC; wet sampler
3	SS	9	PID: 0 FID: 0		
4	SS	18	PID: 0 FID: 0		SS4 Analysis: M&I, PAH, PCB, VOC
5	SS	16	PID: 0 FID: 0		SS5 Analysis: BTEX, VOC, PHC
6	SS	26	PID: 0 FID: 0		
7	SS	50	PID: 0 FID: 0		

Depth Scale (m): 0, 1, 2, 3, 4, 5, 6
Elevation Scale (m): 277, 276, 275, 274, 273, 272, 271

Penetration Test Values (Blows / 0.3m): 10, 20, 30, 40
Dynamic Cone
Undrained Shear Strength (kPa): 40, 80, 120, 160
Unconfined; Field Vane; Pocket Penetrometer; Lab Vane

Moisture / Plasticity: Plastic Limit (PL), Natural Water Content (MC), Liquid Limit (LL): 10, 20, 30

Instrument Details; Unstabilized Water Level

GRAIN SIZE DISTRIBUTION (%) (MIT): GR SA SI CL

Unstabilized water level measured at 5.8 m below ground surface; borehole was open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Jul 3, 2024	2.5	274.8

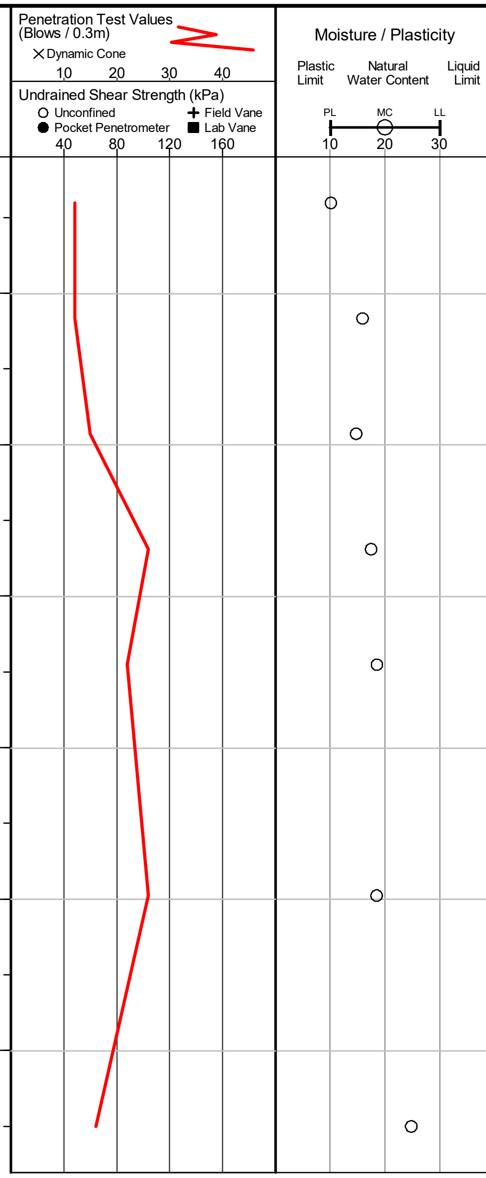
file: 02310769.000 bh logs.gpj

LOG OF BOREHOLE 24-3

Project No.	: 02310769.002	Client	: Oak Valley Health	Originated by	: BR
Date started	: June 17, 2024	Project	: Uxbridge Community Hospital	Compiled by	: AS
Sheet No.	: 1 of 1	Location	: Uxbridge, ON	Checked by	: AS

Position : E: 649905, N: 4884989 (UTM 17T)
Elevation Datum : Geodetic
Rig type : Track-mounted
Drilling Method : Solid stem augers

Depth Scale (m)	Elev Depth (m)	SOIL PROFILE – Description	Sample Number	Type	SPT 'N' Value	Elevation Scale (m)	Headspace Vapour (ppm)	Lab Data and Comments
0	276.9	GROUND SURFACE						
		100mm **TOPSOIL**						
		FILL, silty sand, trace gravel, trace organics, compact, dark brown, moist	1	SS	12		PID: 0 FID: 0	SS1 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC, DUP#1
	276.1 / 0.8	**SILT**, trace to some clay, trace to some sand, dilatant, compact, brown, wet				276		
1			2	SS	12		PID: 0 FID: 0	
2			3	SS	15	275	PID: 0 FID: 0	
								wet sampler
			4	SS	26	274	PID: 0 FID: 0	SS4 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
3			5	SS	22	273	PID: 0 FID: 0	
4		...brownish grey below						
5			6	SS	26	272	PID: 0 FID: 0	
6						271		
			7	SS	16		PID: 0 FID: 0	
	270.2 / 6.7	**END OF BOREHOLE**						



Unstabilized water level measured at 5.2 m below ground surface; borehole caved to 5.3 m below ground surface upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Jul 3, 2024	2.5	274.4

file: 02310769.000 bh logs.gpj

LOG OF BOREHOLE 24-4

ENGLOBE

Project No. : 02310769.002	Client : Oak Valley Health	Originated by : BR
Date started : June 17, 2024	Project : Uxbridge Community Hospital	Compiled by : AS
Sheet No. : 1 of 1	Location : Uxbridge, ON	Checked by : AS

Position : E: 649860, N: 4884968 (UTM 17T)
Elevation Datum : Geodetic
Rig type : Track-mounted
Drilling Method : Solid stem augers

Penetration Test Values (Blows / 0.3m): Dynamic Cone 10 20 30 40
Undrained Shear Strength (kPa): Unconfined; Field Vane; Pocket Penetrometer; Lab Vane 40 80 120 160
Moisture / Plasticity: Plastic Limit (PL) 10, Natural Water Content (MC) 20, Liquid Limit (LL) 30
Lab Data and Comments: GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL

SOIL PROFILE

Elev / Depth (m)	Description
277.3	GROUND SURFACE
	120mm **ASPHALTIC CONCRETE**
276.9 / 0.4	240mm **AGGREGATE**
	FILL, silty sand, trace clay, trace gravel, trace organics, compact, dark brown, moist
276.5 / 0.8	**SILT**, trace to some clay, trace to some sand, dilatant, compact, brown, wet
	...brownish grey below
270.6 / 6.7	

SAMPLES

Number	Type	SPT 'N' Value	Headspace Vapour (ppm)	Lab Data and Comments
1	SS	13	PID: 0 FID: 0	SS1 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
2	SS	17	PID: 0 FID: 0	
3	SS	19	PID: 0 FID: 0	
4	SS	29	PID: 0 FID: 0	
5	SS	23	PID: 0 FID: 0	SS5 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
6	SS	18	PID: 0 FID: 0	wet sampler
7	SS	25	PID: 0 FID: 0	

Depth Scale (m): 0 1 2 3 4 5 6
Elevation Scale (m): 277 276 275 274 273 272 271

END OF BOREHOLE

Wet cave at 5.4 m below ground surface upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

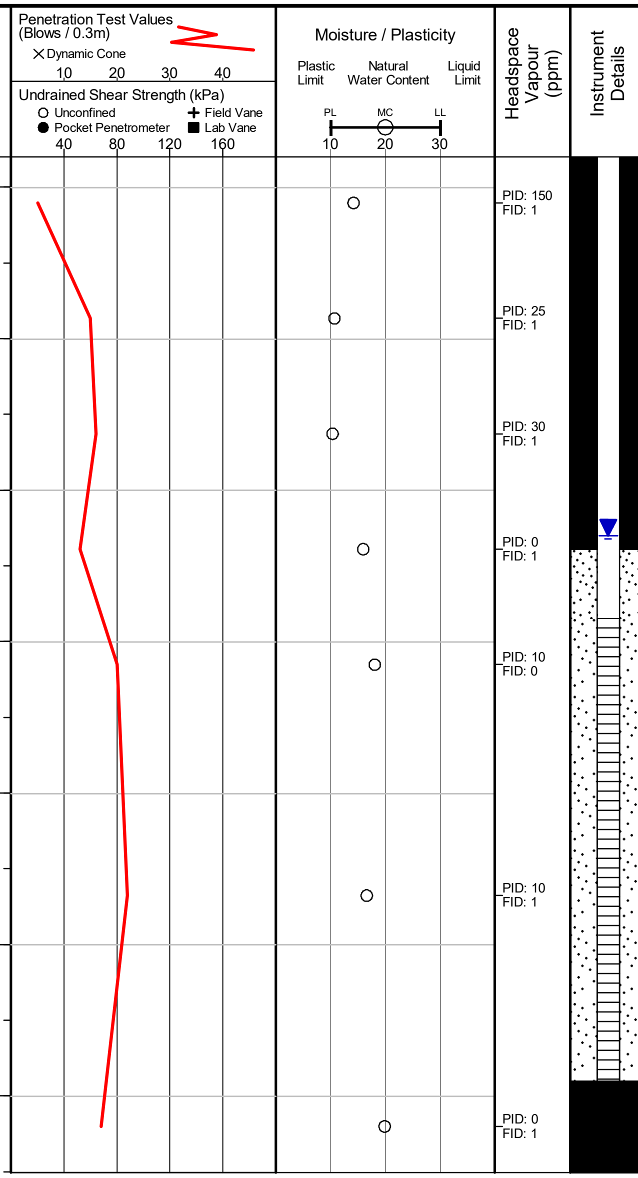
Date	Water Depth (m)	Elevation (m)
Jul 3, 2024	2.4	274.9

LOG OF BOREHOLE 24-5

Project No.	: 02310769.002	Client	: Oak Valley Health	Originated by	: BR
Date started	: June 18, 2024	Project	: Uxbridge Community Hospital	Compiled by	: AS
Sheet No.	: 1 of 1	Location	: Uxbridge, ON	Checked by	: AS

Position : E: 649879, N: 4884957 (UTM 17T)
Elevation Datum : Geodetic
Rig type : Track-mounted
Drilling Method : Solid stem augers

Depth Scale (m)	Elev Depth (m)	Description	Number	Type	SPT 'N' Value	Elevation Scale (m)	Headspace Vapour (ppm)	Lab Data and Comments
0	277.2	GROUND SURFACE						
		100mm **TOPSOIL**						
		FILL, silty sand, trace clay, trace to some gravel, trace organics, loose to compact, dark brown, moist	1	SS	5	277	PID: 150 FID: 1	SS1 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC, DUP#2
1			2	SS	15	276	PID: 25 FID: 1	
2			3	SS	16		PID: 30 FID: 1	
		...wet				275		
	274.6 2.6		4	SS	13		PID: 0 FID: 1	wet sampler
3		**SILT**, trace to some clay, trace to some sand, dilatant, compact, brown, wet	5	SS	20	274	PID: 10 FID: 0	SS5 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
4						273		
5		...brownish grey below	6	SS	22	272	PID: 10 FID: 1	
6						271		
	270.5 6.7		7	SS	17		PID: 0 FID: 1	



END OF BOREHOLE

Unstabilized water level measured at 4.6 m below ground surface; borehole caved to 5.5 m below ground surface upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Jul 3, 2024	2.5	274.7

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LOG OF BOREHOLE 24-6

ENGLOBE

Project No. : 02310769.002 | Client : Oak Valley Health | Originated by : BR

Date started : June 18, 2024 | Project : Uxbridge Community Hospital | Compiled by : AS

Sheet No. : 1 of 1 | Location : Uxbridge, ON | Checked by : AS

Position : E: 649893, N: 4884924 (UTM 17T) | Elevation Datum : Geodetic

Rig type : Track-mounted | Drilling Method : Solid stem augers

SOIL PROFILE

Elev / Depth (m)	Description
276.9	GROUND SURFACE
276.7 / 0.2	150mm **ASPHALTIC CONCRETE**
276.7 / 0.2	40mm **AGGREGATE**
276.4 / 0.5	250mm **TOPSOIL**
276.1 / 0.8	**FILL**, sandy silt, trace clay, trace gravel, trace organics, loose, dark brown, moist
275.4 / 1.5	**SANDY SILT**, trace clay, compact, brown, moist
268.7 / 8.2	**SILT**, trace to some clay, trace to some sand, dilatant, compact, brown, wet; ...brownish grey below; ...very loose; ...compact

SAMPLES

Number	Type	SPT 'N' Value	Headspace Vapour (ppm)
1	SS	6	PID: 30 FID: 0
2	SS	16	PID: 90 FID: 0
3	SS	17	PID: 45 FID: 0
4	SS	20	PID: 40 FID: 0
5	SS	14	PID: 40 FID: 0
6	SS	21	PID: 25 FID: 0
7	SS	1	PID: 0 FID: 0
8	SS	15	PID: 0 FID: 0

Penetration Test Values (Blows / 0.3m): Dynamic Cone; 10 20 30 40

Undrained Shear Strength (kPa): Unconfined; Pocket Penetrometer; Field Vane; Lab Vane; 40 80 120 160

Moisture / Plasticity: Plastic Limit, Natural Water Content, Liquid Limit; PL MC LL; 10 20 30

Depth Scale (m): 0 1 2 3 4 5 6 7 8

Elevation Scale (m): 276 275 274 273 272 271 270 269

Instrument Details; Unstabilized Water Level

Lab Data and Comments

SS2 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC

GRAIN SIZE DISTRIBUTION (%) (MIT)

GR	SA	SI	CL
0	15	70	15

END OF BOREHOLE

Unstabilized water level measured at 3.0 m below ground surface; borehole caved to 6.7 m below ground surface upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Jul 3, 2024	2.1	274.8

file: 02310769.000 bh logs.gpj

LOG OF BOREHOLE 24-7

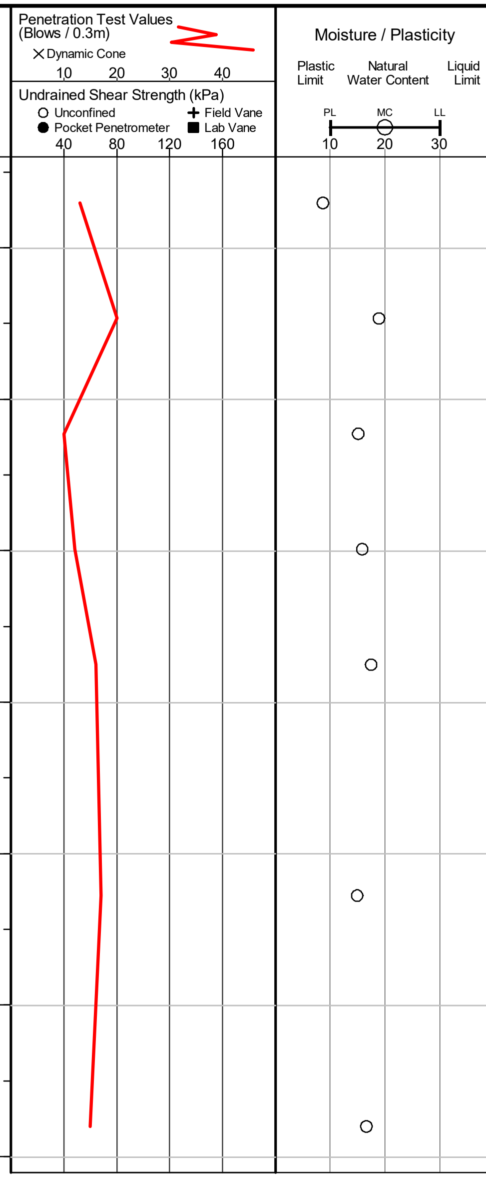
ENGLOBE

Project No. : 02310769.002	Client : Oak Valley Health	Originated by : BR
Date started : June 18, 2024	Project : Uxbridge Community Hospital	Compiled by : AS
Sheet No. : 1 of 1	Location : Uxbridge, ON	Checked by : AS

Position : E: 649715, N: 4884866 (UTM 17T)
Elevation Datum : Geodetic
Rig type : Track-mounted
Drilling Method : Solid stem augers

Elev Depth (m)	Description	Sample Number	Type	SPT 'N' Value	Headspace Vapour (ppm)	Lab Data and Comments
277.6	GROUND SURFACE					
	100mm **TOPSOIL**					
	FILL, silty sand, trace clay, trace gravel, trace organics, compact, dark brown, moist	1	SS	13	PID: 30 FID: 0	
	...topsoil inclusion, black	2	SS	20	PID: 5 FID: 0	
		3	SS	10	PID: 35 FID: 0	SS3 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
275.3 2.3	**SILT**, trace to some clay, trace to some sand, dilatant, compact, brown, wet	4	SS	12	PID: 0 FID: 0	
		5	SS	16	PID: 0 FID: 0	
	...brownish grey below	6	SS	17	PID: 35 FID: 0	wet sampler; SS6 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
270.9 6.7		7	SS	15	PID: 35 FID: 0	

Depth Scale (m): 0, 1, 2, 3, 4, 5, 6
Elevation Scale (m): 277, 276, 275, 274, 273, 272, 271



Instrument Details | Unstabilized Water Level | GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL

END OF BOREHOLE

Borehole was dry and caved to 3.0 m below ground surface upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Jul 3, 2024	1.4	276.2

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LOG OF BOREHOLE 24-8

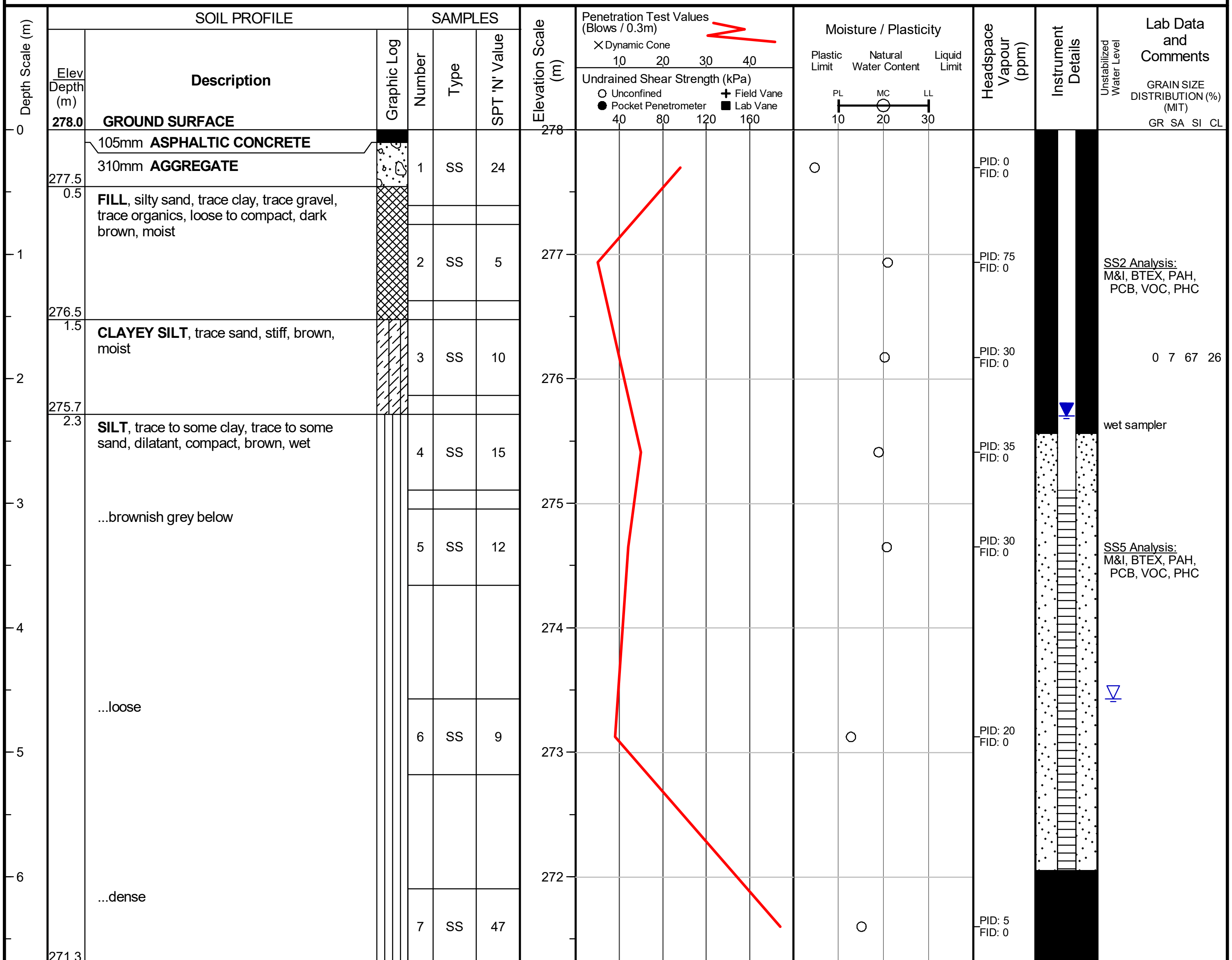
ENGLOBE

Project No. : 02310769.002	Client : Oak Valley Health	Originated by : BR
Date started : June 19, 2024	Project : Uxbridge Community Hospital	Compiled by : AS
Sheet No. : 1 of 1	Location : Uxbridge, ON	Checked by : AS

Position : E: 649793, N: 4884927 (UTM 17T) — Elevation Datum : Geodetic

Rig type : Track-mounted — Drilling Method : Solid stem augers

Elev / Depth (m)	Description	Sample Number	Type	SPT 'N' Value	Natural Water Content (%)	Headspace Vapour (ppm)	Lab Data and Comments
278.0	GROUND SURFACE						
	105mm **ASPHALTIC CONCRETE**						
277.5 / 0.5	310mm **AGGREGATE**	1	SS	24		PID: 0, FID: 0	
276.5 / 1.5	**FILL**, silty sand, trace clay, trace gravel, trace organics, loose to compact, dark brown, moist	2	SS	5		PID: 75, FID: 0	SS2 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
275.7 / 2.3	**CLAYEY SILT**, trace sand, stiff, brown, moist	3	SS	10		PID: 30, FID: 0	GR SA SI CL: 0 7 67 26
	SILT, trace to some clay, trace to some sand, dilatant, compact, brown, wet	4	SS	15		PID: 35, FID: 0	wet sampler
	...brownish grey below	5	SS	12		PID: 30, FID: 0	SS5 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
	...loose	6	SS	9		PID: 20, FID: 0	
271.3 / 6.7	...dense	7	SS	47		PID: 5, FID: 0	



END OF BOREHOLE

Unstabilized water level measured at 4.6 m below ground surface; borehole was open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Jul 3, 2024	2.3	275.7

file: 02310769.000 bh logs.gpj

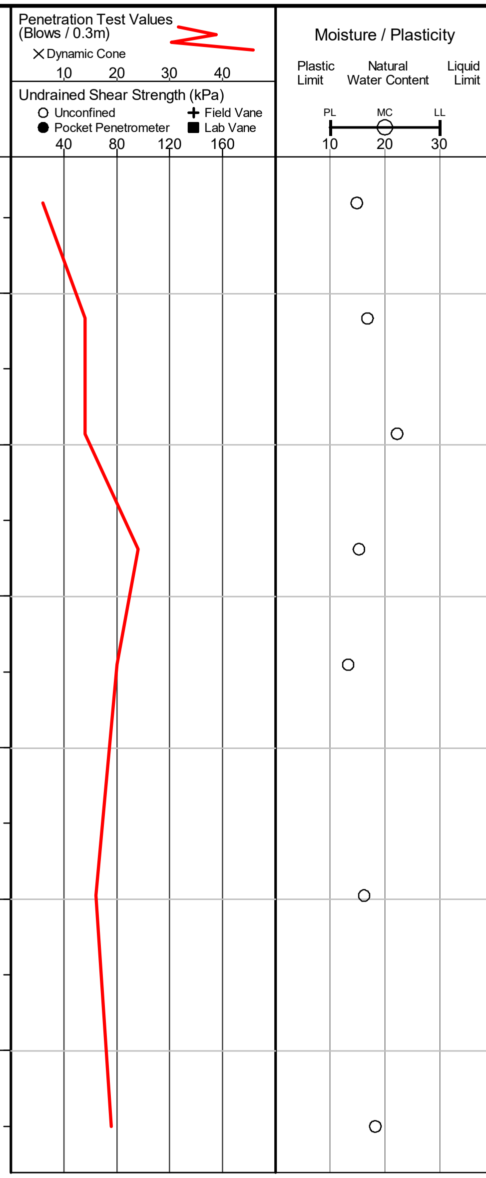
LOG OF BOREHOLE 24-9

Project No. : 02310769.002	Client : Oak Valley Health	Originated by : BR	
Date started : June 19, 2024	Project : Uxbridge Community Hospital	Compiled by : AS	
Sheet No. : 1 of 1	Location : Uxbridge, ON	Checked by : AS	

Position : E: 649712, N: 4884929 (UTM 17T) — Elevation Datum : Geodetic

Rig type : Track-mounted — Drilling Method : Solid stem augers

Depth Scale (m)	Elev Depth (m)	SOIL PROFILE Description	Number	Type	SPT 'N' Value	Elevation Scale (m)	Headspace Vapour (ppm)	Lab Data and Comments
0	275.9	**GROUND SURFACE**						
	275.7 / 0.2	230mm **TOPSOIL**						
		FILL, silty sand, trace clay, trace gravel, trace organics, loose, dark brown, moist	1	SS	6		PID: 0 FID: 0	
1	275.1 / 0.8	**SILTY SAND**, trace clay, compact, brown, wet	2	SS	14	275	PID: 0 FID: 0	SS2 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
2	274.1 / 1.8	**SILT**, trace to some clay, trace to some sand, trace gravel, dilatant, compact, brownish grey, wet	3	SS	14	274	PID: 0 FID: 0	
			4	SS	24	273	PID: 0 FID: 0	
3			5	SS	20	272	PID: 0 FID: 0	
5			6	SS	16	271	PID: 0 FID: 0	
6	269.2 / 6.7		7	SS	19	270	PID: 0 FID: 0	



Instrument Details · Unstabilized Water Level · GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL

END OF BOREHOLE

Unstabilized water level measured at 1.5 m below ground surface; borehole was open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Jul 3, 2024	2.0	273.9

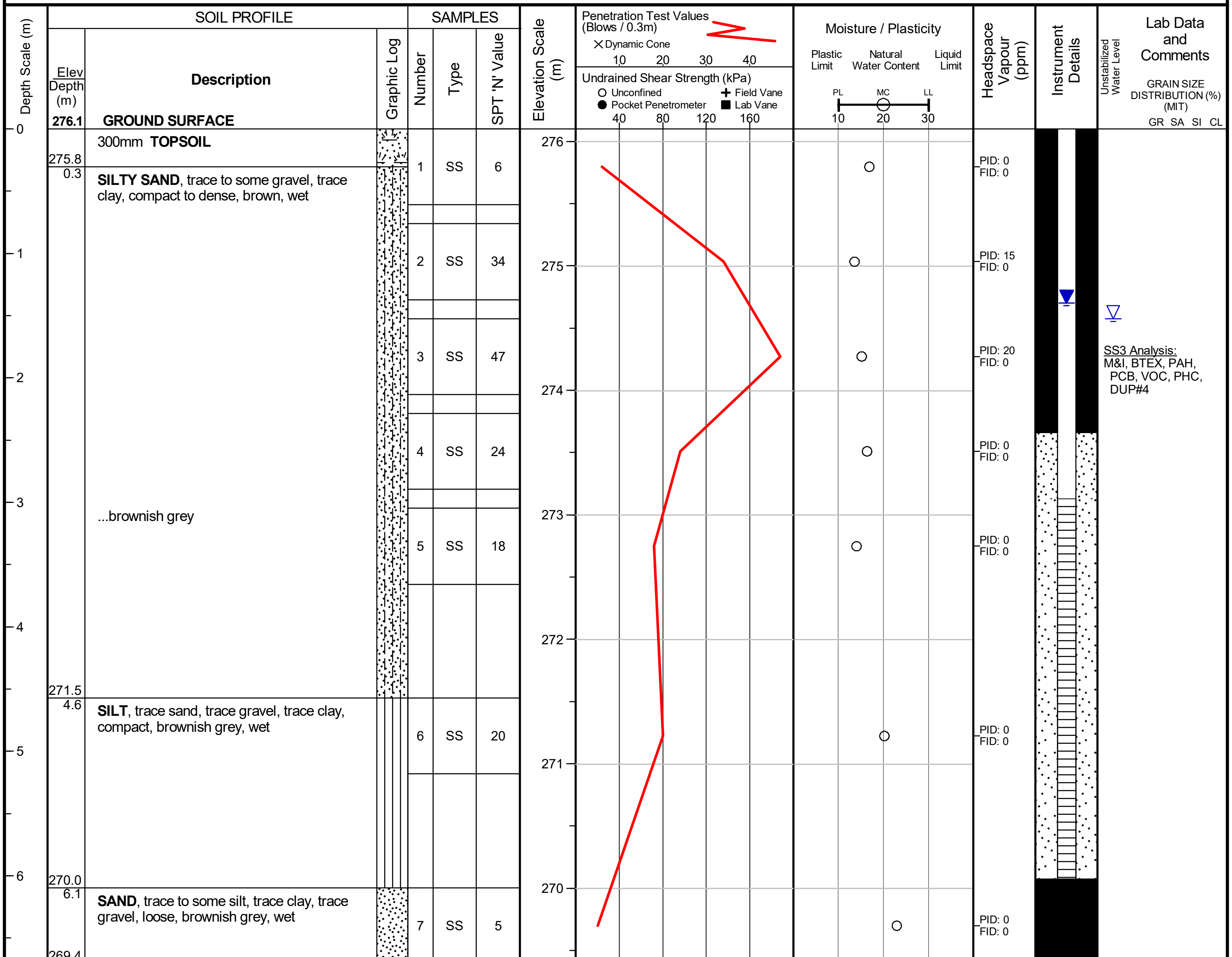
file: 02310769.000 bh logs.gpj

LOG OF BOREHOLE 24-10

Project No.	: 02310769.002	Client	: Oak Valley Health	Originated by	: BR
Date started	: June 19, 2024	Project	: Uxbridge Community Hospital	Compiled by	: AS
Sheet No.	: 1 of 1	Location	: Uxbridge, ON	Checked by	: AS

Position	: E: 649664, N: 4884920 (UTM 17T)	Elevation Datum	: Geodetic
Rig type	: Track-mounted	Drilling Method	: Solid stem augers

Elev (m)	Depth (m)	Description (SOIL PROFILE)	Sample Number	Type	SPT 'N' Value	Headspace Vapour (ppm)	Lab Data and Comments
276.1		GROUND SURFACE					
275.8	0.3	300mm **TOPSOIL**					
		SILTY SAND, trace to some gravel, trace clay, compact to dense, brown, wet	1	SS	6	PID: 0 FID: 0	
			2	SS	34	PID: 15 FID: 0	
			3	SS	47	PID: 20 FID: 0	SS3 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC, DUP#4
			4	SS	24	PID: 0 FID: 0	
		...brownish grey	5	SS	18	PID: 0 FID: 0	
271.5	4.6	**SILT**, trace sand, trace gravel, trace clay, compact, brownish grey, wet	6	SS	20	PID: 0 FID: 0	
270.0	6.1	**SAND**, trace to some silt, trace clay, trace gravel, loose, brownish grey, wet	7	SS	5	PID: 0 FID: 0	
269.4	6.7	**END OF BOREHOLE**					



Unstabilized water level measured at 1.5 m below ground surface; borehole caved to 3.0 m below ground surface upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Jul 3, 2024	1.4	274.7

file: 02310769.000 bh logs.gpj

LOG OF BOREHOLE 24-11

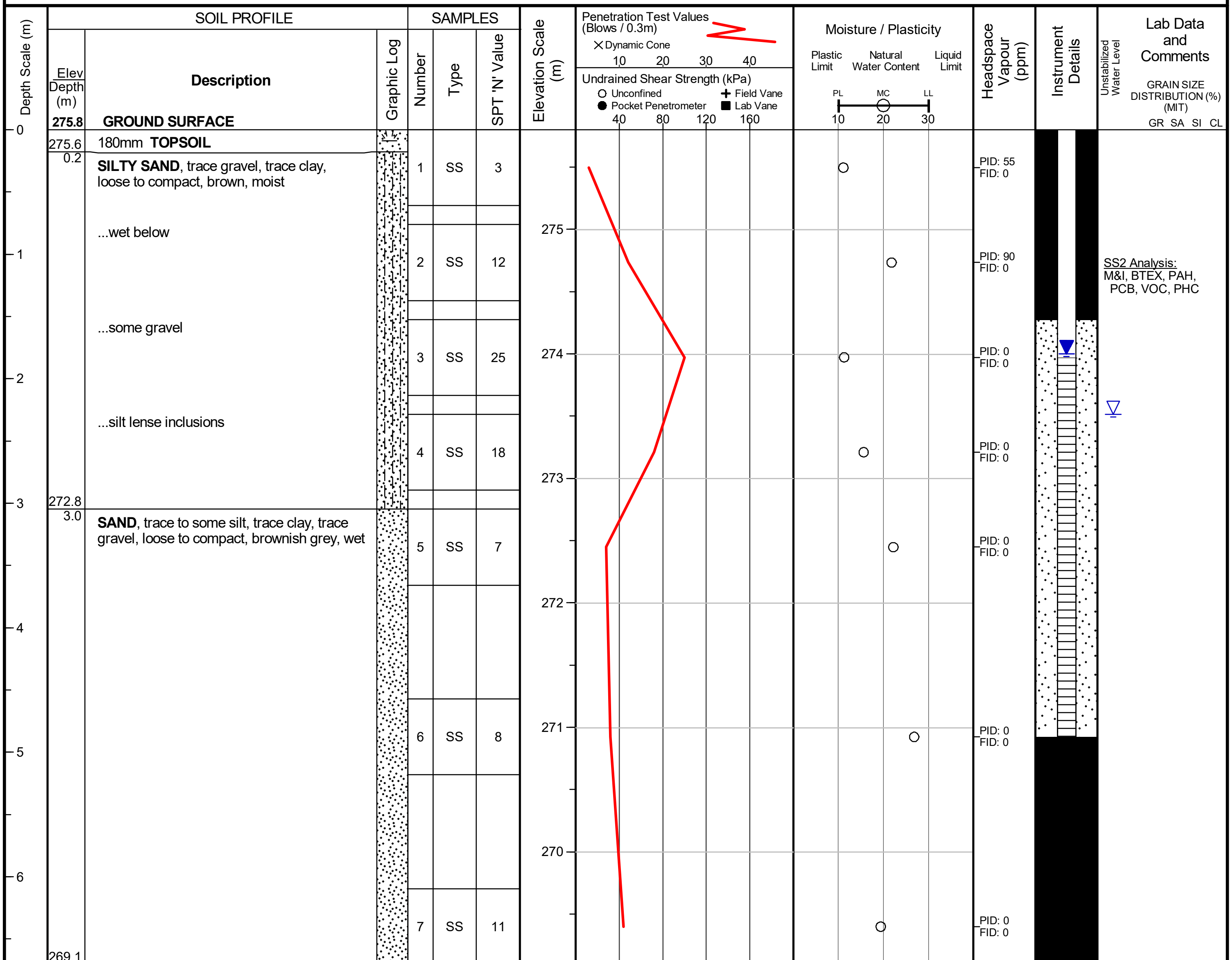
ENGLOBE

Project No.	: 02310769.002	Client	: Oak Valley Health	Originated by	: BR
Date started	: June 20, 2024	Project	: Uxbridge Community Hospital	Compiled by	: AS
Sheet No.	: 1 of 1	Location	: Uxbridge, ON	Checked by	: AS

Position : E: 649647, N: 4884956 (UTM 17T) — Elevation Datum : Geodetic

Rig type : Track-mounted — Drilling Method : Solid stem augers

Elev / Depth (m)	Description	Sample Number	Type	SPT 'N' Value	Headspace Vapour (ppm)	Lab Data and Comments
275.8	GROUND SURFACE					
275.6 / 0.2	180mm **TOPSOIL**					
	SILTY SAND, trace gravel, trace clay, loose to compact, brown, moist	1	SS	3	PID: 55 FID: 0	
	...wet below	2	SS	12	PID: 90 FID: 0	SS2 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
	...some gravel	3	SS	25	PID: 0 FID: 0	
	...silt lense inclusions	4	SS	18	PID: 0 FID: 0	
272.8 / 3.0	**SAND**, trace to some silt, trace clay, trace gravel, loose to compact, brownish grey, wet	5	SS	7	PID: 0 FID: 0	
		6	SS	8	PID: 0 FID: 0	
		7	SS	11	PID: 0 FID: 0	
269.1 / 6.7	**END OF BOREHOLE**					



Unstabilized water level measured at 2.3 m below ground surface; borehole caved to 4.9 m below ground surface upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Jul 3, 2024	1.8	274.0

LOG OF BOREHOLE 24-12

ENGLOBE

Project No.	: 02310769.002	Client	: Oak Valley Health	Originated by	: BR
Date started	: June 20, 2024	Project	: Uxbridge Community Hospital	Compiled by	: AS
Sheet No.	: 1 of 1	Location	: Uxbridge, ON	Checked by	: AS

Position : E: 649611, N: 4884946 (UTM 17T) — Elevation Datum : Geodetic

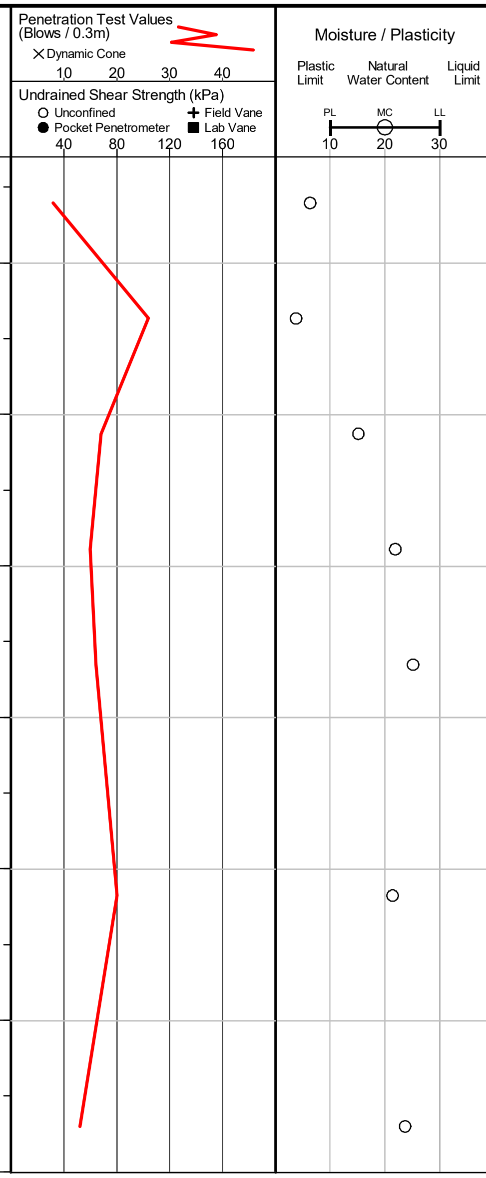
Rig type : Track-mounted — Drilling Method : Solid stem augers

SOIL PROFILE

Depth Scale (m)	Elev Depth (m)	Description
0	275.7	**GROUND SURFACE**
		100mm **TOPSOIL**
		FILL, silty sand, trace clay, trace to some gravel, trace organics, trace stone pieces inclusion, loose to compact, dark brown, moist
1.5	274.2 / 1.5	**SAND**, trace to some silt, trace clay, trace gravel, compact, brown, wet
		...brownish grey
6.7	269.0 / 6.7	**END OF BOREHOLE**

SAMPLES

Number	Type	SPT 'N' Value	Headspace Vapour (ppm)	Lab Data and Comments
1	SS	8	PID: 5, FID: 1	SS1 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
2	SS	26	PID: 0, FID: 0	
3	SS	17	PID: 0, FID: 0	
4	SS	15	PID: 0, FID: 1	Grain size (GR SA SI CL): 1 88 10 1; SS4 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
5	SS	16	PID: 0, FID: 1	
6	SS	20	PID: 0, FID: 1	
7	SS	13	PID: 0, FID: 0	



Elevation Scale (m): 275, 274, 273, 272, 271, 270, 269

Instrument Details; Unstabilized Water Level; GRAIN SIZE DISTRIBUTION (%) (MIT): GR SA SI CL

Wet cave at 1.5 m below ground surface upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Jul 3, 2024	1.7	274.0

file: 02310769.000 bh logs.gpj

LOG OF BOREHOLE 24-13

Project No. : 02310769.002 | Client : Oak Valley Health | Originated by : BR
Date started : June 20, 2024 | Project : Uxbridge Community Hospital | Compiled by : AS
Sheet No. : 1 of 1 | Location : Uxbridge, ON | Checked by : AS

Position : E: 649599, N: 4884884 (UTM 17T) | Elevation Datum : Geodetic
Rig type : Track-mounted | Drilling Method : Solid stem augers

Elev / Depth (m)	Description	Sample Number	Type	SPT 'N' Value	Natural Water Content (%)	Headspace Vapour (ppm)	Lab Data and Comments
276.7	GROUND SURFACE						
276.5 / 0.2	180mm **TOPSOIL**						
275.9 / 0.8	**FILL**, silty sand, trace gravel, trace organics, very loose, dark brown, moist	1	SS	3		PID: 0 FID: 0	
274.4 / 2.3	**SAND AND GRAVEL**, trace silt, dense, brown, moist	2	SS	35		PID: 5 FID: 1	...at 1.5m, wet sampler
		3	SS	39		PID: 25 FID: 0	SS3 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
272.1 / 4.6	**SILT**, trace to some clay, trace to some sand, dilatant, compact, brown, wet	4	SS	18		PID: 0 FID: 1	
		5	SS	21		PID: 0 FID: 2	
270.0 / 6.7	**SAND**, trace to some silt, trace clay, trace gravel, compact, brownish grey, wet	6	SS	13		PID: 0 FID: 1	
		7	SS	11		PID: 0 FID: 0	

Penetration Test Values (Blows / 0.3m): Dynamic Cone 10 20 30 40
Undrained Shear Strength (kPa): Unconfined, Pocket Penetrometer, Field Vane, Lab Vane 40 80 120 160
Moisture / Plasticity: Plastic Limit (PL), Natural Water Content (MC), Liquid Limit (LL) 10 20 30
Lab Data and Comments: GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL

END OF BOREHOLE

Unstabilized water level measured at 2.1 m below ground surface; borehole caved to 3.0 m below ground surface upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Jul 3, 2024	1.6	275.1

file: 02310769.000 bh logs.gpj

LOG OF BOREHOLE 24-14

ENGLOBE

Project No.	: 02310769.002	Client	: Oak Valley Health	Originated by	: BR
Date started	: June 20, 2024	Project	: Uxbridge Community Hospital	Compiled by	: AS
Sheet No.	: 1 of 1	Location	: Uxbridge, ON	Checked by	: AS

Position	: E: 649577, N: 4884848 (UTM 17T)	Elevation Datum	: Geodetic
Rig type	: Track-mounted	Drilling Method	: Solid stem augers

SOIL PROFILE

Elev / Depth (m)	Description
277.8	GROUND SURFACE
	110mm **TOPSOIL**
	FILL, silty sand, trace gravel, trace rootlets, trace organics, loose, dark brown, moist
276.3 / 1.5	**SAND**, trace to some silt, trace clay, trace gravel, compact, brown, wet
	...dense
271.1 / 6.7	**END OF BOREHOLE**

SAMPLES

Number	Type	SPT 'N' Value	Moisture	Headspace Vapour (ppm)	Lab Data and Comments
1	SS	7	○	PID: 0 FID: 0	SS1 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
2	SS	5	○	PID: 0 FID: 0	
3	SS	20	○	PID: 0 FID: 1	
4	SS	22	○	PID: 0 FID: 1	SS4 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
5	SS	13	○	PID: 0 FID: 1	
6	SS	15	○	PID: 0 FID: 0	
7	SS	34	○	PID: 0 FID: 0	

Depth Scale (m): 0, 1, 2, 3, 4, 5, 6

Elevation Scale (m): 277, 276, 275, 274, 273, 272

Penetration Test Values (Blows / 0.3m): × Dynamic Cone; 10, 20, 30, 40

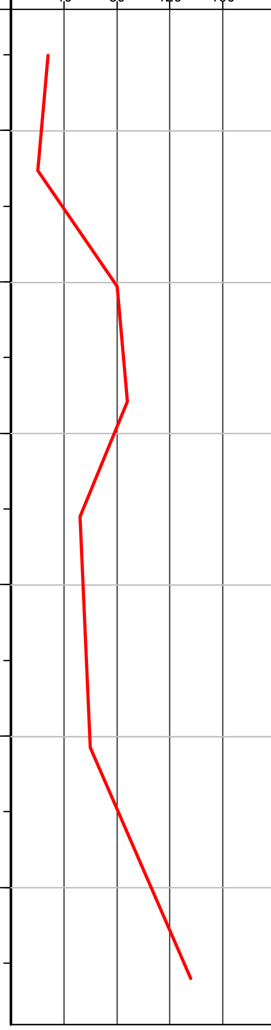
Undrained Shear Strength (kPa): ○ Unconfined, ✚ Field Vane, ● Pocket Penetrometer, ■ Lab Vane; 40, 80, 120, 160

Moisture / Plasticity: Plastic Limit (PL), Natural Water Content (MC), Liquid Limit (LL); 10, 20, 30

Instrument Details

Unstabilized Water Level

GRAIN SIZE DISTRIBUTION (%) (MIT): GR SA SI CL



Wet cave measured at 1.5 m below ground surface upon completion of drilling.

file: 02310769.000 bh logs.gpj

LOG OF BOREHOLE 24-15

ENGLOBE

Project No.	: 02310769.002	Client	: Oak Valley Health	Originated by	: BR
Date started	: June 20, 2024	Project	: Uxbridge Community Hospital	Compiled by	: AS
Sheet No.	: 1 of 1	Location	: Uxbridge, ON	Checked by	: AS

Position : E: 649604, N: 4884843 (UTM 17T)   Elevation Datum : Geodetic

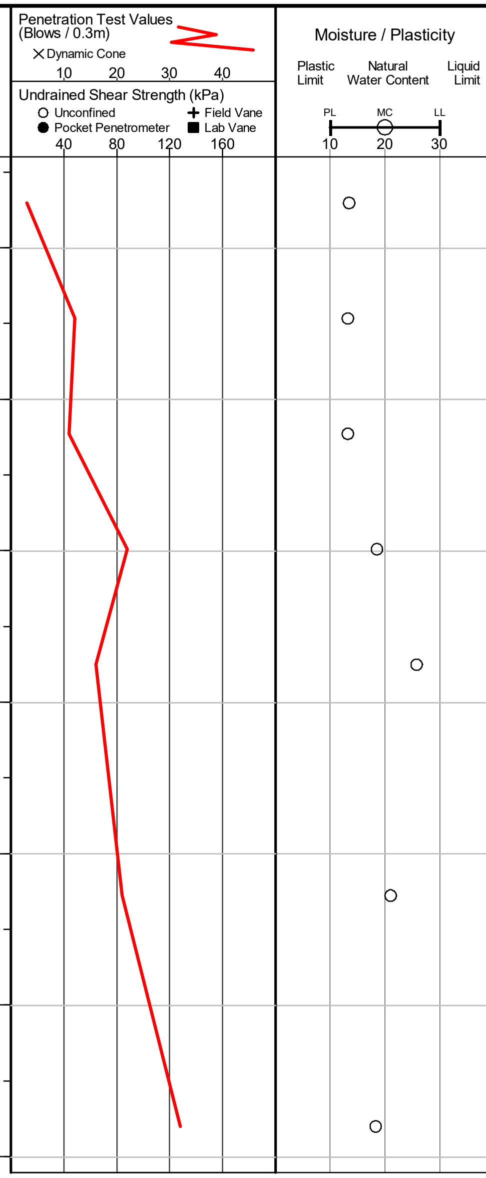
Rig type : Track-mounted   Drilling Method : Solid stem augers

SOIL PROFILE

Elev / Depth (m)	Description
277.6	GROUND SURFACE
277.4 / 0.2	190mm **TOPSOIL**
276.8 / 0.8	**FILL**, silty sand, trace gravel, trace organics, trace rootlets, very loose, dark brown, moist
274.6 / 3.0	**SILT**, some sand to sandy, trace to some clay, trace gravel, dilatent, compact, brown, wet
270.9 / 6.7	**SAND**, trace to some silt, trace clay, trace gravel, compact to dense, brownish grey, wet

SAMPLES

Number	Type	SPT 'N' Value	Headspace Vapour (ppm)
1	SS	3	PID: 0 FID: 0
2	SS	12	PID: 0 FID: 1
3	SS	11	PID: 5 FID: 1
4	SS	22	PID: 0 FID: 1
5	SS	16	PID: 0 FID: 0
6	SS	21	PID: 0 FID: 0
7	SS	32	PID: 0 FID: 0



Lab Data and Comments — GRAIN SIZE DISTRIBUTION (%) (MIT)

GR	SA	SI	CL
5	26	59	10

SS3 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC

wet sampler

END OF BOREHOLE

Unstabilized water level measured at 2.7 m below ground surface; borehole caved to 4.0 m below ground surface upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Jul 3, 2024	1.7	275.9

file: 02310769.000 bh logs.gpj

ENGLOBE

LOG OF BOREHOLE 24-16

Project No. : 02310769.002
Client : Oak Valley Health
Originated by : BR
Date started : June 20, 2024
Project : Uxbridge Community Hospital
Compiled by : AS
Sheet No. : 1 of 1
Location : Uxbridge, ON
Checked by : AS

Position : E: 649844, N: 4885038 (UTM 17T)
Elevation Datum : Geodetic
Rig type : Track-mounted
Drilling Method : Solid stem augers

Depth Scale (m)	Elev Depth (m)	Description	Number	Type	SPT 'N' Value	Elevation Scale (m)	Moisture (%)	Headspace Vapour (ppm)	Lab Data and Comments (Grain size distribution (%) (MIT) GR SA SI CL)
0	280.1	GROUND SURFACE				280			
		100mm TOPSOIL							
		FILL, silty sand, trace gravel, trace organics, loose, dark brown, moist	1	SS	5			PID: 5 FID: 0	SS1 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC, DUP#3
	279.3 0.8	SILT, some sand to sandy, trace to some clay, trace gravel, loose to compact, brown, moist							
1			2	SS	9	279		PID: 0 FID: 0	
									0 30 66 4
2			3	SS	19	278		PID: 0 FID: 0	SS3 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
		...wet, dilatent below							
			4	SS	18			PID: 0 FID: 0	SS4 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
3			5	SS	21	277		PID: 0 FID: 0	
4						276			
5			6	SS	12	275		PID: 0 FID: 0	
	274.9 5.2	END OF BOREHOLE							

Penetration Test Values (Blows / 0.3m): Dynamic Cone 10 20 30 40
Undrained Shear Strength (kPa): Unconfined, Field Vane, Pocket Penetrometer, Lab Vane 40 80 120 160
Moisture / Plasticity: Plastic Limit (PL), Natural Water Content (MC), Liquid Limit (LL) 10 20 30
Instrument Details
Unstabilized Water Level

END OF BOREHOLE

Borehole was dry and open upon completion of drilling.

file: 02310769.000 bh logs.gpj

LOG OF BOREHOLE 24-17

ENGLOBE

Project No.	: 02310769.002	Client	: Oak Valley Health	Originated by	: BR
Date started	: June 17, 2024	Project	: Uxbridge Community Hospital	Compiled by	: AS
Sheet No.	: 1 of 1	Location	: Uxbridge, ON	Checked by	: AS

Position : E: 649904, N: 4885051 (UTM 17T) — Elevation Datum : Geodetic

Rig type : Track-mounted — Drilling Method : Solid stem augers

Penetration Test Values (Blows / 0.3m): × Dynamic Cone — 10, 20, 30, 40

Undrained Shear Strength (kPa): ○ Unconfined, ✚ Field Vane, ● Pocket Penetrometer, ■ Lab Vane — 40, 80, 120, 160

Moisture / Plasticity: Plastic Limit (PL), Natural Water Content (MC), Liquid Limit (LL) — 10, 20, 30

Lab Data and Comments: GRAIN SIZE DISTRIBUTION (%) (MIT) — GR SA SI CL

Depth Scale (m)	Elev Depth (m)	Description	Sample Number	Type	SPT 'N' Value	Elevation Scale (m)	Headspace Vapour (ppm)	Lab Data and Comments
0	277.0	**GROUND SURFACE**				277		
	276.8 0.2	150mm **ASPHALTIC CONCRETE**						
	276.6 0.4	240mm **AGGREGATE**	1	SS	29		PID: 0 FID: 0	SS1 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
	276.2 0.8	**FILL**, sandy silt, trace to some gravel, trace clay, trace organics, compact, dark brown, moist						
1		**SILT**, trace to some clay, trace to some sand, dilatant, compact to very dense, brown, wet	2	SS	12	276	PID: 15 FID: 0	SS2 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
		...brownish grey below	3	SS	21		PID: 0 FID: 0	
2						275		
			4	SS	25		PID: 0 FID: 0	SS4 Analysis: M&I, BTEX, PAH, PCB, VOC, PHC
3						274		
			5	SS	35		PID: 0 FID: 0	
4						273		
5			6	SS	65	272	PID: 0 FID: 0	
	271.8 5.2							

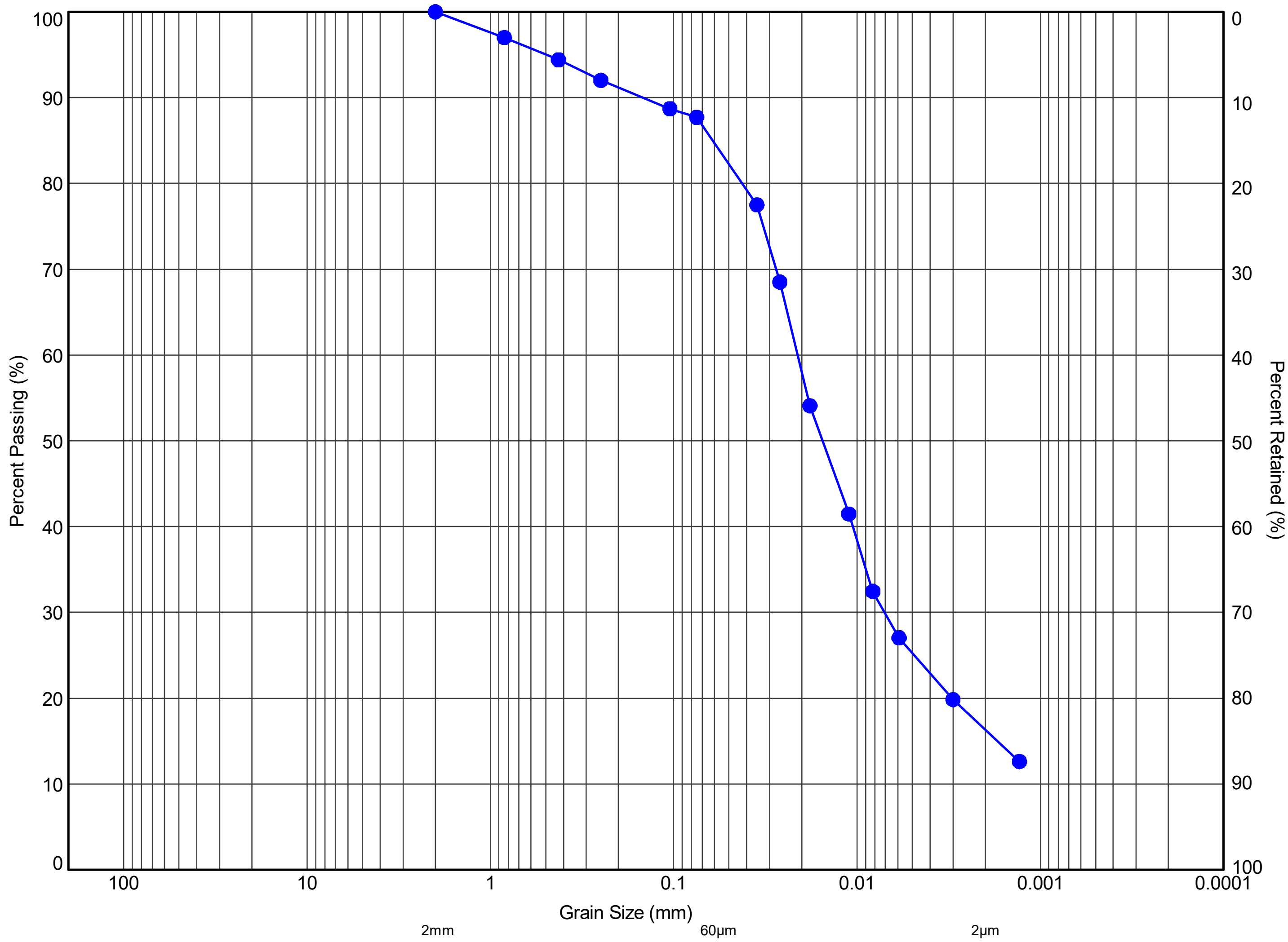
END OF BOREHOLE

Borehole was dry and open upon completion of drilling.

file: 02310769.000 bh logs.gpj

Appendix F

Grain Size Analysis



MIT SYSTEM	COBBLES	GRAVEL			SAND			SILT	CLAY
		COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

MIT SYSTEM

	Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
●	**24-1**	SS3	1.8	274.8	0	16	68	16	

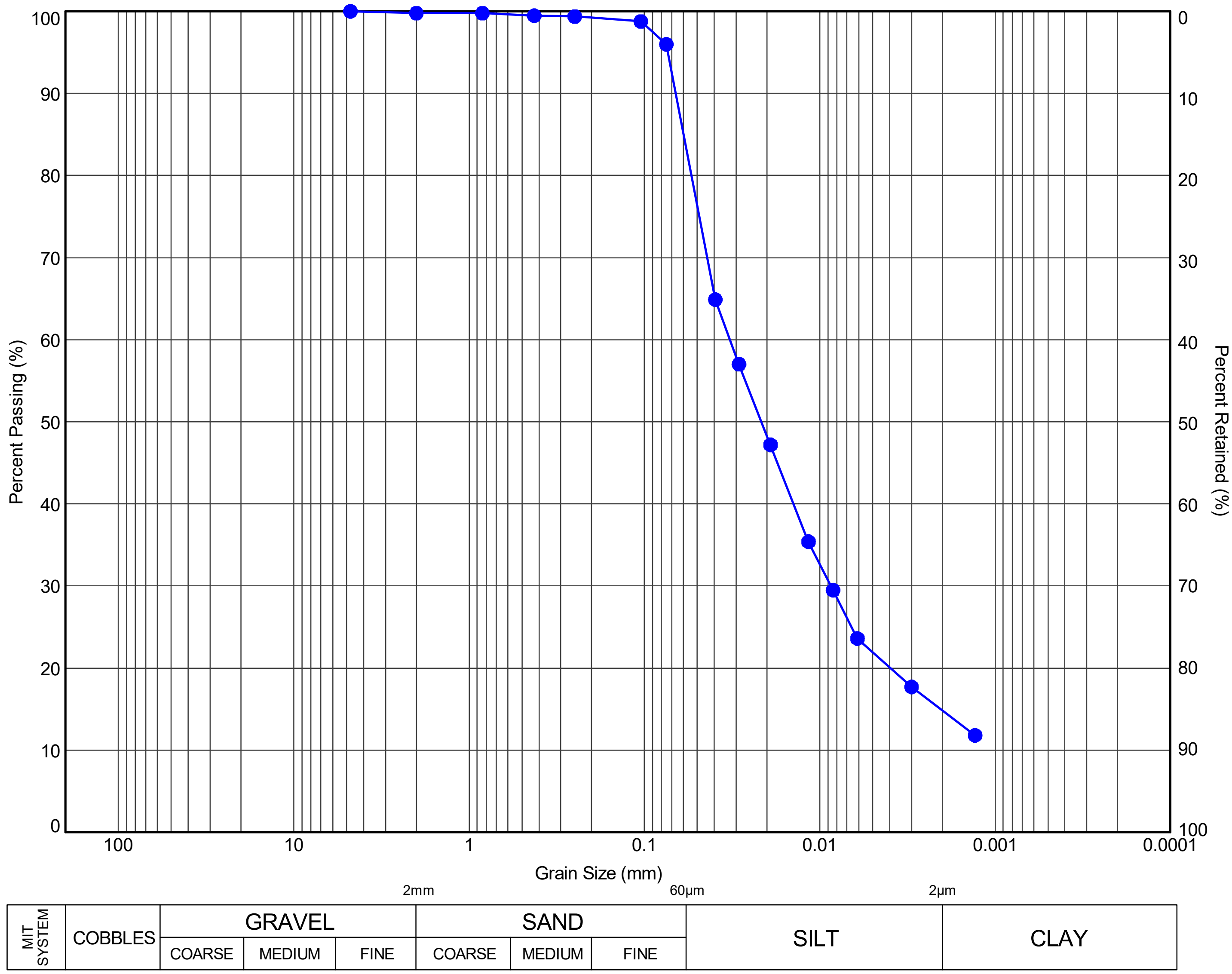
ENGLOBE

Title:

GRAIN SIZE DISTRIBUTION
SILT, SOME SAND, SOME CLAY

File No.:

02310769.002



MIT SYSTEM

	Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
●	**24-6**	SS4	2.6	274.3	0	15	70	15	

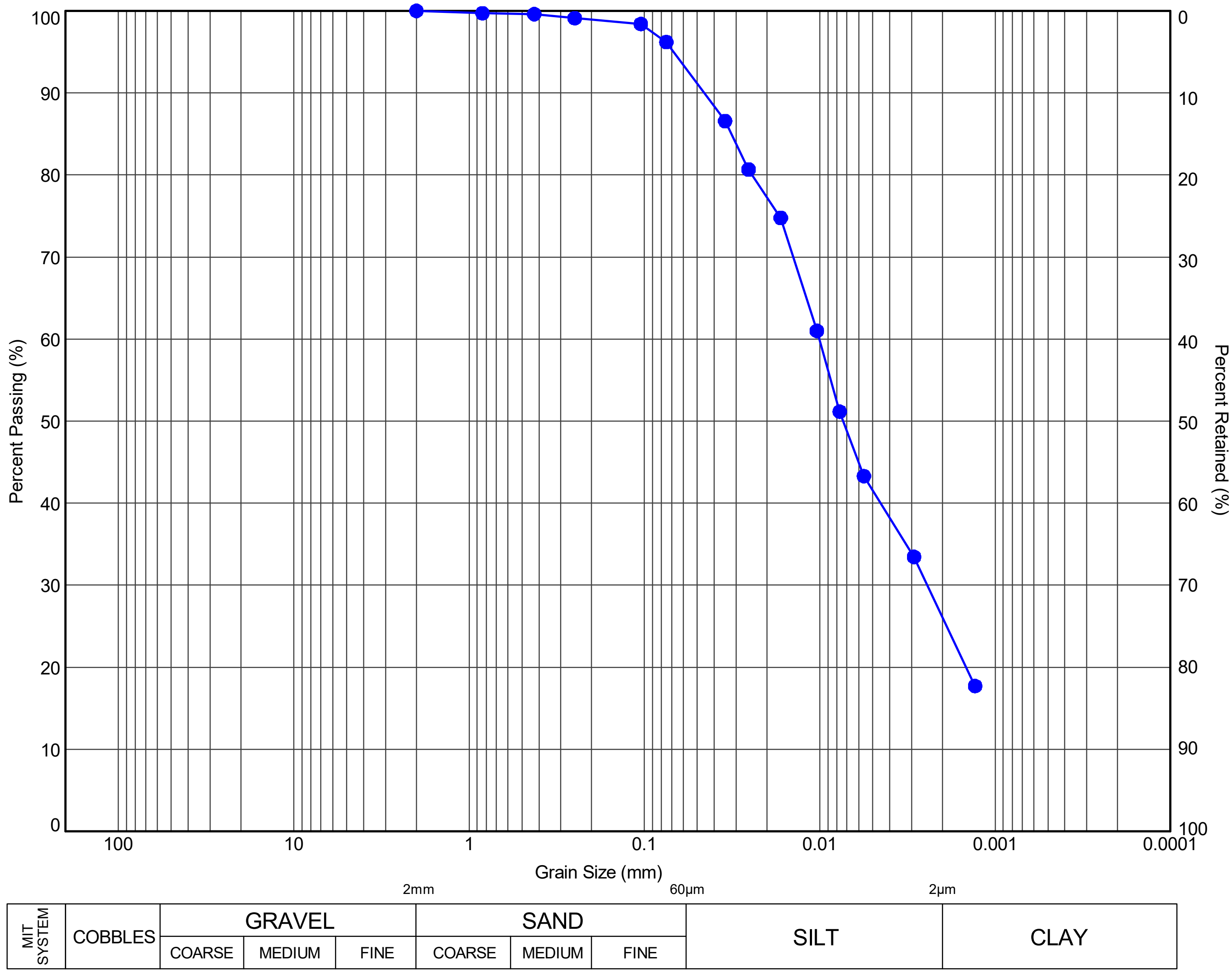
ENGLOBE

Title:

GRAIN SIZE DISTRIBUTION
SILT, SOME SAND, SOME CLAY

File No.:

02310769.002



MIT SYSTEM

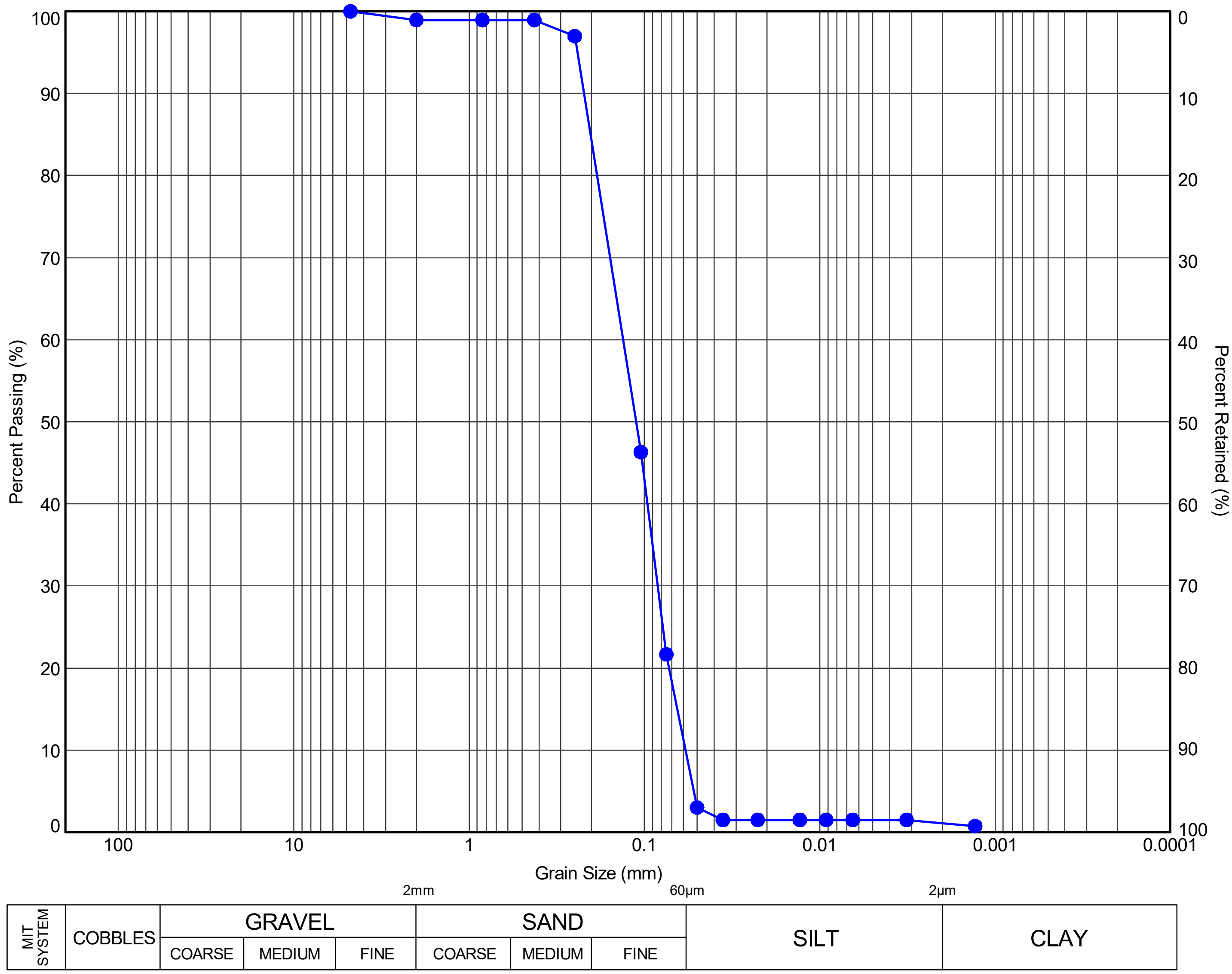
	Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
●	**24-8**	SS3	1.8	276.2	0	7	67	26	

ENGLOBE

Title:

GRAIN SIZE DISTRIBUTION
CLAYEY SILT, TRACE SAND

File No.: **02310769.002**



MIT SYSTEM

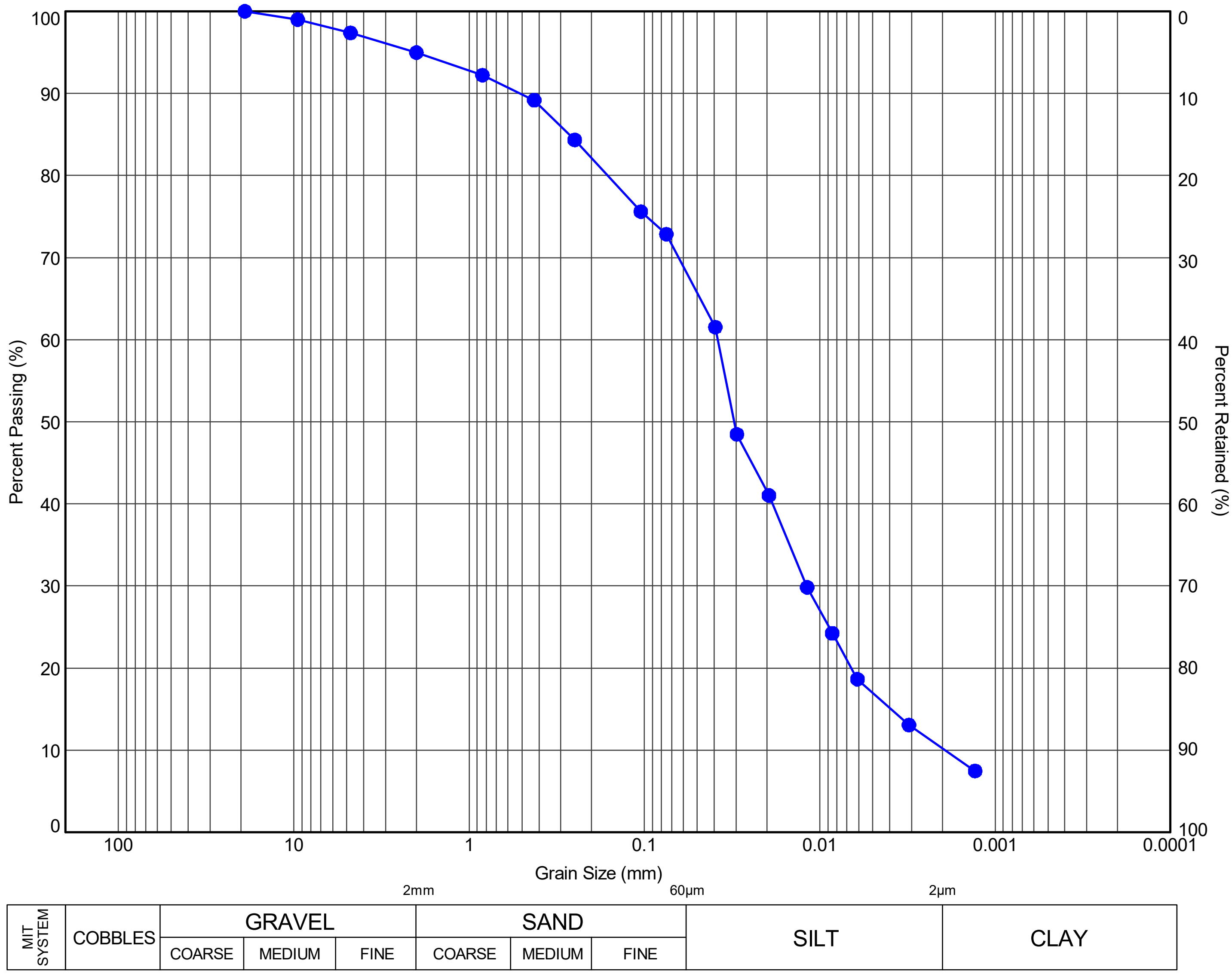
	Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
●	**24-12**	SS4	2.6	273.1	1	88	10	1	

ENGLOBE

Title:

GRAIN SIZE DISTRIBUTION
SAND, SOME SILT, TRACE CLAY, TRACE GRAVEL

File No.: **02310769.002**



MIT SYSTEM

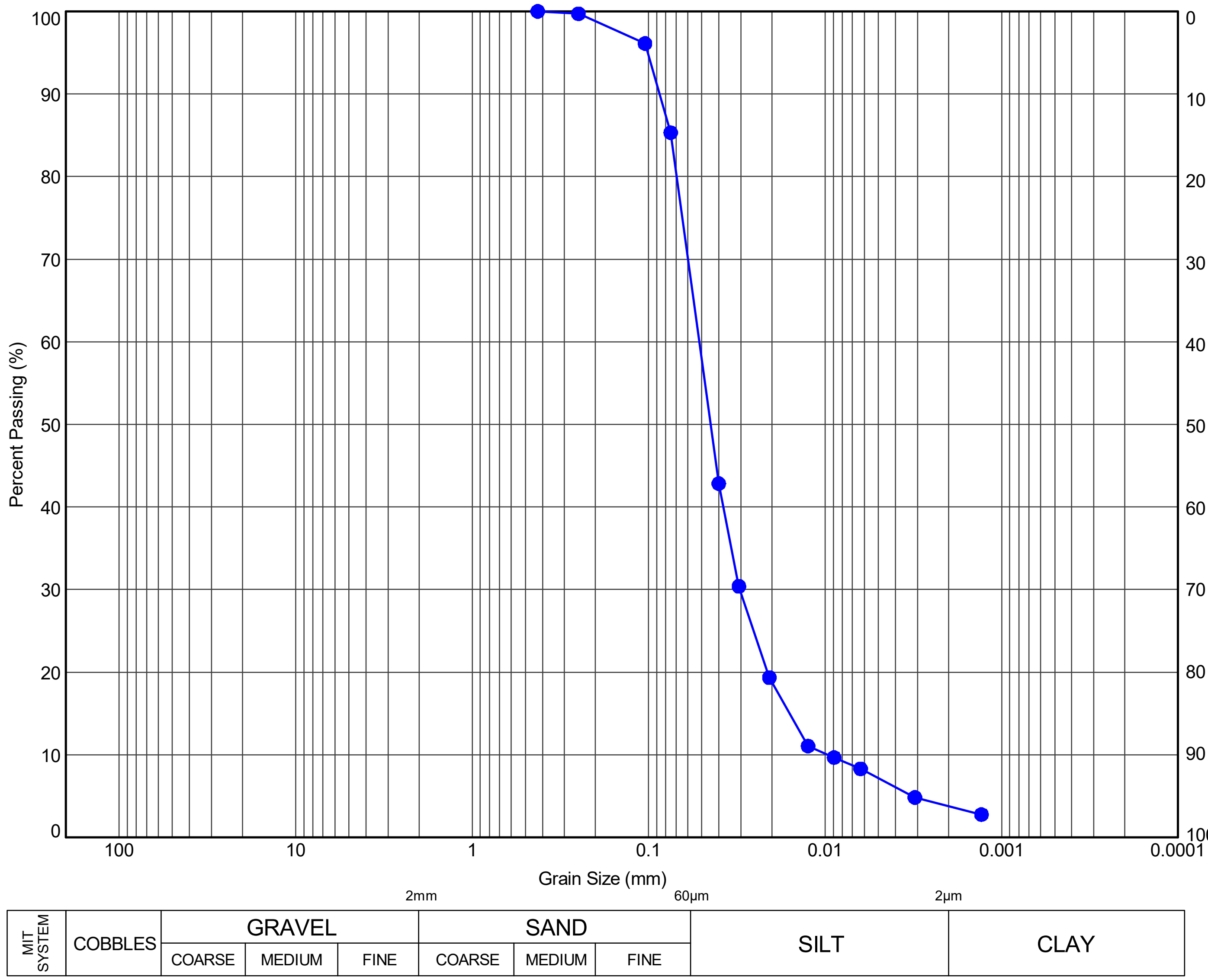
	Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
●	**24-15**	SS3	1.8	275.8	5	26	59	10	

ENGLOBE

Title:

GRAIN SIZE DISTRIBUTION
SANDY SILT, SOME CLAY, TRACE GRAVEL

File No.: **02310769.002**



				MIT SYSTEM				
Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
● **24-16**	SS3	1.8	278.3	0	30	66	4	

ENGLOBE

Title:

GRAIN SIZE DISTRIBUTION
SANDY SILT, TRACE CLAY

File No.: **02310769.002**

K from Grain Size Analysis Report

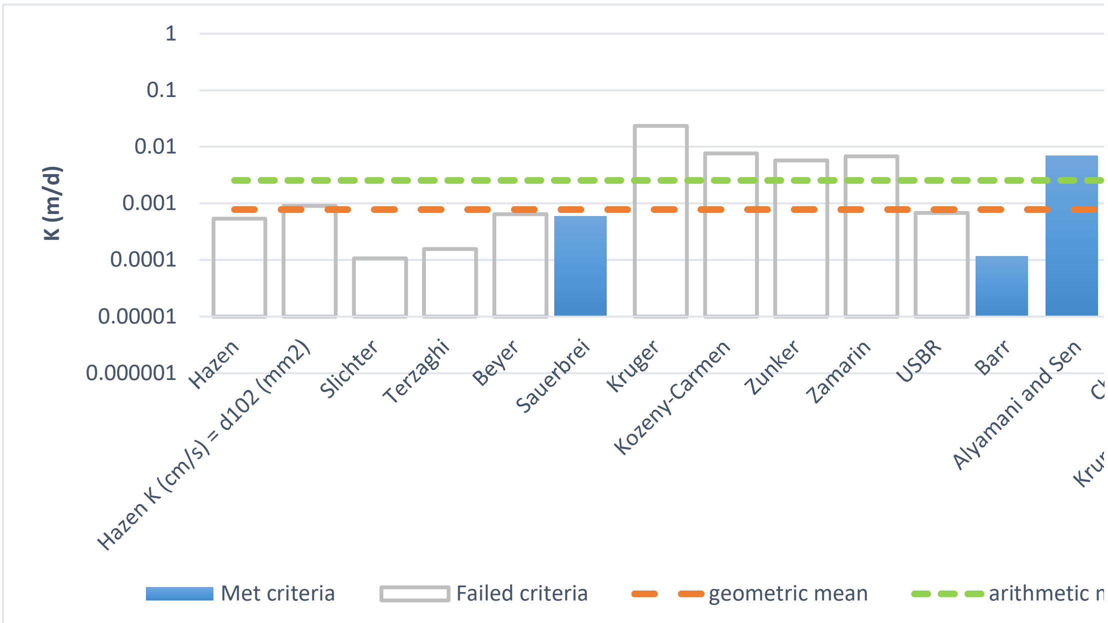
Date:

Sample Name: BH24-1,SS3

Mass Sample (g): 100

T (oC)

Poorly sorted clay with fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d
Hazen	6.24E-07	6.24E-09	5.39E-04
Hazen K (cm/s) = d_{10} (mm)	1.05E-06	1.05E-08	9.05E-04
Slichter	1.24E-07	1.24E-09	1.07E-04
Terzaghi	1.81E-07	1.81E-09	1.56E-04
Beyer	7.44E-07	7.44E-09	6.43E-04
Sauerbrei	6.81E-07	6.81E-09	5.88E-04
Kruger	2.71E-05	2.71E-07	2.34E-02
Kozeny-Carmen	8.89E-06	8.89E-08	7.68E-03
Zunker	6.64E-06	6.64E-08	5.74E-03
Zamarin	7.85E-06	7.85E-08	6.79E-03
USBR	7.88E-07	7.88E-09	6.80E-04
Barr	1.34E-07	1.34E-09	1.16E-04
Alyamani and Sen	8.09E-06	8.09E-08	6.99E-03
Chapuis	2.74E-09	2.74E-11	2.37E-06
Krumbein and Monk	2.56E-05	2.56E-07	2.21E-02
geometric mean	9.04E-07	9.04E-09	7.81E-04
arithmetic mean	2.97E-06	2.97E-08	2.56E-03

K from Grain Size Analysis Report

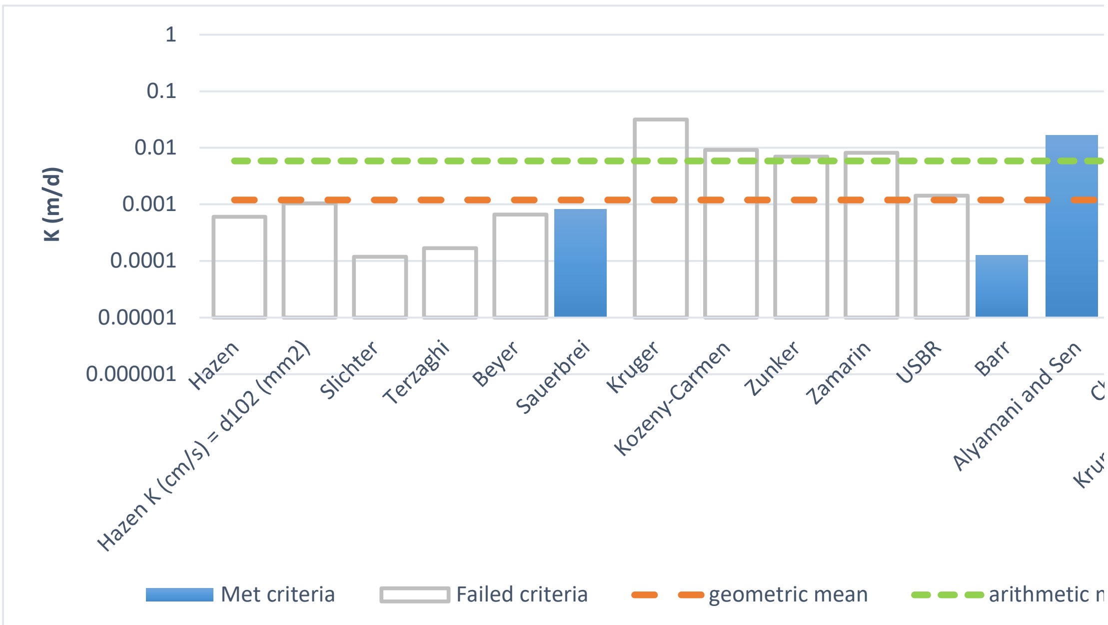
Date:

Sample Name: BH24-6,SS4

Mass Sample (g): 100

T (oC)

Poorly sorted silt with fines



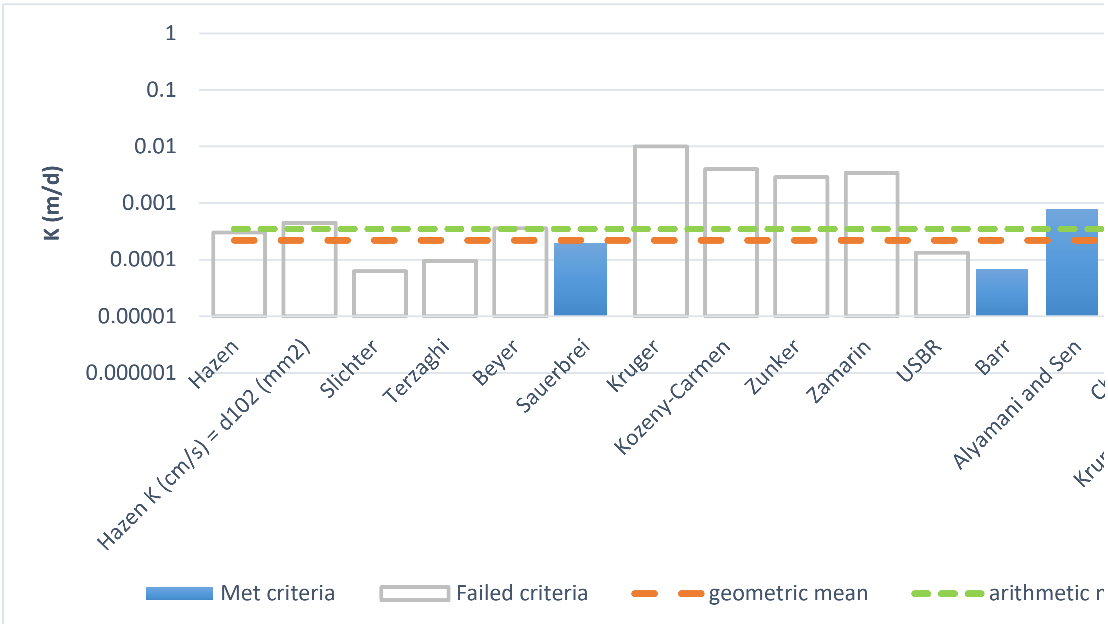
Estimation of Hydraulic Conductivity	cm/s	m/s	m/d
Hazen	6.94E-07	6.94E-09	6.00E-04
Hazen K (cm/s) = d_{10} (mm)	1.21E-06	1.21E-08	1.05E-03
Slichter	1.37E-07	1.37E-09	1.18E-04
Terzaghi	1.96E-07	1.96E-09	1.69E-04
Beyer	7.67E-07	7.67E-09	6.63E-04
Sauerbrei	9.52E-07	9.52E-09	8.23E-04
Kruger	3.64E-05	3.64E-07	3.14E-02
Kozeny-Carmen	1.06E-05	1.06E-07	9.18E-03
Zunker	8.05E-06	8.05E-08	6.96E-03
Zamarin	9.50E-06	9.50E-08	8.20E-03
USBR	1.65E-06	1.65E-08	1.42E-03
Barr	1.47E-07	1.47E-09	1.27E-04
Alyamani and Sen	1.94E-05	1.94E-07	1.68E-02
Chapuis	3.00E-09	3.00E-11	2.59E-06
Krumbein and Monk	4.84E-05	4.84E-07	4.18E-02
geometric mean	1.39E-06	1.39E-08	1.20E-03
arithmetic mean	6.83E-06	6.83E-08	5.90E-03

K from Grain Size Analysis Report Date:

Sample Name: BH24-8,SS3

Mass Sample (g): 100 T (oC)

Poorly sorted clay with fines



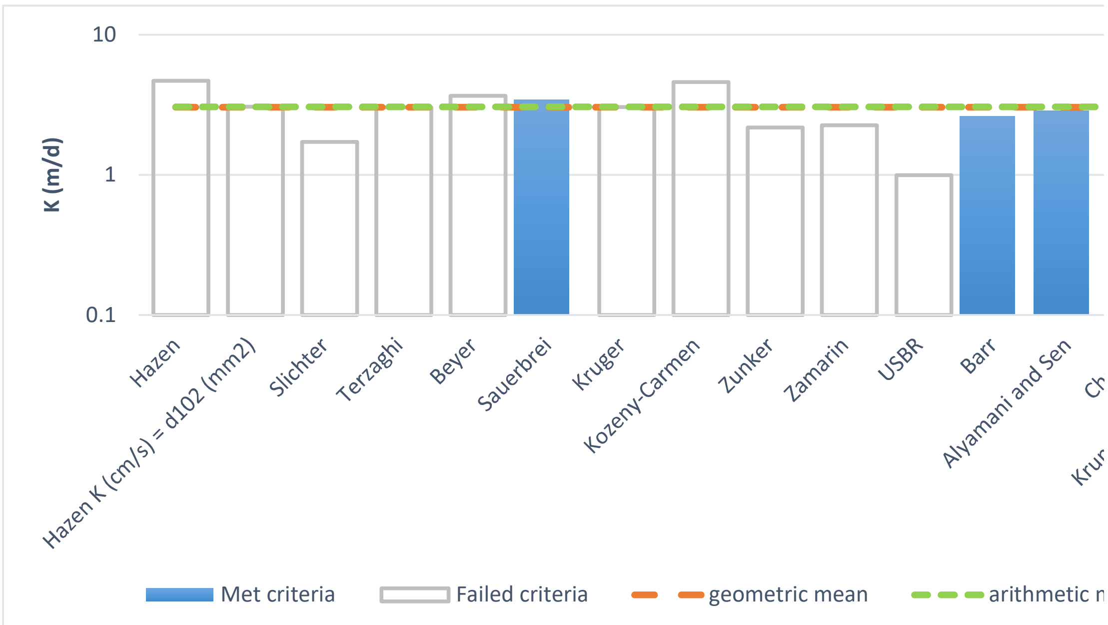
Estimation of Hydraulic Conductivity	cm/s	m/s	m/d
Hazen	3.51E-07	3.51E-09	3.03E-04
Hazen K (cm/s) = d_{10} (mm)	5.18E-07	5.18E-09	4.47E-04
Slichter	7.26E-08	7.26E-10	6.28E-05
Terzaghi	1.10E-07	1.10E-09	9.53E-05
Beyer	4.15E-07	4.15E-09	3.58E-04
Sauerbrei	2.28E-07	2.28E-09	1.97E-04
Kruger	1.16E-05	1.16E-07	1.00E-02
Kozeny-Carmen	4.64E-06	4.64E-08	4.01E-03
Zunker	3.32E-06	3.32E-08	2.87E-03
Zamarin	3.97E-06	3.97E-08	3.43E-03
USBR	1.54E-07	1.54E-09	1.33E-04
Barr	8.03E-08	8.03E-10	6.94E-05
Alyamani and Sen	9.12E-07	9.12E-09	7.88E-04
Chapuis	1.55E-09	1.55E-11	1.34E-06
Krumbein and Monk	1.82E-05	1.82E-07	1.57E-02
geometric mean	2.56E-07	2.56E-09	2.21E-04
arithmetic mean	4.07E-07	4.07E-09	3.51E-04

K from Grain Size Analysis Report | Date:

Sample Name: BH24-12,SS4

Mass Sample (g): 100 | T (oC)

Moderately well sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d
Hazen	5.43E-03	5.43E-05	4.69E+00
Hazen K (cm/s) = d_{10} (mm)	3.54E-03	3.54E-05	3.06E+00
Slichter	1.99E-03	1.99E-05	1.72E+00
Terzaghi	3.50E-03	3.50E-05	3.02E+00
Beyer	4.23E-03	4.23E-05	3.66E+00
Sauerbrei	3.97E-03	3.97E-05	3.43E+00
Kruger	3.52E-03	3.52E-05	3.04E+00
Kozeny-Carmen	5.31E-03	5.31E-05	4.59E+00
Zunker	2.51E-03	2.51E-05	2.17E+00
Zamarin	2.61E-03	2.61E-05	2.25E+00
USBR	1.15E-03	1.15E-05	9.94E-01
Barr	3.03E-03	3.03E-05	2.61E+00
Alyamani and Sen	3.31E-03	3.31E-05	2.86E+00
Chapuis	3.98E-03	3.98E-05	3.44E+00
Krumbein and Monk	3.84E-03	3.84E-05	3.31E+00
geometric mean	3.51E-03	3.51E-05	3.04E+00
arithmetic mean	3.54E-03	3.54E-05	3.06E+00

K from Grain Size Analysis Report

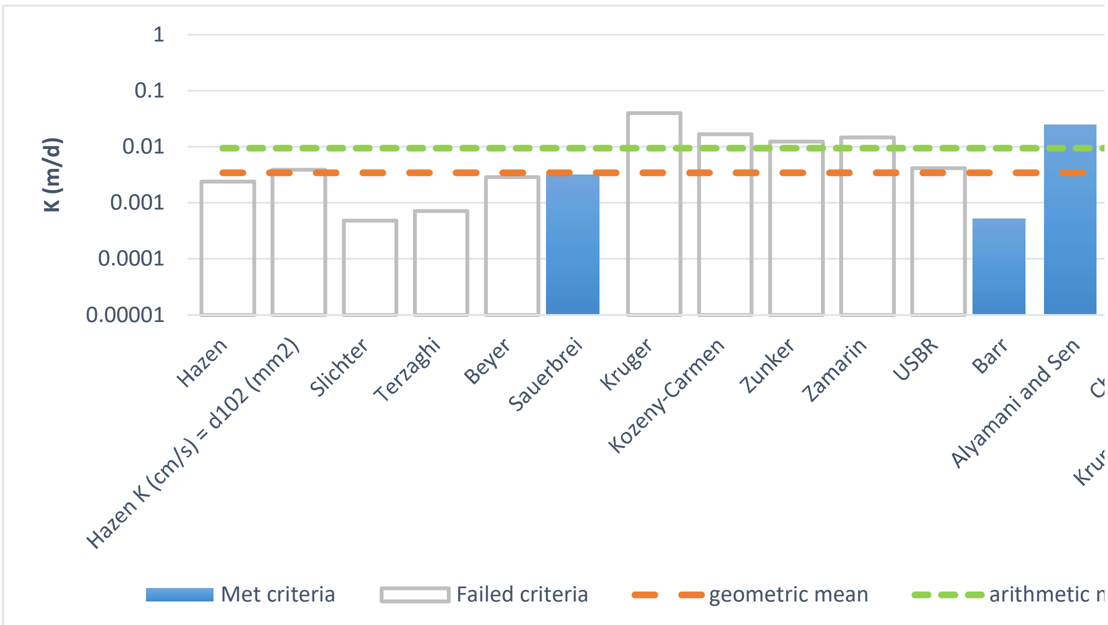
Date:

Sample Name: BH24-15,SS3

Mass Sample (g): 100

T (oC)

Poorly sorted sandy silt with fines



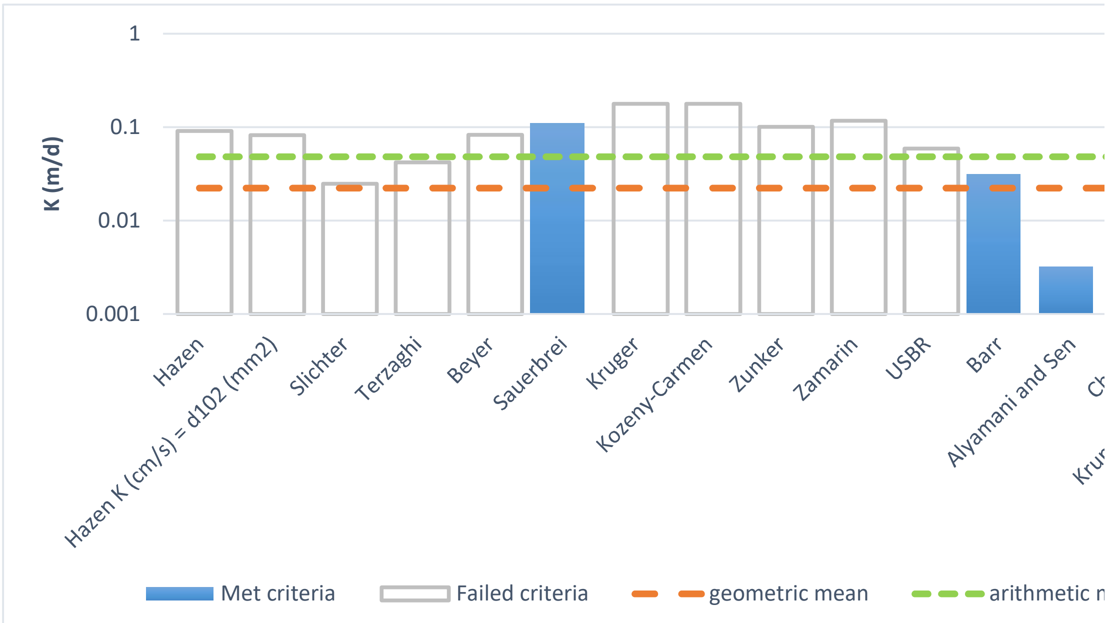
Estimation of Hydraulic Conductivity	cm/s	m/s	m/d
Hazen	2.77E-06	2.77E-08	2.39E-03
Hazen K (cm/s) = d_{10} (mm)	4.48E-06	4.48E-08	3.87E-03
Slichter	5.57E-07	5.57E-09	4.81E-04
Terzaghi	8.20E-07	8.20E-09	7.09E-04
Beyer	3.33E-06	3.33E-08	2.88E-03
Sauerbrei	3.66E-06	3.66E-08	3.16E-03
Kruger	4.59E-05	4.59E-07	3.96E-02
Kozeny-Carmen	1.93E-05	1.93E-07	1.67E-02
Zunker	1.43E-05	1.43E-07	1.24E-02
Zamarin	1.70E-05	1.70E-07	1.47E-02
USBR	4.81E-06	4.81E-08	4.15E-03
Barr	6.06E-07	6.06E-09	5.23E-04
Alyamani and Sen	2.85E-05	2.85E-07	2.46E-02
Chapuis	2.32E-08	2.32E-10	2.00E-05
Krumbein and Monk	3.75E-05	3.75E-07	3.24E-02
geometric mean	3.98E-06	3.98E-08	3.44E-03
arithmetic mean	1.09E-05	1.09E-07	9.44E-03

K from Grain Size Analysis Report | Date:

Sample Name: BH24-16,SS3

Mass Sample (g): 100 | T (oC)

Poorly sorted sandy silt low in fines

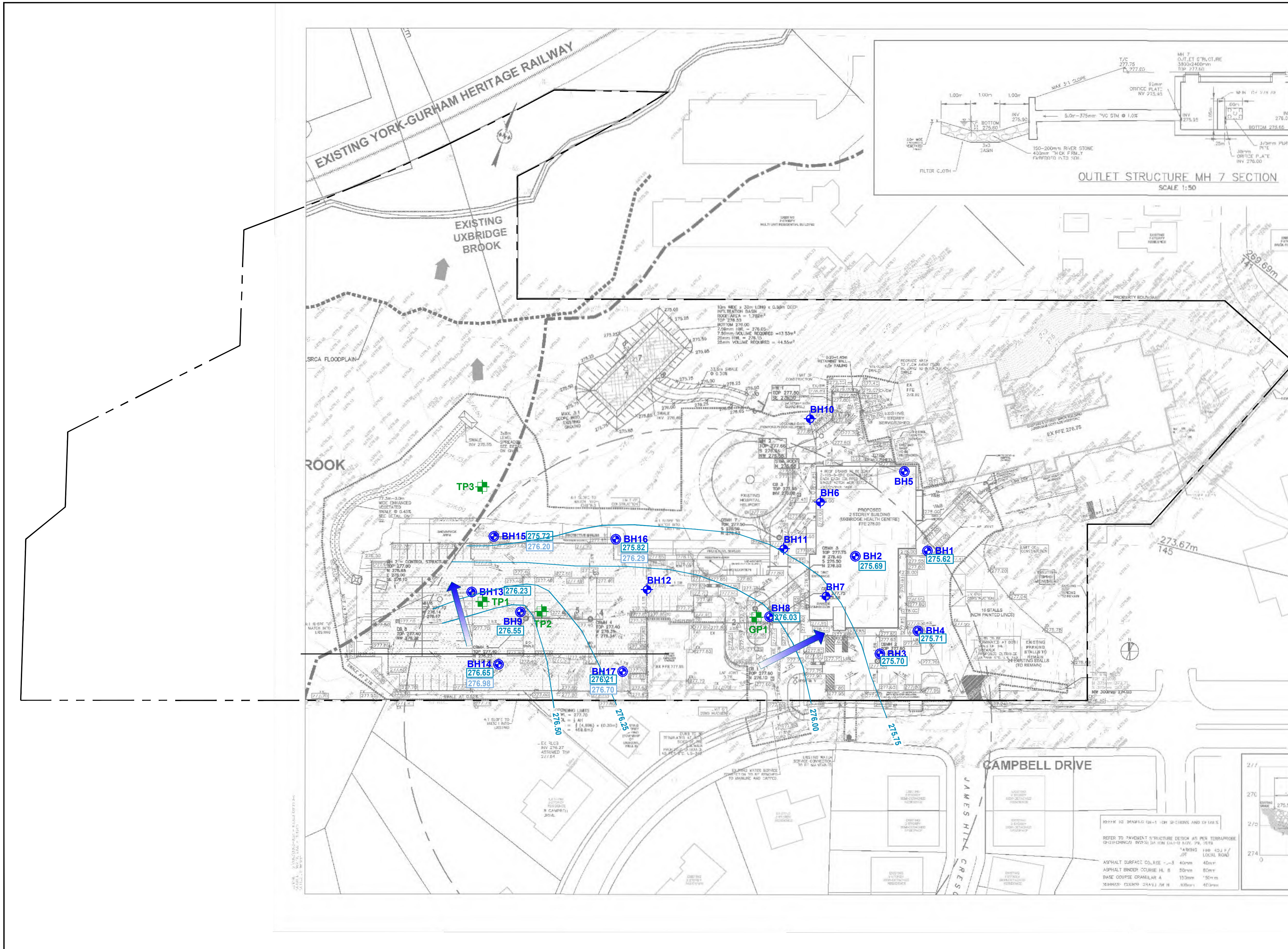


Estimation of Hydraulic Conductivity	cm/s	m/s	m/d
Hazen	1.05E-04	1.05E-06	9.05E-02
Hazen K (cm/s) = d_{10} (mm)	9.48E-05	9.48E-07	8.19E-02
Slichter	2.86E-05	2.86E-07	2.47E-02
Terzaghi	4.86E-05	4.86E-07	4.20E-02
Beyer	9.57E-05	9.57E-07	8.26E-02
Sauerbrei	1.27E-04	1.27E-06	1.10E-01
Kruger	2.05E-04	2.05E-06	1.77E-01
Kozeny-Carmen	2.06E-04	2.06E-06	1.78E-01
Zunker	1.17E-04	1.17E-06	1.01E-01
Zamarin	1.35E-04	1.35E-06	1.17E-01
USBR	6.82E-05	6.82E-07	5.90E-02
Barr	3.64E-05	3.64E-07	3.14E-02
Alyamani and Sen	3.70E-06	3.70E-08	3.20E-03
Chapuis	1.09E-05	1.09E-07	9.41E-03
Krumbein and Monk	2.46E-04	2.46E-06	2.13E-01
geometric mean	2.58E-05	2.58E-07	2.23E-02
arithmetic mean	5.58E-05	5.58E-07	4.82E-02

Appendix G

Ground Water Flow Map

ENGLOBE



Terraprobe Inc.

Consulting Geotechnical & Environmental Engineering
Construction Materials, Inspection & Testing

11 Indell Lane - Brampton Ontario L6T 3Y3 (905) 796-2650

Reference:

Project: Uxbridge Health Center
Sheet Contents: Site Survey
Project No.: 1811142
Sheet No.: ESC-1, Date: 01/17/20
By: B+H Architects

Notes:

Legend:

- Property Boundary
- Borehole Location (Terraprobe 2019)
- Monitoring Well Location (Terraprobe 2019)
- TP Test Pit Location (Terraprobe 2019)
- GP Guelph Permeameter Test Location
- 275.71 Water Table Elevation(mASL), Jan 30,2020
- 276.98 Maximum known Water Table Elevation(mASL), Jan 12,2020 (Wells with Datalogger Only)
- 275.75 Inferred Water Table (mASL, Jan 30, 2020) Contours
- Inferred Flow Direction

Project Title: Hydrogeological Study

Site Location: 4 Campbell Drive, Uxbridge, Ontario

Figure Title: GROUND WATER CONTOURS- JAN 30, 2020

Designed By: SS	**File No.:** 1-19-0022-46.1
Drawn By: MV	**Scale:** As Shown
Reviewed By: SH	**Figure No.:** 8
Date: May 2020	

C:\Users\ssinghania\Desktop\1-19-0022-46.1\1-19-0022-46_REV 1.dwg, ssinghania

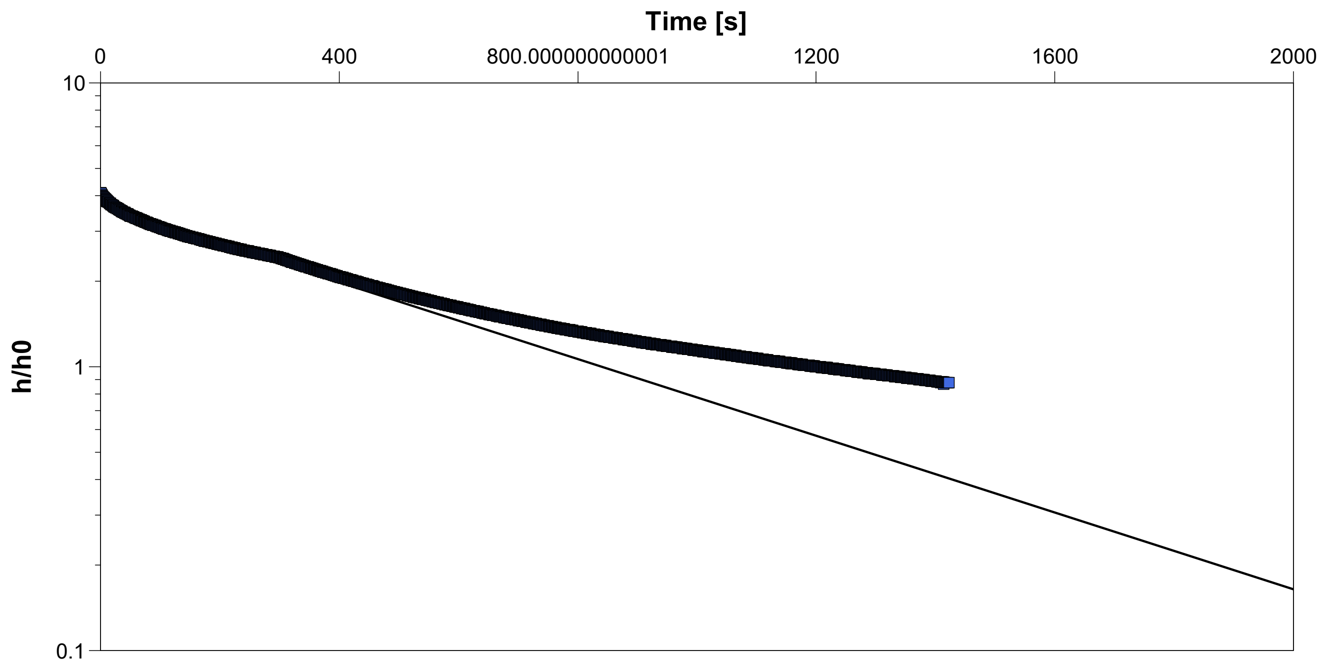
Appendix H

Aquifer Response Tests

ENGLOBE

	Slug Test Analysis Report
	Project: Uxbridge Community Hospital
	Number: 02310769.003
	Client: Oak Valley Health

Location: Uxbridge	Slug Test: BH1	Test Well: BH1
Test Conducted by: A.Q		Test Date: 7/4/2024
Analysis Performed by: A.Q	BH1	Analysis Date: 8/27/2024
Aquifer Thickness:		

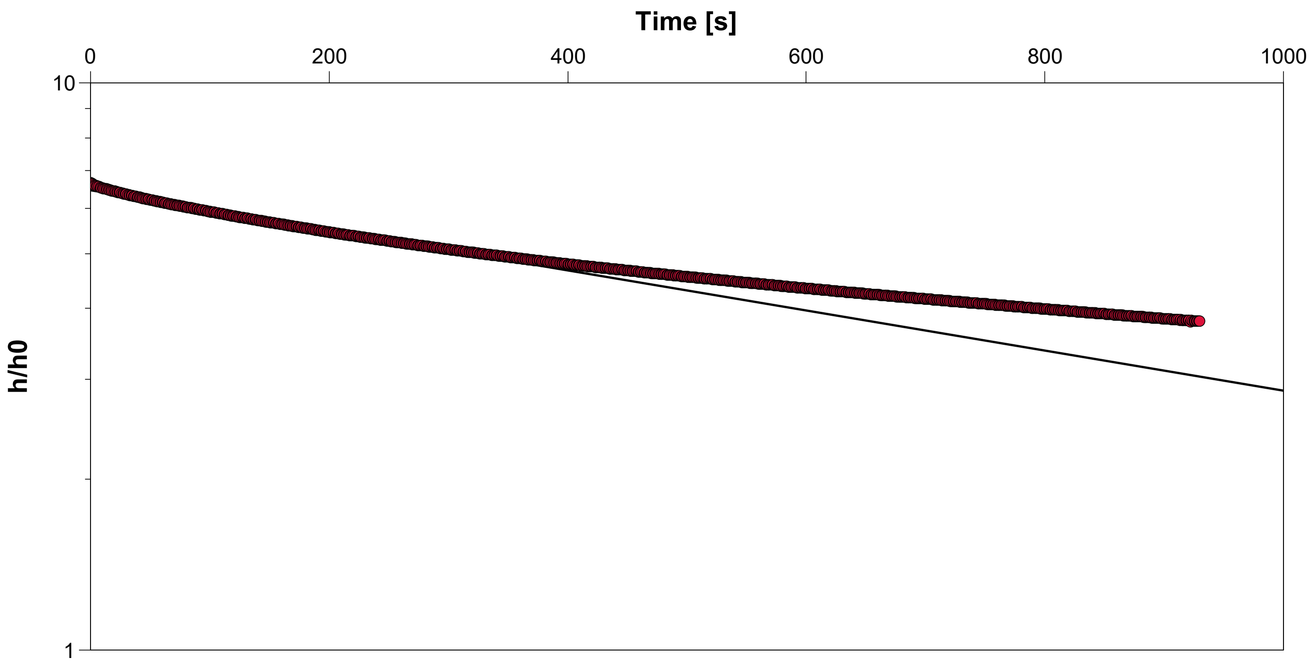


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH1	7.02×10^{-7}	

	Slug Test Analysis Report
	Project: Uxbridge Community Hospital
	Number: 02310769.003
	Client: Oak Valley Health

Location: Uxbridge	Slug Test: BH2	Test Well: BH2
Test Conducted by: A.Q		Test Date: 7/4/2024
Analysis Performed by: A.Q	BH2 Slug Test	Analysis Date: 8/27/2024
Aquifer Thickness:		

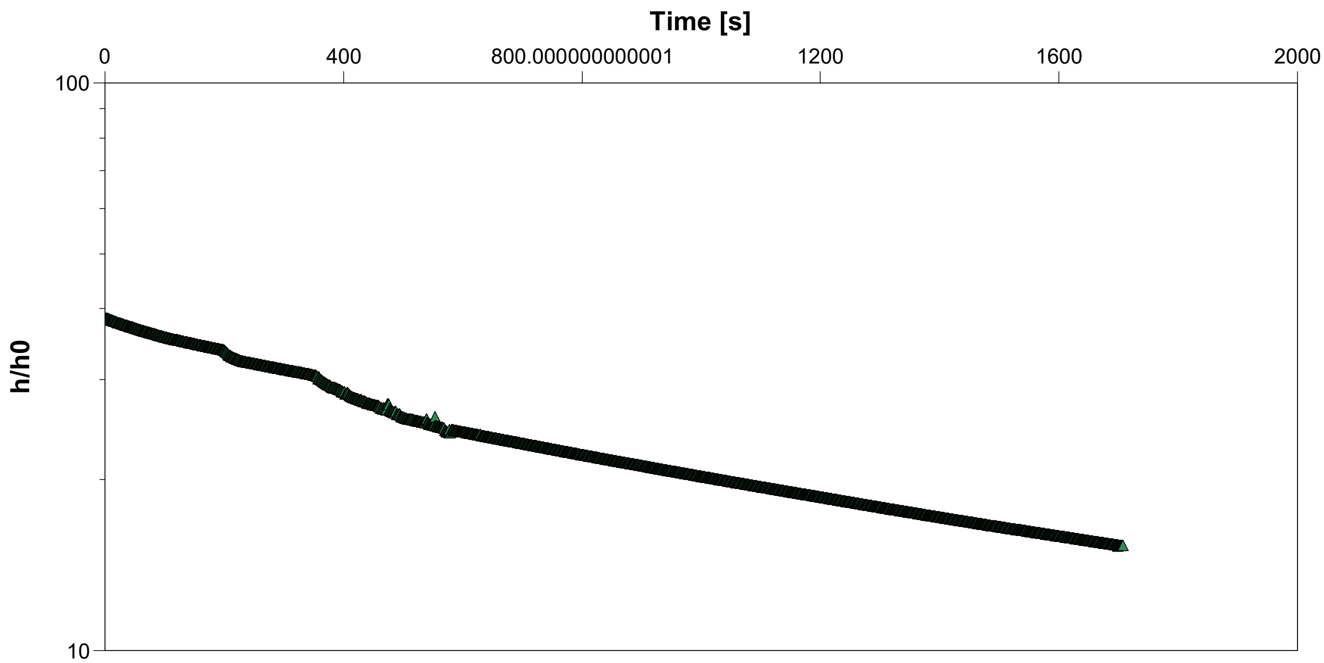


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH2	3.67×10^{-7}	

	Slug Test Analysis Report
	Project: Uxbridge Community Hospital
	Number: 02310769.003
	Client: Oak Valley Health

Location: Uxbridge	Slug Test: BH6	Test Well: BH6
Test Conducted by: A.Q		Test Date: 7/4/2024
Analysis Performed by: A.Q	BH6 Slug Test	Analysis Date: 8/27/2024
Aquifer Thickness:		

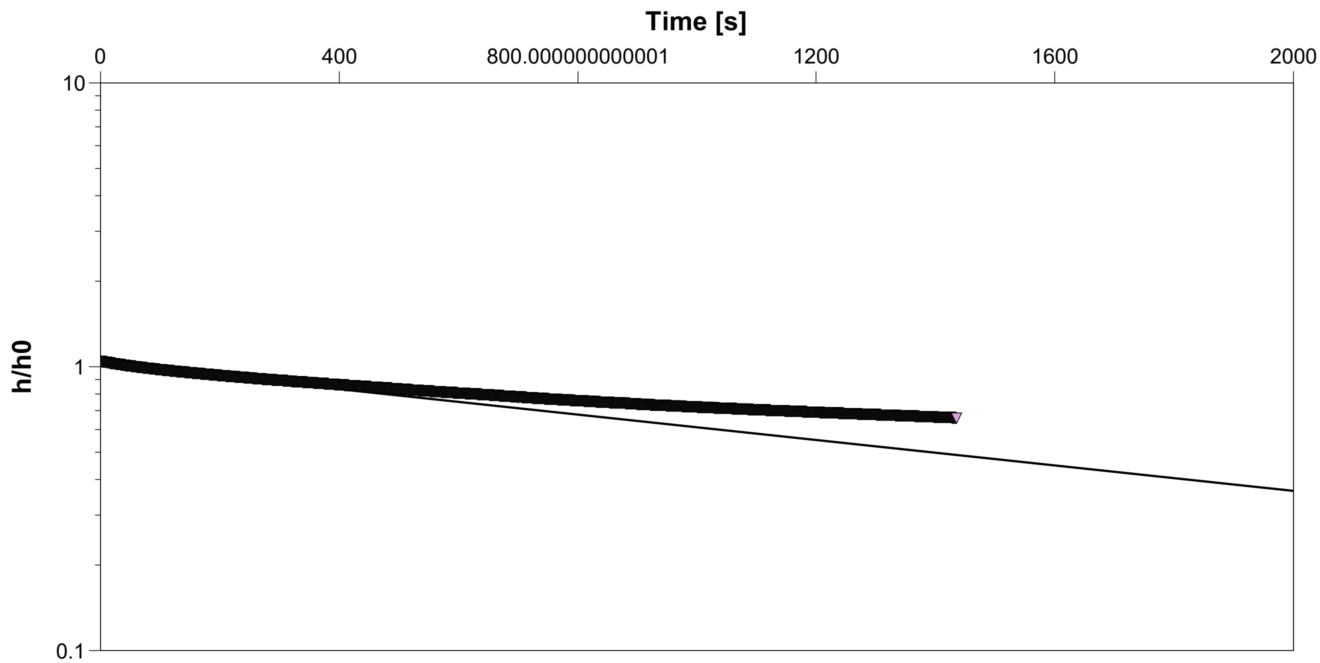


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH6	3.17×10^{-7}	

	Slug Test Analysis Report
	Project: Uxbridge Community Hospital
	Number: 02310769.003
	Client: Oak Valley Health

Location: Uxbridge	Slug Test: BH8	Test Well: BH8
Test Conducted by: A.Q		Test Date: 7/4/2024
Analysis Performed by: A.Q	BH8 Slug Test	Analysis Date: 8/27/2024
Aquifer Thickness:		

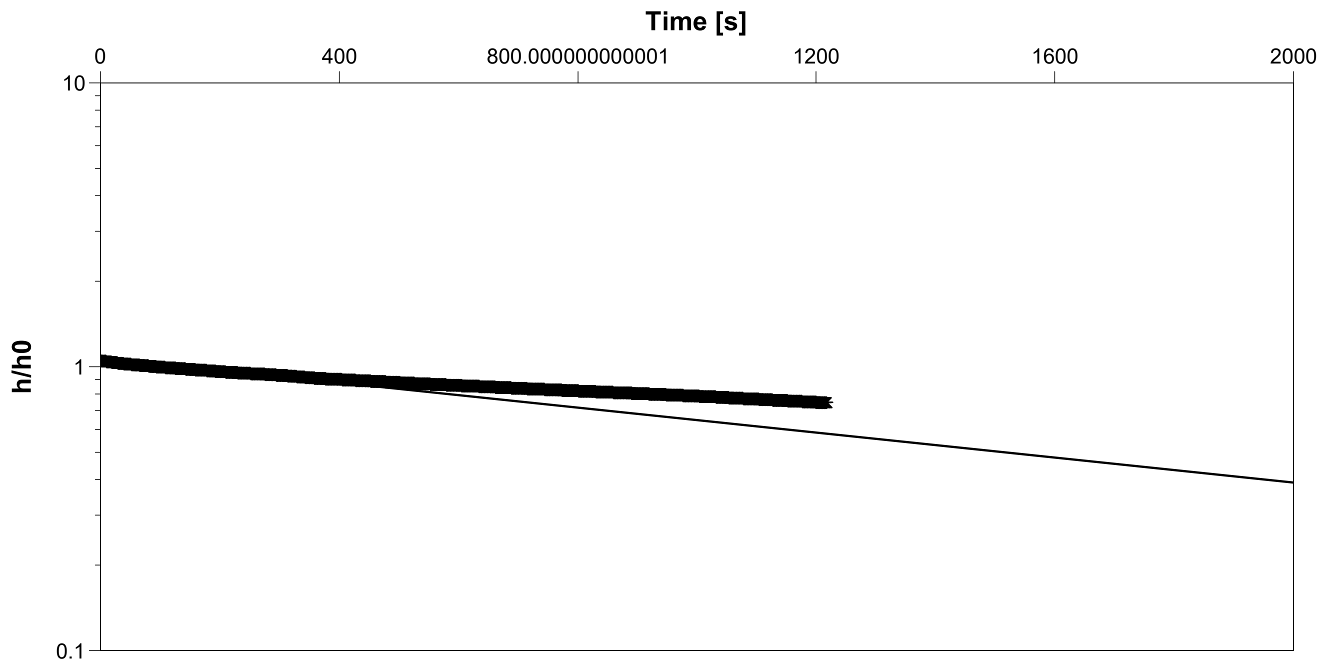


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH8	2.32×10^{-7}	

	Slug Test Analysis Report
	Project: Uxbridge Community Hospital
	Number: 02310769.003
	Client: Oak Valley Health

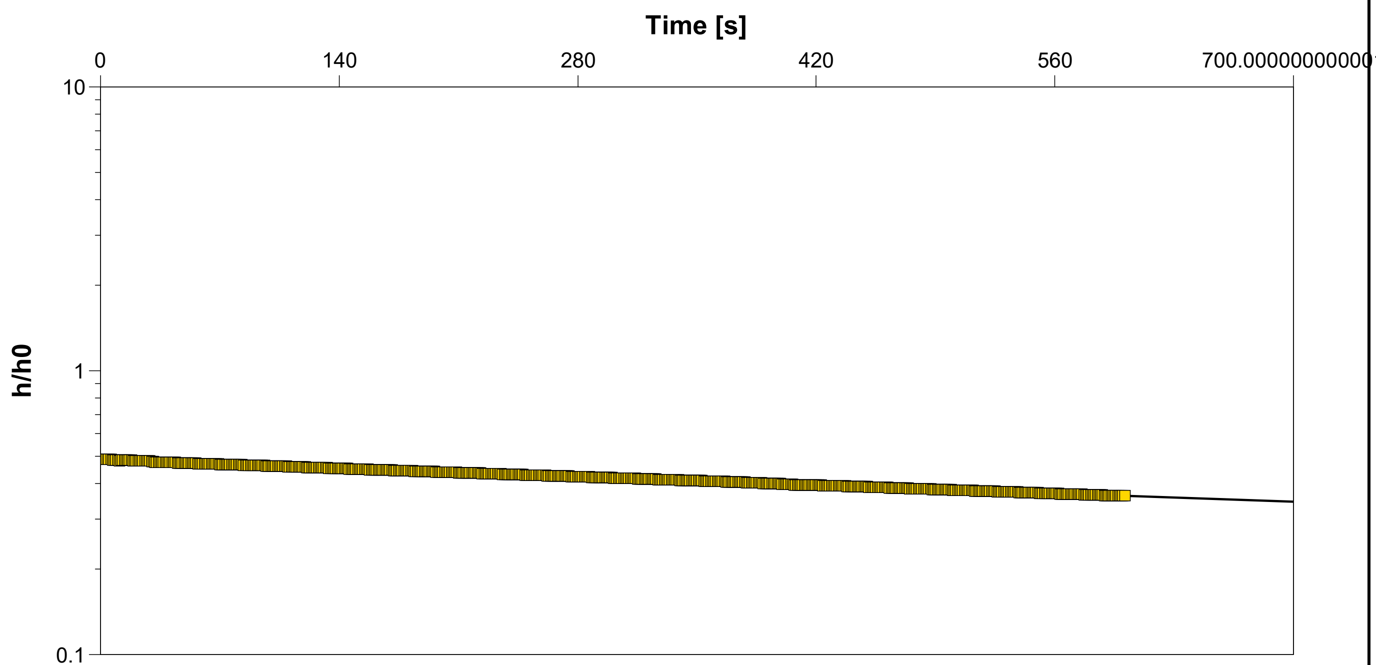
Location: Uxbridge	Slug Test: BH10	Test Well: BH10
Test Conducted by: A.Q		Test Date: 7/4/2024
Analysis Performed by: A.Q	BH10 Slug Test	Analysis Date: 8/27/2024
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH10	2.29×10^{-7}	

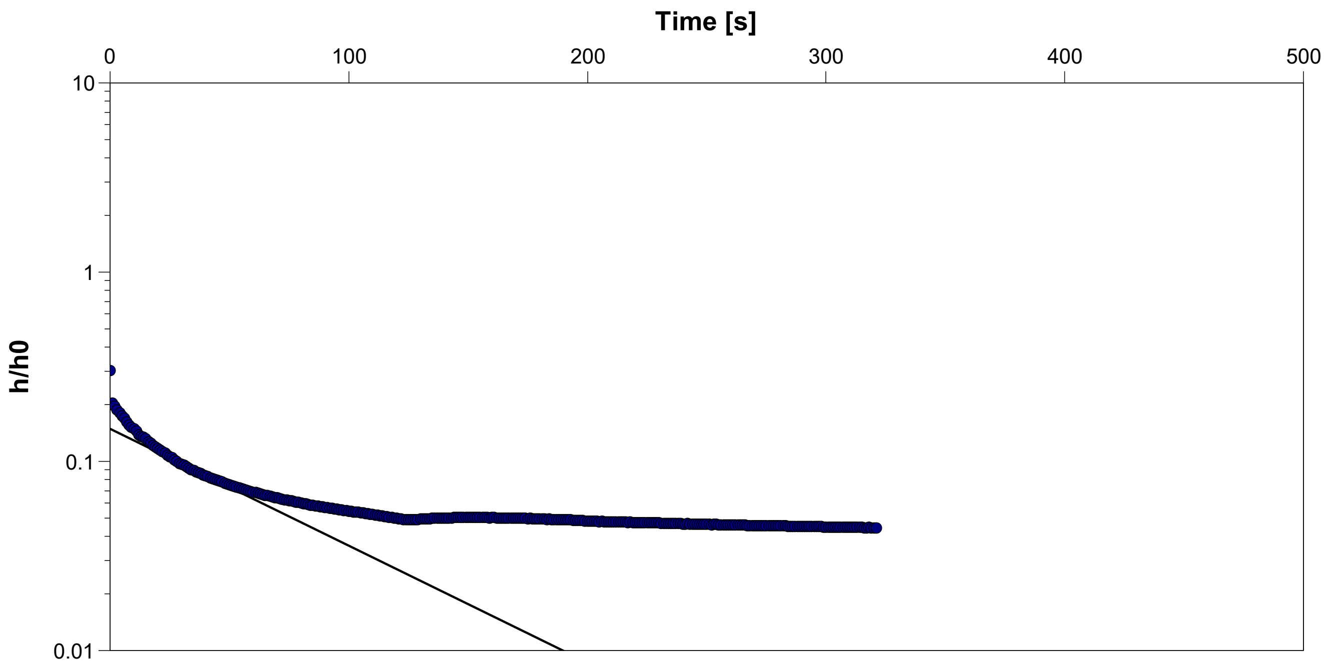
		Slug Test Analysis Report
		Project: Uxbridge Community Hospital
		Number: 02310769.003
		Client: Oak Valley Health
Location: Uxbridge	Slug Test: BH11	Test Well: BH11
Test Conducted by: A.Q		Test Date: 7/5/2024
Analysis Performed by: A.Q	BH11 Slug Test	Analysis Date: 8/27/2024
Aquifer Thickness:		



Calculation using Hvorslev		
Observation Well	Hydraulic Conductivity [m/s]	
BH11	2.20×10^{-7}	

	Slug Test Analysis Report
	Project: Uxbridge Community Hospital
	Number: 02310769.003
	Client: Oak Valley Health

Location: Uxbridge	Slug Test: BH15	Test Well: BH15
Test Conducted by: A.Q		Test Date: 7/5/2024
Analysis Performed by: A.Q	Slug Test BH15	Analysis Date: 8/27/2024
Aquifer Thickness:		

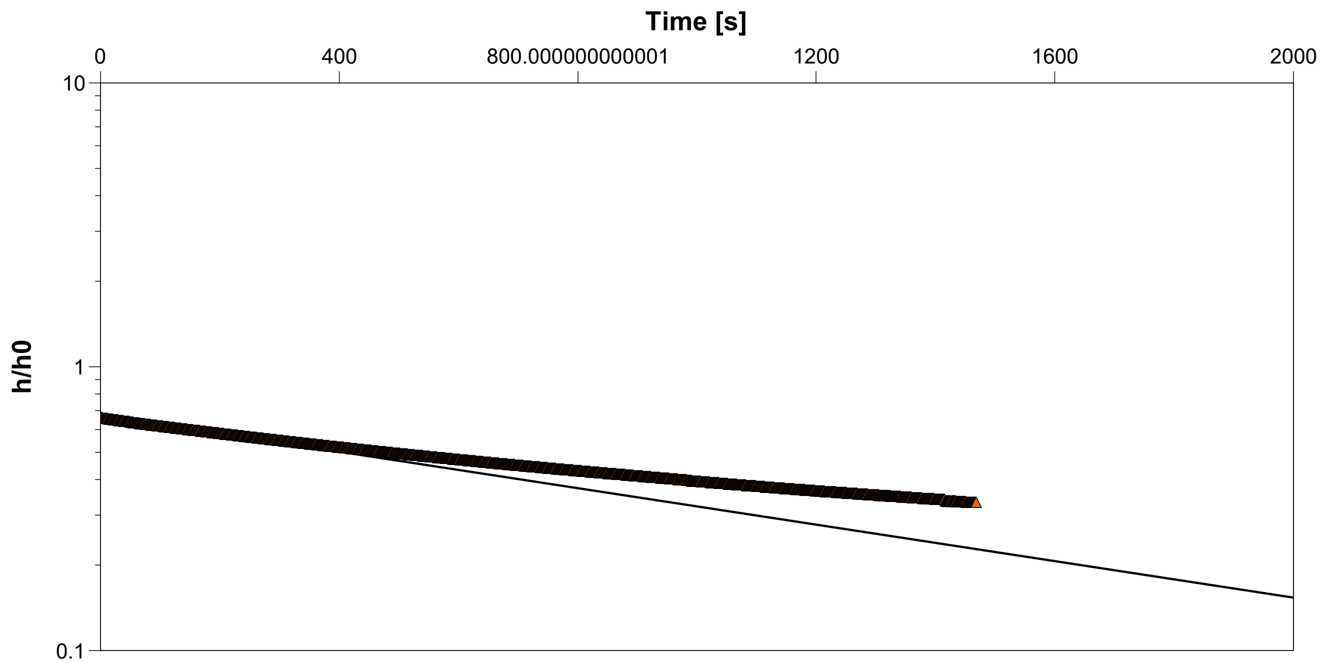


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH15	6.41×10^{-6}	

	Slug Test Analysis Report
	Project: Uxbridge Community Hospital
	Number: 02310769.003
	Client: Oak Valley Health

Location: Uxbridge	Slug Test: BH13	Test Well: BH13
Test Conducted by: A.Q		Test Date: 7/5/2024
Analysis Performed by: A.Q	Slug Test BH13	Analysis Date: 8/27/2024
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH13	3.33×10^{-7}	

Appendix I

Groundwater Quality

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

CLIENT NAME: **ENGLOBE CORP.**
20, CARLSON COURT
ETOBICOKE, ON M9W 7K6
416 301-5909

ATTENTION TO: **Abdul Qadir**

PROJECT: **02310769.002**

AGAT WORK ORDER: **24T170750**

WATER ANALYSIS REVIEWED BY: **Yris Verastegui, Inorganic Team Lead**

DATE REPORTED: **Jul 12, 2024**

PAGES (INCLUDING COVER): **10**

VERSION*: **1**

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

Notes

Disclaimer:

- *All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.*
- *All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.*
- *AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.*
- *This Certificate shall not be reproduced except in full, without the written approval of the laboratory.*
- *The test results reported herewith relate only to the samples as received by the laboratory.*
- *Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.*
- *All reportable information is available on request from AGAT Laboratories, in accordance with ISO/IEC 17025:2017, ISO/IEC 17025:2005 (Quebec), DR-12-PALA and/or NELAP Standards.*
- *This document is signed by an authorized signatory who meets the requirements of the MELCCFP, CALA, CCN and NELAP.*
- *For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.*

Certificate of Analysis

AGAT WORK ORDER: 24T170750
PROJECT: 02310769.002

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

CLIENT NAME: ENGLOBE CORP. **ATTENTION TO: Abdul Qadir**
SAMPLING SITE:4 Campbell Dr, Uxbridge, ON **SAMPLED BY:Abdul Q.**

Water Quality Assessment - PWQO (mg/L)

DATE RECEIVED: 2024-07-05 **DATE REPORTED: 2024-07-12**

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: BH24-7 SAMPLE TYPE: Water DATE SAMPLED: 2024-07-05 15:00 5984811
Electrical Conductivity	µS/cm		2	1310
pH	pH Units	6.5-8.5	NA	7.56
Saturation pH (Calculated)				6.33
Langelier Index (Calculated)				1.23
Hardness (as CaCO3) (Calculated)	mg/L		0.5	648
Total Dissolved Solids	mg/L		10	784
Alkalinity (as CaCO3)	mg/L		5	561
Bicarbonate (as CaCO3)	mg/L		5	561
Carbonate (as CaCO3)	mg/L		5	<5
Hydroxide (as CaCO3)	mg/L		5	<5
Fluoride	mg/L		0.05	<0.05
Chloride	mg/L		0.12	153
Nitrate as N	mg/L		0.05	<0.05
Nitrite as N	mg/L		0.05	<0.05
Bromide	mg/L		0.05	<0.05
Sulphate	mg/L		0.10	49.1
Ortho Phosphate as P	mg/L		0.10	<0.10
Ammonia as N	mg/L		0.02	<0.02
Ammonia-Un-ionized (Calculated)	mg/L	0.02	0.000002	<0.000002
Total Phosphorus	mg/L	*	0.06	1.35
Total Organic Carbon	mg/L		0.5	8.2
True Colour	TCU		2.50	11.6
Turbidity	NTU		0.5	11400
Total Calcium	mg/L		0.20	222
Total Magnesium	mg/L		0.10	22.7
Total Potassium	mg/L		0.50	2.79
Total Sodium	mg/L		0.10	48.3
Aluminum-dissolved	mg/L	*	0.004	0.033
Total Antimony	mg/L	0.020	0.003	<0.003

Certified By: Iris Verástegui

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

Certificate of Analysis

AGAT WORK ORDER: 24T170750
PROJECT: 02310769.002

CLIENT NAME: ENGLOBE CORP.
SAMPLING SITE:4 Campbell Dr, Uxbridge, ON
ATTENTION TO: Abdul Qadir
SAMPLED BY:Abdul Q.

Water Quality Assessment - PWQO (mg/L)

DATE RECEIVED: 2024-07-05
DATE REPORTED: 2024-07-12

Parameter	Unit	G / S	RDL	5984811
			SAMPLE DESCRIPTION:	BH24-7
			SAMPLE TYPE:	Water
			DATE SAMPLED:	2024-07-05 15:00
Total Arsenic	mg/L	0.1	0.003	0.006
Total Barium	mg/L		0.002	0.301
Total Beryllium	mg/L	*	0.001	<0.001
Total Boron	mg/L	0.2	0.010	0.082
Total Cadmium	mg/L	0.0002	0.0001	0.0002
Total Chromium	mg/L		0.003	0.025
Total Cobalt	mg/L	0.0009	0.0005	**0.0086**
Total Copper	mg/L	0.005	0.002	**0.020**
Total Iron	mg/L	0.3	0.050	**22.3**
Total Lead	mg/L	*	0.0005	0.0087
Total Manganese	mg/L		0.002	1.45
Total Mercury	mg/L		0.0001	<0.0001
Total Molybdenum	mg/L	0.040	0.002	0.004
Total Nickel	mg/L	0.025	0.003	0.019
Total Selenium	mg/L	0.1	0.002	<0.002
Total Silver	mg/L	0.0001	0.0001	<0.0001
Total Strontium	mg/L		0.005	0.809
Total Thallium	mg/L	0.0003	0.0003	<0.0003
Total Tin	mg/L		0.002	0.005
Total Titanium	mg/L		0.010	0.868
Total Tungsten	mg/L	0.030	0.010	<0.010
Total Uranium	mg/L	0.005	0.0005	0.0023
Total Vanadium	mg/L	0.006	0.002	**0.035**
Total Zinc	mg/L	0.030	0.020	**0.056**
Total Zirconium	mg/L	0.004	0.004	0.004
Lab Filtration Aluminum Dissolved				1

Certified By: Iris Verástegui

Results relate only to the items tested. Results apply to samples as received.

Certificate of Analysis

AGAT WORK ORDER: 24T170750
PROJECT: 02310769.002

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CLIENT NAME: ENGLOBE CORP.
ATTENTION TO: Abdul Qadir
SAMPLING SITE:4 Campbell Dr, Uxbridge, ON
SAMPLED BY:Abdul Q.

Water Quality Assessment - PWQO (mg/L)

DATE RECEIVED: 2024-07-05
DATE REPORTED: 2024-07-12

Comments:	RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to PWQO * Variable - refer to guideline reference document Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.
5984811	Dilution required, RDL has been increased accordingly. Un-ionized Ammonia detection limit is a calculated RDL. The calculation of Un-ionized Ammonia is based on lab measured parameters (ammonia as N, pH and temperature).Values are reported as calculated.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By: Iris Verástegui

Exceedance Summary

AGAT WORK ORDER: 24T170750

PROJECT: 02310769.002

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CLIENT NAME: ENGLOBE CORP. **ATTENTION TO: Abdul Qadir**

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
5984811	BH24-7	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Cobalt	mg/L	0.0009	0.0086
5984811	BH24-7	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Copper	mg/L	0.005	0.020
5984811	BH24-7	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Iron	mg/L	0.3	22.3
5984811	BH24-7	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Vanadium	mg/L	0.006	0.035
5984811	BH24-7	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Zinc	mg/L	0.030	0.056

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Quality Assurance

CLIENT NAME: ENGLOBE CORP. **AGAT WORK ORDER: 24T170750**

PROJECT: 02310769.002 **ATTENTION TO: Abdul Qadir**

SAMPLING SITE:4 Campbell Dr, Uxbridge, ON **SAMPLED BY:Abdul Q.**

Water Analysis

RPT Date: Jul 12, 2024			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper
Water Quality Assessment - PWQO (mg/L)															
Electrical Conductivity	5984327		9780	10000	2.2%	< 2	102%	90%	110%						
pH	5984327		7.25	7.30	0.7%	NA	99%	90%	110%						
Total Dissolved Solids	5982078		58	56	3.5%	< 10	96%	80%	120%						
Alkalinity (as CaCO3)	5984327		834	843	1.1%	< 5	100%	80%	120%						
Bicarbonate (as CaCO3)	5984327		834	843	1.1%	< 5	NA								
Carbonate (as CaCO3)	5984327		<5	<5	NA	< 5	NA								
Hydroxide (as CaCO3)	5984327		<5	<5	NA	< 5	NA								
Fluoride	5984811	5984811	<0.05	<0.05	NA	< 0.05	100%	70%	130%	97%	80%	120%	93%	70%	130%
Chloride	5984811	5984811	153	150	2.0%	< 0.10	95%	70%	130%	102%	80%	120%	NA	70%	130%
Nitrate as N	5984811	5984811	<0.05	<0.05	NA	< 0.05	101%	70%	130%	100%	80%	120%	97%	70%	130%
Nitrite as N	5984811	5984811	<0.05	<0.05	NA	< 0.05	91%	70%	130%	96%	80%	120%	93%	70%	130%
Bromide	5984811	5984811	<0.05	<0.05	NA	< 0.05	100%	70%	130%	98%	80%	120%	96%	70%	130%
Sulphate	5984811	5984811	49.1	47.8	2.7%	< 0.10	98%	70%	130%	100%	80%	120%	98%	70%	130%
Ortho Phosphate as P	5984811	5984811	<0.10	<0.10	NA	< 0.10	104%	70%	130%	101%	80%	120%	97%	70%	130%
Ammonia as N	5988537		<0.02	<0.02	NA	< 0.02	106%	70%	130%	101%	80%	120%	107%	70%	130%
Total Phosphorus	5984811	5984811	1.35	1.34	0.7%	< 0.02	105%	70%	130%	106%	80%	120%	NA	70%	130%
Total Organic Carbon	5984811	5984811	8.2	8.0	2.5%	< 0.5	96%	90%	110%	102%	90%	110%	107%	80%	120%
True Colour	5978226		<2.50	<2.50	NA	< 2.5	103%	90%	110%						
Turbidity	5984811	5984811	11400	11300	0.9%	< 0.5	99%	80%	120%						
Total Calcium	5989529		201	187	7.2%	< 0.20	103%	70%	130%	101%	80%	120%	81%	70%	130%
Total Magnesium	5989529		34.9	30.0	15.1%	< 0.10	103%	70%	130%	93%	80%	120%	75%	70%	130%
Total Potassium	5989529		24.1	23.0	4.7%	< 0.50	103%	70%	130%	84%	80%	120%	NA	70%	130%
Total Sodium	5989529		2450	2350	4.2%	< 0.10	94%	70%	130%	101%	80%	120%	NA	70%	130%
Aluminum-dissolved	5978226		<0.004	<0.004	NA	< 0.004	94%	70%	130%	102%	80%	120%	91%	70%	130%
Total Antimony	5989529		0.005	0.005	NA	< 0.003	101%	70%	130%	105%	80%	120%	103%	70%	130%
Total Arsenic	5989529		0.005	<0.003	NA	< 0.003	93%	70%	130%	94%	80%	120%	96%	70%	130%
Total Barium	5989529		0.316	0.301	4.9%	< 0.002	99%	70%	130%	104%	80%	120%	110%	70%	130%
Total Beryllium	5989529		<0.001	<0.001	NA	< 0.001	96%	70%	130%	93%	80%	120%	77%	70%	130%
Total Boron	5989529		0.182	0.157	14.7%	< 0.010	100%	70%	130%	101%	80%	120%	80%	70%	130%
Total Cadmium	5989529		<0.0001	<0.0001	NA	< 0.0001	98%	70%	130%	100%	80%	120%	93%	70%	130%
Total Chromium	5989529		<0.003	<0.003	NA	< 0.003	102%	70%	130%	108%	80%	120%	120%	70%	130%
Total Cobalt	5989529		0.0013	0.0015	NA	< 0.0005	106%	70%	130%	104%	80%	120%	115%	70%	130%
Total Copper	5989529		0.012	0.011	8.7%	< 0.002	100%	70%	130%	101%	80%	120%	103%	70%	130%
Total Iron	5989529		1.45	1.32	9.4%	< 0.050	111%	70%	130%	109%	80%	120%	124%	70%	130%
Total Lead	5989529		0.0007	0.0006	NA	< 0.0005	91%	70%	130%	99%	80%	120%	88%	70%	130%
Total Manganese	5989529		0.877	0.814	7.5%	< 0.002	115%	70%	130%	118%	80%	120%	127%	70%	130%
Total Mercury	5982022		<0.0001	<0.0001	NA	< 0.0001	100%	70%	130%	102%	80%	120%	92%	70%	130%
Total Molybdenum	5989529		0.015	0.013	14.3%	< 0.002	108%	70%	130%	94%	80%	120%	98%	70%	130%
Total Nickel	5989529		0.026	0.023	12.2%	< 0.003	108%	70%	130%	108%	80%	120%	114%	70%	130%

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Quality Assurance

CLIENT NAME: ENGLOBE CORP. **AGAT WORK ORDER: 24T170750**
PROJECT: 02310769.002 **ATTENTION TO: Abdul Qadir**
SAMPLING SITE:4 Campbell Dr, Uxbridge, ON **SAMPLED BY:Abdul Q.**

Water Analysis (Continued)

RPT Date: Jul 12, 2024			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper
Total Selenium	5989529		0.004	0.010	NA	< 0.002	104%	70%	130%	94%	80%	120%	83%	70%	130%
Total Silver	5989529		0.0002	0.0001	NA	< 0.0001	88%	70%	130%	88%	80%	120%	76%	70%	130%
Total Strontium	5989529		1.38	1.19	14.8%	< 0.005	95%	70%	130%	96%	80%	120%	85%	70%	130%
Total Thallium	5989529		<0.0003	<0.0003	NA	< 0.0003	97%	70%	130%	107%	80%	120%	88%	70%	130%
Total Tin	5989529		<0.002	<0.002	NA	< 0.002	103%	70%	130%	103%	80%	120%	102%	70%	130%
Total Titanium	5989529		0.016	<0.010	NA	< 0.010	107%	70%	130%	100%	80%	120%	115%	70%	130%
Total Tungsten	5989529		<0.010	<0.010	NA	< 0.010	90%	70%	130%	93%	80%	120%	92%	70%	130%
Total Uranium	5989529		<0.0005	<0.0005	NA	< 0.0005	97%	70%	130%	103%	80%	120%	106%	70%	130%
Total Vanadium	5989529		0.004	0.003	NA	< 0.002	110%	70%	130%	112%	80%	120%	129%	70%	130%
Total Zinc	5989529		0.081	0.080	NA	< 0.020	101%	70%	130%	102%	80%	120%	100%	70%	130%
Total Zirconium	5989529		<0.004	<0.004	NA	< 0.004	98%	70%	130%	88%	80%	120%	95%	70%	130%

Comments: NA signifies Not Applicable.
Duplicate NA: results are under 5X the RDL and will not be calculated.
Matrix spike NA: Spike level < native concentration. Matrix spike acceptance limits do not apply and are not calculated.

Certified By: Iris Verástegui

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Method Summary

CLIENT NAME: ENGLOBE CORP. **AGAT WORK ORDER: 24T170750**
PROJECT: 02310769.002 **ATTENTION TO: Abdul Qadir**
SAMPLING SITE:4 Campbell Dr, Uxbridge, ON **SAMPLED BY:Abdul Q.**

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Electrical Conductivity	INOR-93-6000	modified from SM 2510 B	PC TITRATE
pH	INOR-93-6000	modified from SM 4500-H+ B	PC TITRATE
Saturation pH (Calculated)		SM 2320 B	CALCULATION
Langelier Index (Calculated)		SM 2330B	CALCULATION
Hardness (as CaCO3) (Calculated)	MET-93-6105	modified from EPA SW-846 6010C & 200.7 & SM 2340 B	CALCULATION
Total Dissolved Solids	INOR-93-6028	modified from EPA 1684,ON MOECC E3139,SM 2540C,D	BALANCE
Alkalinity (as CaCO3)	INOR-93-6000	Modified from SM 2320 B	PC TITRATE
Bicarbonate (as CaCO3)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Carbonate (as CaCO3)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Hydroxide (as CaCO3)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Fluoride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Bromide	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Ortho Phosphate as P	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-93-6059	modified from SM 4500-NH3 H	LACHAT FIA
Ammonia-Un-ionized (Calculated)		MOE REFERENCE, PWQOs Tab 2	CALCULATION
Total Phosphorus	INOR-93-6022	modified from SM 4500-P B and SM 4500-P E	SPECTROPHOTOMETER
Total Organic Carbon	INOR-93-6049	modified from SM 5310 B	SHIMADZU CARBON ANALYZER
True Colour	INOR-93-6074	modified from SM 2120 B	LACHAT FIA
Turbidity	INOR-93-6044	modified from SM 2130 B	NEPHELOMETER
Total Calcium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Magnesium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Potassium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Sodium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Aluminum-dissolved	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Total Antimony	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Arsenic	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Barium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Beryllium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Boron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Cadmium	MET -93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Chromium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Cobalt	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS

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Method Summary

CLIENT NAME: ENGLOBE CORP. | **AGAT WORK ORDER: 24T170750**

PROJECT: 02310769.002 | **ATTENTION TO: Abdul Qadir**

SAMPLING SITE:4 Campbell Dr, Uxbridge, ON | **SAMPLED BY:Abdul Q.**

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Total Copper	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Iron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Lead	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Manganese	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Mercury	MET-93-6100	modified from EPA 245.2 and SM 3112 B	CVAAS
Total Molybdenum	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Nickel	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Selenium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Silver	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Strontium	INOR-93-6003	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Thallium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Tin	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Titanium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Tungsten	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Uranium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Vanadium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Zinc	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Zirconium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Lab Filtration Aluminum Dissolved	SR-78-9001		FILTRATION

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Have feedback? Scan here for a quick survey!

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Laboratory Use Only

Work Order #: 24T170750

Cooler Quantity: 1 large

Arrival Temperatures: 14.3 | 14.6 | 14.9

Depot Temperatures:

Custody Seal Intact: ☐Yes ☐No ☒N/A

Notes: L/I

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: Englobe Corp
Contact: Abdul Qadir
Address: 20 Carlson Court, Etobicoke, M9W 7K6
Phone: 365-341-4400 Fax:
Reports to be sent to:
1. Email: abdul.qadir@englobecorp.com
2. Email:

Regulatory Requirements:

(Please check all applicable boxes)

☐ Regulation 153/04 — Table ___ (Indicate One): ☐Ind/Com ☐Res/Park ☐Agriculture; Soil Texture (Check One): ☐Coarse ☐Fine

☐ Regulation 406 — Table ___ (Indicate One): ☐Ind/Com ☐Res/Park ☐Agriculture

☐ Regulation 558

☐ CCME

☐ Sewer Use ☐Sanitary ☐Storm — Region ___

☒ Prov. Water Quality Objectives (PWQO)

☐ Other ___ (Indicate One)

Is this submission for a Record of Site Condition (RSC)? ☐ Yes ☐ No

Report Guideline on Certificate of Analysis ☐ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CSR

Project Information:

Project: 02310769.002
Site Location: 4 Campbell Dr, Uxbridge, ON
Sampled By: Abdul Qadir
AGAT Quote #: 477091 PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Legal Sample ☐

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

GW	Ground Water	SD	Sediment
O	Oil	SW	Surface Water
P	Paint	R	Rock/Shale
S	Soil		

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI, DOC (Y/N)	O. Reg 153: Metals & Inorganics	Metals - ☐ CrVI, ☐ Hg, ☐ HWSB	BTEX, F1-F4 PHCs	VOC	PAHs	PCBs: Aroclors ☐	O. Reg 406: Regulation 406 Characterization Package pH, Metals, BTEX, F1-F4	EC, SAR	Regulation 406 SPLP Rainwater Leach mSPLP: ☐ Metals ☐ VOCs ☐ SVOCs ☐ DOC	O. Reg 558: Landfill Disposal Characterization TCLP: TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Corrosivity: ☐ Moisture ☐ Sulphide	PWQO						Potentially Hazardous or High Concentration (Y/N)
1. BH24-7	05-July-2024	15:00 AM/PM	7	GW	Non filtered	N												✓						
2.		AM/PM																						
3.		AM/PM																						
4.		AM/PM																						
5.		AM/PM																						
6.		AM/PM																						
7.		AM/PM																						
8.		AM/PM																						
9.		AM/PM																						
10.		AM/PM																						
11.		AM/PM																						

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
Abdul Qadir	05/July/24	18:20	Daisy N	July 5	6:25 pm

Page ___ of ___

Nº: T - 159661

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CLIENT NAME: ENGLOBE CORP.
20, CARLSON COURT
ETOBICOKE, ON M9W 7K6
416 301-5909

ATTENTION TO: Abdul Qadir

PROJECT: 02310769.002

AGAT WORK ORDER: 24T170755

MICROBIOLOGY ANALYSIS REVIEWED BY: Nivine Basily, Inorganic Team Lead

TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

WATER ANALYSIS REVIEWED BY: Yris Verastegui, Inorganic Team Lead

DATE REPORTED: Jul 12, 2024

PAGES (INCLUDING COVER): 14

VERSION*: 1

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

Notes

Disclaimer:

- *All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.*
- *All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.*
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- *This Certificate shall not be reproduced except in full, without the written approval of the laboratory.*
- *The test results reported herewith relate only to the samples as received by the laboratory.*
- *Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.*
- *All reportable information is available on request from AGAT Laboratories, in accordance with ISO/IEC 17025:2017, ISO/IEC 17025:2005 (Quebec), DR-12-PALA and/or NELAP Standards.*
- *This document is signed by an authorized signatory who meets the requirements of the MELCCFP, CALA, CCN and NELAP.*
- *For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.*

Certificate of Analysis

AGAT WORK ORDER: 24T170755
PROJECT: 02310769.002

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
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CLIENT NAME: ENGLOBE CORP. **ATTENTION TO: Abdul Qadir**

SAMPLING SITE:4 Campbell Drive, Uxbridge, ON **SAMPLED BY:Abdul Qadir**

E.Coli (MI-Agar)

DATE RECEIVED: 2024-07-05 **DATE REPORTED: 2024-07-12**

			SAMPLE DESCRIPTION:	BH24-7
			SAMPLE TYPE:	Water
			DATE SAMPLED:	2024-07-05 15:00
Parameter	**Unit**	**G / S**	**RDL**	**5984827**
Escherichia coli	CFU/100mL	200		0
Total Coliforms	CFU/100mL			0

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Limits for Storm Sewer Discharge - The Regional Municipality of Durham - By-Law No. 55-2013
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

5984827 Escherichia coli RDL = 2 CFU/100mL.
RDL > 1 indicates dilutions of the sample.

The sample was diluted prior to filtration due to the presence of sediments.

Analysis performed at AGAT Toronto (unless marked by *)

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Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 24T170755
PROJECT: 02310769.002

CLIENT NAME: ENGLOBE CORP.
SAMPLING SITE:4 Campbell Drive, Uxbridge, ON
ATTENTION TO: Abdul Qadir
SAMPLED BY:Abdul Qadir

Durham Sanitary - Organics

DATE RECEIVED: 2024-07-05 **DATE REPORTED: 2024-07-12**

				SAMPLE DESCRIPTION:	BH24-7
				SAMPLE TYPE:	Water
				DATE SAMPLED:	2024-07-05 15:00
Parameter	**Unit**	**G / S: A**	**G / S: B**	**RDL**	**5984827**
Oil and Grease (animal/vegetable) in water	mg/L	150		0.5	5.23[<A]
Oil and Grease (mineral) in water	mg/L	15		0.5	<0.5
Benzene	mg/L	0.01	0.002	0.0002	<0.0002
Chloroform	mg/L	0.04	0.002	0.0002	<0.0002
1,2-Dichlorobenzene	mg/L	0.05	0.0056	0.0001	<0.0001
1,4-Dichlorobenzene	mg/L	0.08	0.0068	0.0001	<0.0001
CIS 1,2-Dichloroethylene	mg/L			0.0002	<0.0002
Trans-1,3-Dichloropropylene	mg/L			0.0003	<0.0003
Ethylbenzene	mg/L	0.16	0.002	0.0001	<0.0001
Methylene Chloride	mg/L	2	0.0052	0.0003	<0.0003
1,1,2,2-Tetrachloroethane	mg/L	1.4	0.017	0.001	<0.001
Tetrachloroethylene	mg/L	1	0.0044	0.0001	<0.0001
Toluene	mg/L	0.27	0.002	0.0002	0.0004[<B]
Trichloroethylene	mg/L	0.4	0.008	0.0002	<0.0002
Xylenes (Total)	mg/L			0.00028	0.0003
Methyl Ethyl Ketone	mg/L	8		0.001	<0.001
Styrene	mg/L			0.0001	<0.0001
Di-n-butyl phthalate	mg/L	0.08	0.015	0.0005	<0.0005
Bis(2-Ethylhexyl)phthalate	mg/L	0.012	0.0088	0.0005	<0.0005
PCBs	mg/L	0.001		0.0002	<0.0002
Nonylphenols	mg/L	0.02		0.001	<0.001
Nonylphenol Ethoxylates	mg/L	0.2		0.01	<0.01

Certified By: NPopukolof

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CLIENT NAME: ENGLOBE CORP.
SAMPLING SITE:4 Campbell Drive, Uxbridge, ON
ATTENTION TO: Abdul Qadir
SAMPLED BY:Abdul Qadir

Durham Sanitary - Organics

DATE RECEIVED: 2024-07-05 **DATE REPORTED: 2024-07-12**

Surrogate	Unit	Acceptable Limits	SAMPLE DESCRIPTION: BH24-7 SAMPLE TYPE: Water DATE SAMPLED: 2024-07-05 15:00 5984827
Toluene-d8	% Recovery	50-140	94
4-Bromofluorobenzene	% Recovery	50-140	90
2-Fluorophenol	%	50-140	65
phenol-d6 surrogate	%	50-140	94
2,4,6-Tribromophenol	%	50-140	98
Chrysene-d12	%	50-140	91
Decachlorobiphenyl	%	50-140	93

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Limits for Sanitary Sewer Discharge - The Regional Municipality of Durham - By-Law No. 55-2013, B Refers to Limits for Storm Sewer Discharge - The Regional Municipality of Durham - By-Law No. 55-2013
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

5984827 Oil and Grease animal/vegetable is a calculated parameter. The calculated value is the difference between Total O&G and Mineral O&G.
Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.

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Certified By: NPopukolof

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Certificate of Analysis

AGAT WORK ORDER: 24T170755
PROJECT: 02310769.002

CLIENT NAME: ENGLOBE CORP.
SAMPLING SITE:4 Campbell Drive, Uxbridge, ON
ATTENTION TO: Abdul Qadir
SAMPLED BY:Abdul Qadir

Durham Sanitary Sewer Use By-Law - Inorganics

DATE RECEIVED: 2024-07-05 **DATE REPORTED: 2024-07-12**

Parameter	Unit	G / S: A	G / S: B	RDL	SAMPLE DESCRIPTION: BH24-7 SAMPLE TYPE: Water DATE SAMPLED: 2024-07-05 15:00 5984827
pH	pH Units	6.0-10.5	6.0-9.0	NA	7.59
BOD (5)	mg/L	300	15	2	4[<B]
Fluoride	mg/L	10		0.05	<0.05
Sulphate	mg/L	1500		0.10	46.6[<A]
Cyanide, SAD	mg/L	2	0.02	0.002	<0.002
Total Kjeldahl Nitrogen	mg/L	100	1	0.10	0.20[<B]
Phenols	mg/L	1	0.008	0.001	<0.001
Total Phosphorus	mg/L	10	0.4	0.02	1.29[B-A]
Total Suspended Solids	mg/L	350	15	10	18800[>A]
Total Aluminum	mg/L	50		0.020	14.5[<A]
Total Antimony	mg/L	5		0.003	<0.003
Total Arsenic	mg/L	1	0.02	0.006	0.007[<B]
Total Cadmium	mg/L	0.7	0.008	0.0002	<0.0002
Total Chromium	mg/L	2	0.08	0.006	0.020[<B]
Total Cobalt	mg/L	5		0.0010	0.0072[<A]
Total Copper	mg/L	3	0.05	0.004	0.018[<B]
Total Lead	mg/L	1	0.12	0.0010	0.0073[<B]
Total Manganese	mg/L	5	0.15	0.004	1.29[B-A]
Total Mercury	mg/L	0.01	0.01	0.0001	<0.0001
Total Molybdenum	mg/L	5		0.004	<0.004
Total Nickel	mg/L	2	0.08	0.006	0.020[<B]
Total Selenium	mg/L	1	0.02	0.004	<0.004
Total Silver	mg/L	5	0.12	0.0002	<0.0002
Total Tin	mg/L	5		0.004	<0.004
Total Titanium	mg/L	5		0.020	0.795[<A]
Total Zinc	mg/L	2	0.04	0.040	0.045[B-A]

Certified By: Iris Verástegui

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CLIENT NAME: ENGLOBE CORP. **ATTENTION TO: Abdul Qadir**

SAMPLING SITE:4 Campbell Drive, Uxbridge, ON **SAMPLED BY:Abdul Qadir**

Durham Sanitary Sewer Use By-Law - Inorganics

DATE RECEIVED: 2024-07-05 **DATE REPORTED: 2024-07-12**

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Limits for Sanitary Sewer Discharge - The Regional Municipality of Durham - By-Law No. 55-2013, B Refers to Limits for Storm Sewer Discharge - The Regional Municipality of Durham - By-Law No. 55-2013
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

5984827 Dilution required, RDL has been increased accordingly.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By: Iris Verástegui

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Exceedance Summary

AGAT WORK ORDER: 24T170755

PROJECT: 02310769.002

CLIENT NAME: ENGLOBE CORP.

ATTENTION TO: Abdul Qadir

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
5984827	BH24-7	ON Durham SM	Durham Sanitary Sewer Use By-Law - Inorganics	Total Manganese	mg/L	0.15	1.29
5984827	BH24-7	ON Durham SM	Durham Sanitary Sewer Use By-Law - Inorganics	Total Phosphorus	mg/L	0.4	1.29
5984827	BH24-7	ON Durham SM	Durham Sanitary Sewer Use By-Law - Inorganics	Total Suspended Solids	mg/L	15	18800
5984827	BH24-7	ON Durham SM	Durham Sanitary Sewer Use By-Law - Inorganics	Total Zinc	mg/L	0.04	0.045
5984827	BH24-7	ON Durham SN	Durham Sanitary Sewer Use By-Law - Inorganics	Total Suspended Solids	mg/L	350	18800

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Quality Assurance

CLIENT NAME: ENGLOBE CORP.
PROJECT: 02310769.002
SAMPLING SITE:4 Campbell Drive, Uxbridge, ON

AGAT WORK ORDER: 24T170755
ATTENTION TO: Abdul Qadir
SAMPLED BY:Abdul Qadir

Microbiology Analysis

RPT Date: Jul 12, 2024			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper
E.Coli (MI-Agar)															
Escherichia coli	5984827	5984827	0	0	NA										
Total Coliforms	5984827	5984827	4	4	0.0%										

Comments: NA - % RPD Not Applicable.

Certified By:

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Quality Assurance

CLIENT NAME: ENGLOBE CORP. | **AGAT WORK ORDER: 24T170755**
PROJECT: 02310769.002 | **ATTENTION TO: Abdul Qadir**
SAMPLING SITE:4 Campbell Drive, Uxbridge, ON | **SAMPLED BY:Abdul Qadir**

Trace Organics Analysis

RPT Date: Jul 12, 2024			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper
Durham Sanitary - Organics															
Oil and Grease (animal/vegetable) in water	5975256		< 0.5	< 0.5	NA	< 0.5	97%	60%	130%	110%	60%	130%	103%	60%	130%
Oil and Grease (mineral) in water	5975256		< 0.5	< 0.5	NA	< 0.5	87%	60%	130%	84%	60%	130%	89%	60%	130%
Benzene	5984080		<0.0002	<0.0002	NA	< 0.0002	89%	50%	140%	80%	60%	130%	92%	50%	140%
Chloroform	5984080		<0.0002	<0.0002	NA	< 0.0002	110%	50%	140%	107%	60%	130%	117%	50%	140%
1,2-Dichlorobenzene	5984080		<0.0001	<0.0001	NA	< 0.0001	108%	50%	140%	89%	60%	130%	100%	50%	140%
1,4-Dichlorobenzene	5984080		<0.0001	<0.0001	NA	< 0.0001	106%	50%	140%	84%	60%	130%	102%	50%	140%
CIS 1,2-Dichloroethylene	5984080		<0.0002	<0.0002	NA	< 0.0002	85%	50%	140%	74%	60%	140%	96%	60%	130%
Trans-1,3-Dichloropropylene	5984080		<0.0003	<0.0003	NA	< 0.0003	82%	50%	140%	71%	60%	130%	74%	50%	140%
Ethylbenzene	5984080		<0.0001	<0.0001	NA	< 0.0001	95%	50%	140%	76%	60%	130%	98%	50%	140%
Methylene Chloride	5984080		<0.0003	<0.0003	NA	< 0.0003	84%	50%	140%	84%	60%	130%	95%	50%	140%
1,1,2,2-Tetrachloroethane	5984080		<0.001	<0.001	NA	< 0.001	100%	50%	140%	107%	60%	130%	102%	50%	140%
Tetrachloroethylene	5984080		<0.0001	<0.0001	NA	< 0.0001	99%	50%	140%	71%	60%	130%	85%	50%	140%
Toluene	5984080		<0.0002	<0.0002	NA	< 0.0002	103%	50%	140%	82%	60%	130%	112%	50%	140%
Trichloroethylene	5984080		<0.0002	<0.0002	NA	< 0.0002	91%	50%	140%	76%	60%	130%	109%	50%	140%
Methyl Ethyl Ketone	5984080		<0.001	<0.001	NA	< 0.001	92%	50%	140%	112%	50%	140%	90%	50%	140%
Styrene	5984080		<0.0001	<0.0001	NA	< 0.0001	89%	50%	140%	71%	60%	130%	99%	50%	140%
Di-n-butyl phthalate	5984827	5984827	< 0.0005	< 0.0005	NA	< 0.0005	95%	50%	140%	79%	50%	140%	80%	50%	140%
Bis(2-Ethylhexyl)phthalate	5984827	5984827	< 0.0005	< 0.0005	NA	< 0.0005	84%	50%	140%	74%	50%	140%	67%	50%	140%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By:

AGAT Laboratories

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Quality Assurance

CLIENT NAME: ENGLOBE CORP. **AGAT WORK ORDER: 24T170755**

PROJECT: 02310769.002 **ATTENTION TO: Abdul Qadir**

SAMPLING SITE:4 Campbell Drive, Uxbridge, ON **SAMPLED BY:Abdul Qadir**

Water Analysis

RPT Date: Jul 12, 2024			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper
Durham Sanitary Sewer Use By-Law - Inorganics															
pH	5984327		7.25	7.30	0.7%	NA	99%	90%	110%						
BOD (5)	5984827	5984827	4	4	NA	< 2	101%	75%	125%						
Fluoride	5984811		<0.05	<0.05	NA	< 0.05	100%	70%	130%	97%	80%	120%	93%	70%	130%
Sulphate	5984811		49.1	47.8	2.7%	< 0.10	98%	70%	130%	100%	80%	120%	98%	70%	130%
Cyanide, SAD	5982022		<0.002	<0.002	NA	< 0.002	92%	70%	130%	105%	80%	120%	105%	70%	130%
Total Kjeldahl Nitrogen	5980745		5.25	5.23	0.4%	< 0.10	99%	70%	130%	104%	80%	120%	NA	70%	130%
Phenols	5986415		<0.001	<0.001	NA	< 0.001	99%	90%	110%	96%	90%	110%	113%	80%	120%
Total Phosphorus	5984811		1.35	1.34	0.7%	< 0.02	105%	70%	130%	106%	80%	120%	NA	70%	130%
Total Suspended Solids	5984460		<10	<10	NA	< 10	94%	80%	120%						
Total Aluminum	5989529		0.273	0.311	13.0%	< 0.010	113%	70%	130%	92%	80%	120%	126%	70%	130%
Total Antimony	5989529		0.005	0.005	NA	< 0.003	101%	70%	130%	105%	80%	120%	103%	70%	130%
Total Arsenic	5989529		0.005	<0.003	NA	< 0.003	93%	70%	130%	94%	80%	120%	96%	70%	130%
Total Cadmium	5989529		<0.0001	<0.0001	NA	< 0.0001	98%	70%	130%	100%	80%	120%	93%	70%	130%
Total Chromium	5989529		<0.003	<0.003	NA	< 0.003	102%	70%	130%	108%	80%	120%	120%	70%	130%
Total Cobalt	5989529		0.0013	0.0015	NA	< 0.0005	106%	70%	130%	104%	80%	120%	115%	70%	130%
Total Copper	5989529		0.012	0.011	8.7%	< 0.002	100%	70%	130%	101%	80%	120%	103%	70%	130%
Total Lead	5989529		0.0007	0.0006	NA	< 0.0005	91%	70%	130%	99%	80%	120%	88%	70%	130%
Total Manganese	5989529		0.877	0.814	7.5%	< 0.002	115%	70%	130%	118%	80%	120%	127%	70%	130%
Total Mercury	5982022		<0.0001	<0.0001	NA	< 0.0001	100%	70%	130%	102%	80%	120%	92%	70%	130%
Total Molybdenum	5989529		0.015	0.013	14.3%	< 0.002	108%	70%	130%	94%	80%	120%	98%	70%	130%
Total Nickel	5989529		0.026	0.023	12.2%	< 0.003	108%	70%	130%	108%	80%	120%	114%	70%	130%
Total Selenium	5989529		0.004	0.010	NA	< 0.002	104%	70%	130%	94%	80%	120%	83%	70%	130%
Total Silver	5989529		0.0002	0.0001	NA	< 0.0001	88%	70%	130%	88%	80%	120%	76%	70%	130%
Total Tin	5989529		<0.002	<0.002	NA	< 0.002	103%	70%	130%	103%	80%	120%	102%	70%	130%
Total Titanium	5989529		0.016	<0.010	NA	< 0.010	107%	70%	130%	100%	80%	120%	115%	70%	130%
Total Zinc	5989529		0.081	0.080	NA	< 0.020	101%	70%	130%	102%	80%	120%	100%	70%	130%

Comments: NA signifies Not Applicable.
Duplicate NA: results are under 5X the RDL and will not be calculated.
Matrix spike NA: Spike level < native concentration. Matrix spike acceptance limits do not apply and are not calculated.

Certified By: Iris Verástegui

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Method Summary

CLIENT NAME: ENGLOBE CORP. | **AGAT WORK ORDER: 24T170755**

PROJECT: 02310769.002 | **ATTENTION TO: Abdul Qadir**

SAMPLING SITE:4 Campbell Drive, Uxbridge, ON | **SAMPLED BY:Abdul Qadir**

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Microbiology Analysis			
Escherichia coli	MIC-93-7010	EPA 1604	Membrane Filtration
Total Coliforms	MIC-93-7010	EPA 1604	Membrane Filtration

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Method Summary

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PROJECT: 02310769.002 | **ATTENTION TO: Abdul Qadir**

SAMPLING SITE:4 Campbell Drive, Uxbridge, ON | **SAMPLED BY:Abdul Qadir**

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Oil and Grease (animal/vegetable) in water	VOL-91-5011	EPA SW-846 3510C & SM5520	BALANCE
Oil and Grease (mineral) in water	VOL-91-5011	EPA SW-846 3510C & SM5520	BALANCE
Benzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Chloroform	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
CIS 1,2-Dichloroethylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Trans-1,3-Dichloropropylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Ethylbenzene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Methylene Chloride	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Toluene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Trichloroethylene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Xylenes (Total)	VOL-91-5010	modified from EPA 5030B & EPA 8260D	(P&T)GC/FID
Methyl Ethyl Ketone	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Styrene	VOL-91-5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Toluene-d8	VOL-91- 5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91- 5001	modified from EPA 5030B & EPA 8260D	(P&T)GC/MS
Di-n-butyl phthalate	ORG-91-5114	EPA SW-846 3510C & 8270D	GC/MS
Bis(2-Ethylhexyl)phthalate	ORG-91-5114	EPA SW-846 3510C & 8270D	GC/MS
2-Fluorophenol	ORG-91-5114	modified from EPA 3510C, 8270E & ON MOECC E3265	GC/MS
phenol-d6 surrogate	ORG-91-5114	modified from EPA 3510C, 8270E & ON MOECC E3265	GC/MS
2,4,6-Tribromophenol	ORG-91-5114	modified from EPA 3510C, 8270E & ON MOECC E3265	GC/MS
Chrysene-d12	ORG-91-5114	modified from EPA 3510C and EPA 8270E	GC/MS
PCBs	ORG-91-5112	modified from EPA SW-846 3510 & 8082A	GC/ECD
Decachlorobiphenyl	ORG-91-5112	modified from EPA SW846 3510C & 8082A	GC/ECD
Nonylphenols	ORG-91-5122	modified ASTM D7485-16	CALCULATION
Nonylphenol Ethoxylates	ORG-91-5122	modified ASTM D7485-16	CALCULATION

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

Method Summary

CLIENT NAME: ENGLOBE CORP. **AGAT WORK ORDER: 24T170755**
PROJECT: 02310769.002 **ATTENTION TO: Abdul Qadir**
SAMPLING SITE:4 Campbell Drive, Uxbridge, ON **SAMPLED BY:Abdul Qadir**

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
pH	INOR-93-6000	modified from SM 4500-H+ B	PC TITRATE
BOD (5)	INOR-93-6006	Modified from SM 5210 B	DO METER
Fluoride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Cyanide, SAD	INOR-93-6051	modified from MOECC E3015; SM 4500-CN- A, B, & C	SEGMENTED FLOW ANALYSIS
Total Kjeldahl Nitrogen	INOR-93-6048	modified from EPA 351.2 and SM 4500-NORG D	LACHAT FIA
Phenols	INOR-93-6072	modified from SM 5530 D	LACHAT FIA
Total Phosphorus	INOR-93-6022	modified from SM 4500-P B and SM 4500-P E	SPECTROPHOTOMETER
Total Suspended Solids	INOR-93-6028	modified from EPA 1684,ON MOECC E3139,SM 2540C,D	BALANCE
Total Aluminum	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Antimony	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Arsenic	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Cadmium	MET -93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Chromium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Cobalt	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Copper	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Lead	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Manganese	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Mercury	MET-93-6100	modified from EPA 245.2 and SM 3112 B	CVAAS
Total Molybdenum	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Nickel	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Selenium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Silver	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Tin	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Titanium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Zinc	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS

AGAT Laboratories

Have feedback? Scan here for a quick survey!

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Laboratory Use Only

Work Order #: 24T170755
Cooler Quantity: 1 large
Arrival Temperatures: 14.3 | 14.6 | 14.9
Depot Temperatures:
Custody Seal Intact: ☐ Yes ☐ No ☒ N/A
Notes: L/1

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: Englobe Corp
Contact: Abdul Qadi
Address: 20 Carlsien Court, Etobicoke, M9W 7K6
Phone: 365-341-4400 Fax:
Reports to be sent to:
1. Email: abdul.qadir@englobecorp.com
2. Email:

Regulatory Requirements:

(Please check all applicable boxes)

☐ Regulation 153/04 — Table (Indicate One): ☐ Ind/Com ☐ Res/Park ☐ Agriculture
Soil Texture (Check One): ☐ Coarse ☐ Fine

☐ Regulation 406 — Table (Indicate One): ☐ Ind/Com ☐ Res/Park ☐ Agriculture
☐ Regulation 558
☐ CCME

☒ Sewer Use: ☒ Sanitary ☒ Storm — Durham (Region)
☐ Prov. Water Quality Objectives (PWQO)
☐ Other (Indicate One)

Is this submission for a Record of Site Condition (RSC)? ☐ Yes ☐ No

Report Guideline on Certificate of Analysis ☐ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☐ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)
☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
*TAT is exclusive of weekends and statutory holidays

For 'Same Day' analysis, please contact your AGAT CSR

Project Information:

Project: 02310769.0002
Site Location: 4 Campbell drive, Uxbridge, ON
Sampled By: Abdul Qadi
AGAT Quote #: 477082 PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Legal Sample ☐

Invoice Information:

Bill To Same: Yes ☐ No ☐
Company:
Contact:
Address:
Email:

Sample Matrix Legend

GW	Ground Water	SD	Sediment
O	Oil	SW	Surface Water
P	Paint	R	Rock/Shale
S	Soil		

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI, DOC (Y/N)	O. Reg 153: Metals & Inorganics	Metals - ☐ CrVI, ☐ Hg, ☐ HWSB	BTEX, F1-F4 PHCs	VOC	PAHs	PCBs: Aroclors ☐	O. Reg 406: Regulation 406 Characterization Package pH, Metals, BTEX, F1-F4	EC, SAR	Regulation 406 SPLP Rainwater Leach mSPLP: ☐ Metals ☐ VOCs ☐ SVOCs ☐ DOC	O. Reg 558: Landfill Disposal Characterization TCLP: TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Corrosivity: ☐ Moisture ☐ Sulphide	Durham Storm/Sanitary					Potentially Hazardous or High Concentration (Y/N)
1. BH24-7	05/July/2024	1500 AM PM	21	GW	Non filtered	N												✓					
2.		AM PM																					
3.		AM PM																					
4.		AM PM																					
5.		AM PM																					
6.		AM PM																					
7.		AM PM																					
8.		AM PM																					
9.		AM PM																					
10.		AM PM																					
11.		AM PM																					

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
Abdul Qadi	05/July/2024	18:20	Daisy N	July 5	6:25 pm

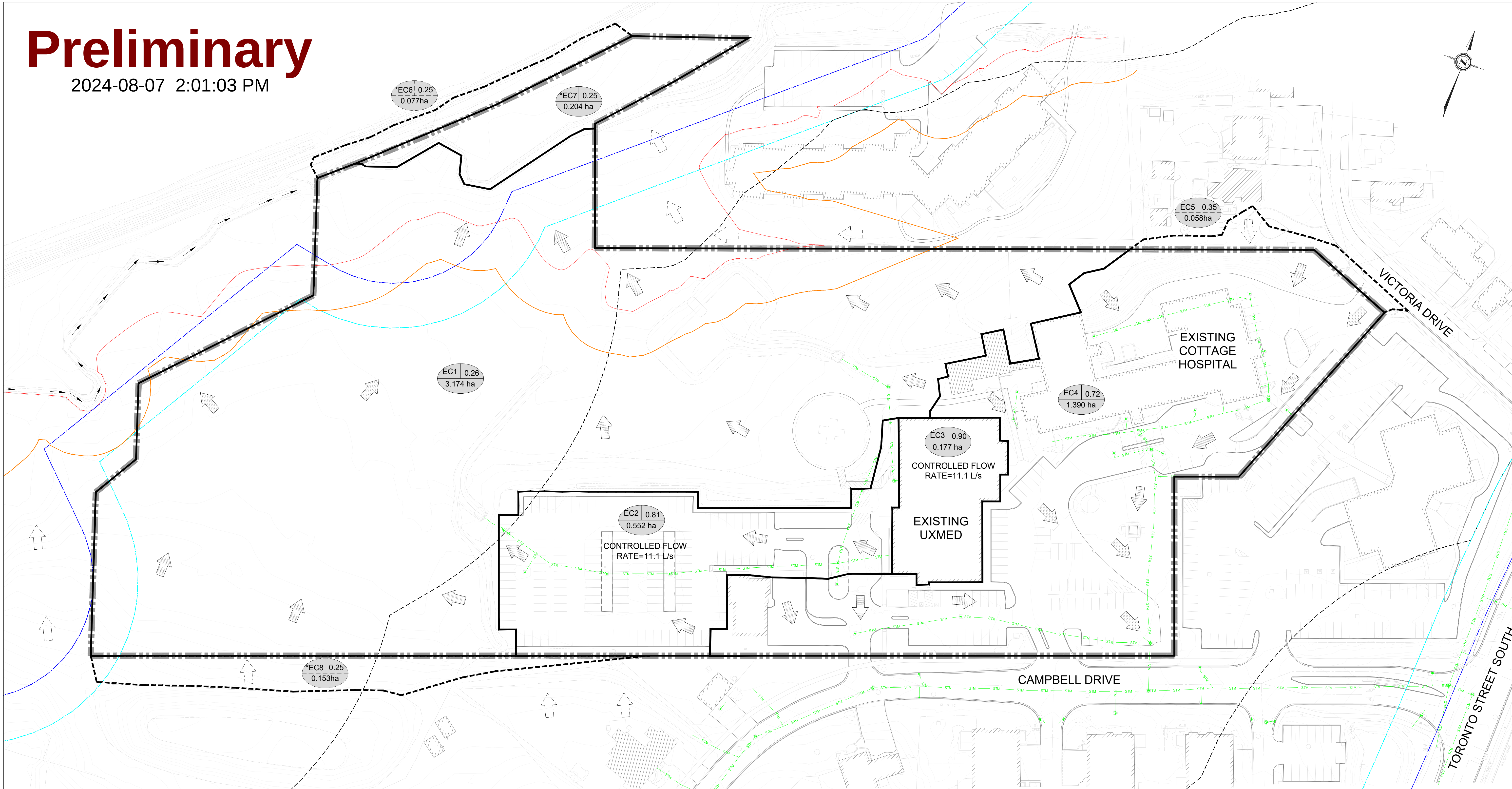
Page ____ of ____

Nº: T - 159657

Pink Copy - Client | Yellow Copy - AGAT | White Copy - AGAT

Appendix J

Water Balance Assessment



LEGEND:

PROPERTY LINE	EXTERNAL DRAINAGE AREA BOUNDARY
DRAINAGE AREA BOUNDARY	EXTERNAL OVERLAND FLOW ROUTE
OVERLAND FLOW DIRECTION	
C1 0.25 / 0.388 ha — CATCHMENT ID/RUNOFF COEFFICIENT DRAINAGE AREA (ha)	C1 0.95 / 1.00ha — EXTERNAL CATCHMENT ID/RUNOFF COEFFICIENT DRAINAGE AREA (ha)

REGIONAL FLOOD LINE
REGIONAL FLOOD LINE OFFSET
MEANDERBELT LIMIT
MEANDERBELT LIMIT OFFSET
LSRCA REGULATION LIMIT

Owner/Client:

diamond schmitt

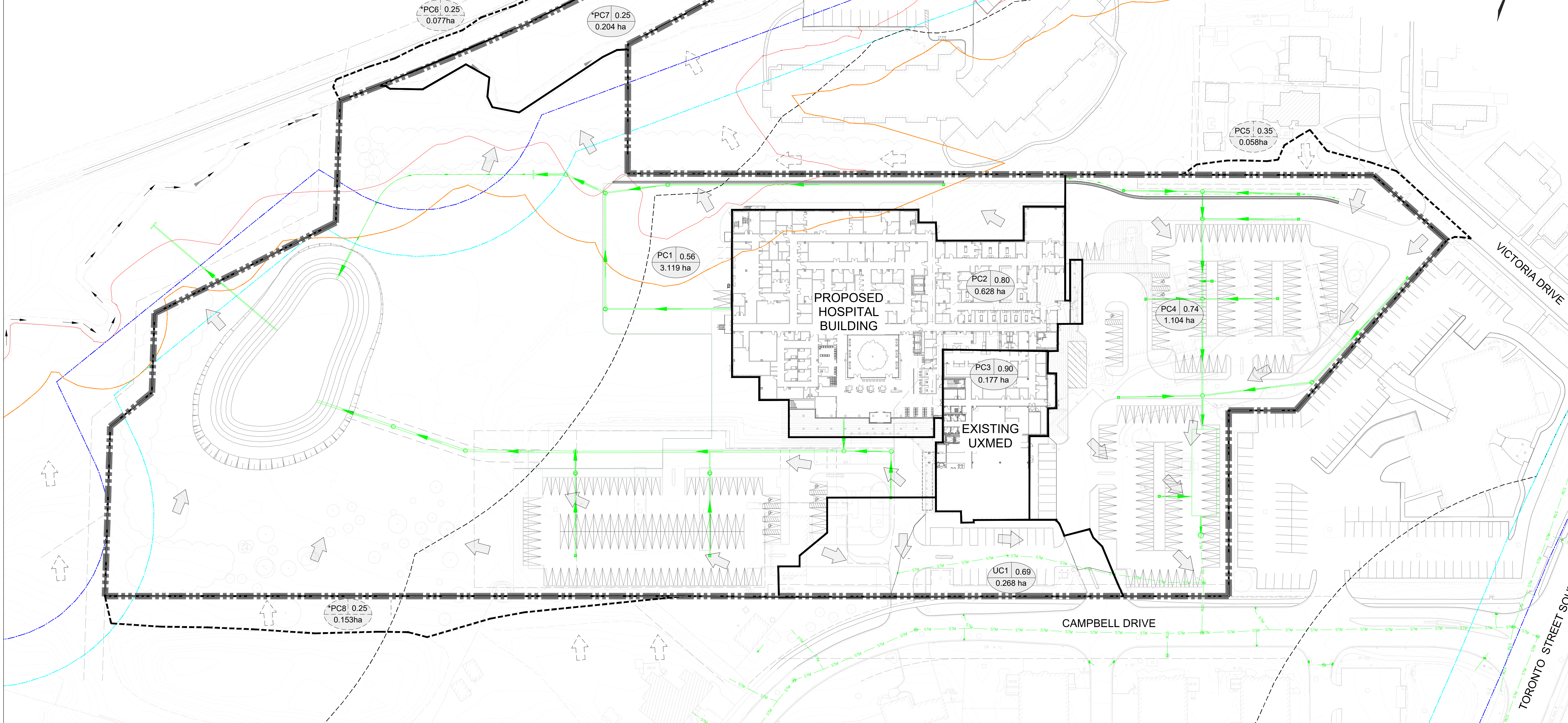
Title:

4 CAMPBELL DRIVE
EXISTING DRAINAGE
AREA PLAN

Drawn By:	P.R.	Checked By:	H.B.
Scale:	N.T.S.	Date:	MAY 2024
Project No.:	24163	Figure No.:	5

Preliminary

2024-08-07 2:01:13 PM



LEGEND:

- PROPERTY LINE
- DRAINAGE AREA BOUNDARY
- OVERLAND FLOW DIRECTION
- C1 0.25 / 0.388 ha — CATCHMENT ID/RUNOFF COEFFICIENT DRAINAGE AREA (ha)
- EXTERNAL DRAINAGE AREA BOUNDARY
- EXTERNAL OVERLAND FLOW ROUTE
- C1 0.95 / 1.00ha — EXTERNAL CATCHMENT ID/RUNOFF COEFFICIENT DRAINAGE AREA (ha)
- REGIONAL FLOOD LINE
- REGIONAL FLOOD LINE OFFSET
- MEANDERBELT LIMIT
- MEANDERBELT LIMIT OFFSET
- LSRCA REGULATION LIMIT

Owner/Client:
diamond schmitt

Title:
4 CAMPBELL DRIVE
PROPOSED DRAINAGE
AREA PLAN

Drawn By:	P.R.	Checked By:	H.B.
Scale:	N.T.S.	Date:	MAY 2024
Project No.:	24163	Figure No.:	6

APPENDIX J - Water Balance (Entire Site) - 4 Campbell Drive,Uxbridge.

File No. File No. 02310769.003

1. Climate Information

Precipitation[1]	892	mm/a	0.89	m/a
Actual Evapotranspiration[1]	574	mm/a	0.57	m/a
Precipitation Surplus	**318**	mm/a	**0.32**	**m/a**

2. Infiltration Rates

Table 3 Approach - Infiltration Factors [2] ***(Pre and Post Development)***

Soil: Silty Sand Fill to Silty Sand

Infiltration	175	mm/a	0.175	m/a
Run-off	143	mm/a	0.143	m/a

3. Property Statistics

Pre- Development Site Coverage					**Runoff Coefficient**
EC1 (Woodland, Open Space, Helipad, SWM)	31,740	m^2	3.17	ha	0.26
EC2 (Parking and Landscaped)	5,530	m^2	0.55	ha	0.81
EC3 (Existing Hospital)	1,770	m^2	0.18	ha	0.90
EC4 (Existing Cottage Hospital, Parking, Landscaped)	13,910	m^2	1.39	ha	0.72
EC7 (Wetland,Woodland)	2,050	m^2	0.21	ha	0.25
TOTAL:	55,000.00	m^2	5.50	ha	

Post-Development Coverage					**Runoff Coefficient**
PC1 (Woodland, Landscaped, SWMP)	31,190	m^2	3.12	ha	0.56
PC2 (Proposed Hospital, Landscaped)	6,280	m^2	0.63	ha	0.80
PC3 (Existing Hospital)	1,770	m^2	0.18	ha	0.90
UC1 (Parking, Landscaped)	2,680	m^2	0.27	ha	0.69
PC4 (Parking, Landscaped)	11,040	m^2	1.10	ha	0.74
PC7 (Woodland, Wetland)	2,040	m^2	0.20	ha	0.25
TOTAL:	55,000.00	m^2	5.50	ha	

Notes/References:

Water Balance Analysis Method: Thornthwaite and Matther approach
1 Lake Simcoe Climate Data Reference Document (April 2017)
2 MOEE Technical Information Requirements for Land Development Applications (1995)
Drainage catchment areas and runoff coefficents taked from pre and post development plans prepared by Lea Consultants, dated May 20

4. Annual Pre Development Water Balance

Land Use	Area (m^2)	Precipitation (m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Run-Off (m^3)
EC1 (Woodland, Open Space, Helipad, SWM)	31,740	28,312	13,482	7,469	7,361
EC2 (Parking and Landscaped)	5,530	4,933	603	334	3,996
EC3 (Existing Hospital)	1,770	1,579	158	nil	1,421
EC4 (Existing Cottage Hospital, Parking, Landscaped)	13,910	12,408	2,236	1,239	8,934
EC7 (Wetland,Woodland)	2,050	1,829	883	489	457
TOTAL	**55,000**	**49,060**	**17,361**	**9,531**	**22,168**

6. Annual Post Development Water Balance - Unmitigated

Land Use	Area (m^2)	Precipitation (m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Run-Off (m^3)
PC1 (Woodland, Landscaped, SWMP)	31,190	27,821	7,877	4,364	15,580
PC2 (Proposed Hospital, Landscaped)	6,280	5,602	721	399	4,481
PC3 (Existing Hospital)	1,770	1,579	158	nil	1,421
UC1 (Parking, Landscaped)	2,680	2,391	477	264	1,649
PC4 (Parking, Landscaped)	11,040	9,848	1,648	913	7,287
PC7 (Woodland, Wetland)	2,040	1,820	878	487	455
TOTAL	**55,000**	**49,060**	**11,759**	**6,427**	**30,874**

7. Comparison of Pre-Development and Post-Development Water Balance

	Precipitation (m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Run-Off (m^3)
Pre-Development	**49,060**	17,361	9,531	22,168
Post-Development	**49,060**	11,759	6,427	30,874
Difference	**0**	**-5,602**	**-3,104**	**8,706**

8. Requirement for Infiltration Maintaenance from roof run-off

Volume of roof run-off from existing and proposed hospital buildings (PC2 and PC3)	5,902
Post-development infiltration deficit	3,104
Percentage of roof run-off required to match pre-development infiltration	**53%**

APPENDIX J - Feature Based Water Balance - 4 Campbell Drive,Uxbridge.

File No. File No. 02310769.003

1. Climate Information

Precipitation[1]	892	mm/a	0.89	m/a
Actual Evapotranspiration[1]	574	mm/a	0.57	m/a
Precipitation Surplus	**318**	mm/a	**0.32**	**m/a**

2. Infiltration Rates

Table 3 Approach - Infiltration Factors [2] ***(Pre and Post Development)***

Soil: Silty Sand Fill to Silty Sand				
Infiltration	175	mm/a	0.175	m/a
Run-off	143	mm/a	0.143	m/a

3. Property Statistics

Pre- Development Site Coverage

					Runoff Coefficient
EC1(Woodland, Landscaped, Helipad, SWM)	31,740	m^2	3.17	ha	0.26
EC2 (Parking, Landscaped)	5,530	m^2	0.55	ha	0.81
EC3 (Existing Hospital)	1,770	m^2	0.18	ha	0.90
EC5 (External Catchment)	580	m^2	0.06	ha	0.35
EC8 (external Catchement)	770	m^2	0.08	ha	0.25
TOTAL:	**40,390.00**	m^2	4.04	ha	

Post-Development Coverage

					Runoff Coefficient
PC1 (Woodland, Landscaped, SWMP)	31,190	m^2	3.12	ha	0.56
PC2 (Proposed Hospital, Landscaped)	6,280	m^2	0.63	ha	0.80
PC3 (Existing Hospital)	1,770	m^2	0.18	ha	0.90
PC5 (Externel Catchement)	580	m^2	0.06	ha	0.35
PC8 (Externel Catchement)	1,530	m^2	0.15	ha	0.25
TOTAL:	**41,350.00**	m^2	4.14	ha	

Notes/References:

Water Balance Analysis Method: Thornthwaite and Matther approach

1 Lake Simcoe Climate Data Reference Document (April 2017)

2 MOEE Technical Information Requirements for Land Development Applications (1995)

Drainage catchment areas and runoff coefficents taked from pre and post development plans prepared by Lea Consultants, dated May 2024

4. Annual Pre-Development Water Balance

Land Use	Area (m^2)	Precipitation (m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Run-Off (m^3)
EC1(Woodland, Landscaped Helipad, SWM)	31,740	28,312	13,482	7,469	7,361
EC3 (Existing Hospital)	5,530	4,933	603	334	3,996
EC2 (Parking, Landscaped)	1,770	1,579	158	nil	1,421
EC5 (External Catchment)	580	517	216	120	181
EC8 (external Catchement)	770	687	331	184	172
TOTAL	**40,390**	**36,028**	**14,791**	**8,107**	**13,130**

6. Annual Post-Development Water Balance - Unmitigated

Land Use	Area (m^2)	Precipitation (m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Run-Off (m^3)
PC1 (Woodland, Landscaped	31,190	27,821	7,877	4,364	15,580
PC2 (Proposed Hospital, Lan	6,280	5,602	721	399	4,481
PC3 (Existing Hospital)	1,770	1,579	158	nil	1,421
PC5 (Externel Catchement)	580	517	216	120	181
PC8 (Externel Catchement)	1,530	1,365	659	365	341
TOTAL	**41,350**	**36,884**	**9,631**	**5,248**	**22,005**

7. Comparison of Pre-Development and Post-Development Water Balance

	Precipitation (m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Run-Off (m^3)
Pre-Development	**36,028**	14,791	8,107	13,130
Post-Development	**36,884**	9,631	5,248	22,005
Difference	**-856**	**-5,160**	**-2,858**	**8,874**

8. Requirement for Infiltration Maintaenance from roof run-off

Volume of roof run-off captured from existing and proposed hospital (PC2 and PC3)	5,902
Volume of post development infiltration deficit	2,858
Percentage of roof run-off required to match pre-development infiltration	**48%**

Appendix K

Arch Set & Site Servicng Plan

UXBRIDGE HOSPITAL - OAK VALLEY HEALTH

03/30/21

SURVEY

CIVIL

C101	Civil Sheet Placeholder

LANDSCAPE

L101	Landscape Sheet Placeholder

ARCHITECTURAL

A001	DRAWING SYMBOLS AND ABBREVIATIONS
A010	SITE SURVEY
A011	SITE PLAN - DEMOLITION
A012	SITE PLAN
A013	PHASING DIAGRAMS
A015	SITE SECTIONS
A020	OBC MATRIX AND LIFE SAFETY SECTIONS
A021	LIFE SAFETY PLANS
A025	ACOUSTIC DETAILS AND STC RATING IDENTIFICATION
A040	EXTERIOR BUILDING ELEMENTS
A041	INTERIOR BUILDING ELEMENTS & DETAILS
A050	DOORS AND SCREENS TYPES
A051	DOORS AND SCREENS SCHEDULE
A055	ROOM FINISHES SCHEDULE
A101	OVERALL FLOOR PLANS
A110	LEVEL 1 - PLAN
A111	LEVEL 1 - PLAN
A112	LEVEL 2 - PLAN
A113	LEVEL 2 - PLAN
A114	PENTHOUSE LEVEL - PLAN
A115	PENTHOUSE LEVEL - PLAN
A116	ROOF LEVEL - PLAN
A117	ROOF LEVEL - PLAN
A301	Exterior Elevations
A302	Exterior Elevations
A401	Overall Building Sections
A402	Overall Building Sections
A701	STAIR A
A702	STAIR B
A703	STAIR C
A704	EXTERIOR STAIR AT LOADING DOCK
A705	EXTERIOR STAIR AT ELECTRICAL RM
A706	EXTERIOR STAIR TO TERRACE
A707	UXMED STAIR
A708	WEST HELOPAD STAIR - ROOF
A709	NORTH HELOPAD STAIR - ROOF
A710	EAST HELOPAD STAIR - ROOF

STRUCTURAL

S101	Structural Sheet Placeholder

MECHANICAL

M101	Mechanical Sheet Placeholder

ELECTRICAL

E101	Electrical Sheet Placeholder

Architect

Diamond Schmitt Architects
384 Adelaide Street West, Suite 100
Toronto, ON M5V 1R7
T: (416)-862-8800

Electrical

EXP
220 Commerce Valley Drive West, Suite 110
Markham, ON M3T 0A8
T: (905)-695-3217

Mechanical

EXP
220 Commerce Valley Drive West, Suite 110
Markham, ON M3T 0A8
T: (905)-695-3217

Structural

Read Jones Christoffersen Ltd.
100 University Ave
Toronto, ON M5H 4H2
T: (416)-977-5335

Civil

LEA Consulting Ltd.
625 Cochrane Drive, 5th Floor
Markham, ON L3R 9R9
T: (905)-470-0015

Landscape

GSP Group
72 Victoria Street South, Suite 201
Kitchener, ON N2G 4Y9
T: (519)-569-8883

diamond schmitt

ANNOTATION SYMBOLS LEGEND

Symbol	Description
ROOM 1230 / ROOM 1230	ROOM/AREA TAGS
	DOOR TAGS
SC2001	SCREEN TAGS
P1 P1	ASSEMBLIES/ACCESSORIES/ FURNITURE/WINDOW/EQUIPMENT/FINISHES TAG
ACT2 2600 / ACT2 2600	CEILING TAGS
1200	SPOT ELEVATION - NEW
1200	SPOT ELEVATION - EXISTING
T/O Concrete 1200	SPOT ELEVATION - "TOP OF" ALIGNMENT BENCHMARK
U/S Soffit 1700	SPOT ELEVATION - "UNDERSIDE OF" ALIGNMENT BENCHMARK
UP	STAIR/RAMP DIRECTION TAG
	STAIR RISE/TREAD TAG
WALL BASE	KEYNOTE TAG
1	KEYNOTE TAG - DEMOLITION

DRAWING SYMBOLS LEGEND

Symbol	Description
1 A100	BUILDING SECTION
1 A100	WALL SECTION
1 A100	DETAIL SECTION
1 A100	CALLOUTS
1 A100	BUILDING ELEVATION
1 A100 1	INTERIOR ELEVATION
1 A	GRIDS
LEVEL 2 5000	LEVELS
	REVISION BUBBLES & TAGS
	BREAKLINE
1 / A202	MATCH LINE
	NORTH ARROW
NORTH ELEVATION 1 : 100 1 A100	VIEW TITLE

ABBREVIATIONS LIST

A

ABM	AIR BARRIER MEMBRANE
ACONC	ARCHITECTURAL CONCRETE
ACP{#}	ACOUSTIC CEILING PANEL {TYPE NO.}
ACT{#}	ACOUSTIC CEILING TILE {TYPE NO.}
AD	AREA DRAIN
ADD	ADDENDUM
ADJ	ADJUSTABLE
ADO	AUTOMATIC DOOR OPERATOR
AF	ABOVE FLOOR
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALUM	ALUMINUM
AP	ACCESS PANEL
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
AVBM{#}	AIR VAPOUR BARRIER MEMBRANE
AW	ACID WASTE
AWP{#}	ACOUSTIC WALL PANEL {TYPE NO.}
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL

B

BBD	TILE BACKER BOARD (IN LIEU OF GB BEHIND CT)
BDRM	BEDROOM
BF	BARRIER FREE
BH	BORE HOLE
BM	BENCHMARK
BR	BUMPER RAIL
BSMT	BASEMENT
BT{#}	BASE TYPE {TYPE NO.}

C

CAM	SECURITY CAMERA
CBD	CEMENT BOARD
CG	CORNER GUARD
CH	COAT HOOK
CHB	CHALKBOARD
CJ	CONTROL JOINT
CL	CENTRE LINE
CLG	CEILING
CM	CONSTRUCTION MANAGER
CMU	CONCRETE MASONRY UNIT
CO	CLEAN OUT
COL	COLUMN
CONC{#}	CONCRETE {TYPE NO.}
CON	CONSTRUCTION
CONJT	CONSTRUCTION JOINT
CONT	CONTINUOUS
CONV	CONVECTOR
CPH	CONCEALED PANIC HARDWARE
CPT{#}	CARPET {TYPE NO.}
CR	CHAIR RAIL
CRD	CURTAIN ROD
CT	CURTAIN TRACK
CTR	CENTRE
CUR{#}	CURTAIN {TYPE NO.}
CW{#}	CURTAIN WALL {TYPE NO.}

D

DEMO	DEMOLITION
DEPT	DEPARTMENT
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIFF	DIFFUSER
DIM	DIMENSION
DISP	DISPENSER
DIV	DIVISION
DN	DOWN
DWG	DRAWING

E

EA	EACH
EHO	ELECTRIC HOLD OPEN
ELEC	ELECTRICAL
ELEV	ELEVATOR
EP{#}	EPOXY FLOORING {TYPE NO.}
EPT{#}	EPOXY TERRAZZO
EQ	EQUAL
EQP	EQUIPMENT
ES{#}	EYEWASH STATION {TYPE NO.}
EW{#}	EXTERIOR WALL TYPE
EXG	EXISTING
EXP	EXPOSED
EXPJT{#}	EXPANSION JOINT
EXPSTR	EXPOSED STRUCTURE

F

F{#}	GYPSUM BOARD FURRING {TYPE NO.}
FA	FIRE ALARM
FCU	FAN COIL UNIT
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FH	FIRE HYDRANT
FHC	FIRE HOSE CABINET
FIN{#}	FINISH {TYPE NO.}
FL	FLOOR OR FLOORING
FLGR{#}	FLOOR GRILLE {TYPE NO.}
FLUOR	FLUORESCENT
FN{#}	FENCE {TYPE NO.}
FR	FIRE RATED
FRR	FIRE RESISTANCE RATING
FRTR	FIRE RETARDANT TREATED
FS	FULL-SIZE

G

GA	GAUGE
GALV	HOT DIPPED GALVANIZED
GB	GYPSUM BOARD
GBC{#}	GYPSUM BOARD CEILING {TYPE NO.}
GBR	GRAB BAR
GC	GENERAL CONTRACTOR
GDRL{#}	GUARDRAIL {TYPE NO.}
GFRG	GLASS FIBRE REINFORCED GYPSUM
GL{#}	GLASS {TYPE NO.}
GMU	GLASS MASONRY UNIT
GT{#}	GEOTEXTILE FILTER FABRIC {TYPE NO.}

H

HB	HOSE BIB
HDRL{#}	HANDRAIL
HM	HOLLOW METAL
HM{#}	HOLLOW METAL DOOR TYPE
HOR	HORIZONTAL
HP	HIGH POINT
HR	HOUR
HSS	HOLLOW STEEL SECTION
HT	HEIGHT
HVAC	HEATING VENTILATING AND AIR CONDITIONING

I

ID	INSIDE DIAMETER
IFP	INTUMESCENT FIREPROOFING
INT	INTERIOR
INS{#}	INSULATION TYPE {#}
INV	INVERT
IVT	INTRAVENOUS TRACK

J

JAN	JANITOR
JT	JOINT

K

KG	KILOGRAM
KO	KNOCKOUT

L

LAB	LABORATORY
LAM	LAMINATED
LAV	LAVATORY
LINO	LINOLEUM
LP	LOW POINT

M

M	METRE
M{#}	CONCRETE MASONRY UNIT WALL {TYPE NO.}
MAX	MAXIMUM
MECH	MECHANICAL
MEZZ	MEZZANINE
MG	MAKE GOOD
MH	MAINTENANCE HOLE
MIC	MICROPHONE
MIN	MINIMUM
MIR	MIRROR
MISC	MISCELLANEOUS
MISCMTL	MISCELLANEOUS METAL
MR{#}	FIRE RATED CONCRETE MASONRY UNIT WALL {TYPE NO.}
MWK	MILLWORK
MM	MILLIMETRE
MO	MASONRY OPENING
MTL	METAL

N

NA	NOT APPLICABLE
NBC	NATIONAL BUILDING CODE
NFHB	NON-FREEZE HOSE BIB
NIC	NOT IN CONTRACT
NO	NUMBER
NRC	NOISE REDUCTION COEFFICIENT
NS	NON-SLIP (SLIP RESISTANT)
NTS	NOT TO SCALE

O

OAA	ONTARIO ASSOCIATION OF ARCHITECTS
OBC	ONTARIO BUILDING CODE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFF	OFFICE
OHD{#}	OVERHEAD DOOR {TYPE NO.}
OPP	OPPOSITE
OWSJ	OPEN WEB STEEL JOIST

P

P{#}	GYPSUM BOARD PARTITION {TYPE NO.}
PCONC	PRECAST CONCRETE
PE{#}	MOVEABLE PARTITION {TYPE NO.}
PERF	PERFORATED
PH	PANIC HARDWARE
PLAS{#}	PLASTER {TYPE NO.}
PLAM{#}	PLASTIC LAMINATE {TYPE NO.}
PLWD	PLYWOOD
PLB	PLUMBING
PPT	PRIME PAINTED
PR{#}	FIRE RATED GYPSUM BOARD PARTITION {TYPE NO.}
PREFAB	PREFABRICATED
PREFIN	PREFINISHED
PROJ	PROJECTION
PS{#}	SHAFT WALL {TYPE NO.}
PSF	POUNDS PER SQUARE FOOT
PSH{#}	HORIZONTAL SHAFT WALL {TYPE NO.}
PSI	POUNDS PER SQUARE INCH
PT{#}	PAINT {TYPE NO.}
PTD	PAPER TOWEL DISPOSAL
PTDD	PAPER TOWEL DISPENSER
PTR	PAPER TOWEL RECEPTOR
PVA	POLYVINYL ACETATE
PVC	POLYVINYL CHLORIDE

R

R	RADIUS
R{#}	ROOF TYPE {TYPE NO.}
RAD	RADIATOR
RBM	ROOT BARRIER MEMBRANE
RC	REINFORCED CONCRETE
RD	ROOF DRAIN
REF	REFERENCE
REFR	REFRIGERATOR
REV	REVISION
RFS	ROOM FINISH SCHEDULE
RM	ROOM
RO	ROUGH OPENING
RP	REMOVABLE PANEL
RPM	REVOLUTIONS PER MINUTE
RSF{#}	RESILIENT SHEET FLOORING {TYPE NO.}
RSU	ROD & SHELF UNIT
RT{#}	RESILIENT TILE {TYPE NO.}
RTU	ROOF-TOP UNIT
RWL	RAINWATER LEADER

S

S{#}	SOFFIT TYPE {TYPE NO.}
SBO	SUPPLIED BY OWNER (FOR CONTRACTOR INSTALLATION)
SC	SCREEN
SD	SOAP DISPENSER
SECT	SECTION
SF{#}	SUBFLOOR {TYPE NO.}
SFRM	SPRAYED FIREPROOFING
SHHC	SHOWER HEAD & CURTAIN
SIM	SIMILAR
SND	SANITARY NAPKIN DISPENSER
SNR	SANITARY NAPKIN RECEPTOR
SPK	SPEAKER
SP{#}	SPANDREL PANEL TYPE NO.
SPEC	SPECIFICATION
SPLR	SPRINKLER
SQ	SQUARE
SS	STAINLESS STEEL
SSM{#}	SOLID SURFACE MATERIAL {TYPE NO.}
ST	STAIN
STC	SOUND TRANSMISSION CLASS
STD	STANDARD
STL	STEEL
STL D	STEEL DECK
STN{#}	STONE {#}
STRUC	STRUCTURAL
SUSP	SUSPENDED
SVC	SPRINKLER VALVE CABINET

T

T&G	TONGUE AND GROOVE
TB	TOWEL BAR
TBD	TACK BOARD
TEL	TELEPHONE
TERR	TERRAZZO
TEX{#}	TEXTILE {TYPE NO.}
THR{#}	THRESHOLD {TYPE NO.}
TL{#}	TILE {TYPE NO.}
TOC	TOP OF CURB
TOCS	TOP OF CONCRETE SLAB
TOL	TOP OF LEDGE
TOS	TOP OF STEEL
TOW	TOP OF WALL
TP	TOILET PARTITION
TPH	TOILET PAPER HOLDER
TR{#}	FLOOR TRANSITION TYPE NO.
TT{#}	TRAFFIC TOPPING {TYPE NO.}
TWSI{#}	TACTILE WARNING SURFACE INDICATORS {TYPE NO.}
TXF	TEXTURED FINISH
TYP	TYPICAL

U

UC	UNDERCUT
U/S	UNDERSIDE
U/SS	UNDERSIDE SOFFIT
UPS	UNINTERRUPTIBLE POWER SUPPLY
UH	UNIT HEATER

V

V	VINYL
VERT	VERTICAL
VEST	VESTIBULE
VWC{#}	VINYL WALL COVERING

W

W	WIDTH
W/	WITH
WA{#}	WASHROOM ACCESSORY {TYPE NO.}
WBD	WHITEBOARD
WC	WATER CLOSET
WD	WOOD FRAME MATERIAL
WD{#}	WOOD DOOR {TYPE NO.}
WDS{#}	SOLID WOOD TYPE NO.
WDFL{#}	WOOD FLOORING TYPE NO.
WDP{#}	WOOD PANEL TYPE NO.
WDVN{#}	WOOD VENEER TYPE NO.
WDU	WASTE DISPOSAL UNIT
WH	WALL HUNG
WMD	WIRE MOLD
WP	WALL PROTECTION
WPM	WATERPROOFING MEMBRANE
WR	WASHROOM
WS{#}	WINDOW SHADES {TYPE NO.}
WTS	WATERPROOF TRAFFIC SURFACING
WWF	WELDED WIRE FABRIC

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No.	Date	Description
1	2024-03-22	SD Costing

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21022

DRAWING SYMBOLS AND ABBREVIATIONS

As indicated

A001

4/22/2024 3:05:17 PM

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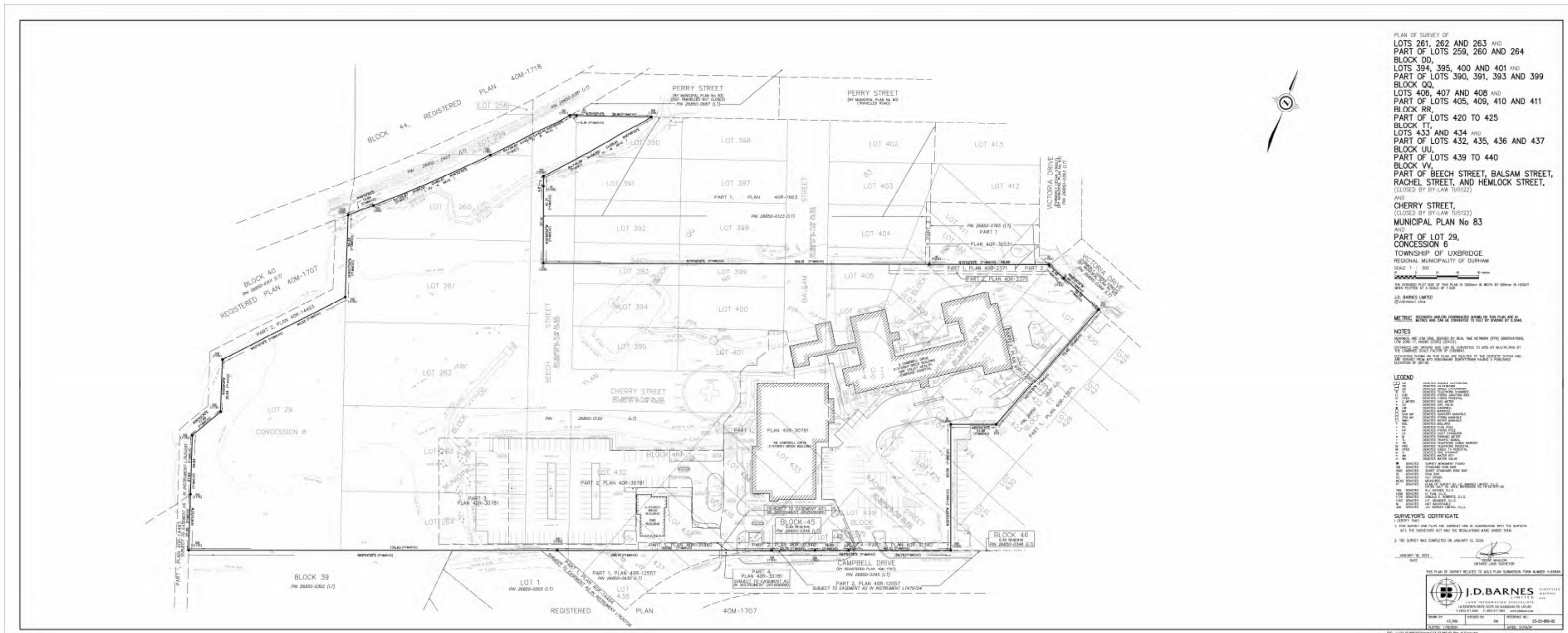
No.	Date	Description
1	2024-03-25	SD Costing



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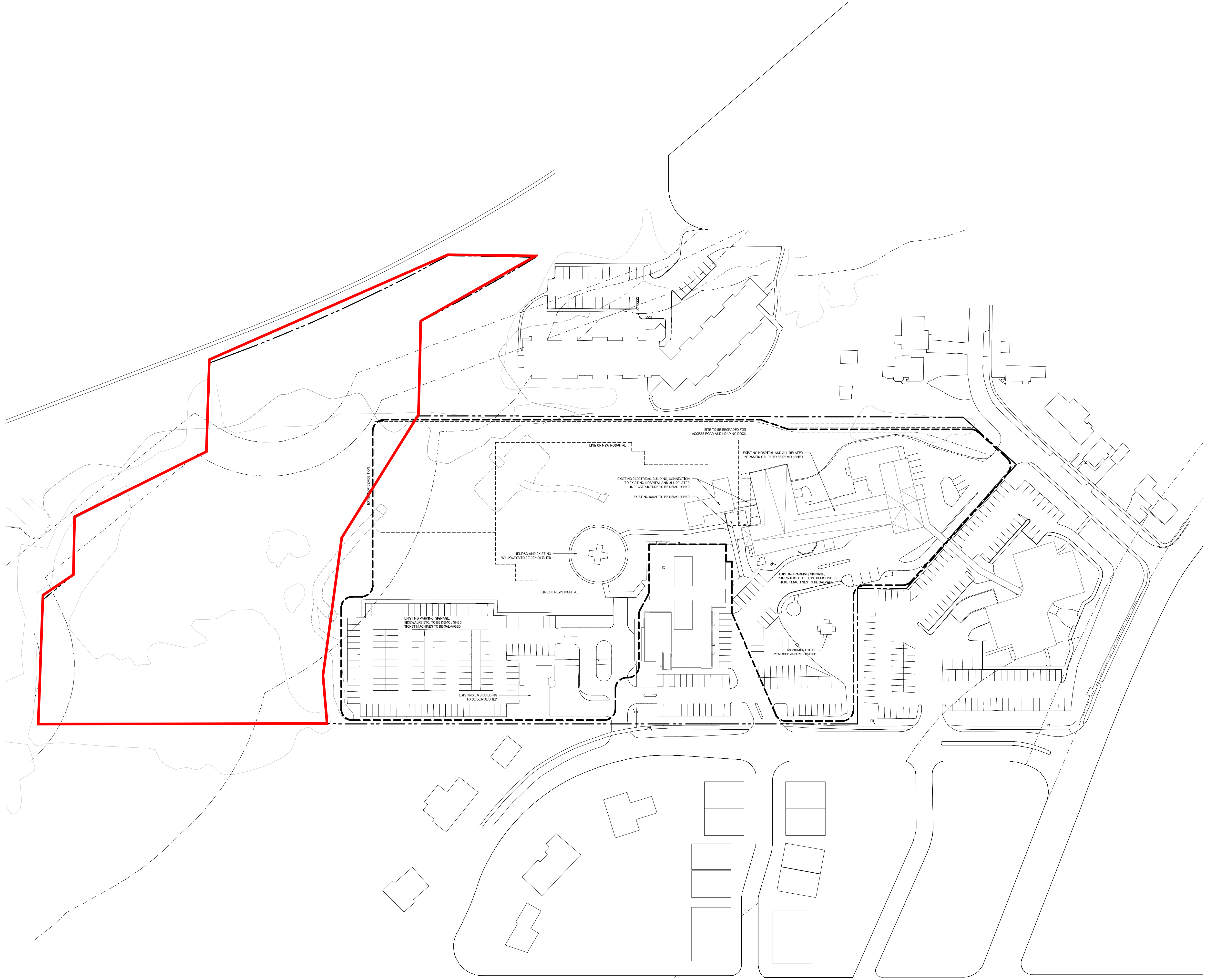
SITE SURVEY

A010



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1	2024-03-25	SD Costing

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SITE PLAN - DEMOLITION

1 : 500

A011

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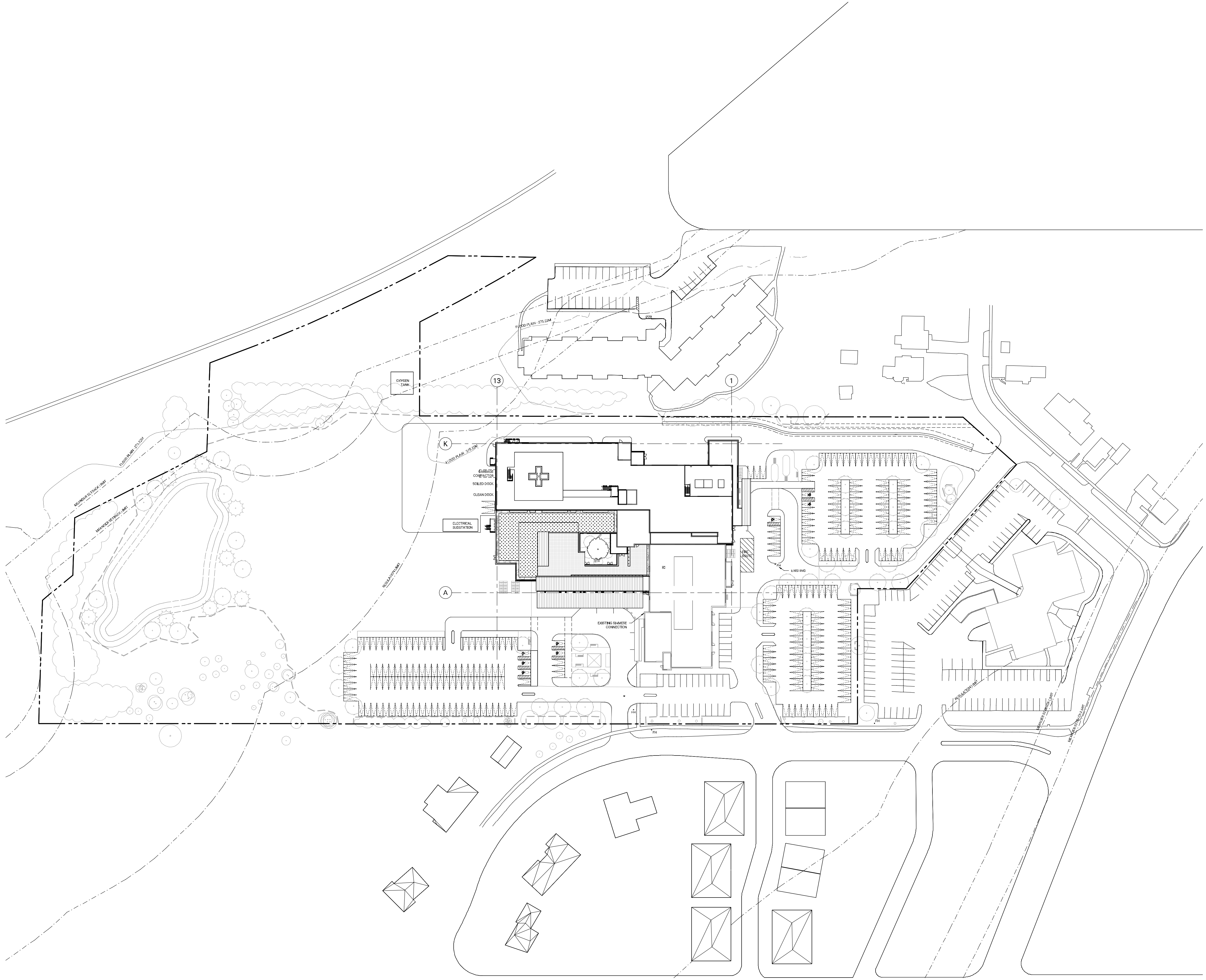

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No.	Date	Description
1	2024-03-25	SD Costing

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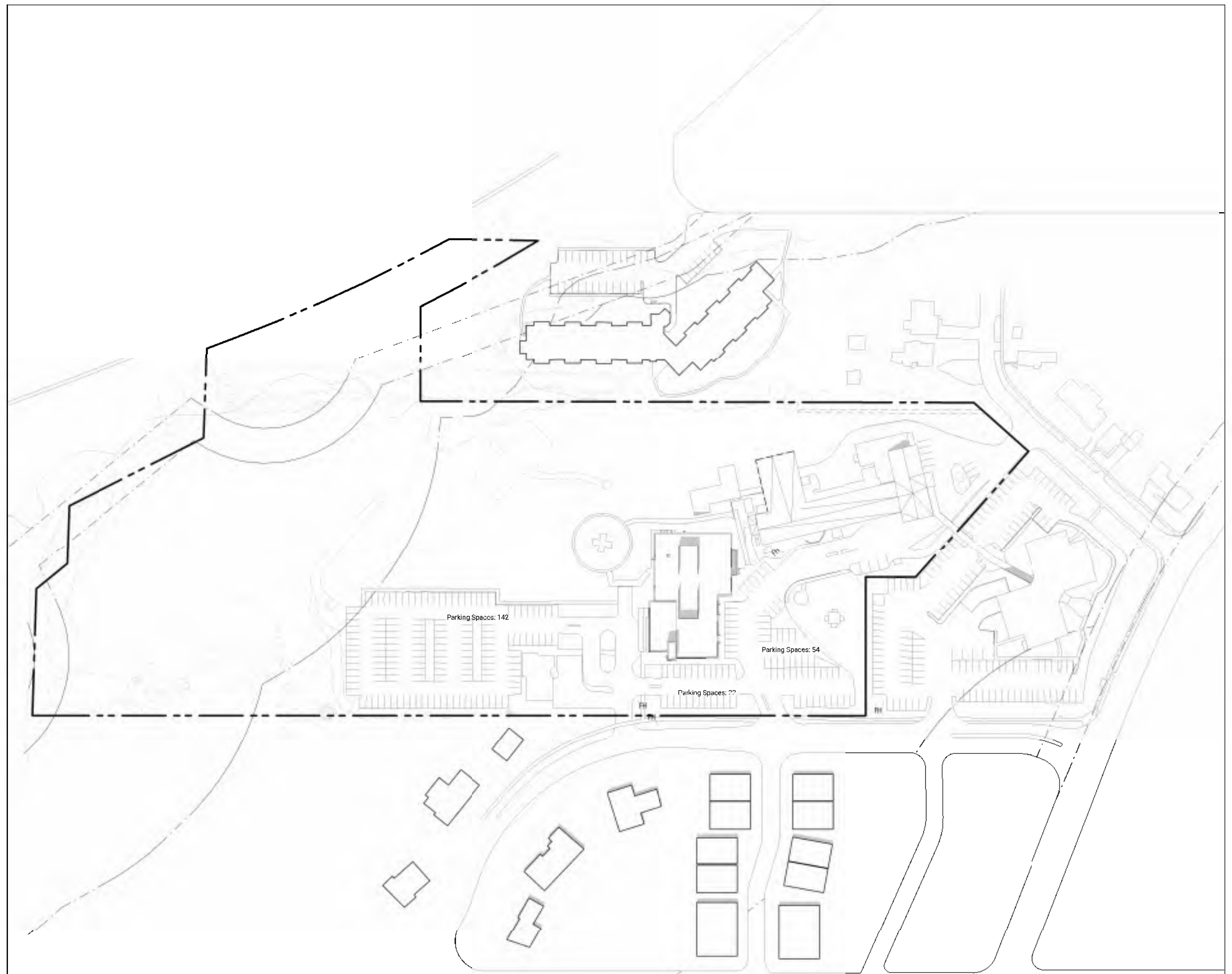
SITE PLAN

1 : 500

A012

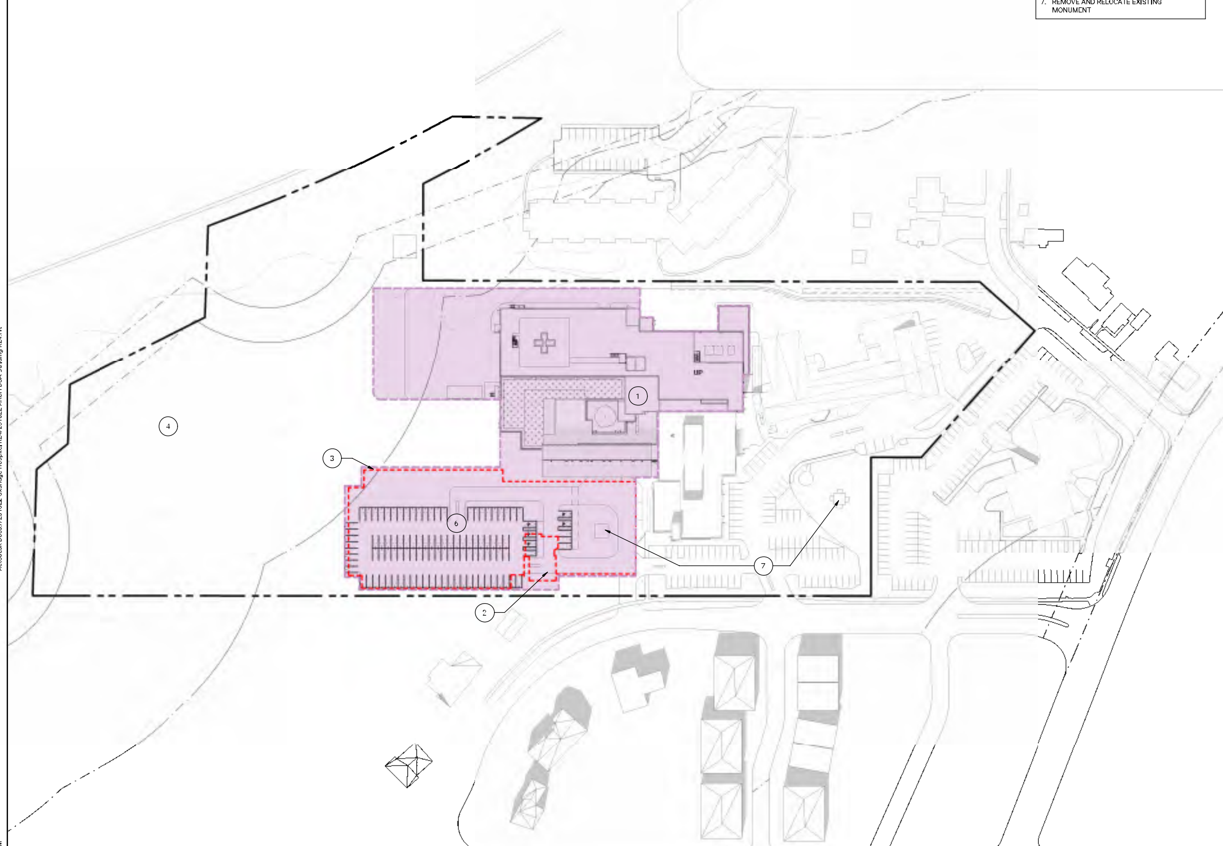


EXISTING SITE PLAN (2 / A013)
1 : 1000

PHASE 1

1. RELOCATE EXISTING HOSPITAL HVAC
2. ADD RETAINING WALL FOR NORTH ACCESS ROAD
3. RELOCATE EXISTING HOSPITAL GENERATOR TO SW CORNER OF EXISTING HOSPITAL
4. ADD NEW TRANSFER SWITCH WITH ENCLOSURE TO SW CORNER OF EXISTING HOSPITAL
5. ADD NEW PAD MOUNTED OIL TANK TO SW CORNER OF EXITING HOSPITAL
6. DEMOLISH EXISTING HOSPITAL ELECTRICAL BUILDING INCLUDING RAMP, CONNECTION TO EXISTING HOSPITAL AND ALL RELATED INFRASTRUCTURE
7. REGRADE SLOPE NORTH OF EXISTING HOSPITAL
8. ADD STAIR FROM SECOND FLOOR EXIT OF EXISTING HOSPITAL

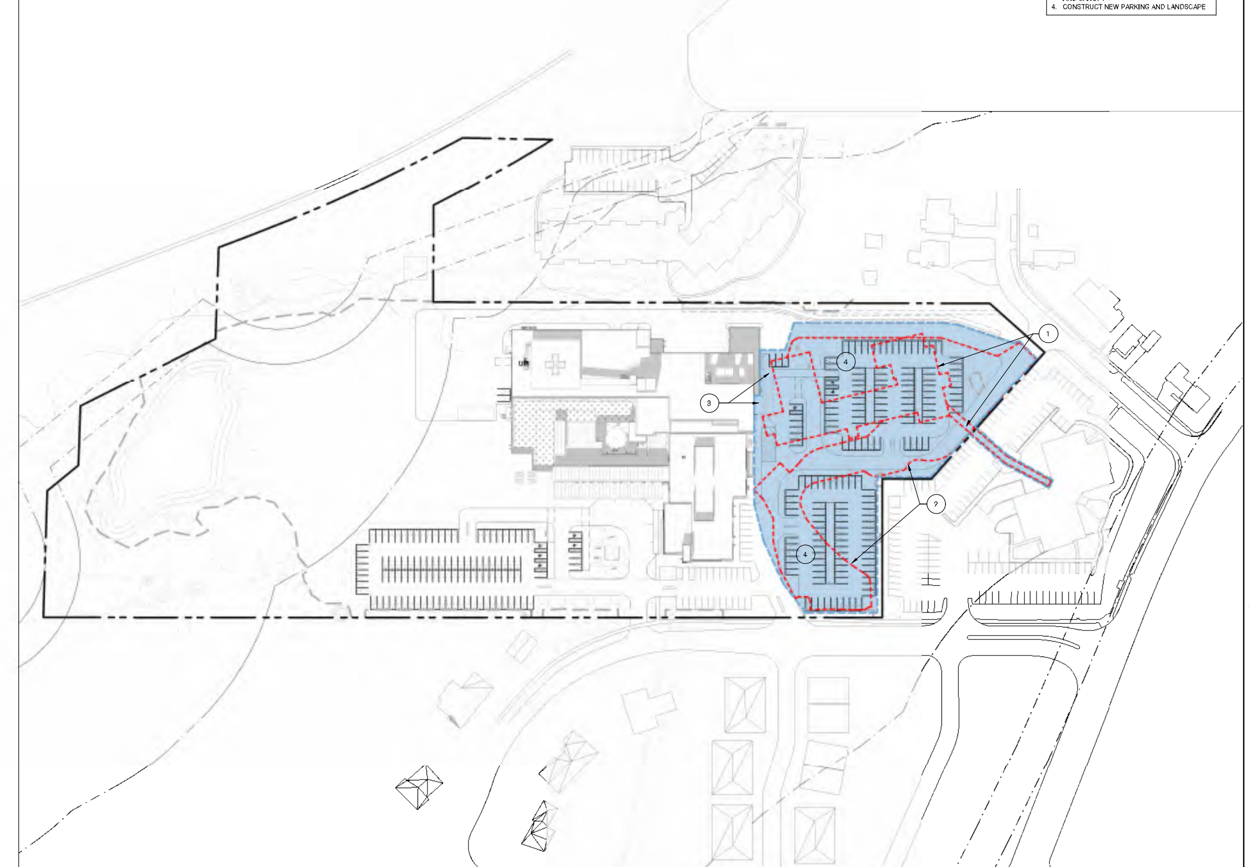
PHASE 1 - EARLY WORKS (1 / A013)
1 : 1000



PHASE 2

1. CONSTRUCT NEW HOSPITAL
2. DEMOLISH EMS BUILDING AND ASSOCIATED INFRASTRUCTURE
3. DEMOLISH EXISTING PARKING
4. CONSTRUCT STORM WATER POND AND ASSOCIATED INFRASTRUCTURE
5. PROVIDE NEW SITE SERVICING
6. CONSTRUCT NEW PARKING AREA AND LANDSCAPE
7. REMOVE AND RELOCATE EXISTING MONUMENT

PHASE 2 - NEW CONSTRUCTION (3 / A013)
1 : 1000



PHASE 3

1. DEMOLISH EXISTING HOSPITAL AND ASSOCIATED INFRASTRUCTURE, INCLUDING BRIDGE
2. DEMOLISH PARKING AREAS AND ASSOCIATED INFRASTRUCTURE
3. CONSTRUCT REMAINING EMERGENCY ENTRY AND CANOPY
4. CONSTRUCT NEW PARKING AND LANDSCAPE

PHASE 3 - EAST SITE WORKS (4 / A013)
1 : 1000

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Construction Phases

- Phase 1 (Early Works)
- Phase 2 (New Construction)
- Phase 3 (East Site New Construction)
- Demolished

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1	2024-03-25	SD Costing

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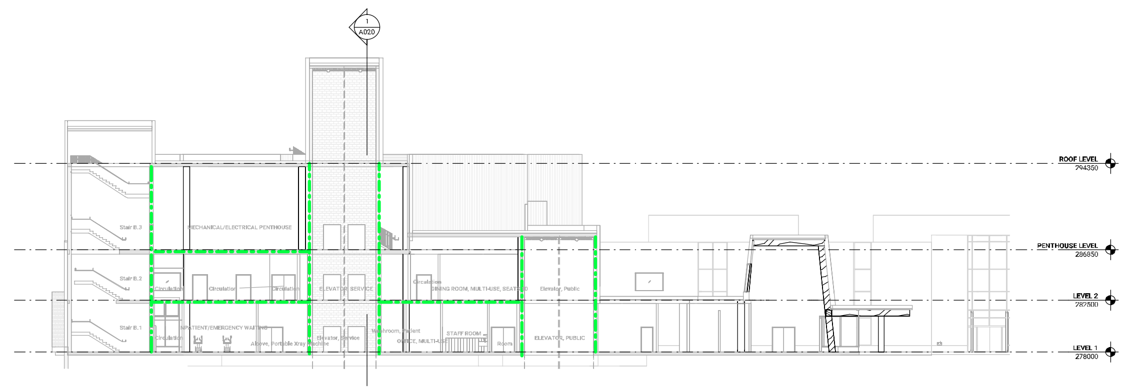
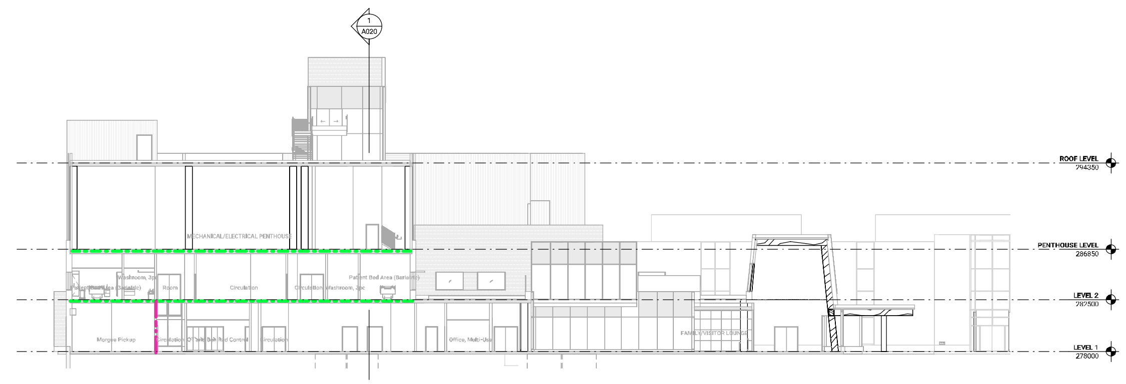
PHASING DIAGRAMS

1 : 1000

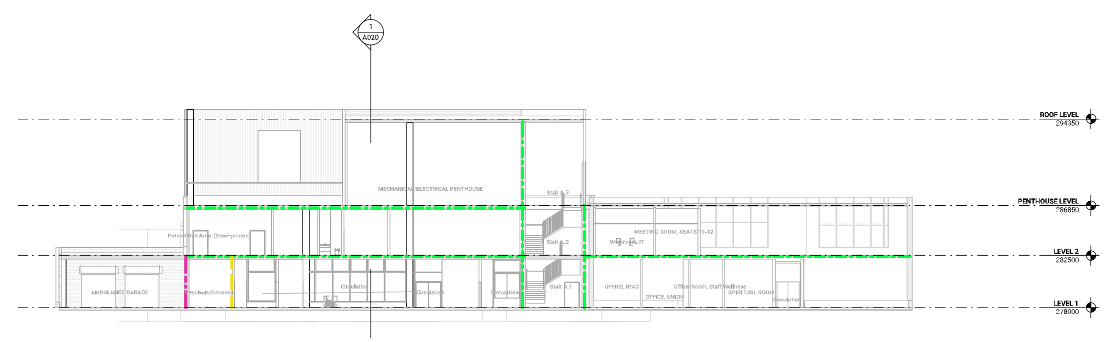
A013



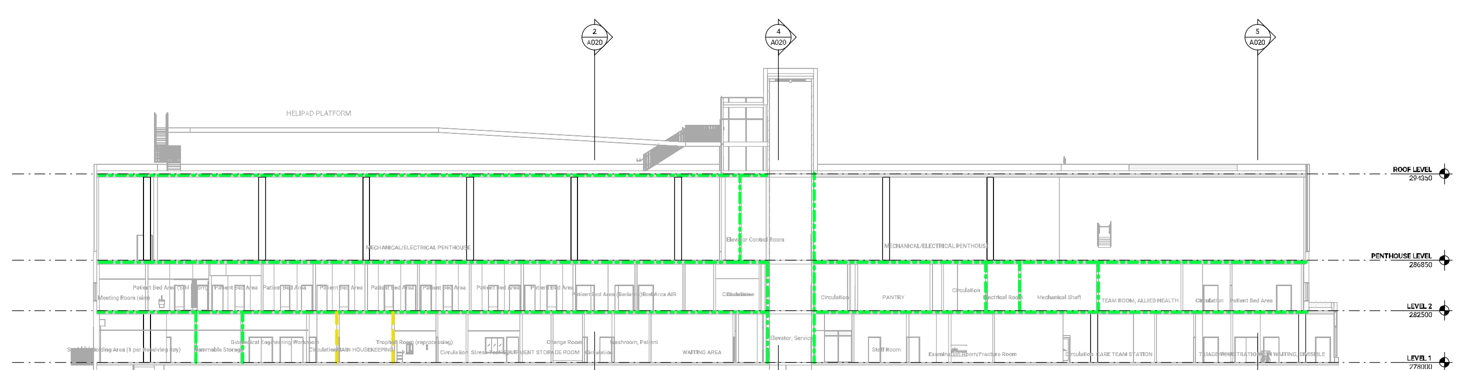
Life Safety Section - North South 3
ref.1 / A020 1 : 200
4 / A020



Life Safety Section - North South 2
ref.1 / A020 1 : 200



Life Safety Section - North South 1
ref.1 / A020 1 : 200



LIFE SAFETY SECTION - EAST WEST
ref.2 / A020 1 : 200

Firm Name: Diamond Schmitt Architects
Certificate of Practice Number:
384 Adelaide St. W, Suite 100
Toronto, ON M5V 1R7
1 (416) 862 8800
The Certificate of Practice Number of the Holder is the Holder's BCDN.

Name of the Project:
Enter Project Name

Location:
Enter Project Address

Date: Enter Date

The Architect Noted Above has Exercised Responsible Control with Respect to Design Activities. The Architect's Seal Number is the Architect's BCDN.

	Ontario Building Code Data Matrix Parts 3		Building Code Reference 1
3.00	Building Code Version:	O.Reg. 332/12 Last Amendment O. Reg. 191/14	
3.01	Project Type:	☐ New ☐ Addition ☐ Renovation ☐ Change of Use ☐ Addition and Renovation Description:-	[A] 1.1.2.
3.02	Major Occupancy Classification:	Occupancy: - Use: -	3.1.2.1.(1)
3.03	Superimposed Major Occupancies:	☐ No ☐ Yes Description:	3.2.2.7.
3.04	Building Area (m²)	Description: - / - / - / - ; Existing 0, New 0, Total 0 (each row); Total 0 0 0	[A] 1.4.1.2.
3.05	Gross Area (m²)	Description: - / - / - / - / - / - / - ; Existing 0, New 0, Total 0 (each row); Total 0 0 0	[A] 1.4.1.2.
3.06	Mezzanine Area (m²)	Description: - / - / - / - / - ; Existing 0, New 0, Total 0 (each row); Total 0 0 0	3.2.1.1.
3.07	Building Height	0 Storeys Above Grade 0 (m) Above Grade 0 Storeys Below Grade	[A] 1.4.1.2. & 3.2.1.1.
3.08	High Building	☐ No ☐ Yes	3.2.6.
3.09	Number of Streets/ Firefighter Access	0 Street(s)	3.2.2.10. & 3.2.5.
3.10	Building Classification: (Size and Construction Relative to Occupancy)	3.2.2. Group/Div -	3.2.2.20. - 83.
3.11	Sprinkler System	☐ Required ☐ Not Required Proposed: ☐ Entire Building ☐ Selected Compartments ☐ Selected Floor Areas ☐ Basement ☐ In Lieu of Roof Rating ☐ None	3.2.1.5. & 3.2.2.17.
3.12	Standpipe System	☐ Required ☐ Not Required	3.2.9.
3.13	Fire Alarm System	☐ Required ☐ Not Required Proposed: ☐ Single Stage ☐ Two stage ☐ None	3.2.4.
3.14	Water Service / Supply is Adequate	☐ No ☐ Yes	
3.15	Construction Type:	Restriction: ☐ Combustible Permitted ☐ Non-Combustible Required Actual: ☐ Combustible ☐ Non-Combustible ☐ Combination Heavy Timber Construction: ☐ No ☐ Yes	3.2.2.20. - 83. & 3.2.1.4.
3.16	Importance Category:	☐ Low ☐ Normal ☐ Low Human Occupancy ☐ Post-Disaster Shelter ☐ High ☐ Minor Storage Building ☐ Explosive or Hazardous Substances ☐ Post Disaster	4.1.2.1.(3) & T4.1.2.1.B
3.17	Seismic Hazard Index:	(IE Fa Sa (0.2)) = - Seismic Design Required for Table 4.1.8.18. Items 6 to 21: ((IE Fa Sa (0.2)) ≥ 0.35 or Post-Disaster) ☐ No ☐ Yes	4.1.2.1.(3) 4.1.8.18.(2)
3.17	Occupant Load	Floor Level/Area: - ; Occupancy Type: - ; Based On: - ; Occupant Load (Persons): 0 / 0 / 0 / 0 / 0 / 0	3.1.17.
3.19	Barrier-Free Design	☐ Yes ☐ No Explanation: -	3.8.
3.20	Hazardous Substances:	☐ Yes ☐ No Explanation: -	3.3.1.2. & 3.3.1.19.
3.21	Required Fire Resistance Ratings	Horizontal Assembly / Rating / Supporting Assembly (H) / Non-Combustible in Lieu of Rating? Floors Over Basement 0 0 ☐ No ☐ Yes ☐ N/A Floors 0 0 ☐ No ☐ Yes ☐ N/A Mezzanine 0 0 ☐ No ☐ Yes ☐ N/A Roof 0 0 ☐ No ☐ Yes ☐ N/A	3.2.2.20. - 83. & 3.2.1.4.
3.22	Spatial Separation	Wall / EBF Area (m²) / L.D. (m) / L/H or H/L / Required FRR (H) / Construction Type Required / Cladding Type Required - 0 0 0 0 ☐ Non-Combustible ☐ Combination (7 rows)	3.2.3.
3.23	Plumbing Fixture Requirements	Ratio: Male:Female = 50:50 Except as Noted Otherwise Floor Level/Area / Occupant Load / OBC Reference / Fixtures Required / Fixtures Provided 0 0 0 (6 rows)	3.7.4.
3.24	Energy Efficiency:	Compliance Path: - Climatic Zone: -	
3.25	Notes:	-	

1 *All References are to Division B of the OBC Unless Preceded by [A] for Division A and [C] for Division C.*

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Issued
No. Date Description

LEGEND - FIRE SEPARATION

- 0-MIN FIRE RATED ASSEMBLY
- 45-MIN FIRE RATED ASSEMBLY
- 60-MIN FIRE RATED ASSEMBLY
- 90-MIN FIRE RATED ASSEMBLY
- 120-MIN FIRE RATED ASSEMBLY
- TRAVEL DISTANCE LINE

GENERAL NOTES - FIRE SEPARATIONS:

1. ALL CLOSURES TO HAVE LABELLED RATINGS (C/W LABELLED FRAMES AND CLOSURES). PROVIDE FIRE DAMPERS AS PER MECHANICAL DRAWINGS.
2. DASHED LINE INDICATES FIRE RESISTANCE RATED ASSEMBLY NOT CONSTRUCTED AS A FIRE SEPARATION
3. TO BE READ IN CONJUNCTION WITH CODE CONSULTANT REPORT

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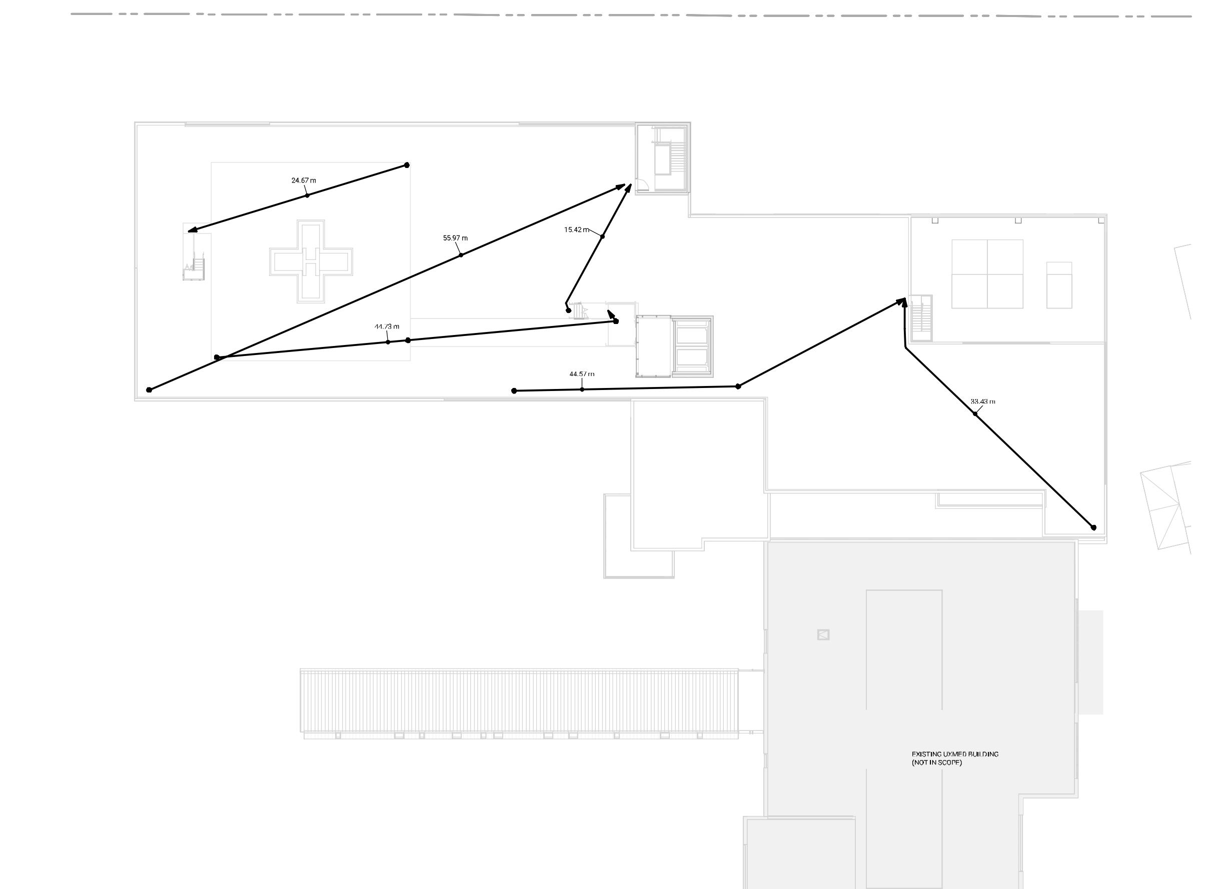
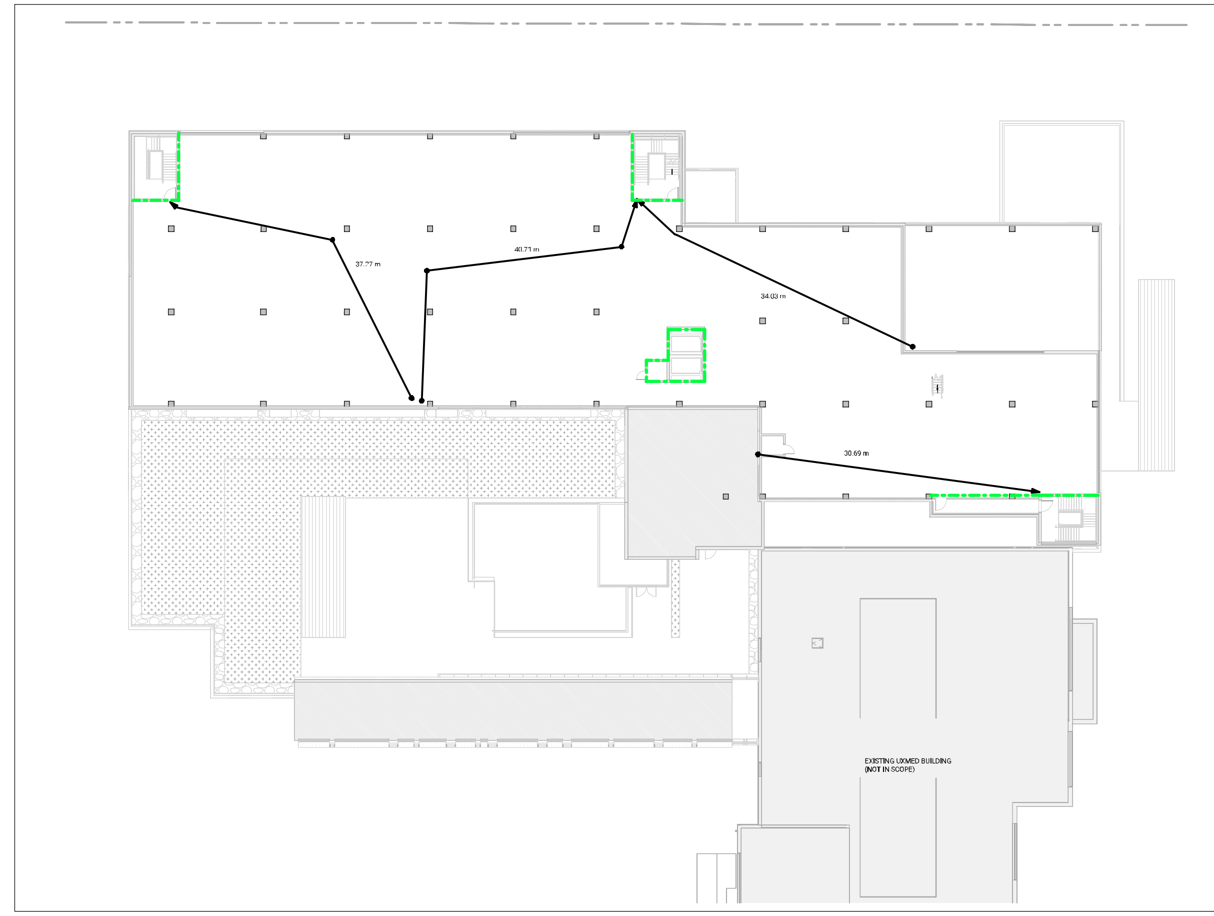
OBC MATRIX AND LIFE SAFETY SECTIONS

As indicated

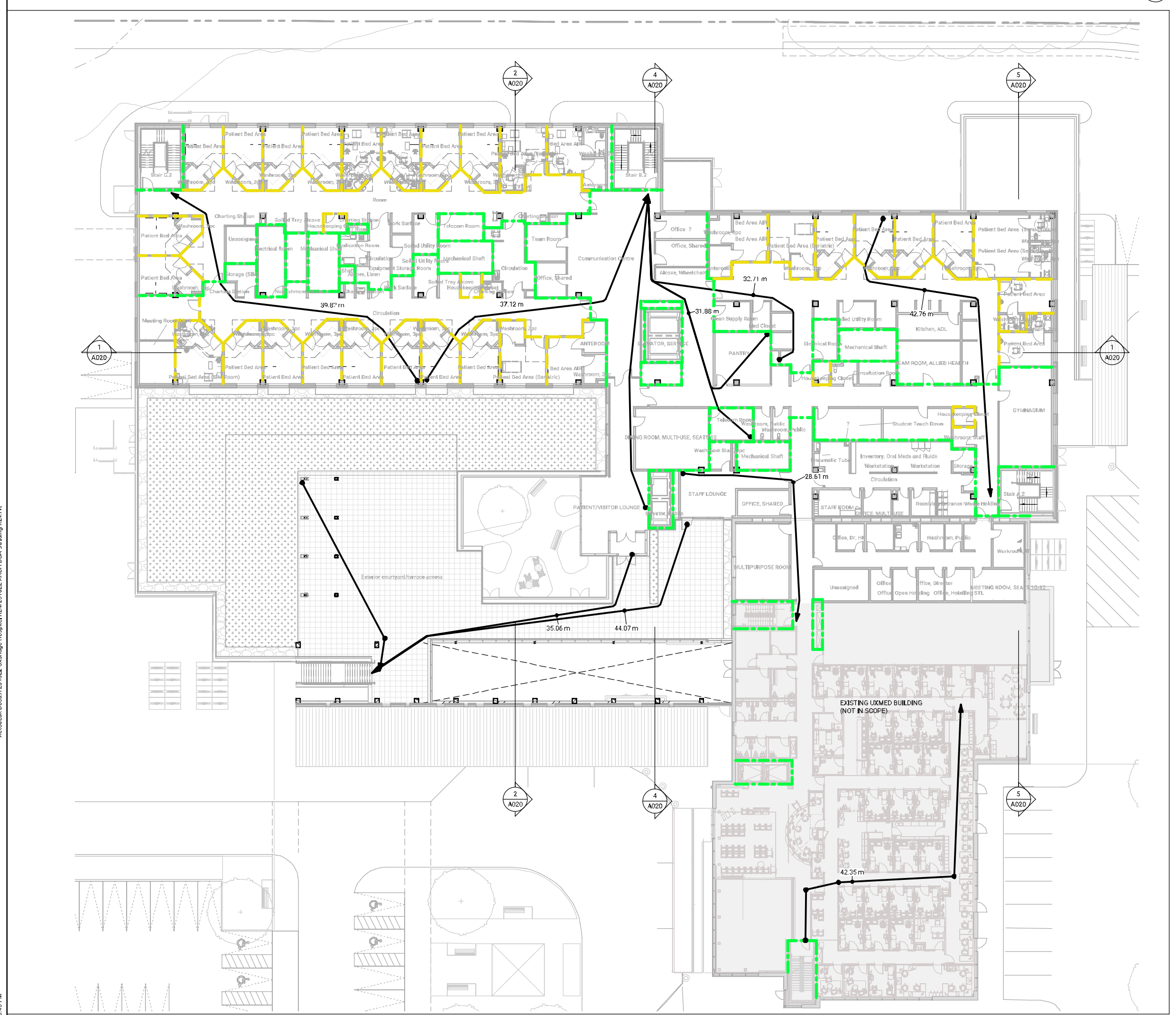
A020



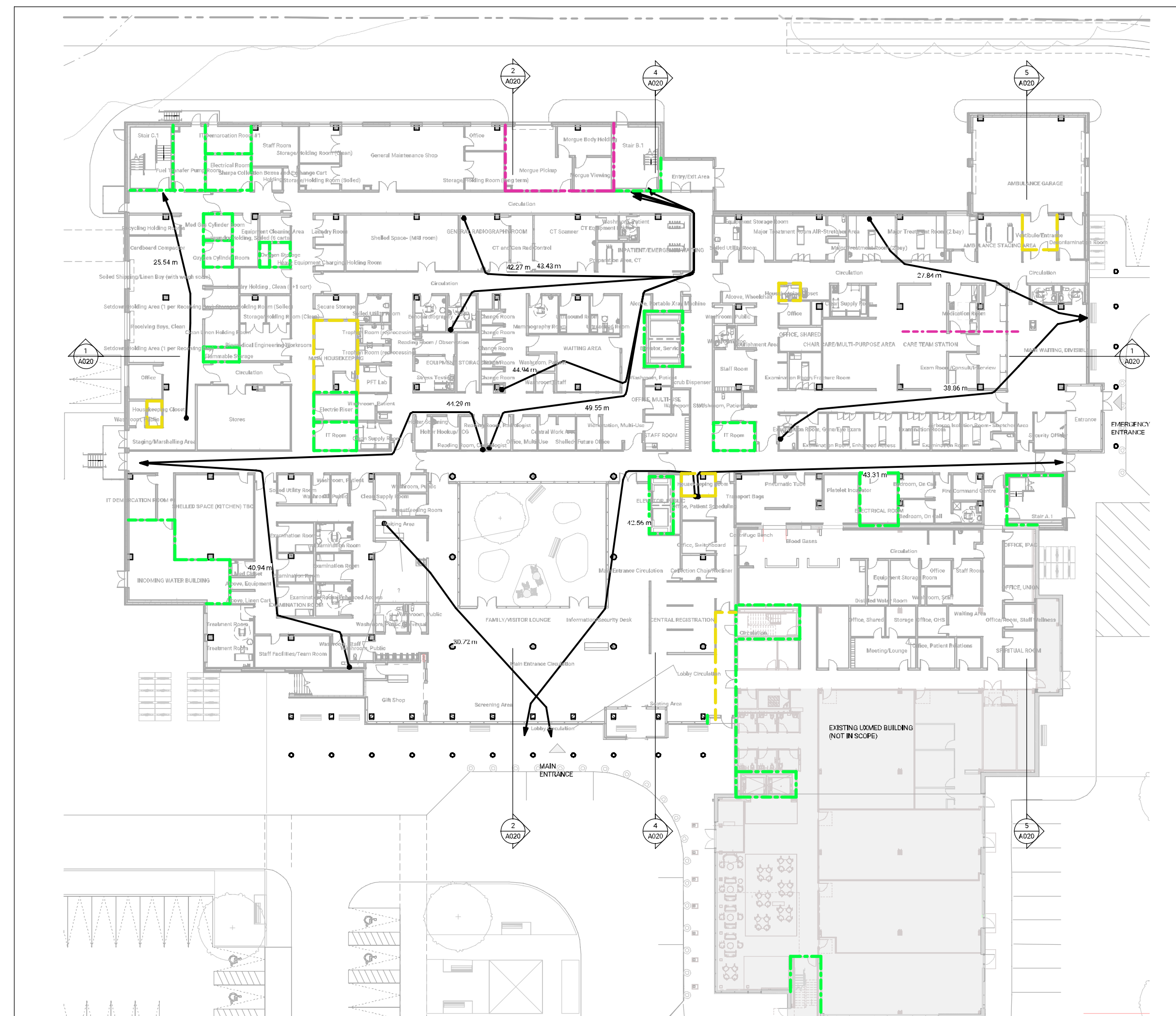
ROOF LEVEL - LIFE SAFETY PLAN 4 A021
ref 1 / A020 1 : 250



PENTHOUSE LEVEL - LIFE SAFETY PLAN 3 A021
1 : 250



LEVEL 2 - LIFE SAFETY PLAN 2 A021
1 : 250



LEVEL 1 - LIFE SAFETY PLAN 1 A021
ref 1 / A020 1 : 250

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No.	Date	Description

LEGEND - FIRE SEPARATION

- 0-MIN FIRE RATED ASSEMBLY
- 45-MIN FIRE RATED ASSEMBLY
- 60-MIN FIRE RATED ASSEMBLY
- 90-MIN FIRE RATED ASSEMBLY
- 120-MIN FIRE RATED ASSEMBLY
- TRAVEL DISTANCE LINE

GENERAL NOTES - FIRE SEPARATIONS:

1. ALL CLOSURES TO HAVE LABELLED RATINGS (C/W LABELLED FRAMES AND CLOSURES). PROVIDE FIRE DAMPERS AS PER MECHANICAL DRAWINGS.
2. DASHED LINE INDICATES FIRE-RESISTANCE RATED ASSEMBLY NOT CONSTRUCTED AS A FIRE SEPARATION
3. TO BE READ IN CONJUNCTION WITH CODE CONSULTANT REPORT

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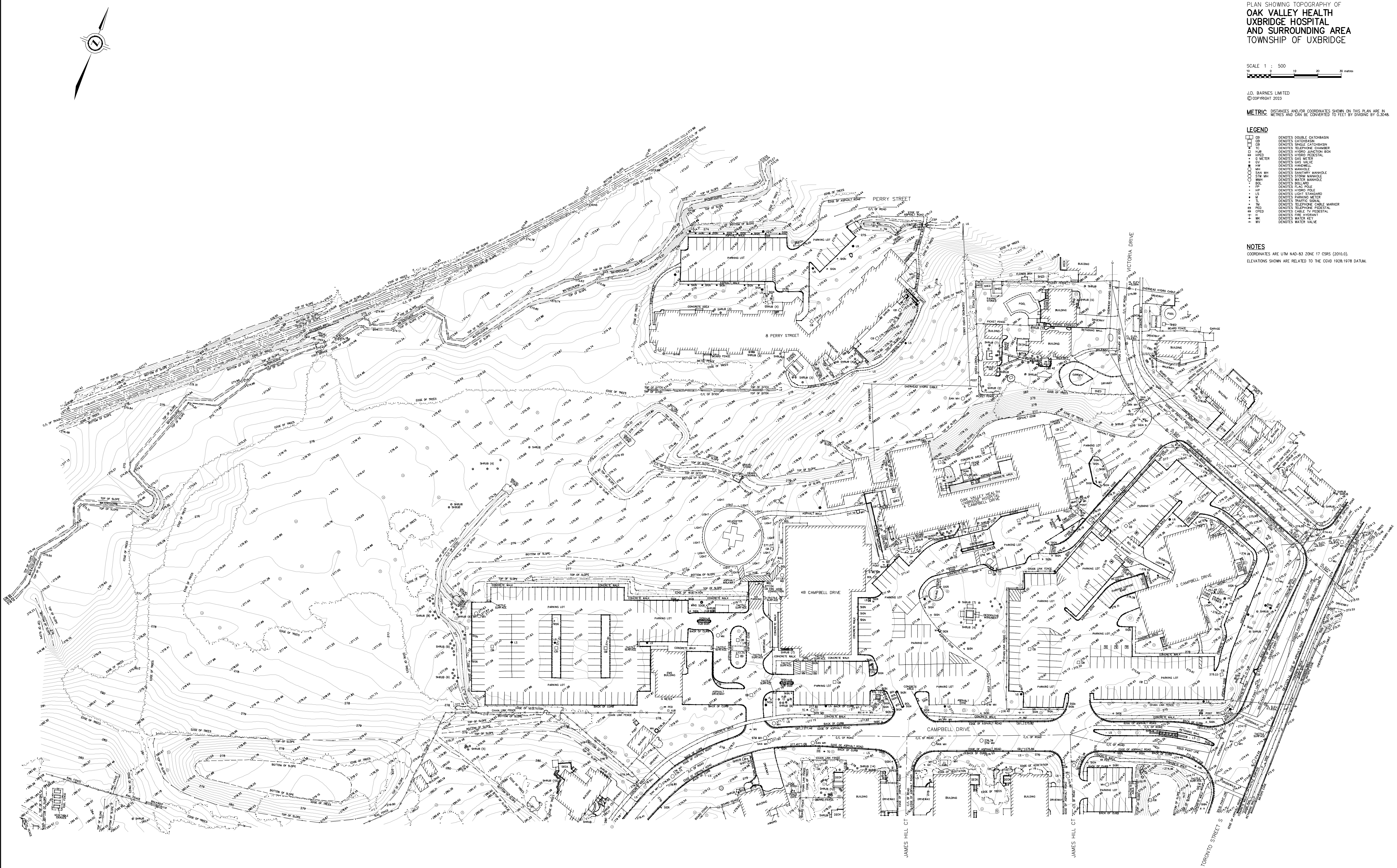
LIFE SAFETY PLANS

1 : 250

A021



PLAN SHOWING TOPOGRAPHY OF

OAK VALLEY HEALTH UXBRIDGE HOSPITAL AND SURROUNDING AREA

TOWNSHIP OF UXBRIDGE

SCALE 1 : 500

10 0 10 20 30 metres

J.D. BARNES LIMITED

METRIC DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

LEGEND

CB	DENOTES DOUBLE CATCHBASIN
CB	DENOTES CATCHBASIN
CB	DENOTES SINGLE CATCHBASIN
TC	DENOTES TELEPHONE CHAMBER
HJB	DENOTES HYDRO JUNCTION BOX
HPED	DENOTES HYDRO PEDESTAL
G METER	DENOTES GAS METER
GV	DENOTES GAS VALVE
HW	DENOTES HANDWELL
MH	DENOTES MANHOLE
SAN MH	DENOTES SANITARY MANHOLE
STM MH	DENOTES STORM MANHOLE
WMH	DENOTES WATER MANHOLE
BOL	DENOTES BOLLARD
FP	DENOTES FLAG POLE
HP	DENOTES HYDRO POLE
LS	DENOTES LIGHT STANDARD
M	DENOTES PARKING METER
TL	DENOTES TRAFFIC SIGNAL
TM	DENOTES TELEPHONE CABLE MARKER
PED	DENOTES TELEPHONE PEDESTAL
CPED	DENOTES CABLE TV PEDESTAL
H	DENOTES FIRE HYDRANT
WK	DENOTES WATER KEY
WV	DENOTES WATER VALVE

NOTES

COORDINATES ARE UTM NAD-83 ZONE 17 CSRS (2010.0).

ELEVATIONS SHOWN ARE RELATED TO THE CGVD 1928:1978 DATUM.

THE SURVEY WAS COMPLETED ON NOVEMBER 3, 2023.

J.D.BARNES LIMITED
SURVEYING MAPPING GIS
LAND INFORMATION SPECIALISTS
140 RENFREW DRIVE, SUITE 100, MARKHAM, ON L3R 6B3
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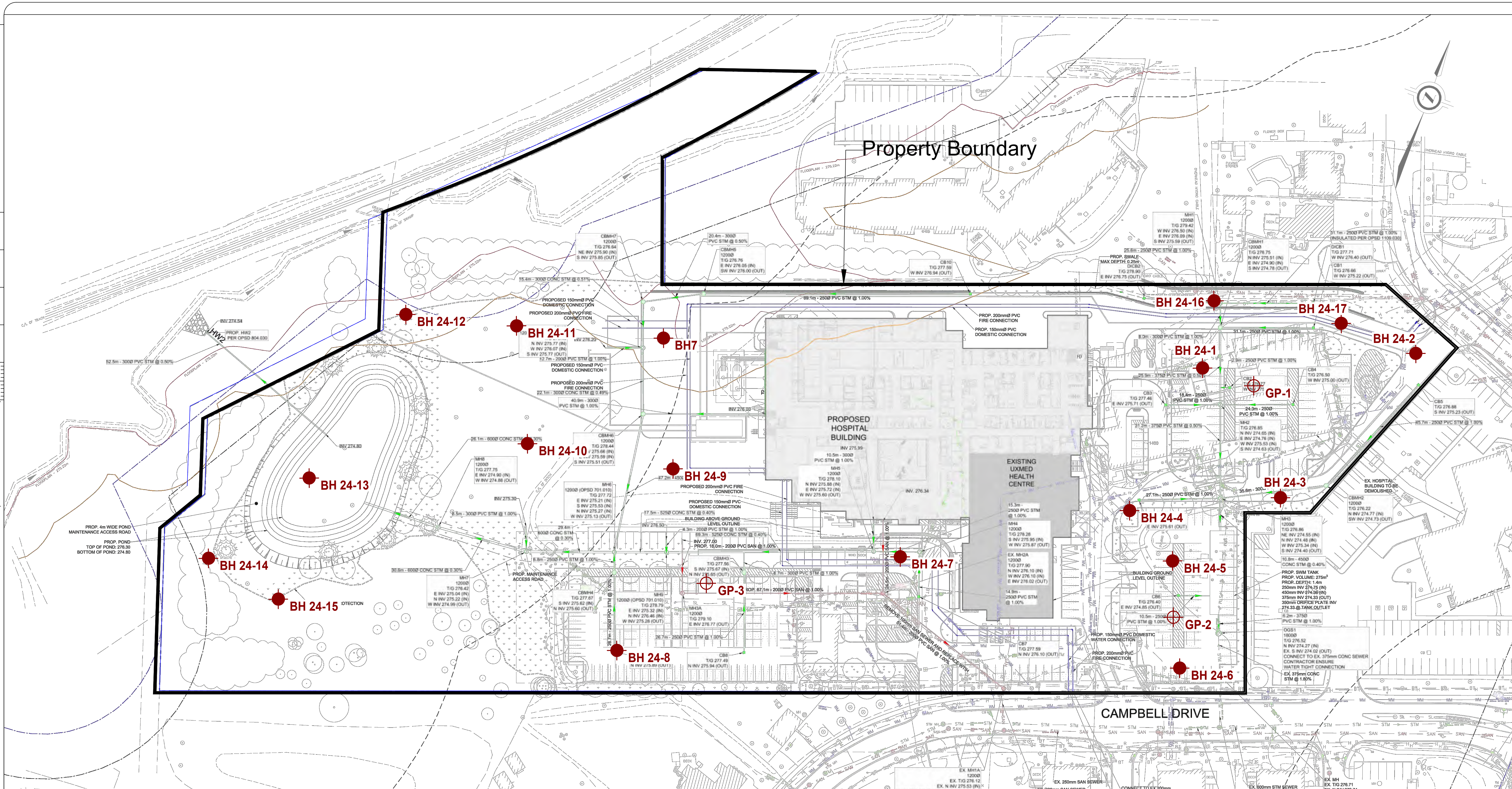
DRAWN BY:	CHECKED BY:	REFERENCE NO.:
TC	MM	23-23-669-01
PLOTTED: 11/28/2023		DATED: 11/27/23

FILE: L:\23-23-669\01\Vision Drawing\2D\23-23-669-01_2D.dgn



LEGEND:

Approximate Borehole Location

Approximate Guelph Permeameter Location

0 10 20 30 40 50 m

SCALE 1:1250

REFERENCE:

Title: Site Servicing Plan (Final Works)
Proj. No.: 24163, Date: Jan.17, 2024
Dwg. No.: C-02, By: LEA

Project

Geotechnical investigation
Proposed Additions
4 Campbell Dr, Uxbridge

Title

Borehole Location Plan
Site Servicing Plan

ENGLOBE

Prepared	C. Kamal	Discipline	GEOTECHNICAL	Project manager	S. Abdus
Drawn	C. Kamal	Scale	AS SHOWN	Sequence no.	--
Checked	S. Abdus	Date	JULY 2024		

Resp.	Project	Phase	Disc.	Type	Drawing no.	Rev.
01	02310769.002	0200	-	D	2C	00

Y:\SHARED\CAITERRAPROBE\BRAMPTON\1-PROJECT FILES\2023\02310769.002 - UXBRIDGE COMMUNITY HOSPITAL, GEO\0100 - GEO\1-DWGS\LOGS\AUTOCAD\02310769.002 FIGURES 2024-07-12.DWG

Appendix L

Hydrogeological Investigation (File No : 1-19-022-46)

ENGLOBE

Terraprobe

Consulting Geotechnical & Environmental Engineering
Construction Materials Inspection & Testing

HYDROGEOLOGICAL STUDY AND WATER BALANCE UXBRIDGE COTTAGE HOSPITAL, 4 CAMPBELL DRIVE UXBRIDGE, ONTARIO

Prepared For: **Uxbridge Health Care**
2 Elgin Park Drive, Unit B
Uxbridge, Ontario
L9P 0B1

Attention: Mrs. Deborah Edgell

File No. 1-19-0022-46

Issued: April 12, 2019
Rev 1.0: May 2020

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1.0 INTRODUCTION

Terraprobe Inc. was retained by Uxbridge Health Care to conduct a Hydrogeological Study and Water Balance Assessment for the proposed addition of Uxbridge Health Centre (UHC) located within the Uxbridge Cottage Hospital at 4 Campbell Drive, Uxbridge, Ontario (herein referenced as the "Property" or "Site").

The scope of the addition was changed and comments on the initial Hydrogeological Study and Water Balance were received from regulatory authorities. As a result, this revised Hydrogeological Study and Water Balance Assessment was prepared subsequent to an associated additional geotechnical investigation, documented under a separate cover.

The general location of the Property is illustrated on Figure 1. The proposed addition is illustrated on Figure 2. Based on design drawings provided by B+H Architects dated January 17, 2020, the proposed redevelopment will include the construction of a new building with a footprint of approximately 1,782 m^2 and approximately 6,320 m^2 of asphalt parking areas and driveways and the removal of a 30 m^2 concrete pad and 2,375 m^2 of paved areas. The new construction involves replacing a portion of these existing paved areas in the southeast portion of the proposed development with either new asphalt or the southern portion of the proposed building.

The adjacent areas to the south of the Property are located within the Oak Ridges Moraine Planning Area, designated as Settlement Areas. Currently the Property and the immediate neighboring areas are serviced with municipal water (ground water-derived) and sewage services. The Property is surrounded by Service Ontario facility to the east, vacant field to the west, primarily residential subdivisions to the south and residential apartment building to the north. A tributary of Uxbridge Brook passes through the northwestern corner of the Property (Subwatershed 5) and a tributary of Uxbridge Brook/inline pond is located approximately 120 m east of the Property (Subwatershed 2).

The Property is located within the Lake Simcoe and Couchiching/Black River Source Protection Area. Of particular relevance to this study is the presence of the Township of Uxbridge's Well 6 which is located within approximately 7.5 m of the southern limit of the proposed redevelopment. As a result, portions of the Property are located within Wellhead Protection Areas (WHPAs) A through D (WHPA-A is illustrated on Figure 2). Only the northeastern portion of the Property is not located within a WHPA. The WHPA is classed as Q2 (an area where activities that reduce recharge may pose a threat). The Property is the location of a Highly Vulnerable Aquifer (Score: 6) but is not a Significant Ground Water Recharge Area. The westernmost portion of the Property is located in an Intake Protection Zone 3 (Score: 4.5).

The study was undertaken to assess hydrogeological conditions of the proposed UHC Property and to provide general information regarding the hydrogeological impact of the proposed redevelopment on the local ground water function. The report addresses the following areas:

- The hydrogeological setting of the Property with respect to regional features.
- A preliminary water balance assessment for the Property based on the current Property development plan.
- Information for appropriate mitigation measures to maintain hydrogeological function following Property development (Source Water Impact Assessment and Mitigation Plan [SWIAMP]).

2.0 SCOPE OF WORK

The scope of work for the study consisted of the following:

- *Review of background information regarding Property geology and hydrogeology.* This included a review of Ministry of the Environment, Conservation and Parks (MECP) well records, watershed information by the Lake Simcoe Region Conservation Authority (LSRCA), geologic and topographic mapping and results of previous studies and subsurface investigations which Terraprobe has conducted in the area.

- *Review of report.* The review included a geotechnical investigation concurrently with this study prepared by Terraprobe. The finding of the geotechnical investigation will be submitted under a separate cover.

- *Review of background information and meteorological data.* This information was obtained from the results of previous investigations conducted by Terraprobe in the general area, a review of the MECP well records. A review of meteorological data was completed to assess local climate and seasonal variations.

- *Detailed Property inspection.* A detailed visual inspection of the Property and surrounding areas was conducted to determine local topography, drainage, and an assessment of potentially hydrogeologically significant features such as closed depressions (potential areas of ground water recharge), seeps, springs, or ground water discharge to the on-site drainage features.

- *Subsurface investigation.* The initial subsurface investigation consisted of the drilling of four (4) boreholes extending to maximum depth of 8 m (~25 ft.) below existing ground surface (mbgs) and installation of four (4) monitoring wells in the borehole (BH1 through BH4, within the southeastern portion of the proposed addition). The second phase of investigation, hydrogeological and geotechnical, entailed the advancing of BH5 through BH17 elsewhere within the footprint of the expanded addition. 6.25 m deep monitoring wells were installed in BH5, BH8, BH9 and BH13 through BH17.

- *Ground water level monitoring.* Ground water level monitoring occurred primarily during the second phase of investigation commencing on October 29, 2019 and ending on April 06, 2020. Manual measurements were taken in all accessible monitoring wells on a nominally monthly basis. Solinst Leveloggers were installed in monitoring wells BH13 through BH17 and took readings at hourly intervals.

- *Ground water sampling and chemical analysis.* During the initial investigation, monitoring wells BH1 through BH3 were sampled on February 15, 2019 and the samples were submitted for analysis for general water quality parameters including sodium, chloride and metals. During the second phase of investigation, monitoring wells BH14 through BH17 were sampled on October 29, 2019 and the samples were submitted for analysis for sodium, chloride and metals.

- *Hydraulic conductivity testing.* In situ hydraulic conductivity tests (rising head/"bail" tests) were conducted in two (2) selected monitoring wells to assess the hydraulic conductivity of the screened intervals.

- *Infiltration testing.* A screening level assessment of soil infiltration rates using grain size distribution data was undertaken during the initial investigation. During the second phase of investigation, infiltration testing was carried out using a Guelph Permeameter at four (4) locations.

- *Water balance assessment.* A water balance assessment for existing (pre-development) and post-development conditions was completed to determine the feasibility of the proposed development and associated Low Impact Development (LID) requirements (i.e., measures to maintain pre-development infiltration).

3.0 FINDINGS

3.1 Property Location and Surrounding Land Use

The Property under study is located on the northwest quadrant of the intersection of Campbell Drive and Victoria Drive in Uxbridge, Ontario, in a mixed residential, commercial (Service Ontario), industrial (Township of Uxbridge Well 6, "industrial" as defined by industrial property use definition clauses 1 and 8, Ontario Regulation 153/04 [O.Reg. 153/04]), and open space property use area in the Township of Uxbridge, Regional Municipality of Durham. The Property is located within Uxbridge Brook Watershed and the Lake Simcoe and Couchiching/Black River Source Protection Area. The adjacent areas to the south of the Property are located within the Oak Ridges Moraine Planning Area designated as Settlement Areas.

The location of the Property is presented on Figure 1. General Property features are presented in the Property Plan (Figure 2). A copy of plan of survey "Lots 261, 262 and 263, Part of Lots 259, 260 and 264 Block DD, Lots 394, 395, 400 and 401, Part of Lots 390, 391, 393 and 399 Block QQ, Lots 406, 407 and 408, Part of Lots 405, 409, 410 and 411 Block RR, Part of Lots 420 to 425 Block TT, Lots 433 and 434 Part of Lots 432, 435, 436 and 437 Block UU, Pat of Lots 439 to 440 Block VV, Part of Beech Street, Balsam Street, Rachel Street and Hemlock Street, and Cherry Street, Municipal Plan No. 83 and Part of Lot 29, Concession 6, Township of Uxbridge", J.D. Barnes Ltd., July 19, 2018, is enclosed in Appendix A.

The proposed development will be serviced with municipal water and sewage services which are currently supplied to the Property. Details regarding the proposed development, taken from Property Survey, Sheet A0-01, Project 1811142, B+H Architects, September 09, 2019, are illustrated on Figure 2. Briefly, it is intended to construct a two storey building (Uxbridge Health Centre, UHC) and associated parking areas and driveways. This will require the removal of an existing concrete pad and parts of the existing parking areas.

The Township of Uxbridge requires that a Hydrogeological investigation be completed in order to assess the potential impact of the proposed development on the ground water resources. This study was undertaken to assess geologic and hydrogeological conditions at the Property and to provide information regarding the potential impact of the proposed development on the local ground water function, including a water balance assessment.

3.2 Property Topography, Drainage and Physiography

Based on the topographic information from the Ministry of Natural Resources and Forestry (MNRF) topographic map, the ground surface at the Property is at approximately 275 m geodetic elevation. Regionally, the ground surface slopes down to the northeast. Grade at the Property generally slopes downwards to the northwest except in the eastern portion of the Property where it slopes downwards to the southeast.

The nearest surface water features are a tributary of Uxbridge Brook that passes through the northwest corner of the Property (Subwatershed 5) and a tributary of Uxbridge Brook present as a pond and creek approximately 120 m east of the Property (Subwatershed 2). To date there has been no monitoring of surface water.

Based on the plan of survey prepared by J.D. Barnes in 2018 (Appendix A), the Property has a relatively flat surface. The Property is located within the elevation range of 277.31 to 277.59 metres Above Sea Level (mASL). The runoff at the Property is expected to flow towards the northwest (majority of the Property) and southeast (southeastern portion of the Property).

According to the Lake Simcoe Region Conservation Authority (LSRCA), the western portion of the Property is located within an LSRCA regulated area (Appendix B).

From a regional perspective, the Property is situated within the physiographic feature known as the Peterborough Drumlin Field, a drumlinized till (clay) plain.

3.3 Regional Geology

Based on published information, the overburden in the region consists of coarse-textured glaciolacustrine deposits. This material is generally characterized as sand, gravel, minor silt and clay from foreshore and basinal deposits. The bedrock in the vicinity of the Property consists of the Blue Mountain Formation, which consists of shale and minor limestone. It should be noted that the subsurface soil, rock and ground water conditions described above represent generalized conditions only, and should not be considered Property specific. The information is presented in Appendix C.

3.4 Regional Hydrogeology

The regional hydrogeological conditions were assessed on the basis of Water Well Records ("WWRs", Appendix D) and geologic mapping (Appendix C). Ground water elevation data and geological strata for the surrounding area are shown in cross-section on Figure 4. Figures 5A, 5 and 6 present a cross-section key plan and Site-specific cross-sections. Manual ground water level measurements and the resulting elevations are presented in Table 1. Figure 7 presents the ground water elevations obtained from manual measurements and from Solinst Leveloggers (combination pressure transducers and dataloggers) installed in BH14 through BH17.

Figure 8 presents the inferred configuration of the shallow water table at the Property on January 30, 2020 (highest water table during a manual water level monitoring event). The nearest surface water features are a tributary of Uxbridge Brook, present as a wetland/creek approximately 100 m northwest of the Property, and Uxbridge Brook, present as a pond and creek approximately 120 m east of the Property. The flow pattern illustrated on Figure 8 is consistent with flow to both tributaries with a ground water flow divide trending, loosely, southwest to northeast through the Property.

A total of 68 WWRs, including 25 Abandonment Records, were on record within a 0.5 km radius of the Property.

Summary of Local Water Well Records

Total Number of Wells	**68**
Wells completed in Overburden	47 (69%)
Wells completed in Bedrock	2 (3%) *
Unknown	19 (28%)
Well Depth Ranges	
100 ft. or Less	30 (44%)
101 ft. to 200 ft.	9 (13%)
201 ft. to 300 ft.	7 (10%)
301 ft. to 400 ft.	3 (5%)
Unknown	19 (28%)
Water Use	
Domestic or Stock	37 (55%)
Monitoring	2 (3%)
Public Supply (1)/Municipal - Not Used (2)	3 (4%)
Not used (other)	1 (1%)
Abandonment Record	25 (37%)

The WWRs for the area indicate that the overburden consists of a till sequence overlying a coarse textured, confined aquifer (the municipal supply aquifer) encountered at depths of approximately 52 to 61 m below grade. The municipal aquifer is underlain by additional till materials. There are coarser zones within the upper till that supply individual domestic wells but are not as productive or widespread as the municipal aquifer. The shale bedrock in the area was encountered at depths of 110 and 112 m and is not utilized as an aquifer for wells in the area.

WWR 1916558, which is for a well located approximately 500 m west-southwest of the Property, reports flowing artesian conditions from an aquifer with an upper contact approximately 30 m below grade. Grade elevation at the location of WWR 1916558 is approximately 20 m higher than at the Property. The WWR for the Township of Uxbridge's Well 6 (WWR 1911055) does not provide information on a sand and gravel unit encountered between 9.1 and 19.5 m below grade, corresponding to the depth of the flowing aquifer at 1916558. Thus, it is unclear if WWR 1916558 documents a localized or widespread condition.

3.5 Results of Subsurface Investigation

Terraprobe conducted an initial geotechnical investigation at the Property on February 8, 2019. The field investigation consisted of drilling and sampling a total of four (4) boreholes extending to a maximum depth of 8.1 m below existing ground surface and installation of four (4) monitoring wells within the proposed addition of UHC located immediately southwest of the existing Uxbridge Cottage Hospital. The second phase of investigation, hydrogeological and geotechnical, entailed the advancing of BH5 through BH17 elsewhere within the footprint of the expanded addition. A total of eight (8) monitoring wells, each of 6.25 m depth, were installed in BH5, BH8, BH9 and BH13 through BH17.

Information regarding borehole logs is presented in Appendix E. The locations of boreholes are shown on Figure 2. A cross-section key plan and Site-specific cross-sections are shown on Figures 5A, 5 and 6. The stratigraphy beneath the investigated areas of the Property is outlined in the following subsections.

3.5.1 Surficial Layers

A pavement structure was encountered in Boreholes 1 to 5 and consisted of 110 and 115 mm thick asphaltic concrete underlain by 150 to 310 mm thick granular base course.

A topsoil layer was encountered in the rest of the boreholes. The topsoil thicknesses were 40 and 150 mm.

The above topsoil and pavement structure thicknesses were measured from the borehole drilling and are approximate. We recommend that a shallow test pit investigation be carried out to determine a precise topsoil/pavement structure thickness present across the Property for quantity estimation and costing purposes.

3.5.2 Earth Fill Materials

The earth fill materials, consisting of sandy silt to silty sand, sand and gravel/sand were encountered at all borehole locations beneath the surficial layer and extended to about 0.6 to 2.3 m depth below grade.

The Standard Penetration Test results (N-values) obtained from the earth fill zone ranged from 4 to 98 blows per 300 mm of penetration, indicating a very loose to very dense relative density. The relatively high N-values obtained from the earth fill materials are likely due to presence of obstruction/debris and do not necessarily represent the degree of compactness of the material tested. The In situ moisture contents of the earth fill samples ranged from 5 to 32 percent by mass, indicating a moist to wet condition.

3.5.3 Silt

A silt unit, with varying amounts of sand (trace to sandy), trace to some clay and trace amounts of gravel was encountered beneath the earth fill zone in all boreholes and extended to the full depth of the investigation.

N-Values obtained from the silt deposit ranged from 8 to 87 blows per 300 mm of penetration, indicating a loose to very dense relative density. The In situ moisture content of the silt sample ranged from 9 to 24, indicating a moist to wet condition.

It must be noted that the undisturbed native soil deposit is likely to contain larger size particles (cobbles and boulders) that are not specifically identified in the boreholes. The size and distribution of such obstructions cannot be predicted with borings, because the borehole sampler size is insufficient to secure representative samples for the particles of this size.

3.5.4 Bedrock

Bedrock was not observed within the investigation depths of 8.1 mbgs. Local WWRs report shale bedrock at depths of 110 – 122 m below grade.

3.6 Ground Water Level Monitoring

After the second phase of investigation, ground water levels measurements were taken on a nominally monthly interval in all wells from October 29, 2019 to April 06, 2020. In addition, Solinst Leveloggers (combination pressure transducers and dataloggers) were installed in monitoring wells BH13 through BH17 and took readings at hourly intervals. Manual ground water level measurements and the resulting elevations are presented in Table 1. Figure 7 presents the ground water elevations obtained from manual measurements and from the Solinst Leveloggers installed in BH14 through BH17. Figure 8 presents the inferred configuration of the water table at the Property on January 30, 2020. January 30, 2020 was used because it was the manual water level monitoring event with the highest water table. Data for wells instrumented with dataloggers for January 12, 2020 (the actual highest water table) are also included on Figure 8.

The depth to ground water ranged from approximately 0.2 to 2.6 m below grade during the monitoring period and was closest to surface in the southwest (vicinity of BH9, BH13 and BH14).

As indicated on Figure 8, a flow divide trends approximately southwest to northeast through the Property. Horizontal flow on the north side of the divide is directed towards a tributary of Uxbridge Brook that passes through the northwest corner of the Property (Subwatershed 5) and flow on the other side of the divide is towards a second tributary located east of the Property (Subwatershed 2). As a result, the direction of the horizontal hydraulic gradient varies from northwest in the west to northeast in the east. The magnitude of the horizontal hydraulic gradient also varies, being relatively steep in the west (up to 0.036 northwest) and near-neutral in the east.

As indicated on Figure 7, water levels in the monitoring wells are influenced by the operation of the Township of Uxbridge's Well 6, located approximately 7.5 m south of the central portion of the Property, i.e., a downward vertical hydraulic gradient exists, at least when Well 6 is or has recently been in operation. However, it cannot be quantified as there are no nested wells at the Property.

Seasonal/weather-related influences are also evident on Figure 8. The high water table observed in early/mid-March 2020 is the usual seasonal high (i.e., post-snowmelt) but the highest water table was measured on January 12, 2020. This is attributed to abnormal weather consisting of 70.6 mm of rain and approximately 7 cm of snowmelt on January 10 and 11, 2020 (Environment Canada Udora Climate

Station, located approximately 17 km north of the Property).

3.7 Ground Water Quality

During the initial investigation, monitoring wells BH1 through BH3 were sampled on February 15, 2019 and the samples were submitted for analysis for general water quality parameters including sodium, chloride and metals. During the second phase of investigation, monitoring wells BH14 through BH17 were sampled on October 29, 2019 and the samples were submitted for analysis for sodium, chloride and metals.

The analytical results are summarized in Table 2 and copies of the Certificates of Analysis are provided in Appendix F. The analytical results are compared to the MECP's Ontario Drinking Water Standards, Objectives and Guidelines (ODWSOG), June 2006, with the exception of arsenic. The criterion for arsenic has been taken from the MECP's Ontario Drinking Water Quality Standards (ODWQS, O.Reg. 169/03) January 01, 2018. Strictly speaking, the ODWQS are applicable to water from regulated drinking water systems (e.g., municipal water supplies), whereas the ODWSOGs presently apply to private wells. Initially, the criteria in the ODWQS and the health-related criteria in the ODWSOG (Maximum Allowable Concentrations, MACs) were identical. There were a number of changes to the ODWQS effective January 01, 2018. With respect to this hydrogeological assessment, the updated ODWQS of 10 μg/L for arsenic has been used as it is more stringent than the ODWSOG of 25 μg/L. It is further noted that the ODWSOG have Aesthetic Objectives (AOs) and Operational Guidelines (OGs) for parameters that do not have ODWQS.

Table 2 documents a pronounced difference in water quality between wells located in the existing parking lot (BH1 through BH3) and those located in the vacant area west of the parking lot (BH13 through BH17). The concentration of chloride beneath the parking lot (maximum 4,620 mg/L at BH1, ODWSOG AO 250 mg/L) is one or even two orders of magnitude higher than further west (25.9 to 247 mg/L). A similar contrast is noted with sodium with a maximum of 1,650 mg/L beneath the parking lot at BH2 as opposed to 21.2 to 141 mg/L elsewhere. There are two ODWSOG for sodium, an AO of 200 mg/L and an MAC of 20 mg/L at which the local Medical Officer of Health must be notified on behalf of persons on sodium-restricted diets.

These findings are attributed to the use of de-icing salt in the parking lot and on adjacent walkways (the most significant impacts are noted at BH1, installed adjacent to the parking lot kiosk). Given the elevated hardness at BH1 (2,990 mg/L as opposed to a maximum of 606 mg/L elsewhere), it is expected that cation exchange of sodium for +2 valent metals is occurring. While the majority of such exchanges affect the concentrations of calcium and magnesium, this mechanism likely accounts for the elevated concentrations of barium (1.95 mg/L as opposed to a MAC of 1 mg/L) and iron (32 mg/L as opposed to an AO of 0.3 mg/L) at BH1 and the elevated concentrations of manganese at BH1 and BH3 (maximum 0.28 mg/L at BH1 as opposed to an AO of 0.05 mg/L).

In summary, de-icing practices in the existing parking lot and vicinity have adversely affected shallow ground water quality. If these same practices are applied to the proposed parking lot, further degradation of shallow ground water quality within an area directly affected by the operation of Well 6 will occur. The adoption of Best Management Practices for future de-icing operations is recommended.

Finally, it is noted that the Total Coliform counts at BH2 (13 CFU/100 mL) and BH3 (4 CFU/100 mL) exceed the MAC of non-detectable. Conditions at BH1 are unclear because of the need to dilute the sample for clarity, resulting in a detection limit of 2 CFU/100 mL.

3.8 Hydraulic Conductivity and Infiltration Rate Testing

3.8.1 Rising Head Tests

In situ hydraulic conductivity tests (rising head/"bail" tests) were conducted in BH3 and BH13 on February 14, 2020 to assess the hydraulic conductivity of the screened intervals (silt with trace to some clay deposits). The tests were conducted by measuring the static water level, placing a Levelogger in the well, measuring the water level in the well until it returned to static, rapidly removing a bailer from the well and recording/manually measuring the recovery of the water level.

The tests were analyzed using the Bouwer & Rice (1976, 1989) Method in a spreadsheet released by the United States Geological Survey (USGS). Copies of the spreadsheets are provided in Appendix G. Based on these analyses, the hydraulic conductivity of the underlying silt ranges from 1.1×10^{-7} to 1.8×10^{-7} m/sec assuming fully penetrating conditions. If the base of the silt unit is set at a depth of 9.1 m (i.e., upper contact of the shallow sand and gravel encountered in Well 6), this range decreases slightly to 9.7×10^{-8} to 1.6×10^{-7} m/s. These hydraulic conductivity values are considered typical for silt.

3.8.2 Infiltration Testing

During the initial phase of investigation, the hydraulic conductivity of the unsaturated zone was estimated using grain size distribution data for soil samples collected from above the water table (Appendix H). The hydraulic conductivity of the native silt was estimated to range from 10^{-6} to 10^{-7}m/s.

This earlier estimate has been superseded by the results of the infiltration testing carried out during the second phase of investigation in the unsaturated silt using a Guelph Permeameter. The analyses of the tests using the method provided by the equipment's manufacturer, Soilmoisture Equipment Corporation, are provided in Appendix H. The estimated hydraulic conductivity ranges of the unsaturated silt ranges from 6.3×10^{-7} m/sec to 9.8×10^{-6} m/sec.

Table 3 presents calculations of the corresponding Infiltration Rates (unadjusted) and Design Infiltration Rates using the method provided in Appendix C of the Toronto and Region Conservation Authority's "Stormwater Management Criteria, ver. 1.0", August 2012 ("TRCA, 2012", this method is identical to the method presented in Appendix B of the corresponding document prepared by Credit Valley Conservation, whose use is required by the LSRCA). The unadjusted Infiltration Rates range from 40.9 to 85.2 mm/hr (geometric mean 59.1 mm/hr). Based on Table C-3 of TRCA, 2012, a safety factor of 3.5 is required when calculating the Design Infiltration Rates which range from 11.7 to 24.3 mm/hr (geometric mean 16.9 mm/hr). The geometric mean Design Infiltration Rate of 16.9 mm/hr is greater than 15 mm/hr, which is the lowest rate for readily feasible infiltration provided in Table 4.1 of the MECP's "Stormwater Management, Planning and Design Manual", March 2003.

3.9 Property Inspection to Assess Hydrogeological Features

A Property inspection was conducted to assess the presence of features which are significant from a Hydrogeological viewpoint. In particular, the Property was inspected to assess the following:

- Areas of visible ground water discharge, springs or seepage at the Property or in the vicinity of the on-site water courses.
- Areas of potential enhanced ground water recharge such as closed drainage features or depressions or large flat areas which may allow for significant ground water infiltration.
- Inspection of swales and drainage courses for evidence of ground water seepage or springs.
- Evidence of phreatophytic vegetation, which may indicate seasonally high ground water levels and/or ground water discharge and seepage.

Inspections were performed on February 1, 8 and 14, 2019 to assess the presence of any natural environmental features. During the Property visit, the ground surface was covered by asphaltic concrete. The Property is currently used as a parking lot for the Uxbridge Hospital. A vacant field is located adjacent to the west of the Property. Surface runoff from the Property appears to flow east/southeast towards catch basins located along Campbell Drive. During the Property visit no areas of ground water recharge (such as depression or unpaved areas) were identified on the Property. No permanent creeks or water features were identified. No phreatophytic vegetation was noticed at or in the immediate vicinity of the Property.

Based on the survey plan dated July 19, 2018 prepared by J.D. Barnes, the Property is generally flat with elevations between 277.31 to 277.59 mASL across the Property.

3.10 Regional Municipality of Durham Official Plan

According to Durham Regional Official Plan dated 2017 prepared by Durham Region as presented in Schedule 'A' - Map 'A2' Regional Structure, the Property is located to the north of the Oak Ridges Moraine Area and not within the Oak Ridges Moraine Area.

According to the Schedule 'B' – Map "B1b', Greenbelt Natural heritage System & Key Natural Heritage and Hydrologic Features, the Property is located in an Urban Area and is not designated as key natural heritage and hydrologic features, greenbelt natural heritage system or Oak Ridges Moraine Plan Area.

3.11 Wellhead Protection Areas and Aquifer Vulnerability

According to the MECP Source Protection Information Atlas, portions of the Property are located within a Wellhead Protection Area A due to the proximity of the Township of Uxbridge's Well 6. The Property is also located above a High Aquifer Vulnerability, Score 6 out of 10. This mapped information is presented in Appendix I.

3.12 Oak Ridges Moraine Conservation Plan

According to the Oak Ridges Moraine Conservation Plan, the Property is located approximately 2.3 km north of the Oak Ridges Moraine, and is not located within the Oak Ridges Moraine Conservation Plan Area. This mapped information is presented in Appendix I.

3.13 Lake Simcoe Region Conservation Authority

According to the Lake Simcoe Region Conservation Authority (LSRCA) webProperty, the Property is not regulated by LSRCA as there are no wetlands, watercourses or steep slopes to be regulated by the Conservation Authority (Appendix B).

3.14 South Georgian Bay Lake Simcoe Source Protection Region Approved Source Protection Plan

The Property is subject to policies LUP-12 and LUP-13. Briefly, it is required that the hydrogeological study demonstrate that the existing water balance can be maintained through the use of best management practices such as low impact development (LID) and the use of these practices to maintain recharge rates is mandatory.

3.15 Township of Uxbridge Official Plan

As a part of Hydrogeological Study, Terraprobe reviewed the Official Plans related to the Property.

According to the Township of Uxbridge January 2014 Official Plan Schedules A to L the Property includes the following information:

Schedule "A" Land Use and Transportation Plan Uxbridge Urban Area

The Property is located outside of Oak Ridges Moraine, in an institutional area. The Property is surrounded by residential area, and located to the north of Oak Ridge Moraine Conservation Plan Area Boundary.

Schedule "B" Natural Heritage System and Supportive Uses Uxbridge Urban Area

The Property does not include any Natural Heritage System and Supportive Use area.

Schedule 'B1' Oak Ridges Moraine Conservation Plan Areas of High Aquifer Vulnerability

The Property is not included in the Oak Ridge Moraine Conservation Plan.

Schedule 'B2' Oak Ridges Moraine Conservation Plan Landform Conservation Areas

The Property is not included in the Oak Ridge Moraine Conservation Plan.

Schedule 'C' Community Improvement Area

The Property is located within the boundary of community improvement area.

Schedule 'D' Phasing Plan Uxbridge Urban Area

The Property is located within the Uxbridge built boundary.

Schedule 'E' Corridor Commercial Special Policy Properties Uxbridge Urban Area

The Property is not located within the corridor commercial properties.

Schedule 'F' Land Use and Transportation Plan Hamlet of Coppins Corners and Adjacent Lands Secondary Plan

The Property is not included in the Secondary Plan.

Schedule 'H' Township of Uxbridge Oak Ridges Moraine Conservation Plan Area Land Use Plan

The Property is not included in the Oak Ridges Moraine Conservation Plan.

Schedule 'I' Township of Uxbridge Oak Ridges Moraine Conservation Plan Area Key Natural Heritage and Hydrologically Sensitive Features

The Property is not included in the Oak Ridges Moraine Conservation Plan.

Schedule 'J' Township of Uxbridge Oak Ridges Moraine Conservation Plan Area Areas of Aquifer Vulnerability

The Property is not included in the Oak Ridges Moraine Conservation Plan.

Schedule 'K' Township of Uxbridge Oak Ridges Moraine Conservation Plan Area Landform Conservation Areas

The Property is not included in the Oak Ridges Moraine Conservation Plan.

Schedule 'L' Township of Uxbridge Wellhead Protection Areas

Portions of the Property are located within WHPA-A to D due to the presence of the Township of Uxbridge's Well 6 approximately 7.5 m south of the southern boundary. The proposed development is located within WHPA-A and -B.

DISCUSSION AND ANALYSIS

3.16 Proposed Development Plan

The proposed addition is illustrated on Figure 2. Based on Drawing G-2, Grading Plan, , Project 1863, B+H Architects, May14, 2020, the proposed redevelopment will include the construction of a new building with a footprint of approximately 1,782 m^2 and approximately 6,320 m^2 of asphalt parking areas and driveways and the removal of a 30 m^2 concrete pad and 2,375 m^2 of paved areas. The new construction involves replacing a portion of these existing paved areas in the southeast portion of the proposed development with either new asphalt paved parking or the southern portion of the proposed building.

Approximately 5,010 m^2 of new asphalt paved area will drain into two 15 x 20 m lined stone filtration trenches to be constructed beneath the western parking lot, which drain into a swale located in the western portion of the site (Figure 2). The clean rooftop runoff from the proposed building will be directed to drain into a 10 x 30 m stone infiltration trench to be located northwest of the proposed building. As the depth to the seasonally high water table in this area is presently unknown, it is intended to construct the infiltration trench on a base of fill and with lateral berms (i.e., as a storage as well as an infiltration feature).

3.17 Summary of Hydrogeological Conditions

The hydrostratigraphy of the Property, based on the investigations to date and the WWR for Well 6, consists of a silt till containing the water table underlain at approximately 9 m below grade by a sand and gravel of unknown properties underlain below a depth of 19.5 m below grade, in turn by additional till overlying the municipal aquifer at a depth of approximately 52 m below grade. The hydraulic conductivity of the silt till containing the water table is estimated at approximately 1×10^{-7} to 2×10^{-7} m/s.

The shallow water table is present 0.2 to 2.6 m below grade. A flow divide resulting from topography and the presence of two tributaries of Uxbridge Brook runs loosely southwest-northeast through the Property (Figure 8), creating a flow divide with horizontal flow direction varying from northwest in the west (steep horizontal hydraulic gradient) to northeast in the east (near-neutral horizontal hydraulic gradient). The effect of the operation of Well 6, precipitation and snowmelt events on shallow water levels are evident (Figure 7).

The Township of Uxbridge’s Well 6 is located approximately 7.5 m south of the southern Property boundary. As a result, portions of the Property are located within WHPA-A through D (Figure 2). Only the northeastern portion of the Property is not located in a WHPA. The Property is the location of a Highly Vulnerable Aquifer (Score: 6) but is not a Significant Ground Water Recharge Area. The westernmost portion of the Property is located in an Intake Protection Zone 3 (Score: 4.5).

Analytical results for ground water samples indicate that the use of de-icing compounds within the existing parking lot has resulted in elevated concentrations of sodium, chloride and, at least locally, barium and iron in ground water. This is of potential concern with respect to water quality in Well 6.

The Source Protection Plan applicable to the Property requires that pre- and post-development water balances be completed and that best management practices, e.g., low impact development measures, be implemented to maintain pre-existing ground water recharge rates.

3.18 Water Balance Assessment

The pre- and post-development water balances for the portion of the Property that is intended to be redeveloped is provided in Table 4. A water balance for the entire Property has not been completed at this time because a larger scale redevelopment of the Property in future has been proposed and the comprehensive water balance is applicable to the subsequent stage of development.

The assessment of precipitation and water surplus has been taken from calculations for Uxbridge Brook Subwatershed, p. 24 of "Lake Simcoe Climate Data: A Reference Document to Support the Completion of Water Balance Assessments, ver. 1.0", Lake Simcoe Region Conservation Authority, April 2017 for silt loam, resulting in a precipitation surplus of 276 mm/yr. For comparison purposes, the Thornthwaite-Mather Method has been applied to Environment Canada's Climate Normals data for the Udora Climate Station (Table J-1, Appendix J), located approximately 15 km to the north, and the Richmond Hill Weather Station (Table J-2), located approximately 30 km to the southwest resulting in precipitation surpluses of 298 mm/yr and 279 mm/yr, respectively, which are reasonably consistent with the Reference Document surplus of 276 mm/yr.

As indicated in Table 4 (first page), an infiltration factor of 0.45 has been derived for pervious surfaces at the Property using infiltration factors provided in Table 2 of former MOEE Hydrogeological Technical Information Requirements for Land Development Applications, 1995 ("MOEE, 1995"). A topography factor of 0.15 was used due to the typical slope of one in 60, i.e., the average of the factors for hilly and rolling land has been used. A soil factor of 0.2 (medium combination of clay and loam) was used due to the silt, trace to some clay soil present and a factor of 0.1 was used for the open land ("Cover - cultivated"). This results in an annual infiltration rate of 124 mm/yr and a runoff rate of 152 mm/yr. The infiltration rate is in reasonable agreement with the ranges provided in Table 3 of MOEE, 1995: 100 – 125 mm/yr for clayey silt and 125 – 150 mm/yr for silt. A runoff factor of 90% and an evapotranspiration factor of 10% was used for the existing concrete slab, proposed building roofs and existing/proposed asphalt paved areas.

The second page of Table 4 presents the pre- and post-development water balances. The post-development infiltration deficit, in the absence of any mitigative measures, is 680 m^3/yr.

3.19 Installation of Property Servicing

Excavations will be required for the installation of Property servicing. Based on the depth of servicing provided and soil stratigraphy data obtained from the subsurface investigation it is expected that excavations for the installation of sanitary sewer servicing will be completed within silt, trace to some clay and, in some areas, trace sand.

As details of the proposed utility installations are not presently available, the following calculation is provided for the purpose of illustration.

The Dupuit-Forchheimer Equation for flow into a fully penetrating trench with unconfined conditions (Driscoll, 1986) is:

$$Q = \pi * K * (H^2 - h_w^2) / (\ln[R_o / r_e]) + 2 * X * K * (H^2 - h_w^2) / (R_o)$$

Where:

Q = flow rate in m^3/s

$\pi = 3.14$

H = initial saturated thickness = 9.1 m assuming base taken from the log for Well 6

h_w = saturated thickness during dewatering = 7.1 m (assumed 2 m deep trench and water table at grade)

K = Hydraulic Conductivity = 1.8×10^{-7} m/s (highest estimate)

X = daily working footprint trench length = 30 m

W = trench width = 1.2 m

r_e = radius of equivalent pumping well = $(W^2/Pi)^{1/2}$

R_o = radius of influence = $3000*(H-h_w)*K^{1/2}$ (Sichardt [1930] Approximation)

Under this scenario, the steady-state dewatering rate would be 12,600 L/day and the radius of influence would be approximately 2.6 m.

3.20 Maintenance of Ground Water Recharge

Figure 8 illustrates the locations of the proposed Low Impact Development (LID) infiltration facility. Clean runoff from the roof of the proposed new building will be directed into a swale connected to a 10 x 30 m stone infiltration trench located northwest of the proposed building. Details are provided in B+H Architects Corp.'s Drawings G-1, G-2 and GN-1, Project 1863.

The proposed building has a footprint of approximately 1,782 m^2. The raised infiltration trench will be bermed on all sides with an inner depth of 0.5 m and a holding capacity of approximately 150 m^3. The holding capacity required for a 25 mm rainfall across the entire roof footprint is 44.5 m^3. The ratio of drainage area to infiltration area is 1,782:300 or approximately 5.9:1.

At present, the depth to the water table at the proposed location of the infiltration trench is unknown. As a conservative measure, it has been assumed to be at grade and the infiltration facility is assumed to be constructed on fill base 0.5 m thick. The fill material to construct the base of infiltration trench will consist of local soil obtained from on-site construction activities.

The assessment of the proposed design consists of two components, (i) assessing the maximum infiltration rate that the proposed LID feature can manage and deriving the associated runoff rate over the catchment area (rooftop) and (ii) assessing the annual infiltration volume using recent weather data (Udora Climate Station). The following assumptions are used in the assessment:

- The hydraulic conductivity of the aquifer and overlying initially unsaturated soil is 1×10^{-7} m/s (the lowest value obtained from any test method; the lowest value from infiltration testing was 6.3×10^{-7} m/s);

- The initial saturated thickness of the aquifer is 7.45 m (based on depth to the underlying sand and gravel at Well 6 less the depth of the highest water table at the nearest monitoring wells, BH15 and BH16);

- The specific yield of the aquifer is 0.08 (value for silt from Johnson, 1967);

- The maximum allowable ground water mound height beneath the simulated infiltration facility is equal to the thickness of the unsaturated zone (i.e., the 0.5 m of fill) at the centroid of the infiltration facility (i.e., the maximum allowable ground water mound contacts the base of the infiltration facility at a single point);

- The assessment using weather data uses only data for 2017 and 2019, rather than the customary three most recent years, because 2018 was wetter than average and would potentially bias the results favourably;

- The assessment using weather data excludes any precipitation in excess of the amount that can be infiltrated over a 24 hour period (i.e., loosely speaking, if 5 mm/day can be infiltrated and a day with 10 mm of rain is followed by a dry day, 5 mm infiltrates on the first day but no infiltration of water stored in the LID facility at midnight on the first day infiltrates on the second day). This is a conservative assumption given that the infiltration trench is designed to contain a 25 mm rainfall event; and

- The assessment using weather data excludes any contribution during months with average temperature below 0º C (January to March and December) and does not include a contribution from seasonal snowmelt.

This is considered to be a conservative assessment. The groundwater mounding assessment was determined by solving a simplified version of the Hantush, 1967 equation for groundwater mounding using an Excel spreadsheet (USGS 2010-5102, a.k.a. Carleton, 2010) outlined in "Simulation of Groundwater Mounding Beneath Hypothetical Stormwater Infiltration Basins (U.S. Geological Survey Scientific Investigations Report 2010-5102)". This spreadsheet provides an estimate of the transient condition experienced during infiltration of stormwater (infiltration will occur over a period of time, and cease) rather than steady state (infiltration of a constant volume of water over time). The spreadsheet assumes vertical anisotropy with the vertical hydraulic conductivity being one-tenth of the horizontal (i.e., input) hydraulic conductivity.

The USGS spreadsheet output is provided after Tables J-1 and J-2 in Appendix J. It should be noted that all measurements are in feet and that the distances at which mounding is reported at are measured from the centre of the infiltration facility. Thus, the measurement of 16.4 ft/5 m corresponds to the outer edge of the 10 m long side of the infiltration trench.

The maximum infiltration rate over the 300 m^2 footprint of the infiltration trench, if constructed over 0.5 of fill, is 0.131 ft/day (40 mm/day). This equates to 6.72 mm/day over the 1,782 m^2 catchment area.

Table J-3 presents the infiltration that would have occurred in 2017 and Table J-4 presents the equivalent data for 2019. The infiltration volumes for 2017 and 2019 with a 0.5 m ground water mound are 768 and 705 m^3, respectively. Given an annual infiltration deficit of 680 m^3/yr, it appears that a 0.5 m fill layer, assuming seasonal high water table at existing grade, underneath the proposed infiltration trench will be adequate.

4.0 SOURCE WATER IMPACT ASSESSMENT AND MITIGATION PLAN (SWIAMP)

4.1 Risk Assessment

4.1.1 Identification of Vulnerable Areas

The location of the Property with respect to Wellhead Protection Areas (WHPAs) is shown on the first page in Appendix I. A portion of the area proposed for redevelopment is located within the WHPA-A of the Town of Uxbridge's Well 6. The WHPA-A consists of a 100 m radius centered around Well 6, as illustrated on Figures 2 and 8. A large portion of the Property, other than the north-central and northeast portions of the Property, is located within Well 6's WHPA-B through D (Appendix I). In prior correspondence, regulatory authorities have indicated that no refueling of construction equipment or storage of fuels/chemicals during construction should occur in the WHPA's, particularly WHPA-A, and that the redevelopment's snow storage area must be located outside WHPA-A.

The Property is located approximately 2.3 km north of the Oak Ridges Moraine, and is not located within the Oak Ridges Moraine Conservation Plan Area.

4.1.2 Identification of Prescribed Drinking Water Threats

The Clean Water Act, 2006, prescribes a number of land uses that are considered to be drinking water threats. The applicable circumstances for activities and conditions to the Property are listed, along with a qualitative evaluation of the threat level, in table below. For the proposed development (i.e., long-term condition, short-term is considered separately in Section 5.2.2), there are three (3) potential drinking water quality threats to consider:

- Use of de-icing salt;
- Operation of sanitary sewers; and
- Activities related to the operation of the Property as a medical facility, including chemical/pathogen handling and storage.

It is assumed that requirements specific to medical practices in Ontario will address potential drinking water quality threats associated with the last issue and it is not considered further.

Drinking Water Quality Threats Summary

#	WHPA Zone on Property	Intrinsic Vulnerability Score	Identified Prescribed Drinking Water Threat	Short Form Name	Type of Threat (Chemical or Pathogen)	Applicable Circumstances	CWA Rating of the Drinking Water Threat
1	WHPA-A and -B	6	The application of road salt	Road salt	Chemical	Exceedances of Table 2 Site Condition Standards due to past activities (Rule 126). Total impervious area >80% of total area.	Low (2017 Threats Table, Chemical, Line 1634)
2	WHPA-A and -B	6	The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage.	Sewage System Or Sewage Works - Sanitary Sewers and related pipes	Pathogen/Chemical (potential)	Detectable Total Coliform Bacteria due to past activities (Table 2).	Low (2017 Threats Table, Pathogen, Line 166)

Notes:

1. The CWA rating does not include a reduction of the threat if contingency or mitigatory measures are applied.

4.1.3 Identification of Drinking Water Quantity Threats

Given the modest potential dewatering requirements for the proposed development (Section 4.4), the primary threat to water quantity would be the post-development infiltration deficit of 680 m^3/yr that would result if mitigative measures were not implemented (Section 4.3). However, the maintenance of recharge is required under South Georgian Bay Lake Simcoe Source Protection Region Approved Source Protection Plan Policies LUP-12 and LUP-13. The associated mitigative measures (re-infiltration) are discussed in Section 4.5.

4.2 Risk Management Plan

4.2.1 Water Quality Threats Management

4.2.1.1 The Application of Road Salt

4.2.1.1.1 Preventive/Mitigation/Management Measures – Road Salt

Impacts associated with current practices related to the application of de-icing salt are documented in Section 3.7. The implementation of a salt management plan to reduce the use of de-icing salt and/or replace it with other de-icing agents is strongly recommended.

All salt (or replacement de-icing agent[s]) stored at the Property for later application shall be stored in water-impermeable containers roof-covered areas of the Property that are either asphalt-paved or have a poured concrete floor to minimize entry into the subsurface. Only quantities required for reasonably foreseeable short-term use should be stored on-site.

Runoff from the proposed western parking lot is proposed to be directed into lined filtration trenches that will discharge to a bioswale in the western portion of the Property (Figure 2) prior to eventual discharge to surface water.

The Transportation Association of Canada (TAC) has produced a document titled Syntheses of Best Practices – Road Salt Management (2013). These should be generally followed at the Property unless prohibited. In addition, best management practices for contractors, residents, and the community are provided by the not-for-profit organization Smart About Salt Council and their recommendations may be of benefit in reducing salt loads.

4.2.1.2 Monitoring, Emergency Response, Financial Assurance and Communication and Implementation Plan – Road Salt

These issues, where applicable, will need to be incorporated into the management plan outlined in the preceding Subsection.

4.2.1.3 Sanitary Sewers and Related Piping

The proposed development will be serviced with municipal sewers. No on-site sewage treatment systems are proposed or anticipated. The proposed medical office building will be constructed slab-on-grade. Service connections may be deeper and possibly below the water table (i.e., greater than 2 m below grade), but will be constructed in the low permeability silt, resulting in at most a modest interception of ground water flow by the utility service trenches. If utility trenches will extend below the water table, trench plugs should be installed at intervals so as to reduce any potential interception of ground water flow.

4.2.1.3.1 Industry Standards, Regulations and Best Management Practices

Sanitary sewage works for the Property will adhere to all applicable provincial and local regulations. Precise metrics for the sewage works will be provided at the detailed design stage. The following legislation regarding design and approval of the sewage works is applicable to the assessment of the environmental risks related to the works:

- **Engineering Standards**
    - General standards for construction.

- **Sanitary Sewer Commissioning Guidelines**
  - Physical and visual infiltration, exfiltration and joint tests to ensure that leakage into and/or out of the system is within the acceptable tolerance limits are mandatory prior to use of new sanitary sewer laterals in Durham Region. These tests are required to be carried out prior to commissioning of the on-site sewage works.
- **Environmental Protection Act, R.S.O. 1990, Chapter E.19, Part X – Spills**
  - Should a spill or leak occur at the Property, property owner (owner of the pollutant) and/or their agents are required to notify the MECP, the Regional Municipality of Durham, and the property owner, immediately upon discovery.
  - Should a spill or leak occur at the Property, the Property owner and/or their agents (persons in control of the pollutant) are required to immediately do everything practicable to prevent, eliminate and ameliorate the adverse effects of the spill.

4.2.1.3.2 Additional Risk Management Measures

In addition to the regulated management practices and procedures outlined in section 4.2.1.3.1, the Property owner will be responsible for implementing and ensuring the following Risk Management Measures at the Property:

- The Property owner will be responsible for ensuring that Property maintenance staff have and maintain an adequate and up-to-date emergency response plan at the Property at all times. The emergency response plan will include the information that the Property is located in a Wellhead Protection Area.
- Camera inspections will be conducted every 5 years to confirm the integrity of sanitary sewers at the Property.
- Any spills or leaks related to the sewage works located on the property will be reported to the Spills Action Centre.
- Contact information for the Spills Action Centre, as well as information detailing the requirement for reporting any spills which occur, will be available at the Property.

4.2.1.4 Monitoring and Emergency Response – Sanitary Sewers and Related Piping

The monitoring and emergency response measures that will be implemented at the Property have been discussed in sections 4.2.1.3.1 and 4.2.1.3.2, and include the following:

Monitoring

- All sewage works will be subject to physical and visual leak tests prior to commissioning.
- Camera inspections will be conducted every 5 years to confirm the integrity of sanitary sewers at the property.

Emergency Response

- The Property owner will be responsible for ensuring that property maintenance staff have and maintain an adequate and up-to-date emergency response plan at the Property at all times. The emergency response plan will include the information that the Property is located in a Wellhead Protection Area.
- Any spills or leaks related to the sewage works located on the property will be reported to the Spills Action Centre.
- Contact information for the Spills Action Centre, as well as information detailing the requirement for reporting any spills will occur, will be available at the Property.

4.2.1.5 Financial Assurance – Sanitary Sewers and Related Piping

Due to the low risk associated with this prescribed threat, financial assurance is not considered to be necessary for sewage works on the Property; however, the Property owners may opt to maintain insurance on the on-site sewage infrastructure.

4.2.1.6 Communication and Implementation Plan – Sanitary Sewers and Related Piping

The Property owner will be responsible for implementation of all regulatory and above-listed Risk Management Measures, including communication to all maintenance staff. Information regarding the Property's location within a Wellhead Protection Area and emergency response numbers will be available at the Property. A copy of this report or appropriate summary documentation to be prepared in future should be provided to all purchasers of the Property to ensure compliance with the above-noted Risk Management Measures.

Should a spill or leak occur at the property, the Region of Durham is to be provided with a copy of the Spills Action Centre's report.

4.2.2 Temporary Storage of Fuels and Chemicals during Construction

During construction of the proposed buildings it may be necessary to temporarily store fuels and/or chemicals at the Property. This represents a potential threat to ground water quality, as a spill of significant size may potentially impact the local water supply. The LSRCA has previously stated that it requires that refueling and the temporary storage of fuels/chemical during construction must not take place in the WHPAs, particularly WHPA-A. This requirement must be communicated to all parties involved in planning construction activities. The north-central and northeastern portions of the Property are not located in WHPAs; however, there are practical considerations associated with the northeastern portion of the Property due to the presence of the current hospital and associated features.

To further prevent and mitigate any spills at the Property, it is recommended that temporary fuel and chemical storage containers of significant size are placed within secondary containment such that a leak/spill can be contained. There are also refueling services that deliver fuel on-site. On-site storage would not be required if such a service was used.

Appropriate spill kits should be maintained at various locations throughout the Property and an emergency response plan should be developed to outline actions to be taken in case of a spill or leak.

The monitoring and emergency response measures recommended to be implemented at the Property include the following:

Monitoring

- It is recommended that temporary fuel and chemical storage locations be inspected on a regular basis to ensure integrity of storage containers.

Emergency Response

- The property owner will be responsible for ensuring that property maintenance staff have and maintain an adequate and up-to-date emergency response plan at the property at all times. The emergency response plan will include the information that the Property is located in a Wellhead Protection Area.
- Any spills or leaks related to the temporary storage of fuels and chemicals located on the property will be reported to the Spills Action Centre.
- Contact information for the Spills Action Centre, as well as information detailing the requirement for reporting should any spills occur, will be available at the Property.

4.3 Water Quantity Threats Management

4.3.1 Ground Water Takings for Dewatering/Depressurization

The proposed development at the Property will be constructed as a slab-on-grade building. An excavation during the short term period will not be required for the proposed construction activities. As such, there will not be a requirement to significantly control ground water during the construction period (i.e., there may be localized dewatering for individual foundation structures) or to control ground water in the post-construction period.

There may be requirement for temporary ground water control for the installation of any subsurface utilities. As discussed in Section 4.4, steady-state dewatering requirements for a trench extending 1 m below the water table are estimated at 12,600 L/day for a trench with a daily working footprint of 1.2 x 30 m.

As there will not be any significant short term ground water control requirements and no long term requirements, there will be no water quantity threats to the underlying aquifer in which the municipal production and public supply wells are installed in.

4.3.2 Reduction in Aquifer Recharge

There will be no adverse impact from the proposed development on the aquifer in which the water supply wells are screened.

Terraprobe recommends that best management measures are taken to maintain the pre-development water balance to maintain the overall continuity of ground water flow and recharge rates.

5.0 CONCLUSIONS AND RECOMMENDATIONS

- The Property is located within Uxbridge Brook Watershed and the Lake Simcoe and Couchiching/Black River Source Protection Area. The adjacent areas to the south of the Property are located within the Oak Ridges Moraine Planning Area, in a Settlement Areas.
- According to the Oak Ridges Moraine Conservation Plan, the Property is located approximately 2.3 km north of the Oak Ridges Moraine, and is not located within the Oak Ridges Moraine Conservation Plan Area. The western portion of the Property is located within the LSRCA regulated area.
- According to Durham Regional Official Plan, the Property is located to the north of the Oak Ridges Moraine Area and not within the Oak Ridges Moraine Area. The Property is also located in an Urban Area and is not designated as key natural heritage and hydrologic features, greenbelt natural heritage system.
- According to the MECP Source Protection Information Atlas, the Property is the site of a Highly Vulnerable Aquifer (score: 6). Aquifer Vulnerability with Vulnerability Score 6 of 10 (low to high). The westernmost portion of the Property is located in an Intake Protection Zone 3 (Score: 4.5). The Property is not located in an area of Significant Groundwater Recharge. Portions of the Property are located within WHPA-A to D due to the presence of the Township of Uxbridge's Well 6 approximately 7.5 m south of the southern boundary. The proposed development is located within WHPA-A and -B.
- The nearest surface water features are a tributary of Uxbridge Brook that passes through the northwest corner of the Property (Subwatershed 5) and a tributary of Uxbridge Brook present as a pond and creek approximately 120 m east of the Property (Subwatershed 2).
- The stratigraphy encountered at the Property consisted of 0.04 to 0.15 m of topsoil or paving materials over 0.6 to 2.3 m of earth fill. Native soil consisted of silt with a variable sand content (trace to sandy). The silt unit extended to the maximum depth of investigation.
- The depth to ground water ranged from approximately 0.2 to 2.6 m below grade during the monitoring period and was closest to surface in the southwest (vicinity of BH9, BH13 and BH14). Water levels in the monitoring wells are influenced by the operation of the Township of Uxbridge's Well 6
- A flow divide in the water table trends approximately southwest to northeast through the Property. Horizontal flow on the north side of the divide is directed towards a tributary of Uxbridge Brook that passes through the northwest corner of the Property (Subwatershed 5) and flow on the other side of the divide is towards a second tributary located east of the Property (Subwatershed 2). As a result, the direction of the horizontal hydraulic gradient varies from northwest in the west to northeast in the east. The magnitude of the horizontal hydraulic gradient also varies, being relatively steep in the west (up to 0.036 northwest) and near-neutral in the east.
- The hydraulic conductivity of the unsaturated materials at the Property, where tested, ranged from 6×10^{-7} m/sec to 1×10^{-5} m/sec. The unadjusted Infiltration Rates range from 40.9 to 85.2 mm/hr (geometric mean 59.1 mm/hr). Based on Table C-3 of TRCA, 2012, a safety factor of 3.5 is required when calculating the Design Infiltration Rates, which range from 11.7 to 24.3 mm/hr (geometric mean 16.9 mm/hr).
- The hydraulic conductivity of the saturated silt to sandy silt, where tested, ranged from 1×10^{-7} m/sec to 2×10^{-7} m/sec.

- There is a pronounced difference in water quality between wells located in the existing parking lot (BH1 through BH3) and those located in the vacant area west of the parking lot (BH13 through BH17). The concentration of chloride beneath the parking lot (maximum 4,620 mg/L at BH1, ODWSOG AO 250 mg/L) is one or even two orders of magnitude higher than further west (25.9 to 247 mg/L). A similar contrast is noted with sodium with a maximum of 1,650 mg/L beneath the parking lot at BH2 as opposed to 21.2 to 141 mg/L elsewhere. These findings are attributed to the use of de-icing salt in the parking lot and on adjacent walkways. It appears that cation exchange of sodium for +2 valent metals is occurring. While the majority of such exchanges affect the concentrations of calcium and magnesium, this mechanism likely accounts for the elevated concentrations of barium (1.95 mg/L as opposed to a MAC of 1 mg/L) and iron (32 mg/L as opposed to an AO of 0.3 mg/L) at BH1 and the elevated concentrations of manganese at BH1 and BH3 (maximum 0.28 mg/L at BH1 as opposed to an AO of 0.05 mg/L). In summary, de-icing practices in the existing parking lot and vicinity have adversely affected shallow ground water quality. If these same practices are applied to the proposed parking lot, further degradation of shallow ground water quality within an area directly affected by the operation of Well 6 will occur. The adoption of Best Management Practices for future de-icing operations is recommended.

- Finally, it is noted that the Total Coliform counts at BH2 (13 CFU/100 mL) and BH3 (4 CFU/100 mL) exceed the MAC of non-detectable. Conditions at BH1 are unclear because of the need to dilute the sample for clarity, resulting in a detection limit of 2 CFU/100 mL.

- The proposed development will result in an annual infiltration deficit of 680 m^3/yr if mitigative measures are not applied. Measures to address the infiltration deficit are required under South Georgian Bay Lake Simcoe Source Protection Region Approved Source Protection Plan Policies LUP-12 and LUP-13. It is proposed to direct roof runoff from the proposed building to a bermed 10 x 30 m infiltration trench constructed on 0.5 m of locally derived fill due to the anticipated shallow water table at the proposed location of the trench. A feasibility assessment documented herein indicates that a fill layer 0.5 m thick should be sufficient to address the infiltration deficit.

- The proposed uses at the Property which have the potential to impact ground water quality include the application of de-icing salt and the operation of sanitary sewers. Although the risks are classified as low, existing water quality data document impacts associated with the use of de-icing salt and detectable Total Coliforms were detected in samples from two wells. Appropriate planning to address these two issues as well as short-term issues associated with construction (e.g., fuel storage and handling) is warranted.

- The proposed development at the Property will be constructed as a slab-on-grade building and the soil is of low to moderate permeability. As such, there will not be deep excavations or requirements for significant ground water control requirements. As a result, construction activities pose no water quantity threats to the water supply wells that are installed in the underlying deep aquifer.

6.0 REFERENCES

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7.0 LIMITATIONS AND USE OF THE REPORT

This report was prepared for the exclusive use of Uxbridge Health Centre and is intended to provide a hydrogeological assessment of the portion of the property identified as 4 Campbell Drive, Uxbridge, Ontario that is intended to be redeveloped.

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We trust that the above-noted information is suitable for your review. If you have any questions regarding this information, please do not hesitate to contact the undersigned.

Yours truly,

Terraprobe Inc.

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TABLES

TERRAPROBE INC.

TABLE 1
Ground Water Elevations
Uxbridge Hospital
Project #1-19-0022-46.1

Well ID	**BH1**		**BH2**		**BH3**		**BH4**		**BH5**	
Stick Up (m)	0.00		0.00		0.00		0.00		0.00	
Depth (mbgs)	5.49		6.38		7.66		6.60		5.42	
Grade (mASL)	277.53		277.49		277.52		277.57		277.68	
Date	DTW (mbg)	Elev. (mASL)	DTW (mbg)	Elev. (mASL)	DTW (mbg)	Elev. (mASL)	DTW (mbg)	Elev. (mASL)	DTW (mbg)	Elev. (mASL)
2019/02/14	2.70	274.83	2.19	275.30	2.16	275.36	2.30	275.27	NA	NA
2019/10/29	2.42	275.11	2.26	275.23	2.21	275.31	2.39	275.18	2.58	275.10
2019/11/18	2.22	275.31	2.04	275.45	2.06	275.46	2.16	275.41	*1.58*	*276.10*
2019/12/21	2.04	275.49	*2.80*	*274.69*	2.01	275.51	2.05	275.52	2.16	275.52
2020/01/30	1.91	275.62	1.80	275.69	1.82	275.70	1.86	275.71	Frozen	
2020/02/14	2.13	275.40	1.99	275.50	1.85	275.67	Buried under snow/ice		Buried under snow/ice	
2020/03/16	1.80	275.73	Decommissioned		1.62	275.90	1.73	275.84	Decommissioned	
2020/04/06	1.81	275.72	Decommissioned		Inaccessible (construction)		1.77	275.80	Decommissioned	

Well ID	**BH8**			**BH9**			**BH13**			**BH14**		
Stick Up (m)	0.93			0.93			0.94			0.94		
Depth (mbgs)	6.64			6.43			6.05			6.36		
Grade (mASL)	277.68			277.16			276.62			277.08		
Date	DTW (mBTOP)	DTW (mbg)	Elev. (mASL)	DTW (mBTOP)	DTW (mbg)	Elev. (mASL)	DTW (mBTOP)	DTW (mbg)	Elev. (mASL)	DTW (mBTOP)	DTW (mbg)	Elev. (mASL)
2019/02/14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2019/10/29	3.00	2.07	275.61	2.38	1.45	275.71	1.90	0.96	275.66	2.23	1.29	275.79
2019/11/18	2.90	1.97	275.71	1.74	0.81	276.35	1.59	0.65	275.97	1.80	0.86	276.22
2019/12/21		--			--			--		1.65	0.71	276.37
2020/01/30	2.58	1.65	276.03	1.54	0.61	276.55	1.33	0.39	276.23	1.37	0.43	276.65
2020/02/14	2.91	1.98	275.70	1.71	0.78	276.38	1.55	0.61	276.01	1.67	0.73	276.35
2020/03/16	2.54	1.61	276.07	1.35	0.42	276.74	1.13	0.19	276.43	1.29	0.35	276.73
2020/04/06	2.61	1.68	276.00	1.46	0.53	276.63	1.21	0.27	276.35	1.40	0.46	276.62

Well ID	**BH15**			**BH16**			**BH17**		
Stick Up (m)	0.80			0.92			0.94		
Depth (mbgs)	6.55			6.60			6.74		
Grade (mASL)	276.44			276.97			277.58		
Date	DTW (mBTOP)	DTW (mbg)	Elev. (mASL)	DTW (mBTOP)	DTW (mbg)	Elev. (mASL)	DTW (mBTOP)	DTW (mbg)	Elev. (mASL)
2019/02/14	NA	NA	NA	NA	NA	NA	NA	NA	NA
2019/10/29	1.88	1.08	275.36	2.49	1.57	275.40	2.66	1.72	275.86
2019/11/18	1.73	0.93	275.51	2.29	1.37	275.60	2.52	1.58	276.00
2019/12/21	1.67	0.87	275.57	2.32	1.40	275.57	2.48	1.54	276.04
2020/01/30	1.52	0.72	275.72	2.07	1.15	275.82	2.31	1.37	276.21
2020/02/14	1.69	0.89	275.55	2.24	1.32	275.65	2.43	1.49	276.09
2020/03/16	1.41	0.61	275.83	1.97	1.05	275.92	2.14	1.20	276.38
2020/04/06	1.45	0.65	275.79	2.01	1.09	275.88	2.14	1.20	276.38

Notes:
- DTW - depth to water
- mBTOP = metres below top of pipe
- mbg = metres below grade
- mASL - metres above sea level
- mbgs - metres below ground surface
- NA - Not Applicable (well not yet installed)

Table 2

Analytical Results - Ground Water

Sample Description	ODWSOG/ODWSQ			UNITS	BH1	BH2	BH3	BH 14	BH 15	BH 16	BH 17
Date Sampled	**Maximum Allowable Concentration**	**Aesthetic Objective**			**02/15/2019**	**02/15/2019**	**02/15/2019**	**10/29/2019**	**10/29/2019**	**10/29/2019**	**10/29/2019**
Electrical Conductivity	-	-	-	uS/cm	11600	8390	6710	874	612	870	1580
pH	-	6.5 - 8.5	-	pH units	7.39	7.93	7.88	7.97	7.94	8.03	7.81
Saturation pH	-	-	-	pH units	5.82	6.89	6.47	-	-	-	-
Escherichia coli	Not detectable	-	-	CFU/100mL	<2	<1	<1	-	-	-	-
Total Coliforms	Not detectable	-	-	CFU/100mL	<2	**13**	**4**	-	-	-	-
Background Colony Count	-	-	-	CFU/100mL	<2	<1	<1	-	-	-	-
Reactive Silica as SiO2	-	-	-	mg/L	20.6	9.2	11.8	-	-	-	-
Langelier Index	-	-	-	-	1.57	1.04	1.41	-	-	-	-
Total Hardness (as CaCO3)	-	-	80-100	mg/L	*2990*	*365*	*606*	-	-	-	-
Total Dissolved Solids	-	500	-	mg/L	*7170*	*4560*	*3850*	-	-	-	-
Alkalinity (as CaCO3)	-	-	30-500	mg/L	401	279	443	-	-	-	-
Bicarbonate (as CaCO3)	-	-	-	mg/L	401	279	443	-	-	-	-
Carbonate (as CaCO3)	-	-	-	mg/L	<5	<5	<5	-	-	-	-
Hydroxide (as CaCO3)	-	-	-	mg/L	<5	<5	<5	-	-	-	-
Fluoride	1.5	-	-	mg/L	<10	<1.0	<1.0	-	-	-	-
Chloride	-	250	-	mg/L	*4620*	*2990*	*2200*	37.4	25.9	7.41	247
Nitrate as N	10	-	-	mg/L	<10	<1.0	<1.0	-	-	-	-
Nitrite as N	1	-	-	mg/L	<u><10</u>	<1.0	<1.0	-	-	-	-
Bromide	-	-	-	mg/L	<10	<1.0	<1.0	-	-	-	-
Sulphate	-	500	-	mg/L	90.0	87.4	76.6	-	-	-	-
Ortho Phosphate as P	-	-	-	mg/L	24	<2.0	<2.0	-	-	-	-
Ammonia as N	-	-	-	mg/L	0.13	0.34	0.14	-	-	-	-
Ammonia-Un-ionized	-	-	-	mg/L	0.0016	0.015	0.0054	-	-	-	-
Total Phosphorus	-	-	-	mg/L	0.03	0.05	0.08	-	-	-	-
Total Organic Carbon	-	5 (dissolved)	-	mg/L	*5.2*	*7.8*	*5.6*	-	-	-	-
Colour	-	5	-	C.U.	<5	*6*	<5	-	-	-	-
Turbidity	-	5	-	NTU	*42.5*	*190*	*132*	-	-	-	-
Calcium	-	-	-	mg/L	984	131	216	-	-	-	-
Magnesium	-	-	-	mg/L	130	9.1	16.2	-	-	-	-
Sodium	20	200	-	mg/L	**1310**	**1650**	**1220**	**24.7**	**21.1**	**53.7**	**141**
Potassium	-	-	-	mg/L	7.4	3.3	5.3	-	-	-	-
Aluminum	-	-	0.1	mg/L	0.006	0.088	0.086	-	-	-	-
Antimony	0.006	-	-	mg/L	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001
Arsenic	0.025/0.010	-	-	mg/L	0.005	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001
Barium	1	-	-	mg/L	**1.95**	0.237	0.087	0.254	0.197	0.273	0.328

Table 2

Analytical Results - Ground Water

Sample Description	ODWSOG/ODWSQ			UNITS	BH1	BH2	BH3	BH 14	BH 15	BH 16	BH 17
Date Sampled	**Maximum Allowable Concentration**	**Aesthetic Objective**			**02/15/2019**	**02/15/2019**	**02/15/2019**	**10/29/2019**	**10/29/2019**	**10/29/2019**	**10/29/2019**
Beryllium	-	-	-	mg/L	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005
Boron	5	-	-	mg/L	0.028	0.040	0.054	0.0344	0.0137	0.0243	0.0253
Cadmium	0.005	-	-	mg/L	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
Chromium	0.05	-	-	mg/L	0.012	0.008	0.006	<0.002	0.005	<0.002	<0.002
Cobalt	-	-	-	mg/L	0.0014	<0.0005	0.0010	<0.0005	<0.0005	<0.0005	<0.0005
Copper	-	1	-	mg/L	0.002	0.002	0.006	<0.1	<0.1	<0.1	<0.1
Iron	-	0.3	-	mg/L	**32.0**	<0.01	0.05	-	-	-	-
Lead	0.01	-	-	mg/L	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	0.0008
Manganese	-	0.05	-	mg/L	*0.280*	0.026	*0.148*	-	-	-	-
Mercury	0.001	-	-	mg/L	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	-	-	-	mg/L	<0.002	0.005	0.002	0.0023	0.0048	0.0139	0.0063
Nickel	-	-	-	mg/L	<0.003	<0.003	<0.003	0.0034	0.0015	0.0011	0.0018
Selenium	0.01	-	-	mg/L	<0.004	<0.004	<0.004	<0.001	<0.001	<0.001	0.001
Silver	-	-	-	mg/L	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002
Strontium	-	-	-	mg/L	2.69	0.556	0.594	-	-	-	-
Thallium	-	-	-	mg/L	<0.0003	<0.0003	<0.0003	0.0017	0.0017	0.0008	0.0017
Tin	-	-	-	mg/L	<0.002	<0.002	<0.002	-	-	-	-
Titanium	-	-	-	mg/L	0.003	0.003	0.003	-	-	-	-
Tungsten	-	-	-	mg/L	<0.010	<0.010	<0.010	-	-	-	-
Uranium	0.02	-	-	mg/L	<0.002	<0.002	<0.002	0.0008	0.0012	0.0059	0.0017
Vanadium	-	-	-	mg/L	<0.002	<0.002	0.006	<0.0004	0.0006	<0.0004	0.0006
Zinc	-	5	-	mg/L	0.009	0.006	0.009	0.0074	<0.005	<0.005	<0.005
Zirconium	-	-	-	mg/L	<0.004	<0.004	<0.004	-	-	-	-
Cation Sum	-	-	-	meq/L	117	79.1	65.3	-	-	-	-
Anion Sum	-	-	-	meq/L	140	91.7	72.5	-	-	-	-
% Difference/ Ion Balance	-	-	-	%	9.02	7.37	5.22	-	-	-	-

NOTES:

1. All results reported in mg/L unless otherwise noted.
2. Results compared to Ontario Drinking Water Standards, Objectives and Guidelines, June 2006 and Ontario Drinking Water Quality Standards, January 2018 (arsenic only).
3. Results exceeding Maximum Allowable Concentrations are in **BOLD.**
4. Results exceeding Aesthetic Objectives or Operational Guidelines are in italics.
5. Detection limits exceeding an applicable standard are underlined.

TABLE 3

HYDRAULIC CONDUCTIVITY ESTIMATES AND INFILTRATION RATES

4 CAMPBELL DRIVE, UXBRIDGE

Test ID	Test Used	Depth (m)	Soil Description	K (cm/s)	LN(I)	Infiltration Rate (mm/hour)	Design Infiltration Rate (Safety factor of 3.5)
TP1	Guelph Permeameter	1	Silty sand, trace gravel	9.8E-04	4.4	85.2	24.3
TP2	Guelph Permeameter	1.7	Silt, trace to some fine sand	6.3E-05	3.7	40.9	11.7
TP3	Guelph Permeameter	1.5	Silty fine sand	1.1E-04	3.9	47.5	13.6
BH8	Guelph Permeameter	1.3	Sand, some silt, trace gravel	5.7E-04	4.3	73.9	21.1
Geometric Mean	n.a.			2.5E-04	4.1	59.1	16.9
For selecting safety factor: geometric mean/minimum			*4.0*	*Safety factor from Table C-3:*		*3.5*	

Reference for calculationof Infiltration Rate and selection of Safety Factor:
Appendix C, Low Impact Development Stormwater Management Planning and Design Guide, ver. 1.0. Toronto and Region Conservation Authority and the Credit Valley Conservation Authority, 2010.

From Figure C 11: $y=6E\text{-}11(X^{3.7363})$
LN(K)=LN6-11LN10+3.7363LN(I)
LN(I)=(LN(K)+11LN(10)-LN(6))/3.7363
with K in cm/s and Infiltration im mm/hr

The measured infiltration rate (in millimetres per hour) at the proposed bottom elevation of the BMP must be divided by a safety correction factor selected from Table C 3 to calculate the design infiltration rate. To select a safety correction factor from Table C 3, calculate the ratio of the mean (geometric) measured infiltration rate at the proposed bottom elevation of the BMP to the rate in the least permeable soil horizon within 1.5 metres below the bottom of the BMP. Based on this ratio, a safety correction factor is selected from Table C 3. For example, where the mean infiltration rate measured at the proposed bottom elevation of the BMP is 30 mm/h, and the mean infiltration rate measured in an underlying soil horizon within 1.5 metres of the bottom is 12 mm/h, the

ratio would be 2.5, the safety correction factor would be 3.5, and the design infiltration rate would be 8.6 mm/h. Where the soil horizon is continuous within 1.5 metres below the proposed bottom of the BMP, the mean infiltration rate measured at the bottom elevation of the BMP should be divided by a safety correction factor of 2.5 to calculate the design infiltration rate.

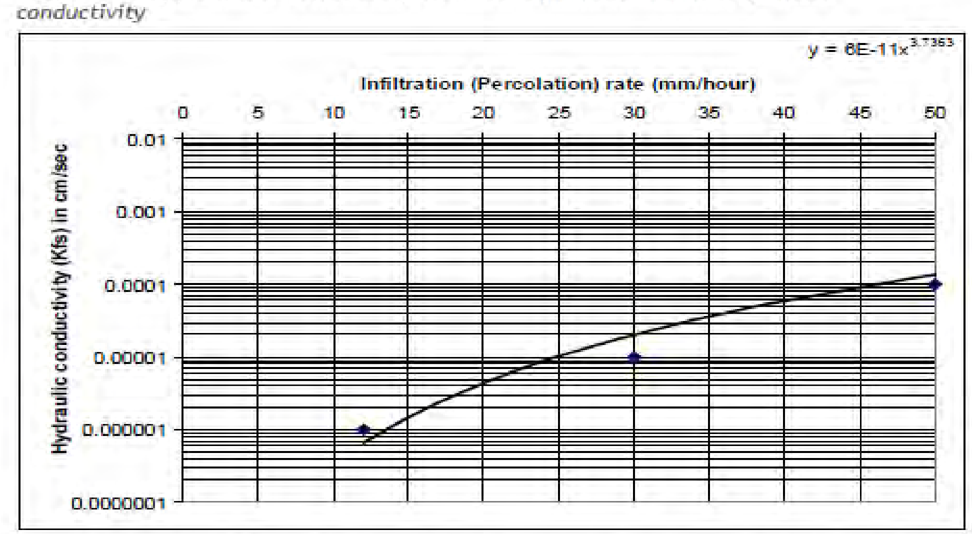
Table C 3: Safety correction factors for calculating design infiltration rates

Ratio of Mean Measured Infiltration Rates[1]	Safety Correction Factor[2]
≤ 1	2.5
1.1 to 4.0	3.5
4.1 to 8.0	4.5
8.1 to 16.0	6.5
16.1 or greater	8.5

Source: Wisconsin Department of Natural Resources. 2004. Conservation Practice Standards. Site Evaluation for Stormwater Infiltration (1002). Madison, WI.

Notes:
1. *Ratio is determined by dividing the geometric mean measured infiltration rate at the proposed bottom elevation of the BMP by the geometric mean measured infiltration rate of the least permeable soil horizon within 1.5 metres below the proposed bottom elevation of the BMP.*
2. *The design infiltration rate is calculated by dividing the geometric mean measured infiltration rate at the proposed bottom elevation of the BMP by the safety correction factor.*

Figure C 11: Approximate relationship between infiltration rate and hydraulic conductivity



Source: Ontario Ministry of Municipal Affairs and Housing (OMMAH). 1997. Supplementary Guidelines to the Ontario Building Code 1997. SG-6 Percolation Time and Soil Descriptions. Toronto, Ontario.

Table 4 - Water Balance

Project No. 1-19-0022-4

1. Climate Information

Source: calculations for Uxbridge Brook Subwatershed, p. 24 of "Lake Simcoe Climate Data: A Reference Document to Support the Completion of Water Balance Assessments, ver. 1.0", Lake Simcoe Region Conservation Authority, April 2017.

Precipitation	892	mm/a
Evapotranspiration	616	mm/a
Water Surplus	276	mm/a

2. Infiltration Rates

MOE, 1995 Infiltration Factors

Pervious Surfaces		*Infiltration Factor*	
1 in 60 (17 m/km) typical slope		0.15	Average of hilly and rolling land factors
Silt		0.2	Use factor for medium combination of clay and loam
Cover - cultivated		0.1	
	TOTAL:	0.45	

Infiltration	124.2	mm/a
Runoff	151.8	mm/a

Impervious Surfaces	*Infiltration Factor*	
Asphalt or building(s)	0	(90% runoff, 10% evapotranspiration)
Existing concrete	0	(90% runoff, 10% evapotranspiration)

3. Property Statistics (Changes within Development Area only)

(i) Pre-Development Site Coverage

Asphalt		2,375	m^2
Concrete		30	m^2
Pervious		5,474	m^2
	TOTAL	7,879	m^2

(ii) Post-Development Coverage

New asphalt		6,319	m^2
Building(s)		1,560	m^2
Concrete		0	m^2
Pervious		0	m^2
	TOTAL:	7,879	m^2

Table 4 - Water Balance

Project No. 1-19-0022-46.1

4. Annual Water Balance Before Development

Land Use	Area (m^2)	Precipitation (m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Runoff (m3)
Asphalt	2,375	2,119	212	0	1,907
Concrete	30	27	3	0	24
Pervious	5,474	4,883	3,372	680	831
TOTAL	**7,879**	**7,028**	**3,587**	**680**	**2,762**

5. Annual Water Balance After Development

Land Use	Area (m^2)	Precipitation (m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Runoff (m3)
Asphalt	6,319	5,637	564	0	5,073
Building	1,560	1,392	139	0	1,252
Concrete	0	-	-	-	-
Pervious	0	-	-	-	-
TOTAL	**7,879**	**7,028**	**703**	**0**	**6,325**

6. Comparison of Pre-Development and Post-Development

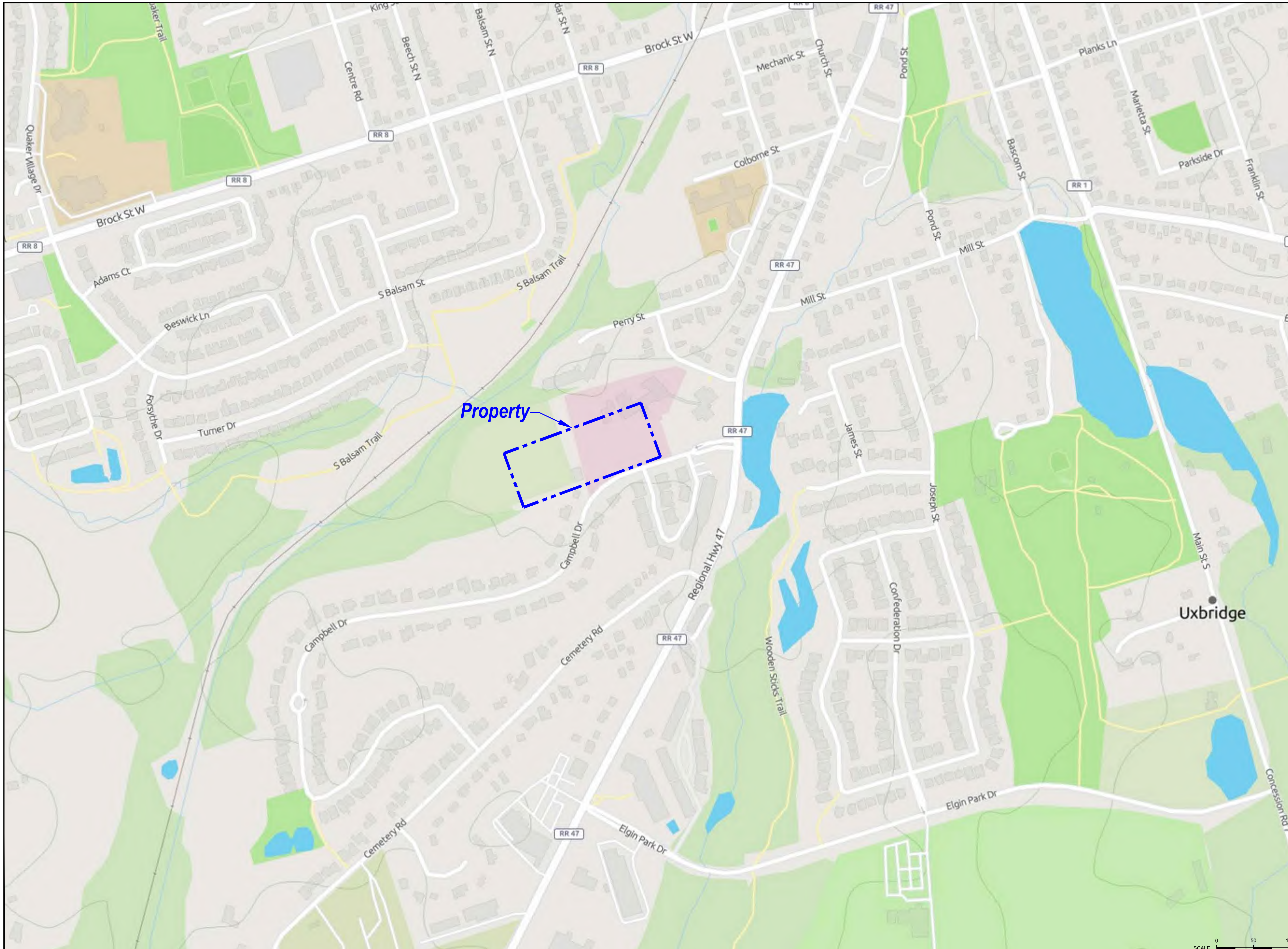
	Precipitation (m^3)	Evapotranspiration (m^3)	Infiltration (m^3)	Runoff (m3)
Pre-Development	7,028	3,587	680	2,762
Post-Development	7,028	703	0	6,325
Change	--	-2,884	-680	3,564

7. Requirement for Infiltration

Required annual infiltration volume to meet pre-development infiltration rates (m^3) 680

FIGURES

TERRAPROBE INC.



Terraprobe Inc.

Consulting Geotechnical & Environmental Engineering
Construction Materials, Inspection & Testing
11 Indell Lane - Brampton Ontario L6T 3Y3 (905) 796-2650

Reference: Toronto Maps

Notes:

Legend:

Property Boundary

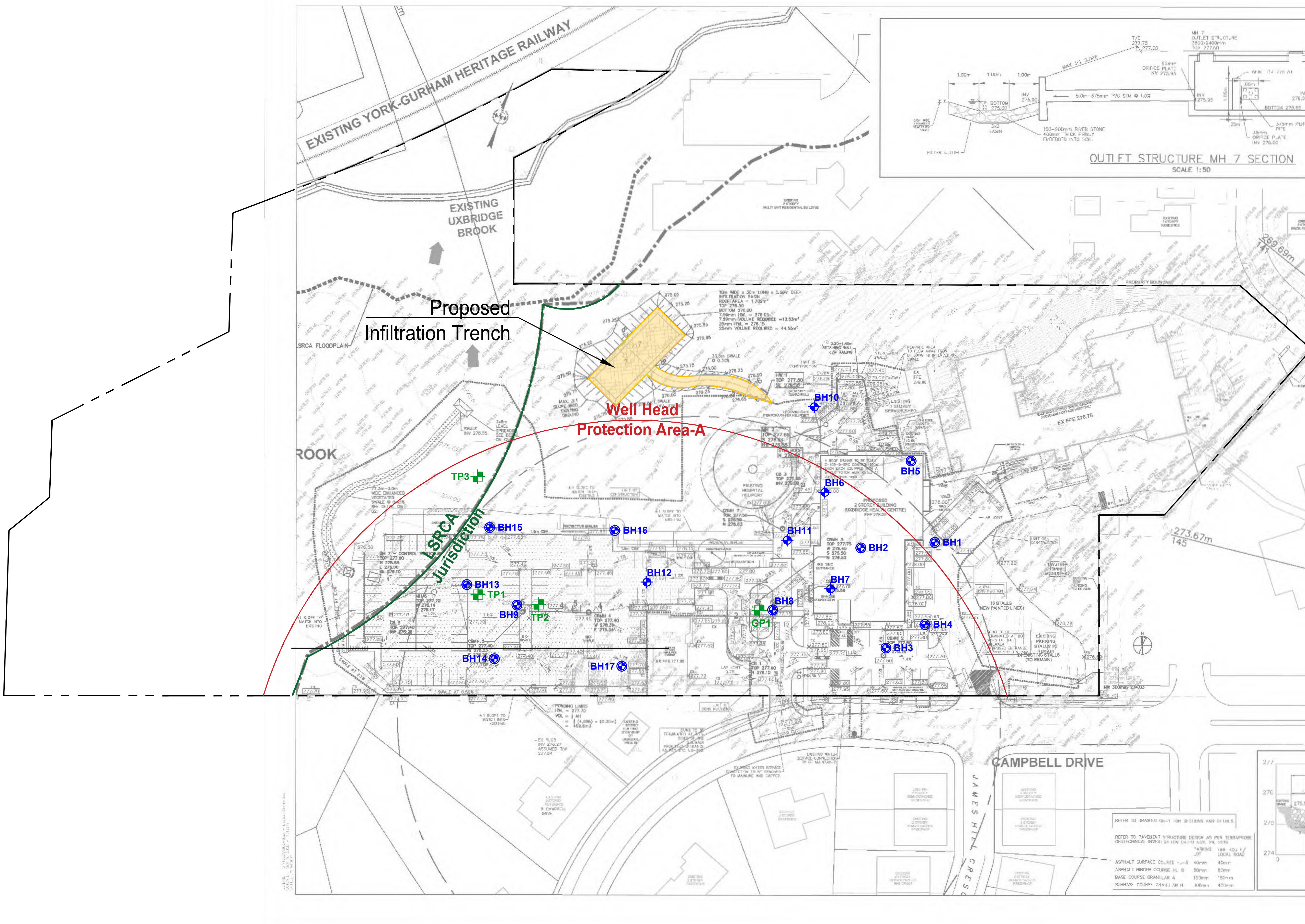
Project Title: Hydrogeological Study

Site Location: 4 Campbell Drive, Uxbridge, Ontario

Figure Title: SITE LOCATION PLAN

Designed By: JW	**File No.:** 1-19-0022-46.1
Drawn By: SSK	**Scale:** As Shown
Reviewed By: SH	
Date: May 2020	**Figure No.:** 1

\\192.168.1.4\tss1-Project Files\2019\1-19-0022 - 4 Campbell Dr. Uxbridge Cottage Hospital\46.1-Hydro G Assessment\A Dwgs, Logs\AutoCAD\1-19-0022 EDITS MAY 27 2020\1-19-0022-46_REV 1.dwg, ssinghania



Terraprobe Inc.

Consulting Geotechnical & Environmental Engineering
Construction Materials, Inspection & Testing

11 Indell Lane - Brampton Ontario L6T 3Y3 (905) 796-2650

Reference:

Project: Uxbridge Health Center
Sheet Contents: Site Survey
Project No.: 1811142
Sheet No.: ESC-1, Date: 01/17/20
By: B+H Architects

Notes:

Legend:

- Property Boundary
- Borehole Location (Terraprobe 2019)
- Monitoring Well Location (Terraprobe 2019)
- TP Test Pit Location (Terraprobe 2019)
- GP Guelph Permeameter Test Location

Project Title:

Hydrogeological Study

Site Location:

4 Campbell Drive, Uxbridge, Ontario

Figure Title:

BOREHOLE, TEST PIT AND MONITORING WELL LOCATION PLAN

Designed By: JW	*File No.:* 1-19-0022-46.1
Drawn By: SSK	*Scale:* As Shown
Reviewed By: SH	*Figure No.:* 2
Date: May 2020	

\\192.168.1.4\tss\1-Project Files\2019\1-19-0022 - 4 Campbell Dr, Uxbridge Cottage Hospital\46.1-Hydro G Assessment\A Dwgs, Logs\AutoCAD\1-19-0022 EDITS MAY 27 2020\1-19-0022-46_REV 1.dwg, ssinghania

Terraprobe Inc.
Consulting Geotechnical & Environmental Engineering
Construction Materials, Inspection & Testing
11 Indell Lane - Brampton Ontario L6T 3Y3 (905) 796-2650

N

Reference:
Google Earth © 2018

Notes:

Legend:

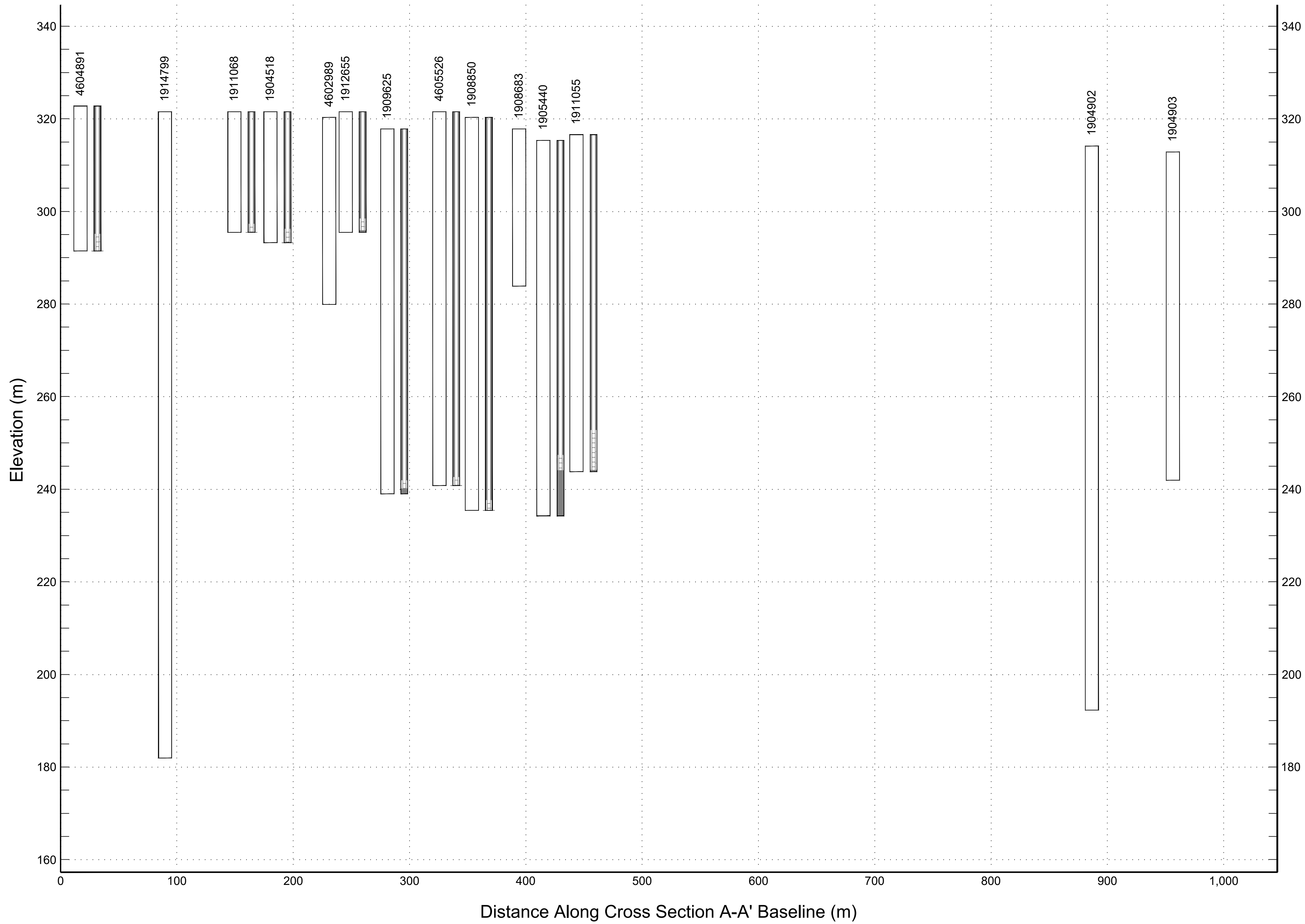
- Property Boundary
- Approximate Development Area Boundary
- Borehole with Monitoring Well Location by Terraprobe 2019
- MECP Monitoring Wells in Study Area
- Approximate Cross Section Location

Project Title:
Hydrogeological Study

Site Location:
4 Campbell Drive, Uxbridge, Ontario

Figure Title:
MECP WELL LOCATION PLAN

Designed By: JW	*File No.:* 1-19-0022-46.1
Drawn By: SSK	*Scale:* As Shown
Reviewed By: SH	*Figure No.:* 3
Date: May 2020	



Terraprobe Inc.

Consulting Geotechnical & Environmental Engineering
Construction Materials, Inspection & Testing

11 Indell Lane - Brampton Ontario L6T 3Y3 (905) 796-2650

N

Reference: Google Earth © 2018

Notes:

Legend:

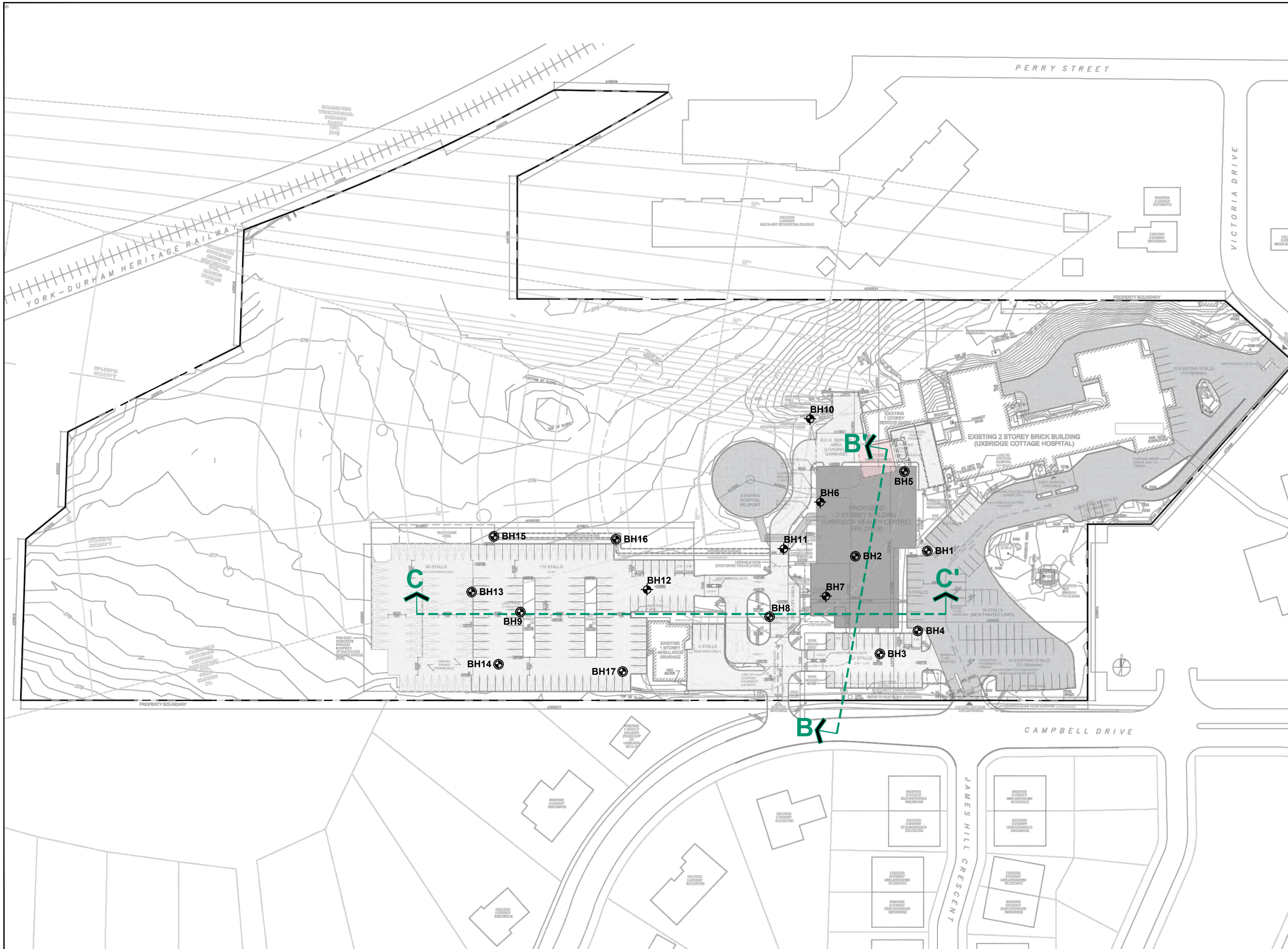
- Topsoil
- Clay
- Sand
- Sandy Clay
- Silty Clay
- Gravel
- Silt
- Boulder
- Clay and Silt
- Fill
- Bedrock (cored)
- Ground Water Level (mbgs)

Project Title: Hydrogeological Study

Site Location: 4 Campbell Drive, Uxbridge, Ontario

Figure Title: MECP CROSS SECTION A-A'

Designed By: JW	*File No.:* 1-19-0022-46.1
Drawn By: SSK	*Scale:* As Shown
Reviewed By: SH	
Date: May 2020	*Figure No.:* 4



Terraprobe Inc.

Consulting Geotechnical & Environmental Engineering
Construction Materials, Inspection & Testing

11 Indell Lane - Brampton Ontario L6T 3Y3 (905) 796-2650

Reference:

Project: Uxbridge Health Center
Sheet Contents: Site Survey
Project No.: 1811142
Sheet No.: A0-01, Date: 09/09/19
By: B+H Architects

Notes:

Legend:

- Property Boundary
- Borehole Location (Terraprobe 2019)
- Monitoring Well Location (Terraprobe 2019)
- Test Pit Location (Terraprobe 2019)
- Cross Section Location

Project Title:

Hydrogeological Study

Site Location:

4 Campbell Drive, Uxbridge, Ontario

Figure Title:

CROSS-SECTION LOCATION PLAN

Designed By: JW	*File No.:* 1-19-0022-46.1
Drawn By: SSK	*Scale:* As Shown
Reviewed By: SQ	*Figure No.:* 5A
Date: May 2020	

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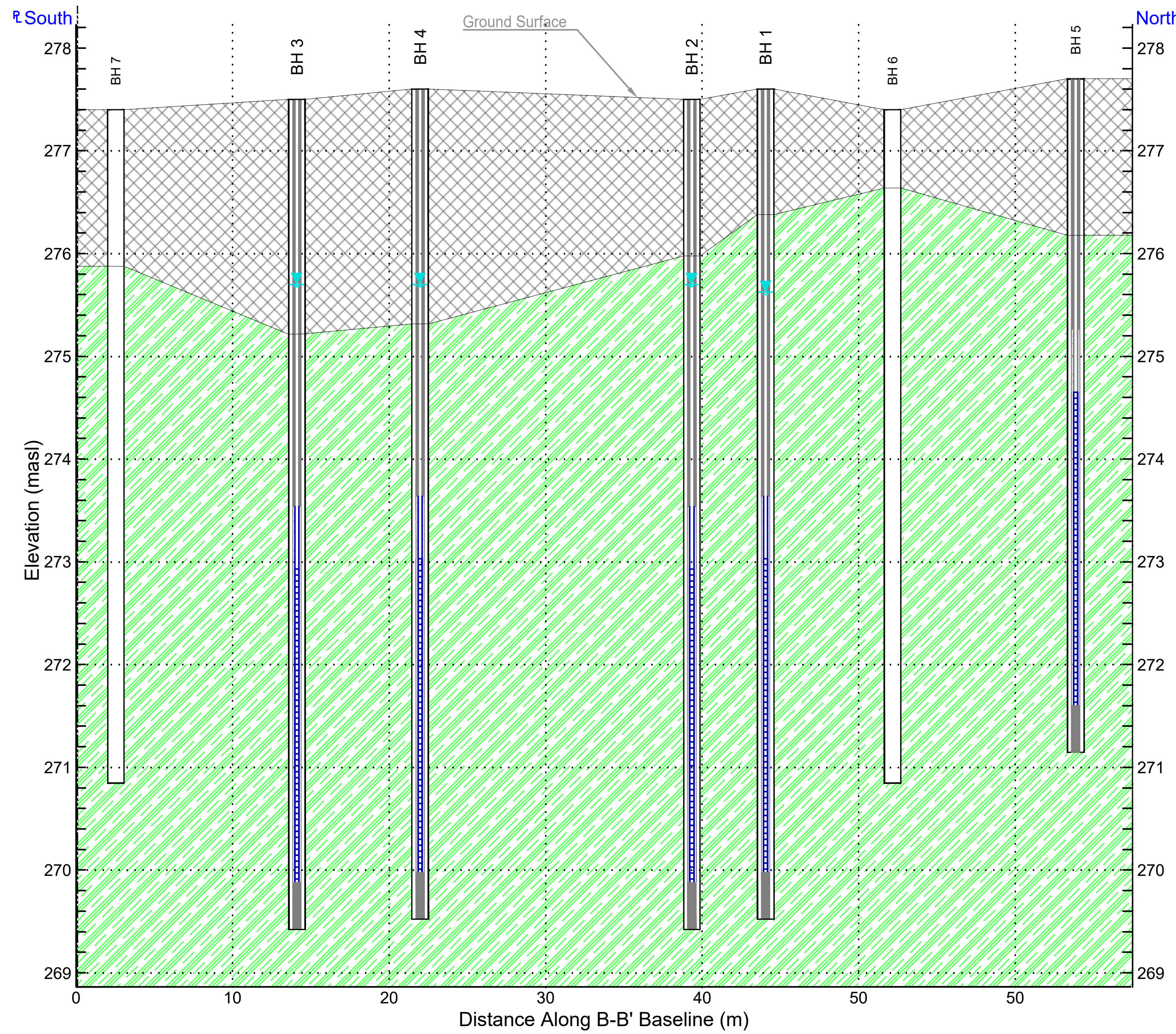


Terraprobe Inc.
Consulting Geotechnical & Environmental Engineering
Construction Materials, Inspection & Testing
11 Indell Lane - Brampton Ontario L6T 3Y3 (905) 796-2650

Reference:
Project: Uxbridge Health Center
Sheet Contents: Site Survey
Project No.: 1811142
Sheet No.: A0-01, Date: 09/09/19
By: B+H Architects

Notes:

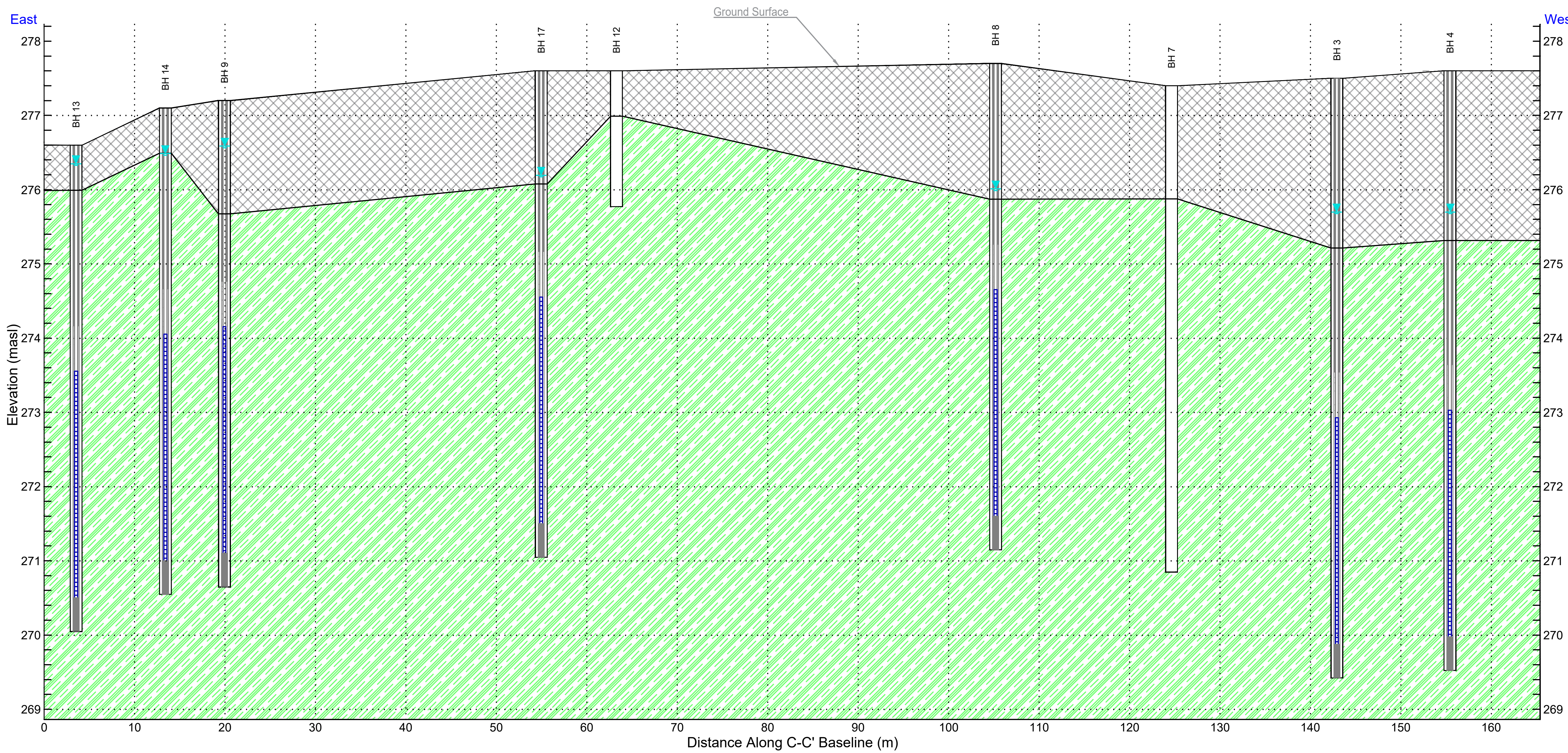
Legend:
Earth Fill
Silt
Monitoring Well Screen
Approximate Elevation of Ground Water Table (masl), Jan. 30, 2020

Project Title: Hydrogeological Study

Site Location: 4 Campbell Drive, Uxbridge, Ontario

Figure Title: HYDROGEOLOGICAL CROSS SECTION B-B'

Designed By: JW	File No.: 1-19-0022-46.1
Drawn By: SSK	Scale: As Shown
Reviewed By: SH	
Date: May 2020	Figure No.: 5



Terraprobe Inc.
Consulting Geotechnical & Environmental Engineering
Construction Materials, Inspection & Testing
11 Indell Lane - Brampton Ontario L6T 3Y3 (905) 796-2650

Reference:
Project: Uxbridge Health Center
Sheet Contents: Site Survey
Project No.: 1811142
Sheet No.: A0-01, Date: 09/09/19
By: B+H Architects

Notes:

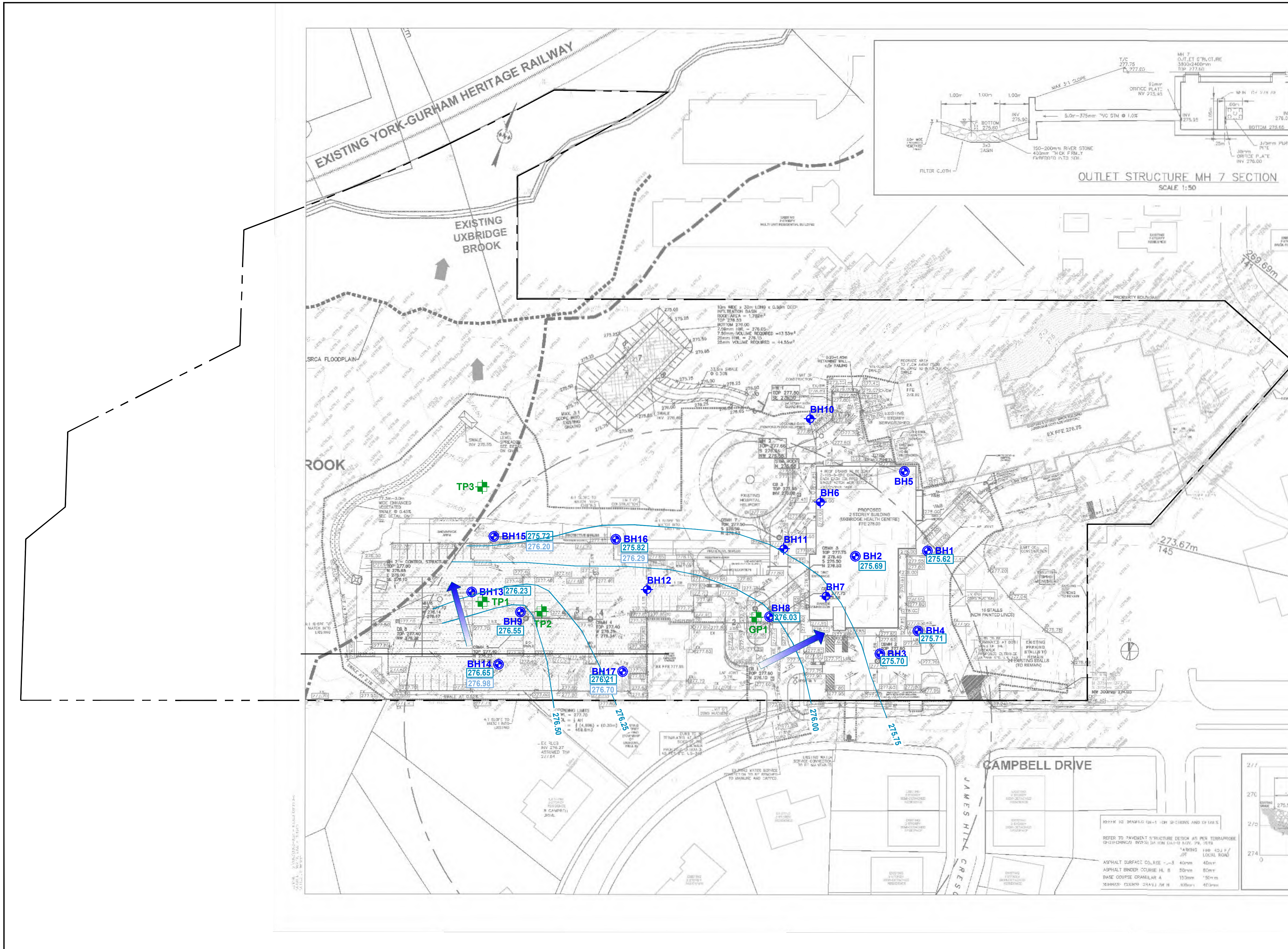
Legend:
- Earth Fill
- Silt
- Monitoring Well Screen
- Approximate Elevation of Ground Water Table (masl), Jan. 30, 2020

Project Title:
Hydrogeological Study

Site Location:
4 Campbell Drive, Uxbridge, Ontario

Figure Title:
HYDROGEOLOGICAL CROSS SECTION C-C'

Designed By: JW	*File No.:* 1-19-0022-46.1
Drawn By: SSK	*Scale:* As Shown
Reviewed By: SH	
Date: May 2020	*Figure No.:* 6



Terraprobe Inc.
Consulting Geotechnical & Environmental Engineering
Construction Materials, Inspection & Testing
11 Indell Lane - Brampton Ontario L6T 3Y3 (905) 796-2650

Reference:
Project: Uxbridge Health Center
Sheet Contents: Site Survey
Project No.: 1811142
Sheet No.: ESC-1, Date: 01/17/20
By: B+H Architects

Notes:

Legend:

- Property Boundary
- Borehole Location (Terraprobe 2019)
- Monitoring Well Location (Terraprobe 2019)
- TP Test Pit Location (Terraprobe 2019)
- GP Guelph Permeameter Test Location
- 275.71 Water Table Elevation(mASL), Jan 30,2020
- 276.98 Maximum known Water Table Elevation(mASL), Jan 12,2020 (Wells with Datalogger Only)
- 275.75 Inferred Water Table (mASL, Jan 30, 2020) Contours
- Inferred Flow Direction

Project Title:
Hydrogeological Study

Site Location:
4 Campbell Drive, Uxbridge, Ontario

Figure Title:
GROUND WATER CONTOURS- JAN 30, 2020

Designed By: JW	*File No.:* 1-19-0022-46.1
Drawn By: SSK	*Scale:* As Shown
Reviewed By: SH	*Figure No.:* 8
Date: May 2020	

\\192.168.1.4\tss\1-Project Files\2019\1-19-0022 - 4 Campbell Dr, Uxbridge Cottage Hospital\46.1-Hydro G Assessment\A Dwgs, Logs\AutoCAD\1-19-0022 EDITS MAY 27 2020\1-19-0022-46_REV 1.dwg, ssinghania

APPENDIX A

TERRAPROBE INC.

SEWER INVERT DATA TABLE

MH/CB	DIRECTION	INVERT	DIAMETER	TOP ELEV.
CB #1	S	0.87	150	276.68
CB #2	N SE	0.82 0.92	150 200	276.52
CB #3	S	0.87	150	276.61
CB #4	W NE E E S	1.55 1.46 1.50 1.03 1.63	200 200 375 50 400	276.57
CB #5	NW NW	0.80 1.10	50 300	276.56
CB #6	S	1.10	150	276.52
CB #7	SW	1.54	*N/A	275.89
CB #8	FULL OF DEBRIS			276.56
CB #9	S	0.87	200	276.52
CB #10	E	0.72	200	276.47
CB #11	NE SW	0.50 0.79	100 150	276.54
CB #12	S	0.98	150	276.71
CB #13	W	1.22	150	276.95
CB #14	E	0.74	200	278.17
CB #15	S	1.48	250	277.43
CB #16	N	1.46	250	277.37
STM MH#1	COULD NOT OPEN			276.64
STM MH#2	N NE W	1.30 1.42 1.43	100 300 375	276.70
STM MH#3	N S NW	2.97 3.13 2.65	375 400 300	276.68
STM MH#4	N E W	3.07 3.30 3.27	400 600 525	276.37
STM MH#5	E SW	3.00 2.76	525 375	277.60
STM MH#6	W E	0.79 0.50	150 100	278.72
SAN MH#1	W E	4.20 4.18	150 150	280.77
SAN MH#2	NE NE S NW	2.15 3.25 3.29 3.30	200 200 200 100	278.46
SAN MH#3	NW SE	3.30 3.48	200 200	277.93
SAN MH#4	SE W	1.48 1.46	100 100	277.71
SAN MH#5	NO VISIBLE INVERTS; RECESSED			277.60
SAN MH#6	NE SW	3.64 3.58	200 200	278.85
SAN MH#7	E SW	2.70 2.67	200 200	277.60
SAN MH#8	E S W	4.18 2.50 4.20	150 150 150	276.93
SAN MH#9	FULL OF DEBRIS			278.60

PLAN OF SURVEY ILLUSTRATING TOPOGRAPHY OF
LOTS 261, 262 AND 263 AND
PART OF LOTS 259, 260 AND 264
BLOCK DD,
LOTS 394, 395, 400 AND 401 AND
PART OF LOTS 390, 391, 393 AND 399
BLOCK QQ,
LOTS 406, 407 AND 408 AND
PART OF LOTS 405, 409, 410 AND 411
BLOCK RR,
PART OF LOTS 420 TO 425
BLOCK TT,
LOTS 433 AND 434 AND
PART OF LOTS 432, 435, 436 AND 437
BLOCK UU,
PART OF LOTS 439 TO 440
BLOCK VV,
PART OF BEECH STREET, BALSAM STREET,
RACHEL STREET, AND HEMLOCK STREET,
(CLOSED BY BY-LAW TU5122)
AND
CHERRY STREET,
(CLOSED BY BY-LAW TU5122)
MUNICIPAL PLAN No 83
AND
PART OF LOT 29,
CONCESSION 6
TOWNSHIP OF UXBRIDGE
REGIONAL MUNICIPALITY OF DURHAM

SCALE 1 : 400

10 0 10 20 30 metres

J.D. BARNES LIMITED

METRIC DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

LEGEND

■	DENOTES	SURVEY MONUMENT FOUND
□	DENOTES	SURVEY MONUMENT SET
SIB	DENOTES	STANDARD IRON BAR
SSIB	DENOTES	SHORT STANDARD IRON BAR
IB	DENOTES	IRON BAR
CC	DENOTES	CUT CROSS
SB	DENOTES	SUBDIVISION BAR
WIT	DENOTES	WITNESS
MEAS	DENOTES	MEASURED
P1	DENOTES	40R-14493
P2	DENOTES	40R-12453
P3	DENOTES	40R-14494
P4	DENOTES	REGISTERED PLAN 40M-1707
P5	DENOTES	40R-13575
P6	DENOTES	40R-1663
P7	DENOTES	PLAN OF SURVEY BY WILLIAM J. PAXTON, O.L.S. DATED JULY 12, 1970, REFERENCE # 70-17
785	DENOTES	B.J. HAYNES, O.L.S
1006	DENOTES	H. FLIM, O.L.S.
1176	DENOTES	DONALD E. ROBERTS, O.L.S.
1183	DENOTES	H.F. GRANDER, O.L.S.
NI	DENOTES	NOT IDENTIFIABLE

CB	DENOTES SINGLE CATCHBASIN
HJB	DENOTES HYDRO JUNCTION BOX
SP	DENOTES STAND PIPE
FP	DENOTES FLAG POLE
HP	DENOTES HYDRO POLE
LS	DENOTES LIGHT STANDARD
TP	DENOTES TELEPHONE POLE
PED	DENOTES TELEPHONE PEDESTAL
H	DENOTES FIRE HYDRANT
WK	DENOTES WATER KEY
SV	DENOTES SPRINKLER VALVE
WV	DENOTES WATER VALVE
— — -	DENOTES OVERHEAD WALKWAY
MH	DENOTES MANHOLE
SAN MH	DENOTES SANITARY MANHOLE
STM MH	DENOTES STORM MANHOLE
—G—	DENOTES UNDERGROUND GAS LINE
—UE—	DENOTES UNDERGROUND ELECTRICAL
—UT—	DENOTES UNDERGROUND TELEPHONE
—UC—	DENOTES UNDERGROUND CABLE
—W—	DENOTES UNDERGROUND WATER LINE
—SAN—	DENOTES UNDERGROUND SANITARY SEWER
—STM—	DENOTES UNDERGROUND STORM SEWER

NOTES

BEARINGS ARE UTM GRID, DERIVED BY REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS)(2010.0)

FOR BEARING COMPARISONS, A ROTATION OF 1°20'55" COUNTER-CLOCKWISE WAS APPLIED TO BEARINGS ON PLANS P1, P2, P3, P4, P5, AND P7, A ROTATION OF 1°21'25" COUNTER-CLOCKWISE WAS APPLIED TO BEARINGS ON P6.

BEFORE DIGGING, UNDERGROUND SERVICES SHOULD BE LOCATED ON SITE BY THE RESPECTIVE AGENCIES

IT IS THE RESPONSIBILTITY OF THE CONTRACTOR TO VERIFY THAT LOCAL BENCHMARKS HAVE NOT BEEN ALTERED OR DISTURBED AND THAT THE RELATIVE ELEVATIONS AGREE WITH THE INFORMATION SHOWN ON THIS PLAN

PRIMARY CONTOURS ARE SET AT 1.00m INTERVALS
SECONDATY CONTOURS ARE SET AT 0.25m INTERVALS

LOCAL BENCHMARK No. 1

NAIL IN HYDRO POLE AT THE NORTH END OF THE PARKING LOT ON THE SOUTH SIDE BETWEEN THE 2 STOREY HOSPITAL AND 1 STOREY GARAGE ELEVATION=228.17

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, AND THE SURVEYORS ACT ACT AND THE REGULATIONS MADE UNDER THEM.

2. THE SURVEY WAS COMPLETED ON THE 6th DAY OF JULY, 2018.

July 19, 2018
DATE

Jack Keat
JOHN C.G. KEAT
ONTARIO LAND SURVEYOR

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2038093
THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR In accordance with Regulation 1026, Section 29(3).

J.D. BARNES LIMITED
SURVEYING MAPPING GIS
LAND INFORMATION SPECIALISTS
110 SCOTIA COURT, #38, WHITBY, ON L1N 8Y7
T: (905) 723-1212 F: (905) 723-4234 www.jdbarnes.com

DRAWN BY:	CHECKED BY:	REFERENCE NO.:
TAB		18-25-537-00
FILE: G:\18-25-537\00\Drawing\18-25-537-00.dgn		DATED: JULY 19, 2018

PLOTTED: 7/19/2018

APPENDIX B

TERRAPROBE INC.

Lake Simcoe Region conservation authority | Ontario Regulation 179/06

Search...

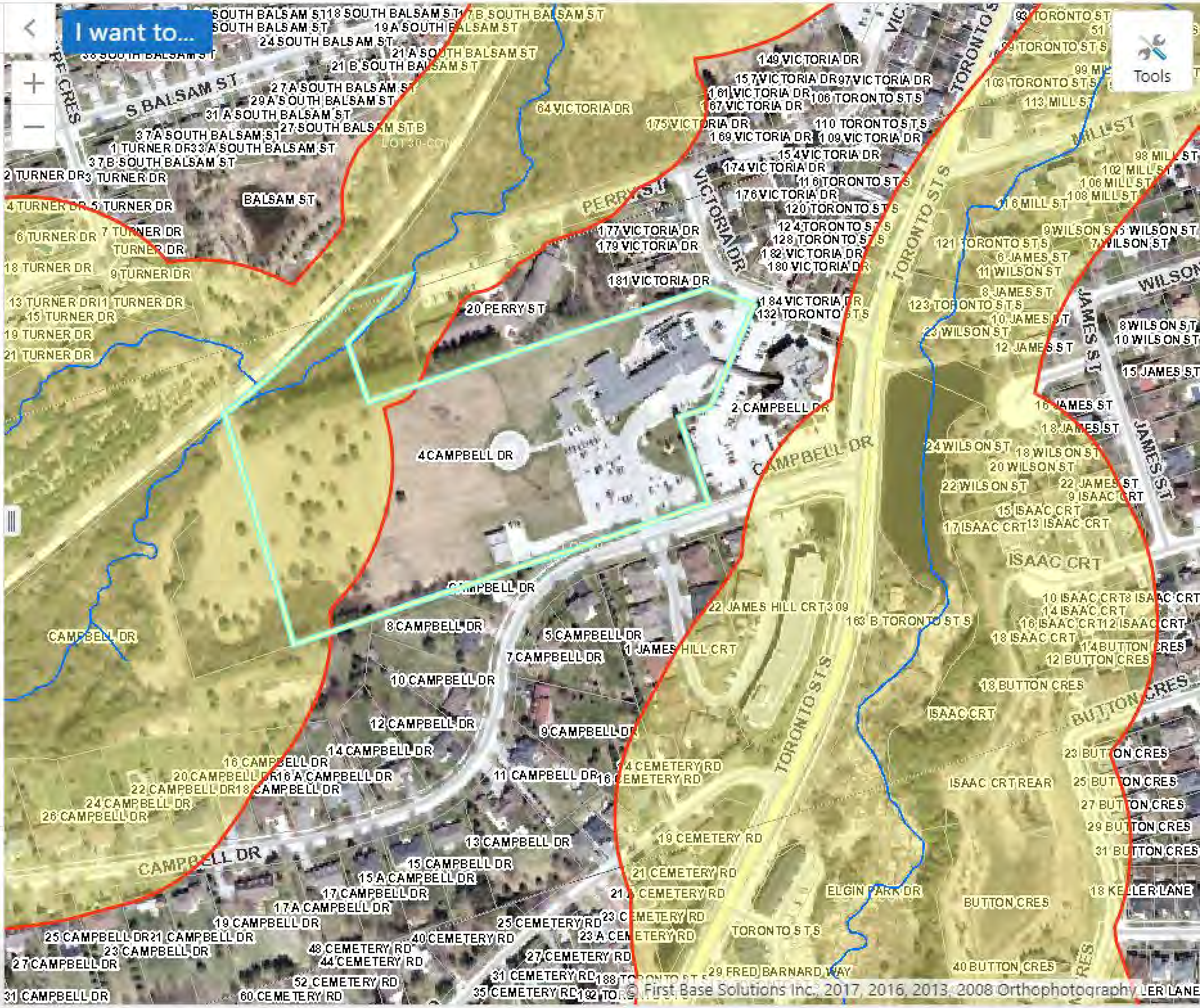
Assessment Parcel (1)

Property Address

ADDRESS: 4 CAMPBELL DR
MUNICIPALITY: Township of Uxbridge
APID: 301999

I want to...

Tools



Displaying 1 - 1 (Total: 1)

Page 1 of 1

Map Use G... | Layers | Assessment...

1:500 | 0 | 50 | 100m

Permit & Regulation Info | Download Pdf Index Maps | Email Feedback

Lake Simcoe Region Conservation Authority

Lake Simcoe Climate Data:

A Reference Document to Support the Completion of Water Balance Assessments

April 2017
Version 1.0

Disclaimer

This document has been provided in an attempt to standardize and aid in evaluation of water balance assessments completed to support development applications reviewed by the Lake Simcoe Region Conservation Authority and should be referred to for this purpose only. The data contained within this document are results from the Lake Simcoe PRMS model developed by Earthfx (2010) and published in the Lake Simcoe and Couchiching-Black River Source Protection Area Approved Assessment Report (2015) which should be referred to for more information.

Users must exercise judgment and flexibly to adapt the data provided when considering specific site conditions and when new information or data becomes available. It is not the intent of the Lake Simcoe Region Conservation Authority to prescribe the methodology nor the data used to undertake water balance assessments, rather it is intended to provide responsible estimates based on current knowledge and evaluation of the conditions within each subwatershed. Where the Qualified Person can show that alternate approaches/data can produce the desired results or even better, such methods and data should be considered. The Qualified Person is solely responsible for the water balance assessments provided to the Lake Simcoe Conservation Authority supporting Land Development Applications for any given site. This document should be used with other established manuals and practices.

Publication Information

Comments on this document should be directed to:

Shelly Cuddy, P.Geo.
Hydrogeologist
Lake Simcoe Region Conservation Authority
120 Bayview Parkway
Newmarket, Ontario, Canada L3Y 3W3
s.cuddy@lsrca.on.ca

Contents

Introduction

Water balance methods are an appropriate means for predicting the changes to the hydrologic cycle that results from urban development. They can be used to determine amounts of water that should be infiltrated to compensate for reductions caused by large paved areas or changes to vegetation.

The maintenance of pre-development 'recharge' is a general requirement in the Oak Ridges Moraine Conservation Plan (ORMCP), Lake Simcoe Protection Plan (LSPP), the South Georgian Bay Lake Simcoe (SGBLS) Source Protection Plan and the Provincial Policy Statement (PPS) that is often captured in municipal Official Plans. Groundwater frequently supports significant watershed features that are necessary components to the maintenance of a healthy watershed. As a result, a water balance analysis is required to estimate the pre-development and post-development infiltration and runoff for most development applications within the Lake Simcoe Region Conservation Authority as outlined in Table 1.

This document aims at providing a standard dataset for land development applicants and their consultants to use when completing water balance analysis. Qualified Persons (QP) should exercise professional judgment and flexibly to adapt the data provided when considering specific site conditions and when new information or data becomes available. It is not the intent of the Lake Simcoe Region Conservation Authority to prescribe the methodology or the data used; rather it is intended to provide responsible estimates based on current knowledge and evaluation of the conditions within each subwatershed. Where there is an alternate approach or data available that can produce the desired results or even better, such methods and data should be considered.

Table 1: Legislation requirements for water balance assessments within the Lake Simcoe Region Conservation Authority	
Legislative Authority:	**Policy Requirements:**
Oak Ridges Moraine	Hydrogeological assessment, pre and post- development water balance required for all major development.
Lake Simcoe Protection Plan – 4.8 Designated Policy	Pre and post- development water balance required for all major development and show how such changes shall be minimized.
Lake Simcoe Protection Plan – 6.40 Designated Policy	Outside of the Oak Ridges Moraine area, an application for major development within a significant groundwater recharge area (SGRA) shall be accompanied by an environmental impact study that demonstrates that the quality and quantity of groundwater in these areas and the function of the recharge areas will be protected, improved or restored.
South Georgian Bay Lake Simcoe Source Protection Plan – Policy LUP-12	For Planning Act applications within the WHPA-Q2 a hydrogeological study is required to show that the existing water balance can be maintained through the use of best management practices. Where necessary implementation and maximization of off-site recharge enhancement within the same WHPA-Q2 may be used to compensate for any predicted loss of recharge from the development. *excludes single detached residential, barns and non-commercial structures that are accessory to an agricultural operation.
Notes: Major development for ORMCP and LSPP includes any site which has a proposed ***building*** footprint of 500 square metres or greater. Major development for SGBLS SPP includes any site which has a proposed ***impervious*** footprint of 500 square metres or greater.	

Water Balance Methodology

The purpose of the water balance analysis is to reasonably estimate the current infiltration rates to the subsurface and to then determine how much this rate will change as a result of the proposed development. It is recognized that site specific water balances are difficult to accurately estimate; the goal should be to assess the difference between pre-development and post development conditions and to mitigate for impacts on infiltration.

The terms ‘infiltration’ and ‘recharge’ are commonly used interchangeably in development application supporting documents. Infiltration relates to the capacity for the soil to allow water to enter the subsurface. Some of this infiltration results in lateral movement in the shallow unsaturated zone where interflow may predominate and some of the infiltration is directed downward to the deeper aquifer system. Recharge is considered to be primarily water that reaches the saturated zone of the aquifer and becomes part of the regional groundwater flow system. The maintenance of infiltration rates is essential to the sustainability of the groundwater flow system which may support local significant ecological features. In addition, infiltration may move to a regional deeper flow system that may be important at a regional scale from either an ecological or water supply perspective.

It is common practice and an accepted method to provide estimates of surplus using a Thornthwaite and Mather approach where surplus is estimated based on precipitation minus evapotranspiration (Steenhuis and Van Der Molen, 1986). Infiltration portion of the surplus can be estimated by applying the infiltration factors provided in the Ministry of the Environment and Energy Hydrogeological Technical Information Requirements for Land Development Applications (1995). These factors consider slope, vegetation and soils. The remainder of surplus is considered to be runoff.

With the recent completion of technical studies required under The Clean Water Act, 2006, numerical models were utilized to estimate, interception, evaporation, potential and actual evapotranspiration, snowmelt, runoff, infiltration, interflow, and groundwater recharge. Many of these model estimates are based on soils, surficial geology and land use mapping products but may also consider detailed vegetation attributes as well as hydrological cycle functions. These modelling output data are available and consultants are encouraged to use them completing site specific water balance assessments.

The water balance tables provided in this document are average values obtained from the numerical modelling undertaken by Earthfx (2010) required under the Clean Water Act, 2006. The resulting water balance parameters are categorized by various vegetation covers in different soil types for each subwatershed within the Lake Simcoe Basin. Infiltration factors can then be applied based on specific site conditions – vegetation, soil and topography, per the above mentioned MOE methodology. When applied to an appropriate catchment area, they can provide reasonable estimates of infiltration for comparison purposes.

This document is meant to summarize the PRMS modelling results (Earthfx, 2010) and not to provide detailed water balance methodology. For additional information on completing hydrogeological water balance assessments please refer to The Ontario Ministry of the Environment Stormwater Planning and Design Manual (2003), Ministry of the Environment and Energy Hydrogeological Technical Information Requirements for Land Development Applications (1995) or the Hydrogeological Assessment Submissions – Conservation Authority Guidelines for Development Applications (2013). In addition, pre-consultation with the Lake Simcoe Region Conservation Authority is strongly recommended to determine the policy context and the scope of your study.

References

Conservation Authorities Geoscience Working Group. 2013. Hydrogeological Assessment Submissions-Conservation Authority Guidelines for Development Applications.

Earthfx Inc. 2010. Water Balance Analysis of the Lake Simcoe Basin using the Precipitation-Runoff Modelling System (PRMS).

Ministry of Environment and Energy. 1995, MOEE Hydrogeological Technical Information Requirements for Land Development Applications.

Ministry of the Environment. 2003. Stormwater Management Planning and Design Manual.

South Georgian Bay-Lake Simcoe Source Protection Committee, 2015. Approved Assessment Report: Lake Simcoe and Couchiching-Black River Source Protection Area Part 1.

Appendix A: Climate Data Tables

Barrie Creeks Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	1.74	952	525	427
Fine Sandy Loam	B		952	539	413
Silt Loam	C		952	573	380
Clay	D		952	643	310
Forest					
Fine Sand	A	4.12	952	521	431
Fine Sandy Loam	B		952	540	412
Silt Loam	C		952	434	518
Clay	D		952	598	354
Pasture & Shrubs					
Fine Sand	A	0.40	952	565	387
Fine Sandy Loam	B		952	546	406
Silt Loam	C		952	558	394
Clay	D		-	-	-
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	0.92	952	528	424
Fine Sandy Loam	B		952	636	316
Silt Loam	C		-	-	-
Clay	D		-	-	-
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	0.43	952	556	396
Fine Sandy Loam	B		952	532	420
Silt Loam	C		-	-	-
Clay	D		-	-	-
Open Alvar					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Aggregates					
Fine Sand	A	0.62	952	471	481
Fine Sandy Loam	B		952	456	496
Silt Loam	C		-	-	-
Clay	D		-	-	-
Mean Annual			**952**	**446**	**506**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

Beaver River Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	1.41	905	582	323
Fine Sandy Loam	B		905	594	311
Silt Loam	C		905	589	316
Clay	D		-	-	-
Forest					
Fine Sand	A	27.16	905	561	344
Fine Sandy Loam	B		905	629	276
Silt Loam	C		905	610	295
Clay	D		905	643	262
Pasture & Shrubs					
Fine Sand	A	6.88	905	550	355
Fine Sandy Loam	B		905	620	285
Silt Loam	C		905	613	292
Clay	D		905	584	321
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	106.22	905	584	321
Fine Sandy Loam	B		905	647	258
Silt Loam	C		905	649	256
Clay	D		905	636	269
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	96.36	905	569	336
Fine Sandy Loam	B		905	653	252
Silt Loam	C		905	649	256
Clay	D		905	656	249
Open Alvar					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Aggregates					
Fine Sand	A	4.39	905	477	428
Fine Sandy Loam	B		905	515	390
Silt Loam	C		905	495	410
Clay	D		-	-	-
Mean Annual			**905**	**610**	**295**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

Black River Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	3.13	895	564	331
Fine Sandy Loam	B		895	579	316
Silt Loam	C		895	569	326
Clay	D		895	596	299
Forest					
Fine Sand	A	73.90	895	578	317
Fine Sandy Loam	B		895	605	290
Silt Loam	C		895	589	306
Clay	D		895	632	263
Pasture & Shrubs					
Fine Sand	A	14.32	895	581	314
Fine Sandy Loam	B		895	605	290
Silt Loam	C		895	591	304
Clay	D		895	607	288
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	57.67	895	581	314
Fine Sandy Loam	B		895	603	292
Silt Loam	C		895	624	271
Clay	D		895	601	294
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	86.23	895	585	310
Fine Sandy Loam	B		895	615	280
Silt Loam	C		895	620	275
Clay	D		895	652	243
Open Alvar					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Aggregates					
Fine Sand	A	3.53	895	486	409
Fine Sandy Loam	B		895	509	386
Silt Loam	C		895	485	410
Clay	D		-	-	-
Mean Annual			**895**	**574**	**320**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

East Holland Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	10.04	878	579	299
Fine Sandy Loam	B		878	638	240
Silt Loam	C		878	594	283
Clay	D		878	613	265
Forest					
Fine Sand	A	39.28	878	608	270
Fine Sandy Loam	B		878	624	253
Silt Loam	C		878	600	278
Clay	D		878	618	260
Pasture & Shrubs					
Fine Sand	A	11.08	878	601	276
Fine Sandy Loam	B		878	621	256
Silt Loam	C		878	606	272
Clay	D		878	594	283
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	24.28	878	622	256
Fine Sandy Loam	B		878	649	229
Silt Loam	C		878	632	246
Clay	D		878	619	259
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	48.80	878	601	276
Fine Sandy Loam	B		878	646	231
Silt Loam	C		878	648	230
Clay	D		878	647	231
Open Alvar					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Aggregates					
Fine Sand	A	24.28	878	508	371
Fine Sandy Loam	B		878	532	346
Silt Loam	C		878	462	417
Clay	D		-	-	-
Mean Annual			**878**	**567**	**311**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

Georgina Creeks Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	1.19	907	550	357
Fine Sandy Loam	B		907	568	339
Silt Loam	C		907	664	243
Clay	D		907	593	314
Forest					
Fine Sand	A	9.69	907	575	332
Fine Sandy Loam	B		907	594	313
Silt Loam	C		907	594	313
Clay	D		907	643	264
Pasture & Shrubs					
Fine Sand	A	1.02	907	592	315
Fine Sandy Loam	B		907	612	295
Silt Loam	C		907	585	322
Clay	D		907	651	257
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	2.59	907	649	258
Fine Sandy Loam	B		907	624	283
Silt Loam	C		907	640	267
Clay	D		907	610	297
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	12.98	907	616	291
Fine Sandy Loam	B		907	642	265
Silt Loam	C		907	640	267
Clay	D		907	647	260
Open Alvar					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Aggregates					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Mean Annual			**907**	**576**	**331**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

Hawkestone Creek Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	0.37	-	-	-
Fine Sandy Loam	B		973	656	317
Silt Loam	C		-	-	-
Clay	D		-	-	-
Forest					
Fine Sand	A	13.95	973	551	422
Fine Sandy Loam	B		973	629	344
Silt Loam	C		973	588	385
Clay	D		973	671	303
Pasture & Shrubs					
Fine Sand	A	1.25	973	551	422
Fine Sandy Loam	B		973	620	353
Silt Loam	C		973	644	329
Clay	D		973	647	326
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	10.50	973	586	387
Fine Sandy Loam	B		973	643	330
Silt Loam	C		973	617	356
Clay	D		973	653	320
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	5.83	973	601	372
Fine Sandy Loam	B		973	647	326
Silt Loam	C		973	608	365
Clay	D		973	667	306
Open Alvar					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Aggregates					
Fine Sand	A	0.97	973	478	495
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Mean Annual			**973**	**589**	**385**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

Hewitts Creek Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	0.20	939	654	285
Fine Sandy Loam	B		939	539	401
Silt Loam	C		-	-	-
Clay	D		-	-	-
Forest					
Fine Sand	A	1.48	939	547	392
Fine Sandy Loam	B		939	586	353
Silt Loam	C		939	649	290
Clay	D		-	-	-
Pasture & Shrubs					
Fine Sand	A	0.41	939	498	441
Fine Sandy Loam	B		939	640	299
Silt Loam	C		939	662	278
Clay	D		-	-	-
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	1.58	939	566	373
Fine Sandy Loam	B		939	618	321
Silt Loam	C		939	621	318
Clay	D		-	-	-
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	7.47	939	613	326
Fine Sandy Loam	B		939	624	315
Silt Loam	C		939	641	298
Clay	D		-	-	-
Open Alvar					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Aggregates					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Mean Annual			**939**	**567**	**372**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

Innisfil Creek Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	1.44	909	538	371
Fine Sandy Loam	B		909	578	331
Silt Loam	C		909	549	360
Clay	D		-	-	-
Forest					
Fine Sand	A	18.24	909	534	375
Fine Sandy Loam	B		909	575	334
Silt Loam	C		909	584	325
Clay	D		909	571	338
Pasture & Shrubs					
Fine Sand	A	1.71	909	572	337
Fine Sandy Loam	B		909	596	313
Silt Loam	C		909	585	324
Clay	D		-	-	-
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	17.89	909	627	282
Fine Sandy Loam	B		909	625	284
Silt Loam	C		909	655	254
Clay	D		-	-	-
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	29.78	909	606	303
Fine Sandy Loam	B		909	625	284
Silt Loam	C		909	674	235
Clay	D		909	664	245
Open Alvar					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Aggregates					
Fine Sand	A	0.56	909	462	447
Fine Sandy Loam	B		909	454	455
Silt Loam	C		909	456	453
Clay	D		-	-	-
Mean Annual			**909**	**571**	**339**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

Lovers Creek Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	1.69	914	537	377
Fine Sandy Loam	B		914	571	343
Silt Loam	C		914	585	329
Clay	D		-	-	-
Forest					
Fine Sand	A	8.05	914	574	340
Fine Sandy Loam	B		914	557	357
Silt Loam	C		914	593	321
Clay	D		914	560	354
Pasture & Shrubs					
Fine Sand	A	1.66	914	566	348
Fine Sandy Loam	B		914	582	332
Silt Loam	C		914	658	256
Clay	D		-	-	-
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	3.89	914	571	343
Fine Sandy Loam	B		914	608	306
Silt Loam	C		914	650	264
Clay	D		-	-	-
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	16.20	914	589	325
Fine Sandy Loam	B		914	623	291
Silt Loam	C		914	646	268
Clay	D		914	523	391
Open Alvar					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Aggregates					
Fine Sand	A	0.20	914	493	421
Fine Sandy Loam	B		914	529	385
Silt Loam	C		-	-	-
Clay	D		-	-	-
Mean Annual			**914**	**545**	**369**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

Maskinonge River Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	0.04	-	-	-
Fine Sandy Loam	B		893	432	461
Silt Loam	C		-	-	-
Clay	D		-	-	-
Forest					
Fine Sand	A	5.78	893	583	310
Fine Sandy Loam	B		893	626	267
Silt Loam	C		893	587	306
Clay	D		893	584	309
Pasture & Shrubs					
Fine Sand	A	1.09	893	596	297
Fine Sandy Loam	B		893	632	261
Silt Loam	C		893	596	297
Clay	D		893	537	356
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	8.93	893	606	287
Fine Sandy Loam	B		893	634	259
Silt Loam	C		893	615	278
Clay	D		893	629	264
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	35.46	893	603	290
Fine Sandy Loam	B		893	635	258
Silt Loam	C		893	592	301
Clay	D		893	574	319
Open Alvar					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Aggregates					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Mean Annual			**893**	**599**	**293**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

Oro Creeks North Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	0.50	990	509	482
Fine Sandy Loam	B		990	572	418
Silt Loam	C		990	586	404
Clay	D		-	-	-
Forest					
Fine Sand	A	19.74	990	561	429
Fine Sandy Loam	B		990	606	385
Silt Loam	C		990	602	388
Clay	D		990	654	336
Pasture & Shrubs					
Fine Sand	A	2.04	990	553	437
Fine Sandy Loam	B		990	618	373
Silt Loam	C		990	621	369
Clay	D		990	588	402
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	18.06	990	570	420
Fine Sandy Loam	B		990	623	368
Silt Loam	C		990	626	364
Clay	D		990	659	332
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	7.32	990	568	423
Fine Sandy Loam	B		990	631	360
Silt Loam	C		990	652	339
Clay	D		990	619	372
Open Alvar					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Aggregates					
Fine Sand	A	1.50	990	476	515
Fine Sandy Loam	B		-	-	-
Silt Loam	C		990	490	500
Clay	D		-	-	-
Mean Annual			**990**	**562**	**427**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

Oro Creeks South Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	0.64	961	622	339
Fine Sandy Loam	B		961	574	387
Silt Loam	C		-	-	-
Clay	D		-	-	-
Forest					
Fine Sand	A	16.66	961	591	370
Fine Sandy Loam	B		961	626	335
Silt Loam	C		961	603	359
Clay	D		-	-	-
Pasture & Shrubs					
Fine Sand	A	0.83	961	608	354
Fine Sandy Loam	B		961	635	326
Silt Loam	C		961	640	321
Clay	D		-	-	-
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	11.52	961	584	378
Fine Sandy Loam	B		961	650	312
Silt Loam	C		961	640	321
Clay	D		-	-	-
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	10.44	961	582	379
Fine Sandy Loam	B		961	652	309
Silt Loam	C		961	650	312
Clay	D		-	-	-
Open Alvar					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Aggregates					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Mean Annual			**961**	**608**	**354**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

Pefferlaw Brook Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	5.06	897	529	368
Fine Sandy Loam	B		897	551	346
Silt Loam	C		897	601	296
Clay	D		897	608	289
Forest					
Fine Sand	A	54.17	897	552	345
Fine Sandy Loam	B		897	611	286
Silt Loam	C		897	596	301
Clay	D		897	651	246
Pasture & Shrubs					
Fine Sand	A	8.73	897	552	345
Fine Sandy Loam	B		897	582	315
Silt Loam	C		897	584	313
Clay	D		897	611	286
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	59.27	897	574	323
Fine Sandy Loam	B		897	634	263
Silt Loam	C		897	649	248
Clay	D		897	637	260
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	57.79	897	570	327
Fine Sandy Loam	B		897	624	273
Silt Loam	C		897	650	247
Clay	D		897	652	245
Open Alvar					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Aggregates					
Fine Sand	A	8.10	897	432	465
Fine Sandy Loam	B		897	448	449
Silt Loam	C		897	671	226
Clay	D		-	-	-
Mean Annual			**897**	**572**	**325**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

Pefferlaw Brook Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	5.06	897	529	368
Fine Sandy Loam	B		897	551	346
Silt Loam	C		897	601	296
Clay	D		897	608	289
Forest					
Fine Sand	A	54.17	897	552	345
Fine Sandy Loam	B		897	611	286
Silt Loam	C		897	596	301
Clay	D		897	651	246
Pasture & Shrubs					
Fine Sand	A	8.73	897	552	345
Fine Sandy Loam	B		897	582	315
Silt Loam	C		897	584	313
Clay	D		897	611	286
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	59.27	897	574	323
Fine Sandy Loam	B		897	634	263
Silt Loam	C		897	649	248
Clay	D		897	637	260
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	57.79	897	570	327
Fine Sandy Loam	B		897	624	273
Silt Loam	C		897	650	247
Clay	D		897	652	245
Open Alvar					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Aggregates					
Fine Sand	A	8.10	897	432	465
Fine Sandy Loam	B		897	448	449
Silt Loam	C		897	671	226
Clay	D		-	-	-
Mean Annual			**897**	**572**	**325**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

Ramara Creeks Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	1.10	966	576	390
Fine Sandy Loam	B		966	653	313
Silt Loam	C		966	638	328
Clay	D		966	676	290
Forest					
Fine Sand	A	13.12	966	565	401
Fine Sandy Loam	B		966	614	352
Silt Loam	C		966	599	367
Clay	D		966	657	309
Pasture & Shrubs					
Fine Sand	A	3.09	966	546	420
Fine Sandy Loam	B		966	625	341
Silt Loam	C		966	612	354
Clay	D		966	627	339
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	54.65	966	591	375
Fine Sandy Loam	B		966	652	314
Silt Loam	C		966	661	305
Clay	D		966	654	312
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	14.65	966	581	385
Fine Sandy Loam	B		966	663	303
Silt Loam	C		966	663	303
Clay	D		966	639	327
Open Alvar					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Aggregates					
Fine Sand	A	0.43	-	-	-
Fine Sandy Loam	B		966	525	441
Silt Loam	C		966	502	464
Clay	D		966	540	426
Mean Annual			**966**	**605**	**361**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

Talbot River Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	0.29	940	533	407
Fine Sandy Loam	B		940	546	394
Silt Loam	C		940	639	301
Clay	D		-	-	-
Forest					
Fine Sand	A	9.47	940	566	374
Fine Sandy Loam	B		940	579	361
Silt Loam	C		940	580	360
Clay	D		940	587	353
Pasture & Shrubs					
Fine Sand	A	2.79	940	595	345
Fine Sandy Loam	B		940	607	333
Silt Loam	C		940	583	357
Clay	D		940	537	403
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	29.21	940	593	347
Fine Sandy Loam	B		940	608	332
Silt Loam	C		940	623	317
Clay	D		940	628	312
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	7.82	940	572	368
Fine Sandy Loam	B		940	618	322
Silt Loam	C		940	586	354
Clay	D		940	652	288
Open Alvar					
Fine Sand	A	0.06	-	-	-
Fine Sandy Loam	B		940	506	434
Silt Loam	C		940	503	437
Clay	D		-	-	-
Aggregates					
Fine Sand	A	1.39	940	490	450
Fine Sandy Loam	B		940	507	433
Silt Loam	C		940	468	472
Clay	D		940	453	487
Mean Annual			**940**	**587**	**353**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

Upper Talbot River Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	0.43	952	479	474
Fine Sandy Loam	B		952	517	435
Silt Loam	C		-	-	-
Clay	D		952	612	340
Forest					
Fine Sand	A	70.50	952	557	395
Fine Sandy Loam	B		952	586	366
Silt Loam	C		952	596	356
Clay	D		952	556	396
Pasture & Shrubs					
Fine Sand	A	37.78	952	546	406
Fine Sandy Loam	B		952	581	371
Silt Loam	C		952	544	408
Clay	D		952	583	369
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	9.56	952	538	414
Fine Sandy Loam	B		952	562	390
Silt Loam	C		952	575	377
Clay	D		952	588	364
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	26.17	952	528	424
Fine Sandy Loam	B		952	599	353
Silt Loam	C		952	629	323
Clay	D		952	559	393
Open Alvar					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Aggregates					
Fine Sand	A	1.70	952	474	478
Fine Sandy Loam	B		952	549	403
Silt Loam	C		952	493	459
Clay	D		-	-	-
Mean Annual			**952**	**568**	**384**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

Uxbridge Brook Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	1.74	892	532	360
Fine Sandy Loam	B		892	560	332
Silt Loam	C		892	616	276
Clay	D		-	-	-
Forest					
Fine Sand	A	30.46	892	551	341
Fine Sandy Loam	B		892	606	286
Silt Loam	C		892	591	301
Clay	D		892	531	361
Pasture & Shrubs					
Fine Sand	A	5.20	892	548	344
Fine Sandy Loam	B		892	591	301
Silt Loam	C		892	613	279
Clay	D		892	508	385
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	35.79	892	561	331
Fine Sandy Loam	B		892	625	267
Silt Loam	C		892	624	268
Clay	D		892	569	323
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	43.40	892	585	307
Fine Sandy Loam	B		892	627	265
Silt Loam	C		892	627	265
Clay	D		892	525	367
Open Alvar					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Aggregates					
Fine Sand	A	1.75	892	433	459
Fine Sandy Loam	B		892	416	476
Silt Loam	C		892	490	402
Clay	D		-	-	-
Mean Annual			**892**	**574**	**317**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

West Holland Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	4.38	868	537	331
Fine Sandy Loam	B		868	613	255
Silt Loam	C		868	598	270
Clay	D		-	-	-
Forest					
Fine Sand	A	47.88	868	559	309
Fine Sandy Loam	B		868	614	254
Silt Loam	C		868	647	221
Clay	D		868	634	234
Pasture & Shrubs					
Fine Sand	A	12.54	868	586	282
Fine Sandy Loam	B		868	610	258
Silt Loam	C		868	640	228
Clay	D		868	645	223
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	46.19	868	581	287
Fine Sandy Loam	B		868	618	250
Silt Loam	C		868	663	205
Clay	D		868	665	203
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	153.92	868	576	292
Fine Sandy Loam	B		868	606	262
Silt Loam	C		868	659	209
Clay	D		868	660	208
Open Alvar					
Fine Sand	A	-	-	-	-
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Aggregates					
Fine Sand	A	0.07	868	496	372
Fine Sandy Loam	B		868	506	362
Silt Loam	C		-	-	-
Clay	D		-	-	-
Mean Annual			**868**	**605**	**264**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

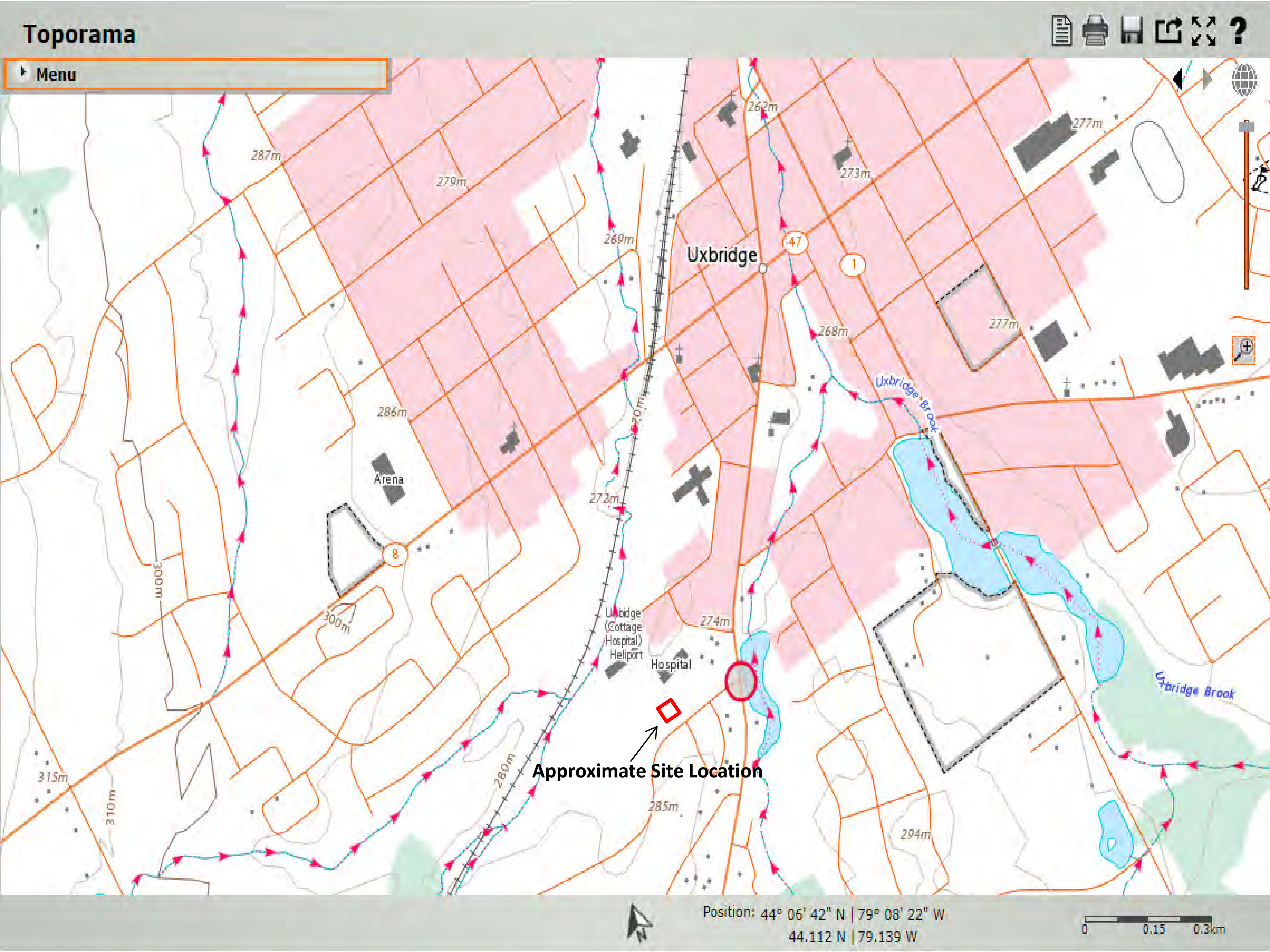
Whites Creek Subwatershed

	Hydrologic Soil Group	Subwatershed Area (km^2)	Mean Annual Precipitation (mm/yr.)	Actual Evapotranspiration (mm/yr.)	Precipitation Surplus (mm/yr.)
Urban Lawns/Golf Courses					
Fine Sand	A	0.12	925	538	387
Fine Sandy Loam	B		925	408	517
Silt Loam	C		925	636	289
Clay	D		-	-	-
Forest					
Fine Sand	A	8.37	925	577	348
Fine Sandy Loam	B		925	603	322
Silt Loam	C		925	589	336
Clay	D		925	612	313
Pasture & Shrubs					
Fine Sand	A	3.34	925	569	356
Fine Sandy Loam	B		925	612	313
Silt Loam	C		925	579	346
Clay	D		925	570	355
Non-Intensive Agriculture (e.g. Hay)					
Fine Sand	A	40.79	925	599	327
Fine Sandy Loam	B		925	637	288
Silt Loam	C		925	622	303
Clay	D		925	641	284
Intensive Agriculture (e.g. Row crop)					
Fine Sand	A	21.31	925	579	346
Fine Sandy Loam	B		925	642	283
Silt Loam	C		925	621	304
Clay	D		925	643	282
Open Alvar					
Fine Sand	A	0.19	-	-	-
Fine Sandy Loam	B		925	528	397
Silt Loam	C		925	534	391
Clay	D		-	-	-
Aggregates					
Fine Sand	A	0.15	925	493	432
Fine Sandy Loam	B		-	-	-
Silt Loam	C		-	-	-
Clay	D		-	-	-
Mean Annual			**925**	**602**	**323**

Notes: Precipitation and Actual Evapotranspiration values are the AVERAGE ANNUAL estimates obtained from the Lake Simcoe PRMS model (Earthfx, 2010).

APPENDIX C

TERRAPROBE INC.


Toporama
Menu
Uxbridge
Uxbridge Brook
Arena
Uxbridge (Cottage Hospital) Heliport
Hospital
Approximate Site Location
287m
279m
269m
262m
273m
277m
268m
286m
272m
274m
285m
280m
294m
300m
310m
315m
47
1
8
Position: 44° 06' 42" N | 79° 08' 22" W
44.112 N | 79.139 W
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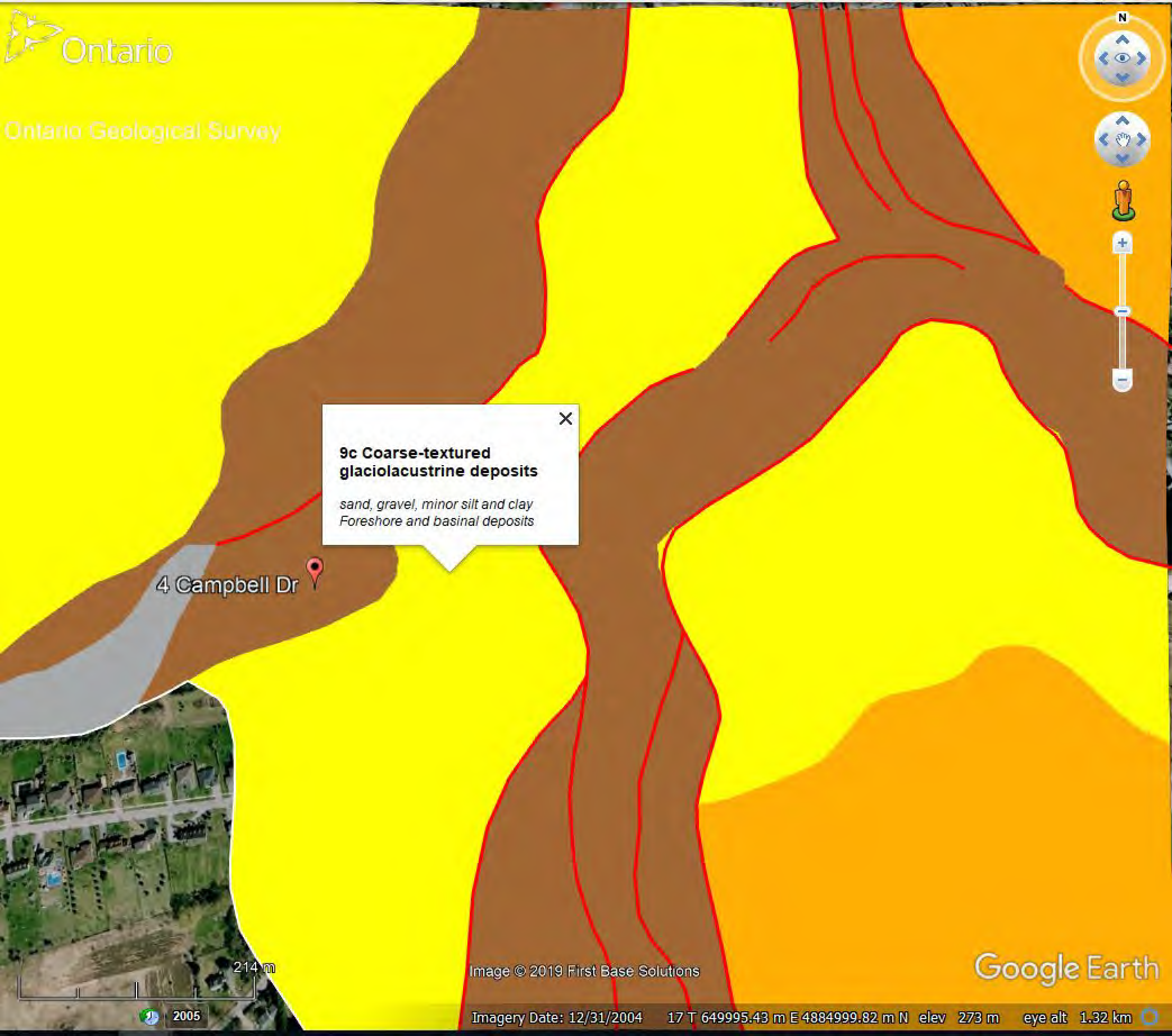
0.3km


Ontario
Ontario Geological Survey
9c Coarse-textured glaciolacustrine deposits
sand, gravel, minor silt and clay
Foreshore and basinal deposits
4 Campbell Dr
214 m
Image © 2019 First Base Solutions
Google Earth
2005
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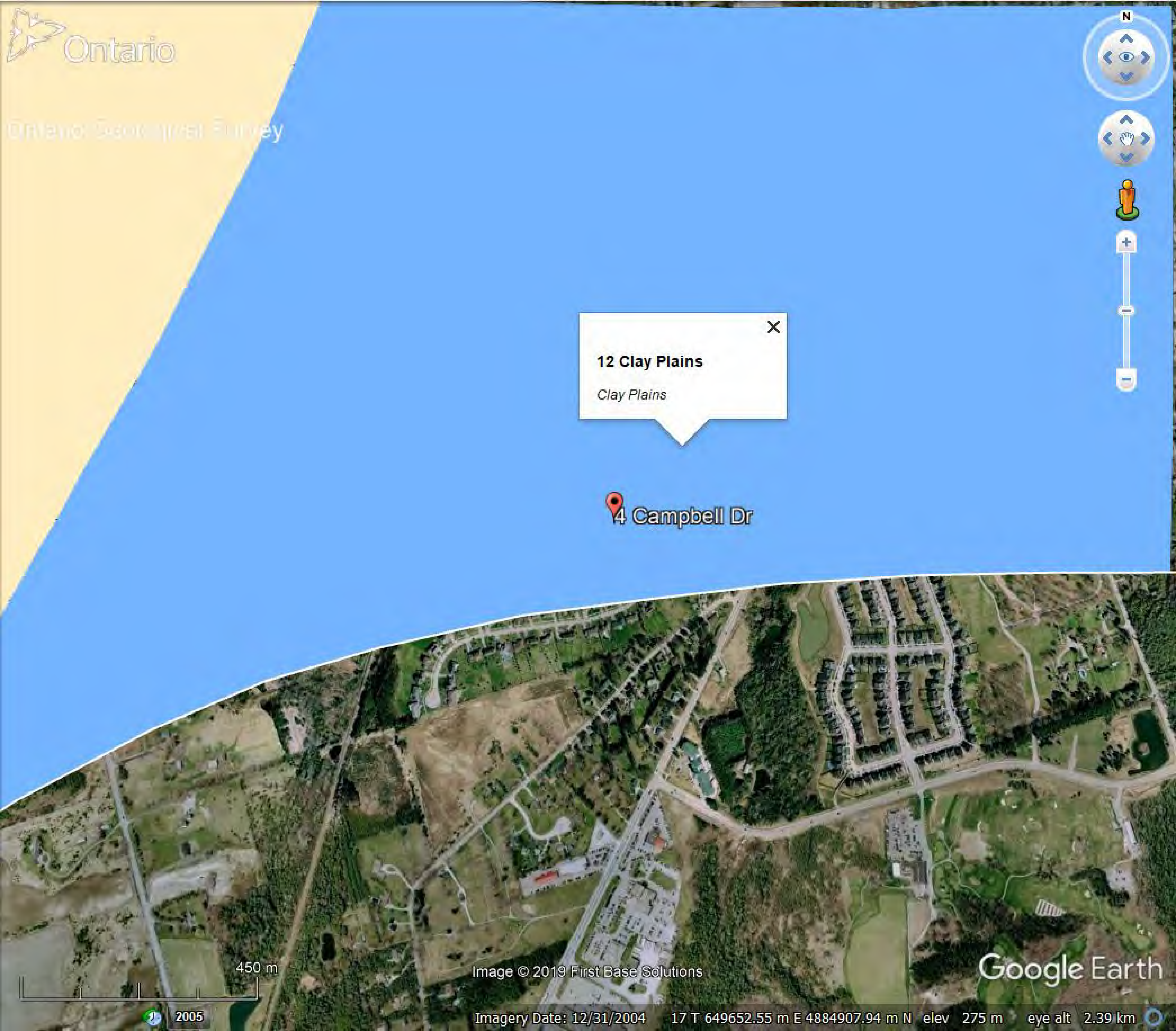

Ontario
12 Clay Plains
Clay Plains
4 Campbell Dr
450 m
Image © 2019 First Base Solutions
Google Earth
2005
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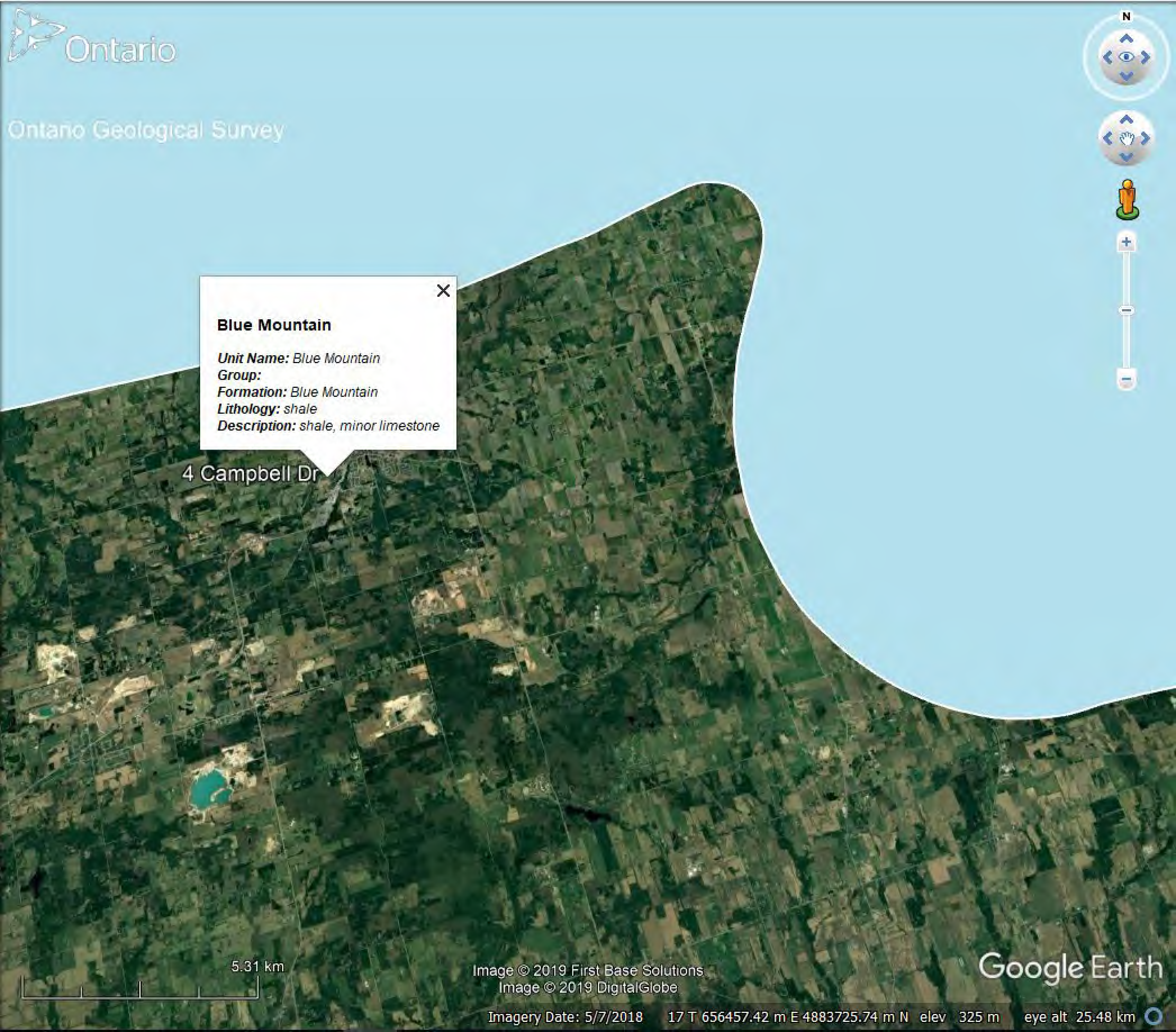
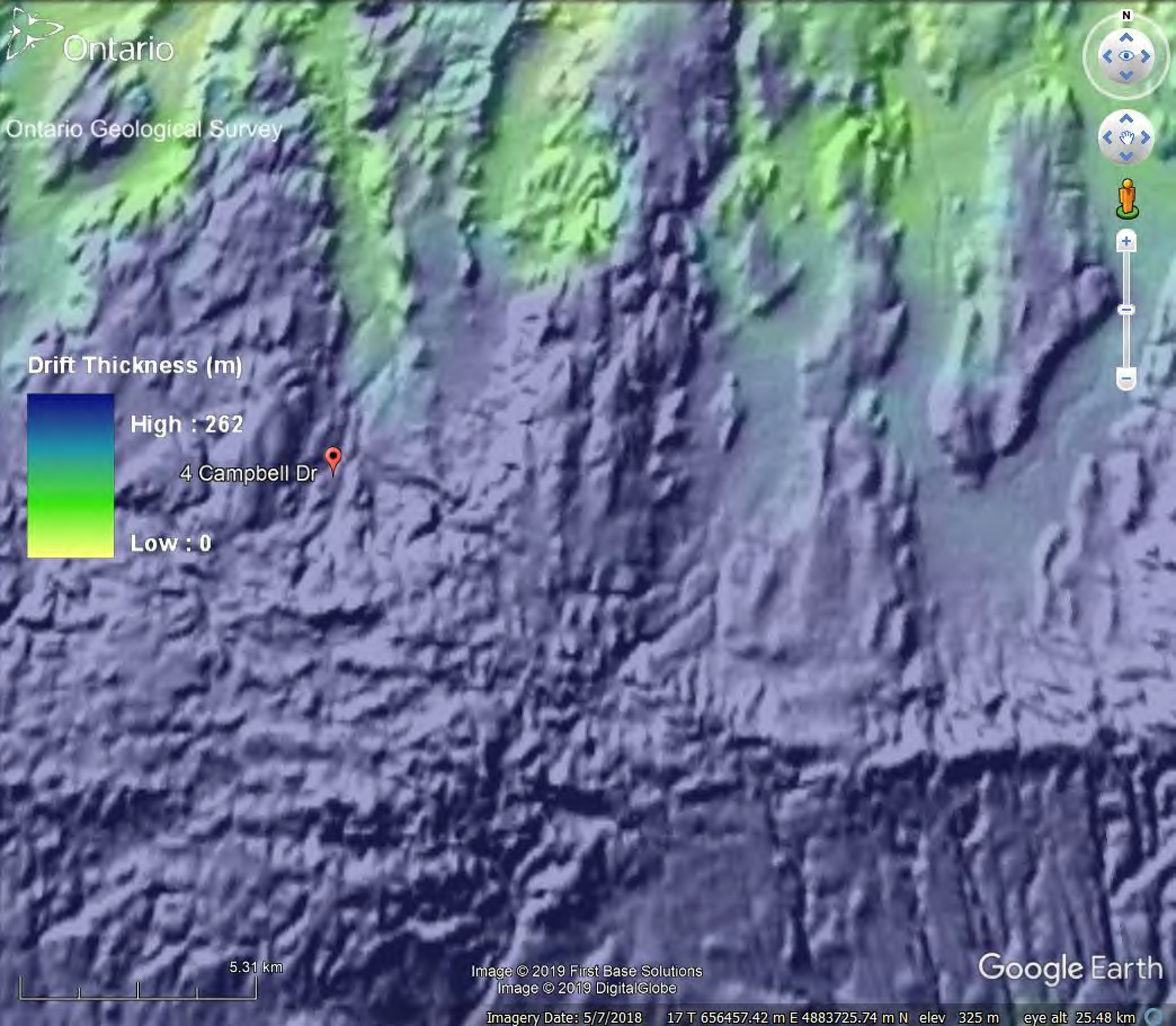

Ontario
Ontario Geological Survey
N
Blue Mountain
Unit Name: Blue Mountain
Group:
Formation: Blue Mountain
Lithology: shale
Description: shale, minor limestone
4 Campbell Dr
5.31 km
Image © 2019 First Base Solutions
Image © 2019 DigitalGlobe
Google Earth
Imagery Date: 5/7/2018
17 T 656457.42 m E 4883725.74 m N
elev 325 m
eye alt 25.48 km


Ontario
Ontario Geological Survey
Drift Thickness (m)
High : 262
Low : 0
4 Campbell Dr
5.31 km
Image © 2019 First Base Solutions
Image © 2019 DigitalGlobe
Google Earth
Imagery Date: 5/7/2018
17 T 656457.42 m E 4883725.74 m N elev 325 m eye alt 25.48 km

APPENDIX D

TERRAPROBE INC.

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
GEORGINA TOWNSHIP (N CON 09 012	17 649806 4884447 W	2007/06 1413	36		2///:			7046906 (Z57510) A	
UXBRIDGE TOWNSHIP (U	17 650112 4885051 W	2013/01 7241	1.5			MT	0014 10	7197204 (Z165618) A143698	BRWN SAND 0004 GREY CLAY 0024
UXBRIDGE TOWNSHIP (U CON 06 022	17 649789 4884764 W	1987/12 1413	5	FR 0225	80/90/12/2:30	DO	0221 4	1908850 (24808)	BRWN SAND PCKD 0020 BRWN CLAY HARD 0080 BRWN SAND CLAY LYRD 0100 GREY CLAY HARD 0200 GREY GRVL SAND CLN 0225
UXBRIDGE TOWNSHIP (U CON 06 027	17 649805 4884596 W	1995/11 3136	8 6	FR 0028	8/43/10/1:0	DO	0046 8	1912654 (165154)	BRWN LOAM 0001 BRWN CLAY SNDY PCKD 0018 BRWN SAND SLTY 0028 BRWN FSND 0055
UXBRIDGE TOWNSHIP (U CON 06 028	17 649933 4884732 W	1988/07 4743	6	FR 0069	4/50/10/2:30	DO	0069 4	1909390 (31453)	BRWN LOAM SOFT 0002 BRWN SAND SOFT 0027 GREY CLAY GRVL SAND 0068 BRWN CSND LOOS LOOS 0073
UXBRIDGE TOWNSHIP (U CON 06 028	17 649749 4884605 W	1986/12 4743	6 5	FR 0048	8/55/10/2:30	DO	0050 4	1908083 (NA)	BLCK LOAM 0002 BRWN SAND CLAY LYRD 0038 BRWN SAND LOOS 0046 GREY CLAY 0048 BRWN SAND CLN FSND 0058 GREY CLAY STKY 0062
UXBRIDGE TOWNSHIP (U CON 06 028	17 649776 4884444 L	2000/10 6874	30	FR 0020	17/26/25/2:	DO		1914838 (222356)	UNKN CMTD 0012 BRWN SAND 0026
UXBRIDGE TOWNSHIP (U CON 06 028	17 649776 4884444 L	2000/08 5459						1914799 (221528) A	GREY GRVL FILL 0001 BRWN CLAY SLTY STNS 0022 GREY CLAY SILT 0075 GREY CLAY SAND DNSE 0150 GREY CLAY STNS SILT 0367 BLCK SHLE HARD 0370
UXBRIDGE TOWNSHIP (U CON 06 028	17 649776 4884444 L	2000/08 5459						1914797 (221525) A	BRWN LOAM SOFT 0003 BRWN FSND SOFT 0075 GREY CLAY STNS HARD 0080 GREY CLAY STNS HARD 0280 GREY CLAY SILT STNS 0360 BLCK SHLE HARD 0370
UXBRIDGE TOWNSHIP (U CON 06 028	17 649779 4884443 L	2000/03 5459	6	FR 0055	8/35/30/1:30	DO	0052 3	1914417 (211656)	BRWN CLAY SNDY 0026 BRWN FSND 0055 BRWN MSND 0060
UXBRIDGE TOWNSHIP (U CON 06 028	17 649779 4884443 L	1999/10 5459	6	UK 0048			0054 3	1914300 (211615)	BRWN CLAY 0028 BRWN SAND CLAY 0043 BRWN CLAY 0048 BRWN SAND SILT 0057
UXBRIDGE TOWNSHIP (U CON 06 028	17 649756 4884604 W	1986/05 4743	6	FR 0052	11/45/10/1:30	DO	0068 4	1907669 ()	BLCK LOAM 0004 BRWN LOAM 0006 BRWN CLAY GRVL LOOS 0012 YLLW SAND DRTY 0048 BRWN CLAY SOFT 0052 BRWN SAND CLN 0072
UXBRIDGE TOWNSHIP (U CON 06 028	17 649779 4884443 L	1999/07 5459						1914209 (195550) A	BRWN SAND SLTY 0062 BRWN SAND SILT STNS 0089 GREY CLAY STNS 0117 GREY SAND STNS 0127 GREY CLAY SAND STNS 0158
UXBRIDGE TOWNSHIP (U CON 06 028	17 649765 4884573 W	1976/09 2407	6	FR 0069	22/72/5/1:0	DO	0069 6	1904518 ()	BLUE LOAM 0001 BLUE CLAY 0032 BLUE SAND QSND 0060 BLUE CLAY 0062 BLUE SAND 0075
UXBRIDGE TOWNSHIP (U CON 06 028	17 649778 4884521 W	1991/05 4743	6	FR 0066	7/50/10/2:0	DO	0066 3	1911068 (73178)	BRWN LOAM BLDR LOOS 0003 BRWN CLAY SOFT 0015 GREY CLAY HARD 0027 GREY SAND LOOS 0032 BRWN SAND 0069

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
UXBRIDGE TOWNSHIP (U CON 06 028	17 649757 4884568 W	1992/09 4743	6 5	FR 0050	13/40/6/4:30	DO	0050 9	1911649 (110978)	BRWN CLAY 0012 BRWN SAND CLAY LYRD 0026 BRWN CLAY SOFT 0051 BRWN SAND FSND 0060 GREY CLAY SILT 0070 GREY CLAY STNS HARD 0070
UXBRIDGE TOWNSHIP (U CON 06 028	17 649779 4884443 L	1995/01 5459	6	FR 0201	18/201/2/5:0	DO	0201 3	1912334 (141583)	BRWN CLAY SNDY 0016 GREY CLAY STNS 0022 BRWN SAND SILT 0031 GREY CLAY STNS ROCK 0189 GREY SAND SILT 0195 GREY CLAY SILT 0201 GREY SAND CLN 0206
UXBRIDGE TOWNSHIP (U CON 06 028	17 649779 4884443 L	1995/02 5459				DO		1912335 (141584) A	PGVL 0120
UXBRIDGE TOWNSHIP (U CON 06 028	17 649779 4884443 L	1999/08 5459						1914210 (195536) A	BRWN SAND SILT 0062 BRWN SAND STNS SILT 0089 GREY SAND STNS 0117 GREY SAND STNS 0123
UXBRIDGE TOWNSHIP (U CON 06 028	17 649665 4884443 W	1971/11 1413	5	FR 0083	20/76/9/3:30	DO	0075 4 0079 4	4604891 ()	BRWN MSND 0020 GREY SILT 0071 RED FSND 0083
UXBRIDGE TOWNSHIP (U CON 06 028	17 649704 4884574 W	2012/05 5459						7182315 (Z141291) A	
UXBRIDGE TOWNSHIP (U CON 06 028	17 650002 4884638 W	1975/12 4743	6	FR 0056	3/20/15/3:0	DO	0057 3	4606390 ()	BLCK LOAM 0001 GREY CLAY GRVL 0020 BRWN CLAY SAND 0038 GREY FSND 0046 GREY GRVL 0060
UXBRIDGE TOWNSHIP (U CON 06 028	17 649912 4884558 W	1975/12 4743	6	FR 0040	8/35/15/1:0	DO	0040 8	4606386 ()	BLCK LOAM 0001 GREY CLAY SAND 0040 GREY SAND 0048 GREY FSND CLAY 0052 GREY GRVL 0054 BLUE CLAY GRVL 0062
UXBRIDGE TOWNSHIP (U CON 06 028	17 649839 4884623 W	1974/07 1350	6	FR 0035	10/35/6/2:0	DO	0037 5	4605933 ()	SAND CLAY 0012 CLAY 0017 SILT CLAY SAND 0035 SAND 0045
UXBRIDGE TOWNSHIP (U CON 06 028	17 649906 4884748 W	1987/10 4743	6	FR 0076	16/26/10/2:15	DO		1908683 (18839)	BRWN LOAM 0007 BLCK BLDR HARD 0010 GREY CLAY SOFT 0035 GREY CLAY SAND 0045 GREY CLAY SAND LYRD 0050 GREY CLAY SOFT 0076 GREY GRVL SAND 0079 GREY GRVL CLN 0090
UXBRIDGE TOWNSHIP (U CON 06 028	17 649675 4884583 W	1973/04 1413	5	FR 0061	12/25/9/1:30	DO	0045 8	4605428 ()	PRDG 0019 BRWN SAND SILT 0050 GREY SAND 0061
UXBRIDGE TOWNSHIP (U CON 06 028	17 649779 4884443 L	1986/02 4743	6 5	FR 0047	15/40/8/1:30	DO	0050 7	1907591 ()	BRWN CLAY SAND 0015 YLLW CLAY SAND PCKD 0047 BRWN FSND 0057 BRWN CLAY SAND LYRD 0064 GREY CLAY STNS HPAN 0077
UXBRIDGE TOWNSHIP (U CON 06 028	17 649615 4884523 W	1969/08 1413	5	FR 0067	23/60/7/2:0	DO	0067 8	4604116 ()	BRWN MSND 0020 RED MSND CLAY 0060 RED FSND 0075
UXBRIDGE TOWNSHIP (U CON 06 028	17 649815 4884473 W	1979/04 4743	6	FR 0063	23/60/6/2:0	DO	0066 4	1905323 ()	BRWN SAND LOOS 0023 YLLW CLAY 0047 GREY CLAY SOFT 0063 GREY SAND CLAY 0066 GREY FSND 0070
UXBRIDGE TOWNSHIP (U CON 06 028	17 649718 4884605 W	1967/10 3109	30	FR 0025	5///:	DO		4602991 ()	LOAM 0002 BRWN CLAY MSND 0024 MSND 0027
UXBRIDGE TOWNSHIP (U CON 06 028	17 649826 4884585 W	1961/08 1415	6	FR 0106	6/40/20/0:30	DO		4602989 ()	GRVL MSND 0004 FSND 0090 MSND CLAY 0100 MSND GRVL 0106 GRVL 0107
UXBRIDGE TOWNSHIP (U CON 06 028	17 649894 4884794 W	1959/10 4102	30	FR 0020	15///:	DO		4602988 ()	FSND 0025
UXBRIDGE TOWNSHIP (U CON 06 028	17 649515 4884473 W	1980/06 1413			///:	NU		1905766 () A	BRWN SAND DRY 0008 BRWN CLAY DNSE 0023 GREY CLAY DNSE 0040 GREY SILT SOFT 0046 GREY CLAY STNS HARD 0100

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
UXBRIDGE TOWNSHIP (U CON 06 028	17 649635 4884553 W	1968/11 1413	5	FR 0037	8/18/9/6:0	DO		4603776 ()	BRWN CLAY MSND 0030 FSND 0034 CLAY 0036 MSND GRVL 0037
UXBRIDGE TOWNSHIP (U CON 06 028	17 649915 4884523 W	1978/01 4743	6	FR 0040	12/35/8/1:0	DO	0042 4	1904966 ()	BRWN SAND 0040 BRWN SAND WBRG 0046
UXBRIDGE TOWNSHIP (U CON 06 029	17 649740 4884558 W	1995/11 3136	8 6	FR 0034	13/62/5/1:0	DO	0063 4	1912653 (165155)	BRWN LOAM 0002 BRWN CLAY SNDY 0016 GREY CLAY SNDY 0027 GREY CLAY SNDY 0034 BRWN FSND 0068 GREY CLAY 0068
UXBRIDGE TOWNSHIP (U CON 06 029	17 649652 4884805 L	1995/06 4743	6	FR 0083	16/40/20/2:0	DO	0084 6	1912475 (152130)	BLCK LOAM 0001 BRWN CLAY SAND LYRD 0021 BRWN SAND LOOS 0025 GREY CLAY SOFT 0059 BRWN FSND 0083 BRWN SAND GRVL CLN 0090
UXBRIDGE TOWNSHIP (U CON 06 029	17 650265 4885073 W	1977/02 2801				NU MN		1904902 ()	BLCK LOAM 0001 BRWN CLAY GRVL SNDY 0023 FSND LOOS 0040 GREY CLAY SNDY SLTY 0050 GREY CLAY SNDY HARD 0057 GREY CLAY GRVL HARD 0065 GREY CLAY GRVL SNDY 0106 GREY CLAY GRVL FSND 0142 BLDR VERY HARD 0144 GREY CLAY GRVL HARD 0166 GREY CLAY SLTY SNDY 0238 BRWN CLAY SAND GRVL 0261 BRWN GRVL CLAY SNDY 0296 GREY CLAY GRVL SLTY 0307 GREY CLAY GRVL HARD 0323
UXBRIDGE TOWNSHIP (U CON 06 029	17 649652 4884805 L	1998/08 5459						1913770 (195371) A	
UXBRIDGE TOWNSHIP (U CON 06 029	17 649786 4884871 W	1990/10 2801	24 12		9/29/600/12:0	PS	0171 21	1911055 (58011)	CLAY GRVL 0022 GRVL CLAY 0030 SAND GRVL 0064 GRVL CLAY SAND 0074 GRVL CLAY 0080 CGVL BLDR 0091 CGVL CLAY 0092 FGVL BLDR 0101 CLAY CGVL HARD 0118 GRVL CLAY 0121 CLAY GRVL HARD 0126 GRVL CLAY SOFT 0147 CLAY GRVL HARD 0156 FGVL CGVL SAND 0171 FGVL CGVL CLAY 0173 FGVL CGVL BLDR 0188 FGVL CGVL BLDR 0193
UXBRIDGE TOWNSHIP (U CON 06 029	17 649652 4884805 L	1989/02 5459	6	FR 0206	/206/15/3:0	DO	0203 3	1909625 (37847)	BRWN CLAY SNDY 0021 BRWN SAND 0026 GREY CLAY SNDY 0127 GREY SAND STNS 0147 GREY CLAY SAND 0187 GREY CLAY SILT 0198 GREY SAND STNS 0209
UXBRIDGE TOWNSHIP (U CON 06 029	17 650315 4885123 W	1977/02 2801				NU MN		1904903 ()	BLCK LOAM 0001 BRWN CLAY GRVL SNDY 0008 GREY CLAY GRVL SLTY 0022 BRWN FSND LOOS 0052 GREY CLAY SNDY SLTY 0060 BLDR VERY HARD 0062 GREY CLAY GRVL SNDY 0068 FGVL MGVL CGVL 0079 GREY CLAY GRVL SNDY 0159 BRWN CLAY GRVL SNDY 0188
UXBRIDGE TOWNSHIP (U CON 06 029	17 649652 4884805 L	1988/07 5459	6	FR 0200	30/206/2/8:0	DO	0200 6	1909176 (NA)	BRWN SAND 0010 BLUE CLAY STNS 0080 BLUE CLAY SOFT 0140 BLUE CLAY STNS 0200 GREY GRVL CMTD 0206
UXBRIDGE TOWNSHIP (U CON 06 029	17 649715 4884923 W	1979/08 2801	2	FR 0070 FR 0163	///:	MN	0182 70	1905440 ()	BRWN CLAY GRVL LOOS 0007 BRWN CLAY SAND SOFT 0019 GREY CLAY SOFT 0029 GREY SAND SILT CLAY 0052 GREY SILT SAND CLAY 0062 BRWN SAND GRVL CLAY 0070 BRWN SAND FGVL CGVL 0096 GREY CLAY GRVL 0163 GREY SAND GRVL PCKD 0195 GREY SAND GRVL CLAY 0215
UXBRIDGE TOWNSHIP (U CON 06 029	17 649652 4884805 L	1999/10 5459				NU		1914299 (211611) A	

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
UXBRIDGE TOWNSHIP (U CON 06 029	17 649725 4884673 W	1973/11 4743	6	FR 0030 FR 0050	18/50/8/6:0	DO	0048 4 0052 4	4605641 ()	BRWN CLAY 0013 YLLW SAND CLAY 0030 YLLW FSND 0038 YLLW CLAY SAND MUCK 0050 BRWN FSND 0056 GREY SILT 0059
UXBRIDGE TOWNSHIP (U CON 06 029	17 649815 4884723 W	1973/07 5459	6	FR 0208	55/125/6/3:0	DO	0214 3	4605526 ()	BRWN SAND 0045 GRVL CLAY 0070 BLUE CLAY STNS 0170 CLAY GRVL 0208 SAND GRVL 0214
UXBRIDGE TOWNSHIP (U CON 06 029	17 649574 4884494 W	2005/12 4743						1917954 (Z26838) A032314 A	
UXBRIDGE TOWNSHIP (U CON 06 029	17 649570 4884498 W	2005/11 4743						1917953 (Z26837) A032316 A	
UXBRIDGE TOWNSHIP (U CON 06 029	17 649649 4884806 L	2003/09 5459				NU		1916696 (264138) A	
UXBRIDGE TOWNSHIP (U CON 06 029	17 649649 4884806 L	2003/09 5459	6	FR 0117	-10/100/20/2:0	DO	0129 6	1916695 (264133)	BRWN SAND 0017 BRWN CLAY FILL 0040 GREY SAND SILT 0048 GREY CLAY 0074 GREY SAND GRVL 0078 GREY CLAY STNS 0103 GREY SAND GRVL 0105 GREY CLAY 0117 GREY SAND GRVL 0135
UXBRIDGE TOWNSHIP (U CON 06 029	17 649649 4884806 L	2003/08 5459	10 6	FR 0110	-14/-14/60/0:0	DO	0110 6	1916658 (264125)	BRWN SAND STNS 0036 GREY CLAY STNS 0075 GREY CLAY SLTY 0081 GREY CLAY STNS 0086 GREY CLAY SLTY 0089 GREY CLAY STNS SILT 0101 GREY SAND STNS 0121
UXBRIDGE TOWNSHIP (U CON 06 029	17 649650 4884806 L	2001/08 2801						1915308 (232024) A	
UXBRIDGE TOWNSHIP (U CON 06 029	17 649652 4884805 L	1998/08 5459						1913768 (195369) A	
UXBRIDGE TOWNSHIP (U CON 06 029	17 649650 4884806 L	2001/07 2801				NU		1915204 (232021) A	
UXBRIDGE TOWNSHIP (U CON 06 029	17 649805 4884622 W	1995/12 3136	8 6	FR 0029	14/64/6/1:0	DO	0063 5	1912655 (165176)	BRWN LOAM 0003 BRWN CLAY SNDY 0027 BRWN FSND 0047 GREY FSND 0069 GREY CLAY 0069
UXBRIDGE TOWNSHIP (U CON 06 029	17 649652 4884805 L	1999/08 5459	6	FR 0198	45/190/10/1:	DO	0200 6	1914163 (195534)	BRWN SAND SILT 0062 BRWN SAND STNS SILT 0089 GREY CLAY STNS 0117 GREY SAND STNS SILT 0127 GREY CLAY STNS STNS 0198 GREY SAND STNS 0211
UXBRIDGE TOWNSHIP (U CON 06 029	17 649652 4884805 L	1998/08 5459						1913769 (195370) A	
UXBRIDGE TOWNSHIP (U CON 06 029	17 649652 4884805 L	1998/08 5459						1913767 (195368) A	
UXBRIDGE TOWNSHIP (U CON 06 029	17 649652 4884805 L	1998/08 5459						1913766 (195367) A	
UXBRIDGE TOWNSHIP (U CON 06 029	17 649652 4884805 L	1996/05 3136				NU		1912850 (165175) A	
UXBRIDGE TOWNSHIP (U CON 06 029	17 649652 4884805 L	1996/05 3136				NU		1912849 (165174) A	

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
UXBRIDGE TOWNSHIP (U CON 06 029	17 649652 4884805 L	1996/05 3136				NU		1912848 (165173) A	
UXBRIDGE TOWNSHIP (U CON 06 029	17 649652 4884805 L	1996/05 3136				NU		1912847 (165170) A	
UXBRIDGE TOWNSHIP (U CON 06 029	17 649652 4884805 L	1996/05 3136				NU		1912846 (165171) A	
UXBRIDGE TOWNSHIP (U CON 06 029	17 649652 4884478 W	1995/12 3136	8 6	UK 0019 FR 0037	9/61/8/1:0	DO	0066 5	1912672 (165177)	BRWN LOAM 0002 BRWN CLAY SNDY 0019 BRWN SAND 0073 GREY CLAY 0073
UXBRIDGE TOWNSHIP (U CON 06 029	17 649650 4884806 L	2001/01 2662	6 2				0165 10	1915255 (228240)	BLCK LOAM 0005 BRWN CLAY SNDY GRVL 0013 GREY CLAY GRVL 0022 GREY SAND SLTY 0043 GREY CLAY GRVL 0052 GREY CLAY SNDY GRVL 0081 GREY SAND SLTY GRVL 0093 GREY CLAY SNDY GRVL 0166 GREY GRVL SAND WBRG 0182
UXBRIDGE TOWNSHIP (U CON 06 030	17 649805 4884447 W	2007/06 1413	42		4///:			7046902 (Z57506) A	

Notes:
UTM: UTM in Zone, Easting, Northing and Datum is NAD83; L: UTM estimated from Centroid of Lot; W: UTM not from Lot Centroid
DATE CNTR: Date Work Completedand Well Contractor Licence Number
CASING DIA: .Casing diameter in inches
WATER: Unit of Depth in Fee. See Table 4 for Meaning of Code

PUMP TEST: Static Water Level in Feet / Water Level After Pumping in Feet / Pump Test Rate in GPM / Pump Test Duration in Hour : Minutes
WELL USE: See Table 3 for Meaning of Code
SCREEN: Screen Depth and Length in feet
WELL: WEL (AUDIT #) Well Tag . A: Abandonment; P: Partial Data Entry Only
FORMATION: See Table 1 and 2 for Meaning of Code

1. Core Material and Descriptive terms

Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
BLDR	BOULDERS	FCRD	FRACTURED	IRFM	IRON FORMATION	PORS	POROUS	SOFT	SOFT
BSLT	BASALT	FGRD	FINE-GRAINED	LIMY	LIMY	PRDG	PREVIOUSLY DUG	SPST	SOAPSTONE
CGRD	COARSE-GRAINED	FGVL	FINE GRAVEL	LMSN	LIMESTONE	PRDR	PREV. DRILLED	STKY	STICKY
CGVL	COARSE GRAVEL	FILL	FILL	LOAM	TOPSOIL	QRTZ	QUARTZITE	STNS	STONES
CHRT	CHERT	FLDS	FELDSPAR	LOOS	LOOSE	QSND	QUICKSAND	STNY	STONEY
CLAY	CLAY	FLNT	FLINT	LTCL	LIGHT-COLOURED	QTZ	QUARTZ	THIK	THICK
CLN	CLEAN	FOSS	FOSILIFEROUS	LYRD	LAYERED	ROCK	ROCK	THIN	THIN
CLYY	CLAYEY	FSND	FINE SAND	MARL	MARL	SAND	SAND	TILL	TILL
CMTD	CEMENTED	GNIS	GNEISS	MGRD	MEDIUM-GRAINED	SHLE	SHALE	UNKN	UNKNOWN TYPE
CONG	CONGLOMERATE	GRNT	GRANITE	MGVL	MEDIUM GRAVEL	SHLY	SHALY	VERY	VERY
CRYS	CRYSTALLINE	GRSN	GREENSTONE	MRBL	MARBLE	SHRP	SHARP	WBRG	WATER-BEARING
CSND	COARSE SAND	GRVL	GRAVEL	MSND	MEDIUM SAND	SHST	SCHIST	WDFR	WOOD FRAGMENTS
DKCL	DARK-COLOURED	GRWK	GREYWACKE	MUCK	MUCK	SILT	SILT	WTHD	WEATHERED
DLMT	DOLOMITE	GVLY	GRAVELLY	OBDN	OVERBURDEN	SLTE	SLATE		
DNSE	DENSE	GYPS	GYPSUM	PCKD	PACKED	SLTY	SILTY		
DRTY	DIRTY	HARD	HARD	PEAT	PEAT	SNDS	SANDSTONE		
DRY	DRY	HPAN	HARDPAN	PGVL	PEA GRAVEL	SNDY	SANDYOAPSTONE		

2. Core Color

Code	Description
WHIT	WHITE
GREY	GREY
BLUE	BLUE
GREN	GREEN
YLLW	YELLOW
BRWN	BROWN
RED	RED
BLCK	BLACK
BLGY	BLUE-GREY

3. Well Use

Code	Description	Code	Description
DO	Domestic	OT	Other
ST	Livestock	TH	Test Hole
IR	Irrigation	DE	Dewatering
IN	Industrial	MO	Monitoring
CO	Commercial	MT	Monitoring TestHole
MN	Municipal		
PS	Public		
AC	Cooling And A/C		
NU	Not Used		

4. Water Detail

Code	Description	Code	Description
FR	Fresh	GS	Gas
SA	Salty	IR	Iron
SU	Sulphur		
MN	Mineral		
UK	Unknown		

APPENDIX E

TERRAPROBE INC.

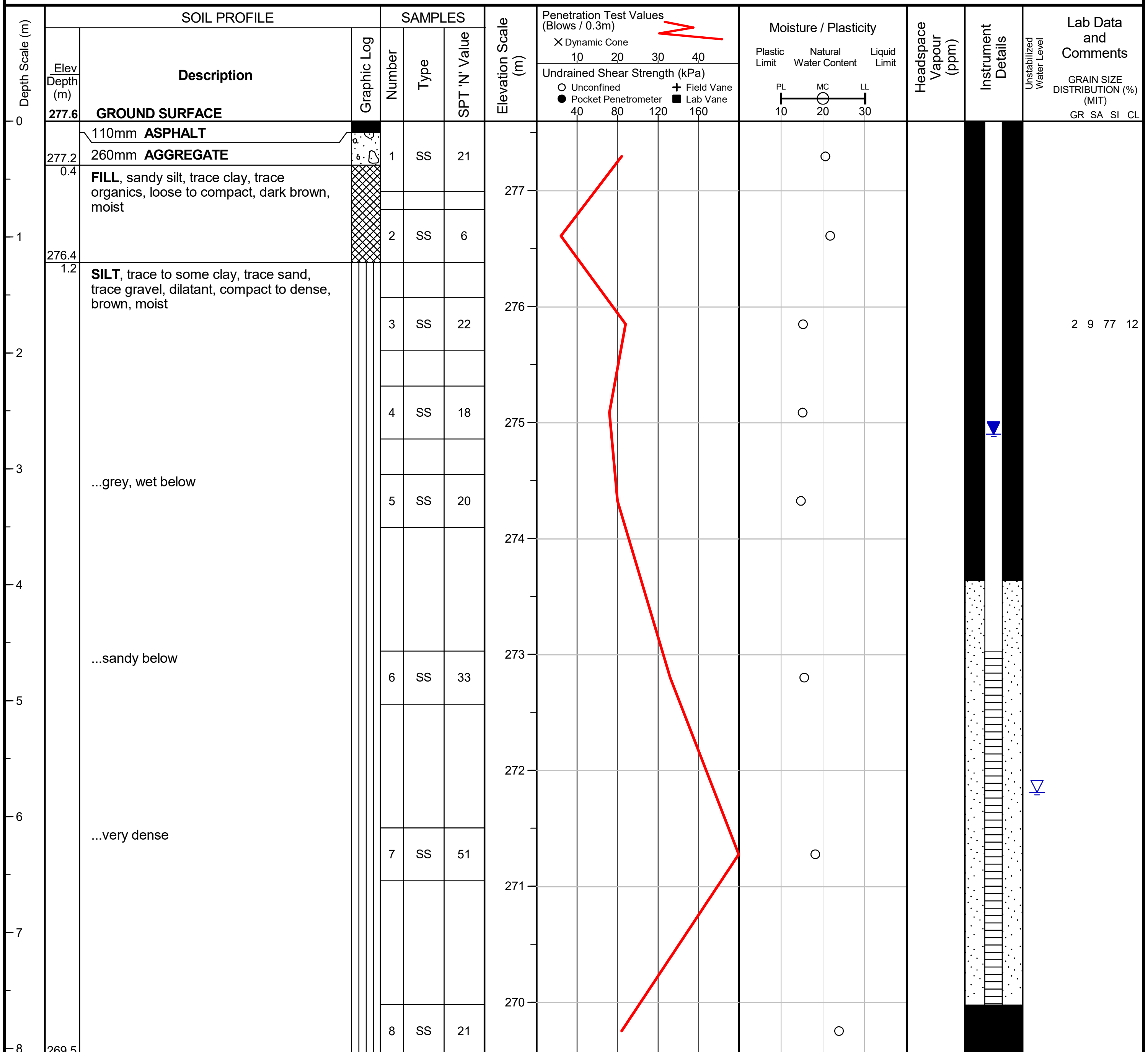
Terraprobe

LOG OF BOREHOLE 1

Project No. : 1-19-0022	Client : Uxbridge Health Centre	Originated by : NB
Date started : February 8, 2019	Project : 4 Campbell Dr	Compiled by : AR
Sheet No. : 1 of 1	Location : Uxbridge, Ontario	Checked by : SZ

Position : E: 649849, N: 4884951 (UTM 17T)
Elevation Datum : Geodetic
Rig type : CME 75, truck-mounted
Drilling Method : Solid stem augers

Elev / Depth (m)	Description	Sample Number	Type	SPT 'N' Value	Natural Water Content	Lab Data (GR SA SI CL)
277.6	GROUND SURFACE					
	110mm **ASPHALT**					
277.2 / 0.4	260mm **AGGREGATE**	1	SS	21		
	FILL, sandy silt, trace clay, trace organics, loose to compact, dark brown, moist	2	SS	6		
276.4 / 1.2	**SILT**, trace to some clay, trace sand, trace gravel, dilatant, compact to dense, brown, moist	3	SS	22		2 9 77 12
		4	SS	18		
	...grey, wet below	5	SS	20		
	...sandy below	6	SS	33		
	...very dense	7	SS	51		
269.5 / 8.1		8	SS	21		



END OF BOREHOLE

Unstabilized water level measured at 5.8 m below ground surface; borehole caved to 7.3 m below ground surface upon completion of drilling.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Feb 14, 2019	2.7	274.9
Oct 29, 2019	2.4	275.1

file: 1-19-0022 bh logs.gpj

Terraprobe

LOG OF BOREHOLE 2

Project No. : 1-19-0022
Client : Uxbridge Health Centre
Originated by : NB

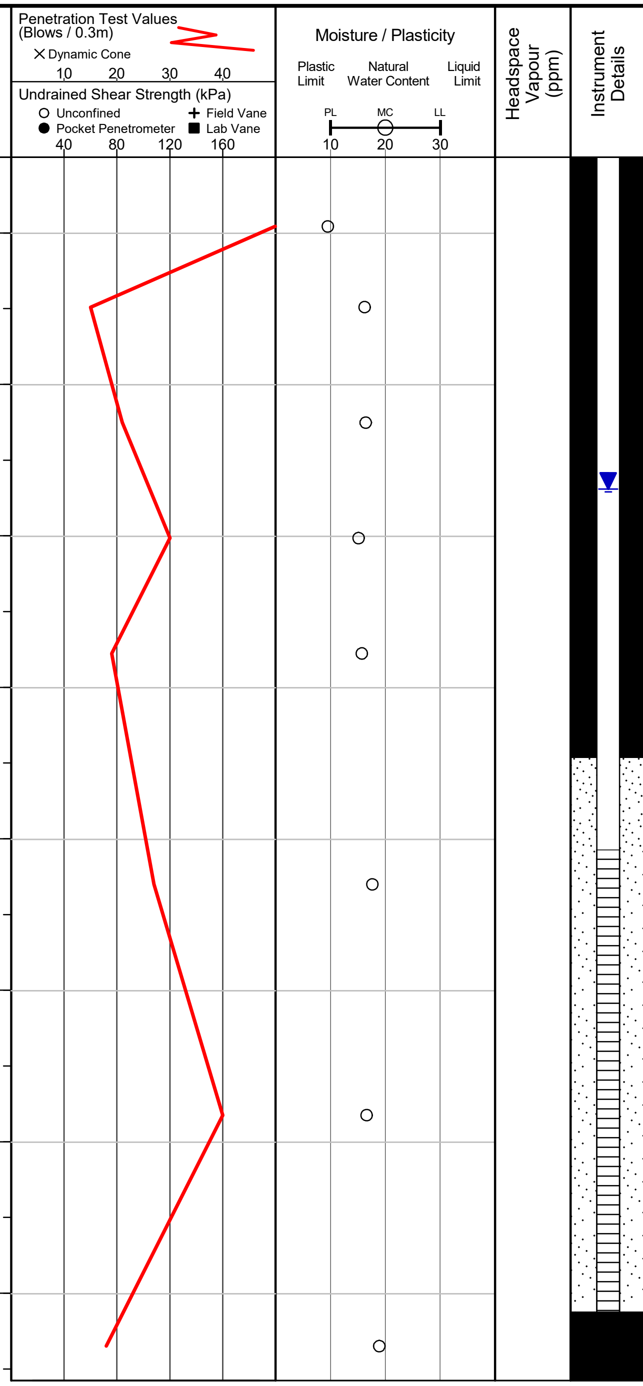
Date started : February 8, 2019
Project : 4 Campbell Dr
Compiled by : AR

Sheet No. : 1 of 1
Location : Uxbridge, Ontario
Checked by : SZ

Position : E: 649829, N: 4884945 (UTM 17T)
Elevation Datum : Geodetic

Rig type : CME 75, truck-mounted
Drilling Method : Solid stem augers

Depth Scale (m)	Elev / Depth (m)	Description (SOIL PROFILE)	Sample Number	Type	SPT 'N' Value	Elevation Scale (m)	Lab Data and Comments: GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL
0	277.5	GROUND SURFACE					
		110mm **ASPHALT**					
	277.1 / 0.4	310mm **AGGREGATE**					
		FILL, sand and gravel, asphalt pieces, very dense, dark brown, moist	1	SS	98	277	
1			2	SS	15		
	276.0 / 1.5	**SILT**, trace to some clay, trace sand, trace gravel, dilatant, compact to dense, brown, moist	3	SS	21	276	3 8 74 15
2			4	SS	30	275	
3		...grey, wet below	5	SS	19	274	
4		...sandy below	6	SS	27	273	
5						272	
6			7	SS	40	271	
7						270	
8	269.4 / 8.1		8	SS	18		



END OF BOREHOLE

Unstabilized water level measured at 5.8 m below ground surface; borehole caved to 7.3 m below ground surface upon completion of drilling.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Feb 14, 2019	2.2	275.3
Oct 29, 2019	2.3	275.2

file: 1-19-0022 bh logs.gpj

Terraprobe

LOG OF BOREHOLE 3

Project No. : 1-19-0022 | Client : Uxbridge Health Centre | Originated by : NB

Date started : February 8, 2019 | Project : 4 Campbell Dr | Compiled by : AR

Sheet No. : 1 of 1 | Location : Uxbridge, Ontario | Checked by : SZ

Position : E: 649844, N: 4884922 (UTM 17T) | Elevation Datum : Geodetic

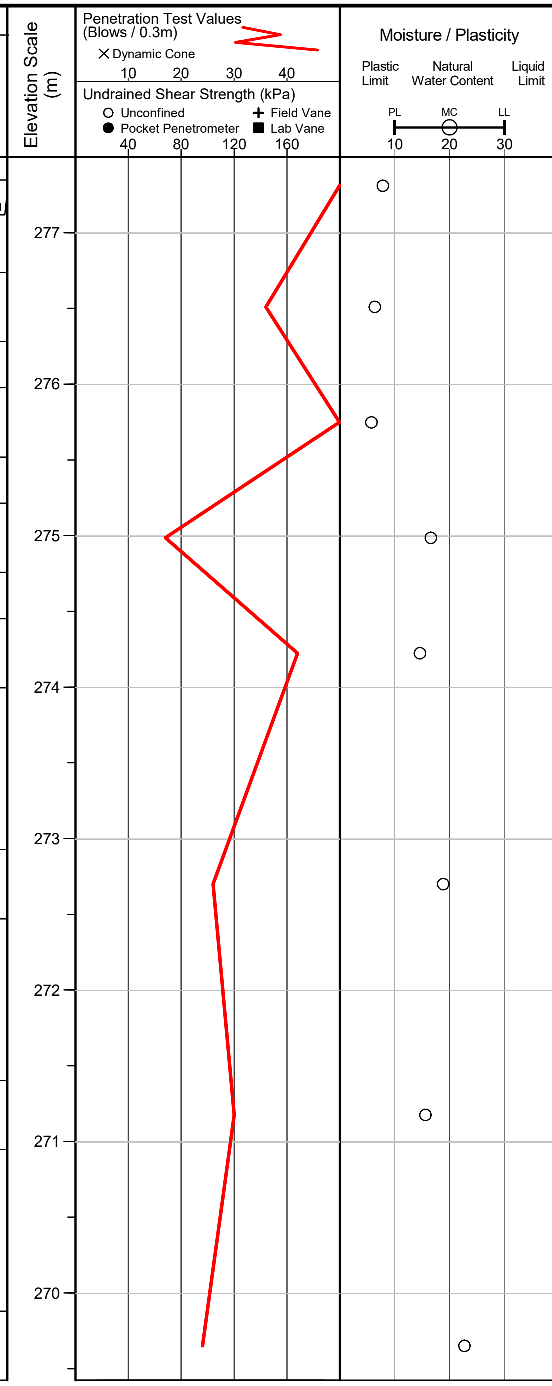
Rig type : CME 75, truck-mounted | Drilling Method : Solid stem augers

SOIL PROFILE

Elev Depth (m)	Description
277.5	**GROUND SURFACE**
	110mm **ASPHALT**
277.1 / 0.4	260mm **AGGREGATE**
	FILL, sand, some gravel, trace silt, trace brick fragments, dense to very dense, brown, moist
275.2 / 2.3	**SILT**, trace to some clay, trace sand, dilatant, compact to dense, brown, wet
	...sandy below
269.4 / 8.1	

SAMPLES

Number	Type	SPT 'N' Value
1	SS	50 / 75mm
2	SS	36
3	SS	60
4	SS	17
5	SS	42
6	SS	26
7	SS	30
8	SS	24



Lab Data and Comments — GRAIN SIZE DISTRIBUTION (%) (MIT): GR SA SI CL — Sample 4: 0 7 79 14

Headspace Vapour (ppm) | Instrument Details | Unstabilized Water Level

END OF BOREHOLE

Unstabilized water level measured at 5.8 m below ground surface; borehole caved to 7.3 m below ground surface upon completion of drilling.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Feb 14, 2019	2.2	275.3
Oct 29, 2019	2.2	275.3

file: 1-19-0022 bh logs.gpj

Terraprobe

LOG OF BOREHOLE 4

Project No. : 1-19-0022	Client : Uxbridge Health Centre	Originated by : NB
Date started : February 8, 2019	Project : 4 Campbell Dr	Compiled by : AR
Sheet No. : 1 of 1	Location : Uxbridge, Ontario	Checked by : SZ

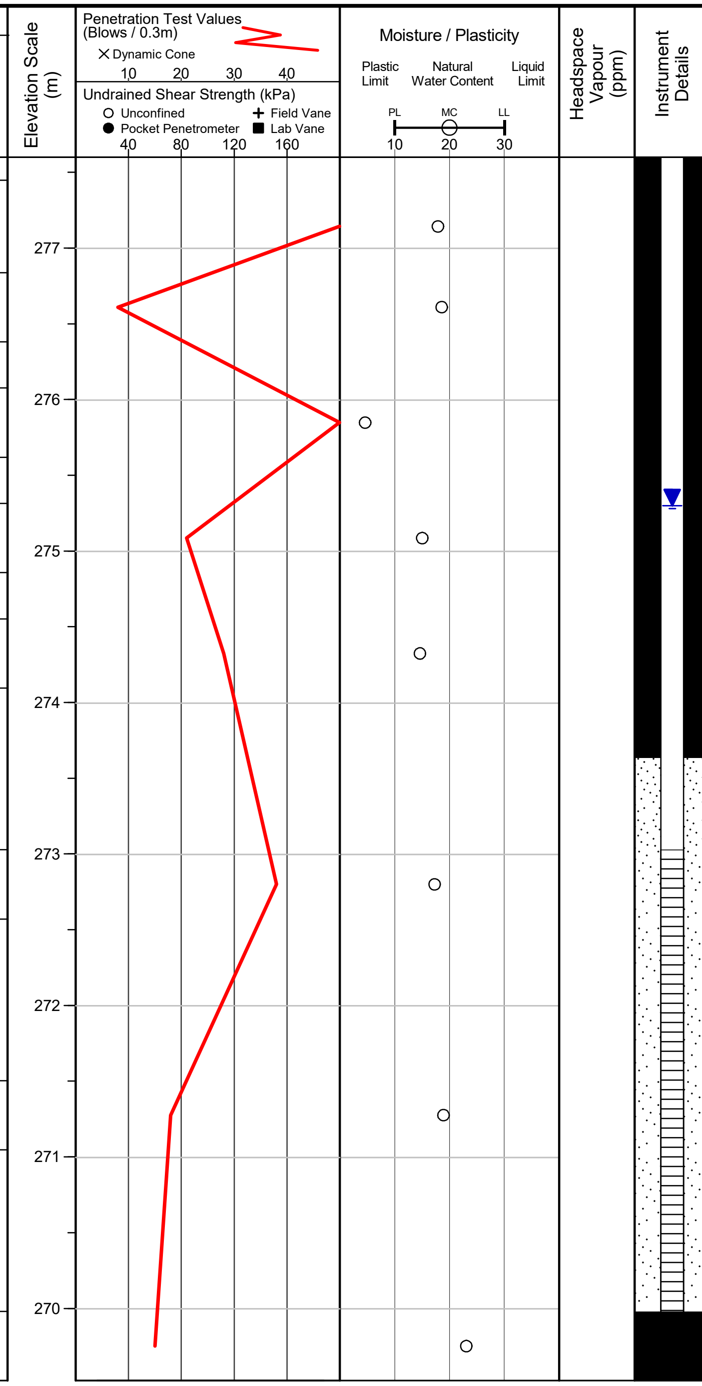
Position : E: 649854, N: 4884926 (UTM 17T) — Elevation Datum : Geodetic

Rig type : CME 75, truck-mounted — Drilling Method : Solid stem augers

SOIL PROFILE / SAMPLES

Elev Depth (m)	Description	Number	Type	SPT 'N' Value
277.6	GROUND SURFACE			
	110mm **ASPHALT**			
	260mm **AGGREGATE**			
277.2 / 0.4	**FILL**, silty sand, trace gravel, loose to very dense, dark brown, moist	1	SS	74
		2	SS	8
276.1 / 1.5	**FILL**, sand and gravel, very dense, brown, moist	3	SS	75
275.3 / 2.3	**SILT**, trace to some clay, trace sand, dilatant, compact to dense, brown, wet	4	SS	21
		5	SS	28
		6	SS	38
		7	SS	18
		8	SS	15
269.5 / 8.1				

Lab Data and Comments — GRAIN SIZE DISTRIBUTION (%) (MIT): GR SA SI CL — at sample 6: 0 8 83 9



END OF BOREHOLE

Unstabilized water level measured at 5.8 m below ground surface; borehole caved to 7.3 m below ground surface upon completion of drilling.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Feb 14, 2019	2.3	275.3
Oct 29, 2019	2.4	275.2

file: 1-19-0022 bh logs.gpj

LOG OF BOREHOLE 5

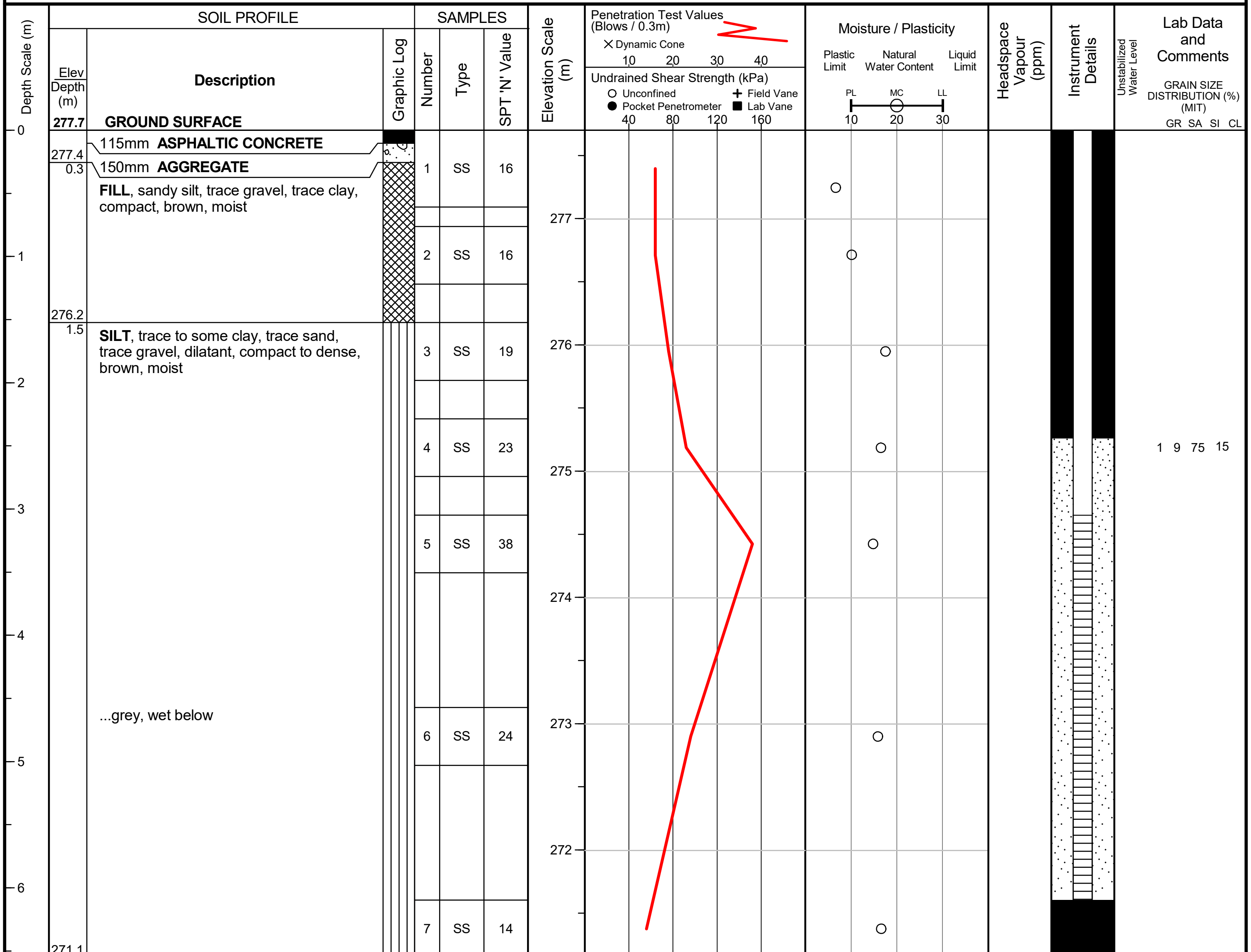
Terraprobe

Project No. : 1-19-0022	Client : Uxbridge Health Centre	Originated by : AK
Date started : October 7, 2019	Project : 4 Campbell Dr	Compiled by : AR
Sheet No. : 1 of 1	Location : Uxbridge, Ontario	Checked by : SZ

Position : E: 649831, N: 4884971 (UTM 17T)   Elevation Datum : Geodetic

Rig type : Track-mounted   Drilling Method : Solid stem augers

Elev / Depth (m)	Description	Sample Number	Type	SPT 'N' Value	Natural Water Content (%)	Lab Data and Comments (GR SA SI CL)
277.7	GROUND SURFACE					
	115mm **ASPHALTIC CONCRETE**					
277.4 / 0.3	150mm **AGGREGATE**					
	FILL, sandy silt, trace gravel, trace clay, compact, brown, moist	1	SS	16		
		2	SS	16		
276.2 / 1.5	**SILT**, trace to some clay, trace sand, trace gravel, dilatant, compact to dense, brown, moist	3	SS	19		
		4	SS	23		1 9 75 15
		5	SS	38		
	...grey, wet below	6	SS	24		
		7	SS	14		
271.1 / 6.6	**END OF BOREHOLE**					



Borehole was dry and open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Oct 29, 2019	2.6	275.1

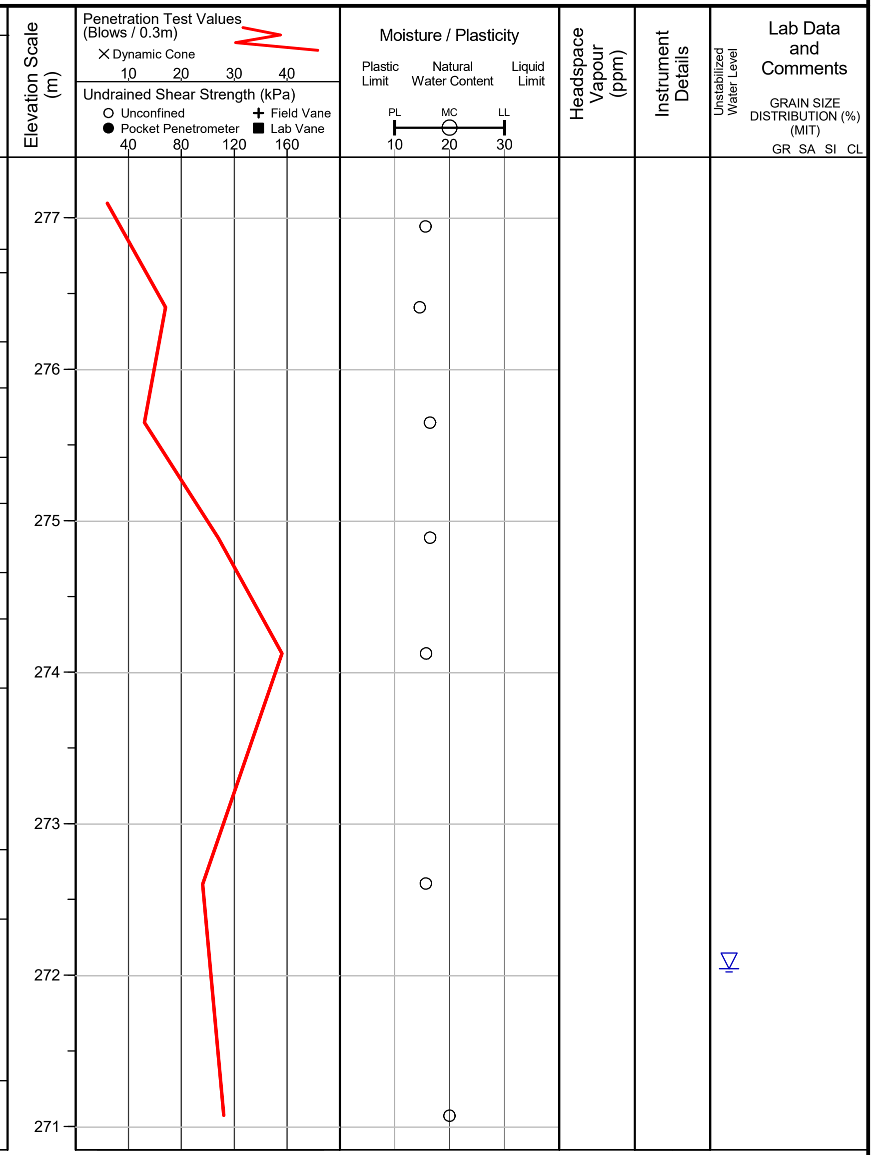
LOG OF BOREHOLE 6

Terraprobe

Project No. : 1-19-0022 | Client : Uxbridge Health Centre | Originated by : AK
Date started : October 7, 2019 | Project : 4 Campbell Dr | Compiled by : AR
Sheet No. : 1 of 1 | Location : Uxbridge, Ontario | Checked by : SZ

Position : E: 649812, N: 4884953 (UTM 17T) | Elevation Datum : Geodetic
Rig type : Track-mounted | Drilling Method : Solid stem augers

Elev / Depth (m)	Description	Sample Number	Type	SPT 'N' Value
277.4	GROUND SURFACE			
	50mm **TOPSOIL**			
	FILL, sandy silt, trace gravel, trace clay, compact, brown, moist	1	SS	6
276.6 / 0.8	**SILT**, trace to some clay, trace sand, trace gravel, dilatant, compact, brown, moist	2	SS	17
		3	SS	13
		4	SS	27
	...Dense	5	SS	39
	...grey, wet below	6	SS	24
	...some sand	7	SS	28
270.8 / 6.6	**END OF BOREHOLE**			



Unstabilized water level measured at 5.4 m below ground surface; borehole caved to 5.5 m below ground surface upon completion of drilling.

file: 1-19-0022 bh logs.gpj

Terraprobe

LOG OF BOREHOLE 7

Project No. : 1-19-0022 | Client : Uxbridge Health Centre | Originated by : AK

Date started : October 7, 2019 | Project : 4 Campbell Dr | Compiled by : AR

 | Location : Uxbridge, Ontario | Checked by : SZ

Position : E: 649825, N: 4884922 (UTM 17T) | Elevation Datum : Geodetic

Rig type : Track-mounted | Drilling Method : Solid stem augers

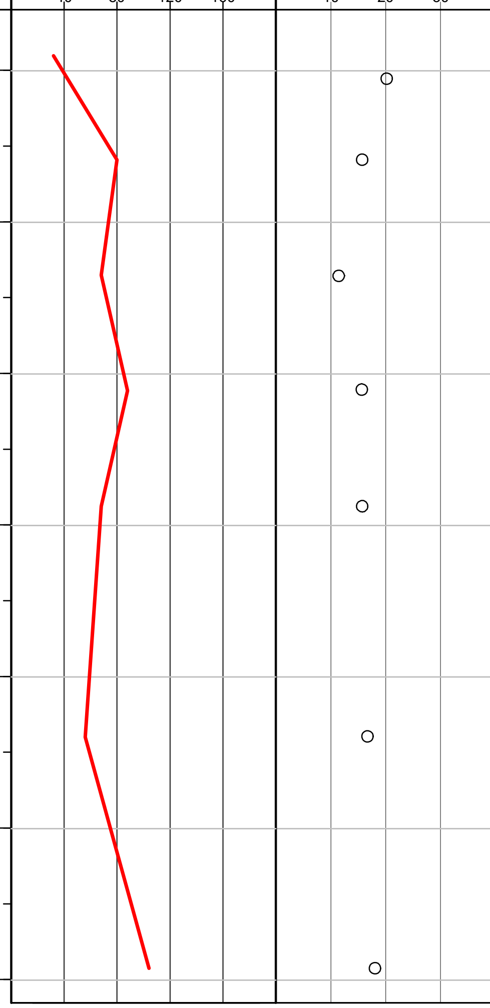
Depth Scale (m)	Elev Depth (m)	Description	Graphic Log	Sample Number	Type	SPT 'N' Value
0	277.4	**GROUND SURFACE**				
		50mm **TOPSOIL**				
		FILL, sandy silt, trace gravel, trace clay, trace rootlets, loose to compact, brown, moist		1	SS	8
1				2	SS	20
	275.9 1.5	**SILT**, trace to some clay, trace sand, trace gravel, dilatant, compact, brown, moist		3	SS	17
2				4	SS	22
3		...grey, wet below		5	SS	17
4						
5				6	SS	14
6				7	SS	26
	270.8 6.6	**END OF BOREHOLE**				

Elevation Scale (m): 277, 276, 275, 274, 273, 272, 271

Penetration Test Values (Blows / 0.3m)
X Dynamic Cone: 10 20 30 40
Undrained Shear Strength (kPa): 40 80 120 160
O Unconfined + Field Vane
● Pocket Penetrometer ■ Lab Vane

Moisture / Plasticity
Plastic Limit (PL) — Natural Water Content (MC) — Liquid Limit (LL): 10 20 30

Headspace Vapour (ppm) | Instrument Details | Unstabilized Water Level | Lab Data and Comments — GRAIN SIZE DISTRIBUTION (%) (MIT): GR SA SI CL



Unstabilized water level measured at 6.0 m below ground surface; borehole was open upon completion of drilling.

Terraprobe

LOG OF BOREHOLE 8

Project No. : 1-19-0022	Client : Uxbridge Health Centre	Originated by : AK
Date started : October 7, 2019	Project : 4 Campbell Dr	Compiled by : AR
Sheet No. : 1 of 1	Location : Uxbridge, Ontario	Checked by : SZ

Position : E: 649808, N: 4884914 (UTM 17T)

Elevation Datum : Geodetic

Rig type : Track-mounted

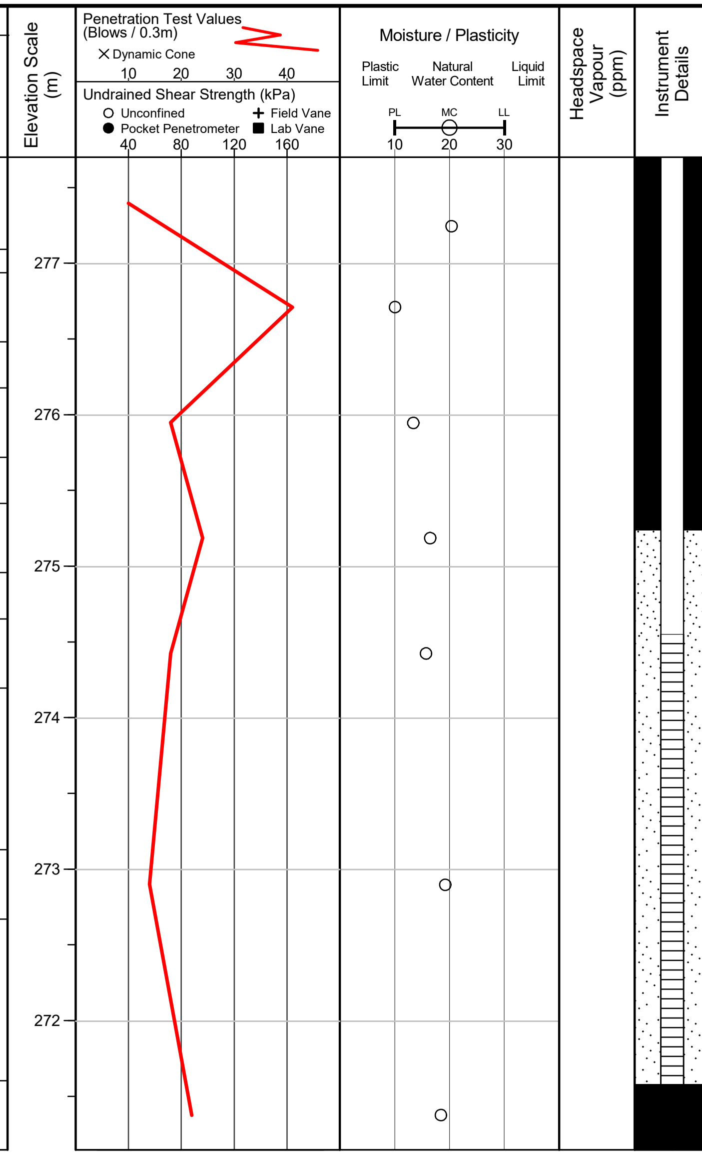
Drilling Method : Solid stem augers

SOIL PROFILE

Elev / Depth (m)	Description
277.7	GROUND SURFACE
	40mm **TOPSOIL**
	FILL, sandy silt, trace gravel, trace clay, loose to dense, brown, moist
	...stone fragments
275.9 / 1.8	**SILT**, trace to some clay, trace sand, trace gravel, dilatant, compact, brown, moist
	...grey, wet below
271.1 / 6.6	**END OF BOREHOLE**

SAMPLES

Number	Type	SPT 'N' Value	Natural Water Content	Lab Data (GR SA SI CL)
1	SS	10		
2	SS	41		
3	SS	18		
4	SS	24		
5	SS	18		0 9 78 13
6	SS	14		
7	SS	22		



Lab Data and Comments: GRAIN SIZE DISTRIBUTION (%) (MIT)

Borehole was dry and open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Oct 29, 2019	2.1	275.6

file: 1-19-0022 bh logs.gpj

LOG OF BOREHOLE 9

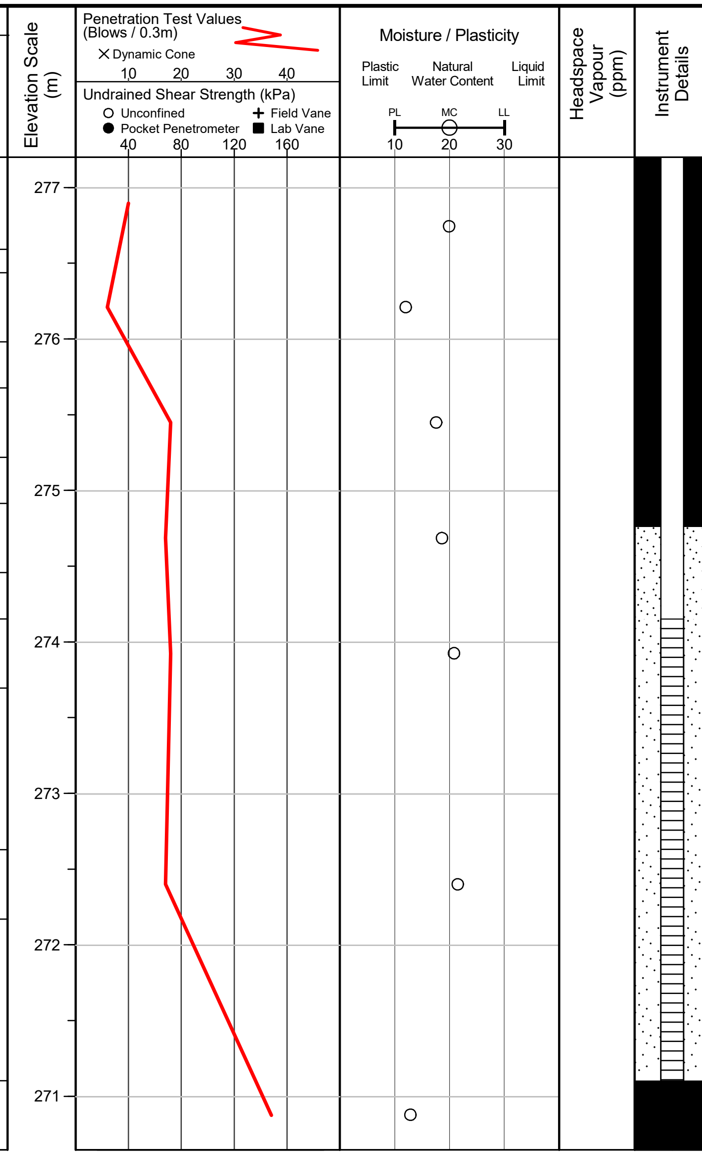
Terraprobe

Project No. : 1-19-0022	Client : Uxbridge Health Centre	Originated by : AK
Date started : October 7, 2019	Project : 4 Campbell Dr	Compiled by : AR
Sheet No. : 1 of 1	Location : Uxbridge, Ontario	Checked by : SZ

Position : E: 649731, N: 4884884 (UTM 17T) | Elevation Datum : Geodetic

Rig type : Track-mounted | Drilling Method : Solid stem augers

Depth Scale (m)	Elev Depth (m)	Description	Sample Number	Type	SPT 'N' Value	Lab Data and Comments (Grain Size Distribution (%) (MIT) GR SA SI CL)
0	277.2	GROUND SURFACE				
		75mm **TOPSOIL**				
		FILL, sandy silt, trace gravel, trace clay, trace rootlets, loose, brown, moist	1	SS	10	
1			2	SS	6	
	275.7 / 1.5	**SILT**, trace to some clay, trace sand, trace gravel, dilatant, compact, brown, moist	3	SS	18	
2			4	SS	17	
3		...grey below	5	SS	18	
4		...wet below	6	SS	17	0 6 86 8
6		...dense	7	SS	37	
	270.6 / 6.6	**END OF BOREHOLE**				



Unstabilized water level measured at 6.0 m below ground surface; borehole was open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Oct 29, 2019	1.5	275.7

LOG OF BOREHOLE 10

Terraprobe

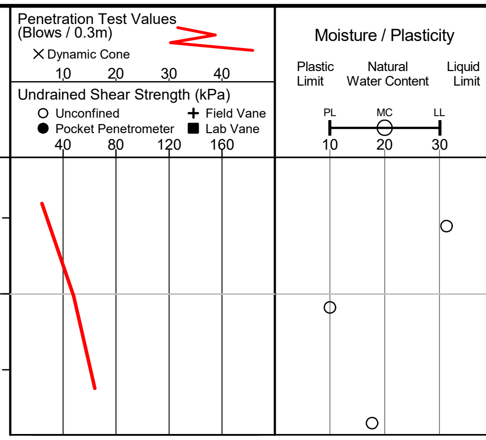
Project No.	: 1-19-0022	Client	: Uxbridge Health Centre	Originated by	: AK
Date started	: October 7, 2019	Project	: 4 Campbell Dr	Compiled by	: AR
Sheet No.	: 1 of 1	Location	: Uxbridge, Ontario	Checked by	: SZ

Position : E: 649804, N: 4884979 (UTM 17T) — Elevation Datum : Geodetic

Rig type : Track-mounted — Drilling Method : Solid stem augers

Depth Scale (m)	Elev / Depth (m)	Description	Sample Number	Type	SPT 'N' Value	Elevation Scale (m)	Moisture / Plasticity	Lab Data and Comments (Grain Size Distribution (%) (MIT) GR SA SI CL)
0	277.9	GROUND SURFACE						
		40mm **TOPSOIL**						
		FILL, sandy silt, trace gravel, trace clay, trace rootlets, loose to compact, brown, moist	1	SS	6			
1			2	SS	12	277		
	276.7 / 1.2	**SILT**, trace clay, some sand, trace gravel, dilatant, compact, brown, moist	3	SS	16			2 13 69 15
	276.1 / 1.8	**END OF BOREHOLE**						

Borehole was dry and open upon completion of drilling.



Headspace Vapour (ppm) | Instrument Details | Unstabilized Water Level

file: 1-19-0022 bh logs.gpj

LOG OF BOREHOLE 11

Terraprobe

Project No. : 1-19-0022	Client : Uxbridge Health Centre	Originated by : AK
Date started : October 7, 2019	Project : 4 Campbell Dr	Compiled by : AR
Sheet No. : 1 of 1	Location : Uxbridge, Ontario	Checked by : SZ

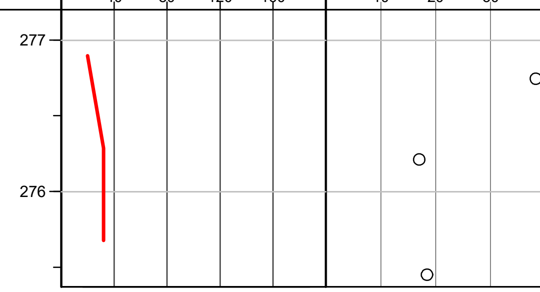
Position : E: 649803, N: 4884934 (UTM 17T) — Elevation Datum : Geodetic

Rig type : Track-mounted — Drilling Method : Solid stem augers

Elev (m)	Depth (m)	Description	Sample Number	Type	SPT 'N' Value
277.2	0	GROUND SURFACE			
277.0	0.2	150mm **TOPSOIL**			
		FILL, sandy silt, trace gravel, trace clay, trace rootlets, loose, brown, moist	1	SS	5
			2	SS	8
276.0	1.2	**SILT**, trace to some clay, trace sand, trace gravel, dilatant, loose, brown, moist	3	SS	8
275.4	1.8	**END OF BOREHOLE**			

Borehole was dry and open upon completion of drilling.

Column headings: Depth Scale (m); SOIL PROFILE; Graphic Log; SAMPLES; Elevation Scale (m); Penetration Test Values (Blows / 0.3m) — Dynamic Cone 10 20 30 40; Undrained Shear Strength (kPa) — Unconfined, Field Vane, Pocket Penetrometer, Lab Vane 40 80 120 160; Moisture / Plasticity — Plastic Limit, Natural Water Content, Liquid Limit, PL MC LL 10 20 30; Headspace Vapour (ppm); Instrument Details; Unstabilized Water Level; Lab Data and Comments — GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL



LOG OF BOREHOLE 12

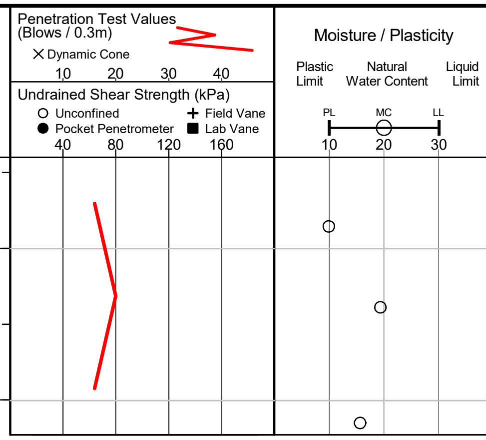
Terraprobe

Project No. : 1-19-0022	Client : Uxbridge Health Centre	Originated by : AK
Date started : October 8, 2019	Project : 4 Campbell Dr	Compiled by : AR
Sheet No. : 1 of 1	Location : Uxbridge, Ontario	Checked by : SZ

Position : E: 649768, N: 4884908 (UTM 17T) Elevation Datum : Geodetic

Rig type : Track-mounted Drilling Method : Solid stem augers

Depth Scale (m)	Elev Depth (m)	Description	Number	Type	SPT 'N' Value	Elevation Scale (m)
0	277.6	**GROUND SURFACE**				
		50mm **TOPSOIL**				
	277.0 / 0.6	**FILL**, sandy silt, trace gravel, trace clay, trace rootlets, compact, brown, moist	1	SS	16	277
1		**SILT**, trace to some clay, trace sand, trace gravel, dilatant, compact, brown, moist	2	SS	20	
	275.8 / 1.8		3	SS	16	276



Headspace Vapour (ppm) | Instrument Details | Unstabilized Water Level | Lab Data and Comments — GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL

END OF BOREHOLE

Borehole was dry and open upon completion of drilling.

file: 1-19-0022 bh logs.gpj

LOG OF BOREHOLE 13

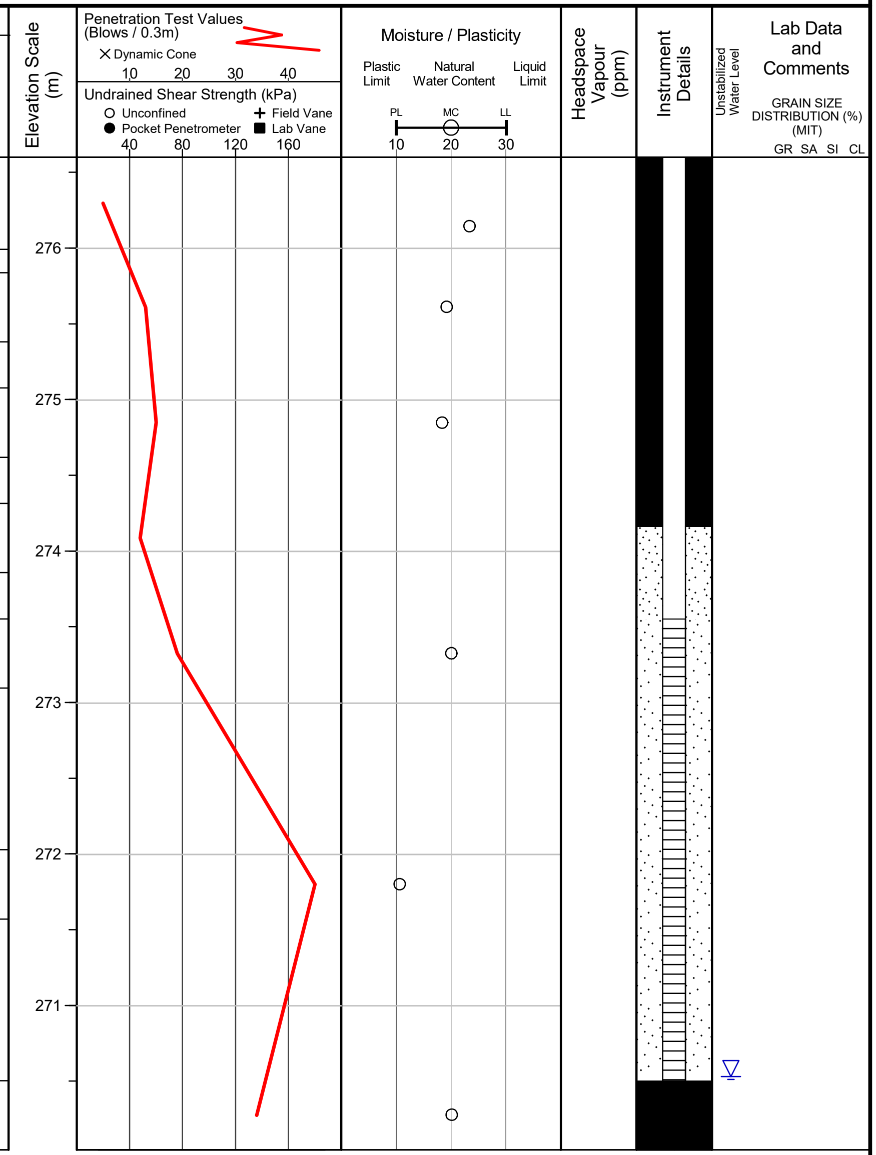
Terraprobe

Project No. : 1-19-0022	Client : Uxbridge Health Centre	Originated by : AK
Date started : October 8, 2019	Project : 4 Campbell Dr	Compiled by : AR
Sheet No. : 1 of 1	Location : Uxbridge, Ontario	Checked by : SZ

Position : E: 649713, N: 4884882 (UTM 17T) | Elevation Datum : Geodetic

Rig type : Track-mounted | Drilling Method : Solid stem augers

Elev (m) / Depth (m)	Description	Sample Number	Type	SPT 'N' Value
276.6	GROUND SURFACE			
	75mm **TOPSOIL**			
276.0 / 0.6	**FILL**, sandy silt, trace gravel, trace clay, trace rootlets, loose, brown, moist	1	SS	5
	SILT, trace to some clay, trace sand, trace gravel, dilatant, compact, brown, moist	2	SS	13
		3	SS	15
		4	SS	12
	...grey, wet below	5	SS	19
	...dense below	6	SS	45
270.0 / 6.6		7	SS	34



END OF BOREHOLE

Unstabilized water level measured at 6.1 m below ground surface; borehole was open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Oct 29, 2019	1.0	275.7

LOG OF BOREHOLE 14

Terraprobe

Project No.	: 1-19-0022	Client	: Uxbridge Health Centre	Originated by	: AK
Date started	: October 8, 2019	Project	: 4 Campbell Dr	Compiled by	: AR
Sheet No.	: 1 of 1	Location	: Uxbridge, Ontario	Checked by	: SZ

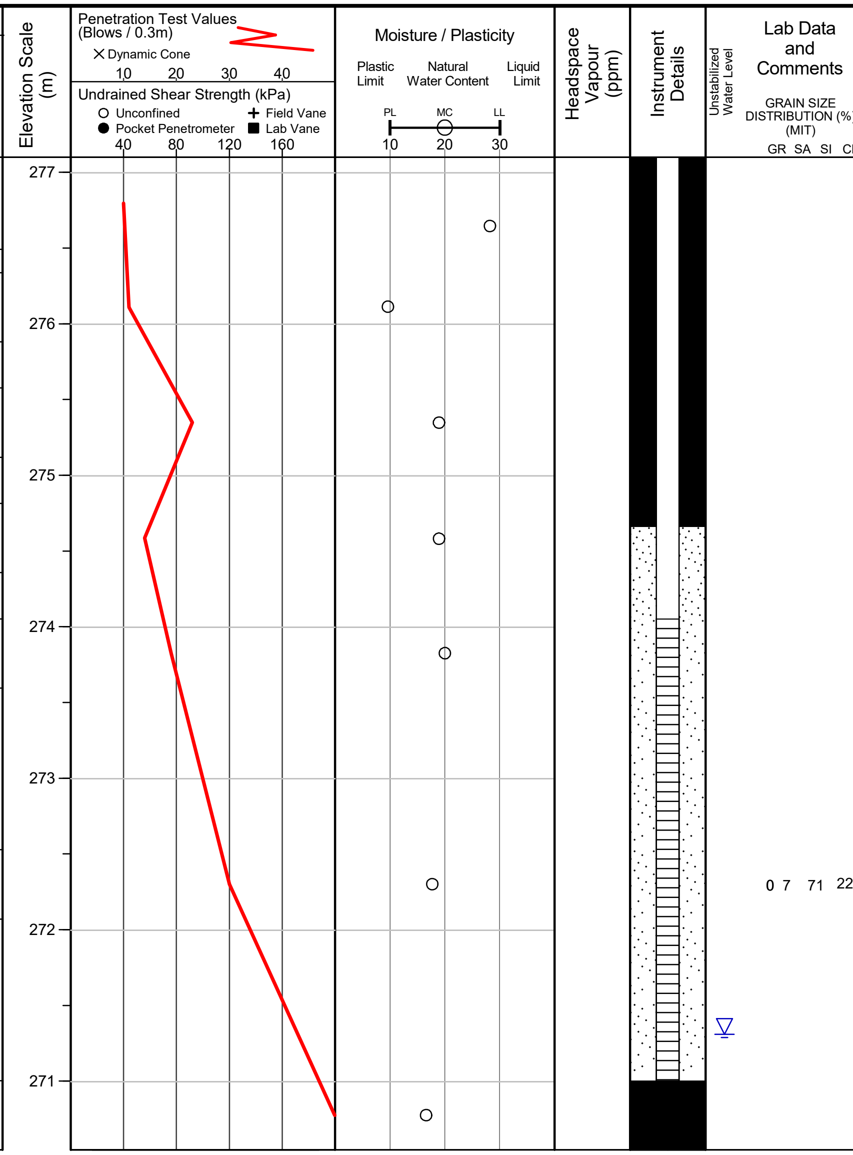
Position : E: 649726, N: 4884869 (UTM 17T)
Elevation Datum : Geodetic
Rig type : Track-mounted
Drilling Method : Solid stem augers

SOIL PROFILE

Elev / Depth (m)	Description
277.1	GROUND SURFACE
	75mm **TOPSOIL**
	FILL, sandy silt, trace gravel, trace clay, trace rootlets, loose, brown, moist
276.5 / 0.6	**SILT**, trace to some clay, trace sand, trace gravel, dilatant, compact to dense, brown, moist
	...wet below
	...grey below
	...clayey silt, trace sand
	...very dense
270.5 / 6.6	**END OF BOREHOLE**

SAMPLES

Number	Type	SPT 'N' Value	Lab Data and Comments (GR SA SI CL)
1	SS	10	
2	SS	11	
3	SS	23	
4	SS	14	
5	SS	19	
6	SS	30	0 7 71 22
7	SS	87	



Unstabilized water level measured at 5.8 m below ground surface; borehole was open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Oct 29, 2019	1.3	275.8

file: 1-19-0022 bh logs.gpj

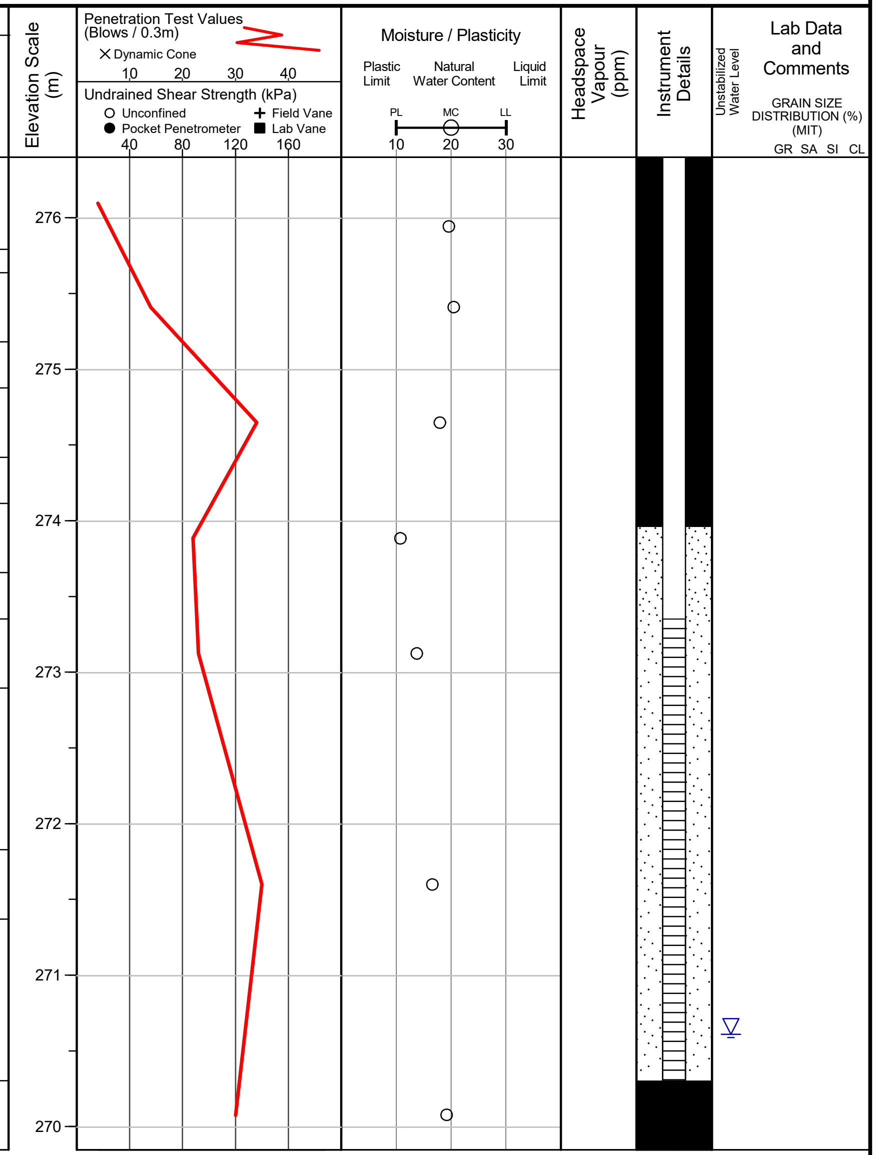
LOG OF BOREHOLE 15

Terraprobe

Project No. : 1-19-0022	Client : Uxbridge Health Centre	Originated by : AK
Date started : October 8, 2019	Project : 4 Campbell Dr	Compiled by : AR
Sheet No. : 1 of 1	Location : Uxbridge, Ontario	Checked by : SZ

Position : E: 649712, N: 4884902 (UTM 17T)
Elevation Datum : Geodetic
Rig type : Track-mounted
Drilling Method : Solid stem augers

Elev / Depth (m)	Description	Sample Number	Type	SPT 'N' Value
276.4	GROUND SURFACE			
	100mm **TOPSOIL**			
	FILL, sandy silt, trace gravel, trace clay, trace rootlets, very loose, brown, moist	1	SS	4
275.8 / 0.6	**SILT**, trace to some clay, trace sand, trace gravel, dilatant, compact to dense, brown, moist	2	SS	14
		3	SS	34
	...grey below	4	SS	22
		5	SS	23
	...wet below	6	SS	35
		7	SS	30
269.8 / 6.6	**END OF BOREHOLE**			



Unstabilized water level measured at 5.8 m below ground surface; borehole was open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Oct 29, 2019	1.1	275.4

file: 1-19-0022 bh logs.gpj

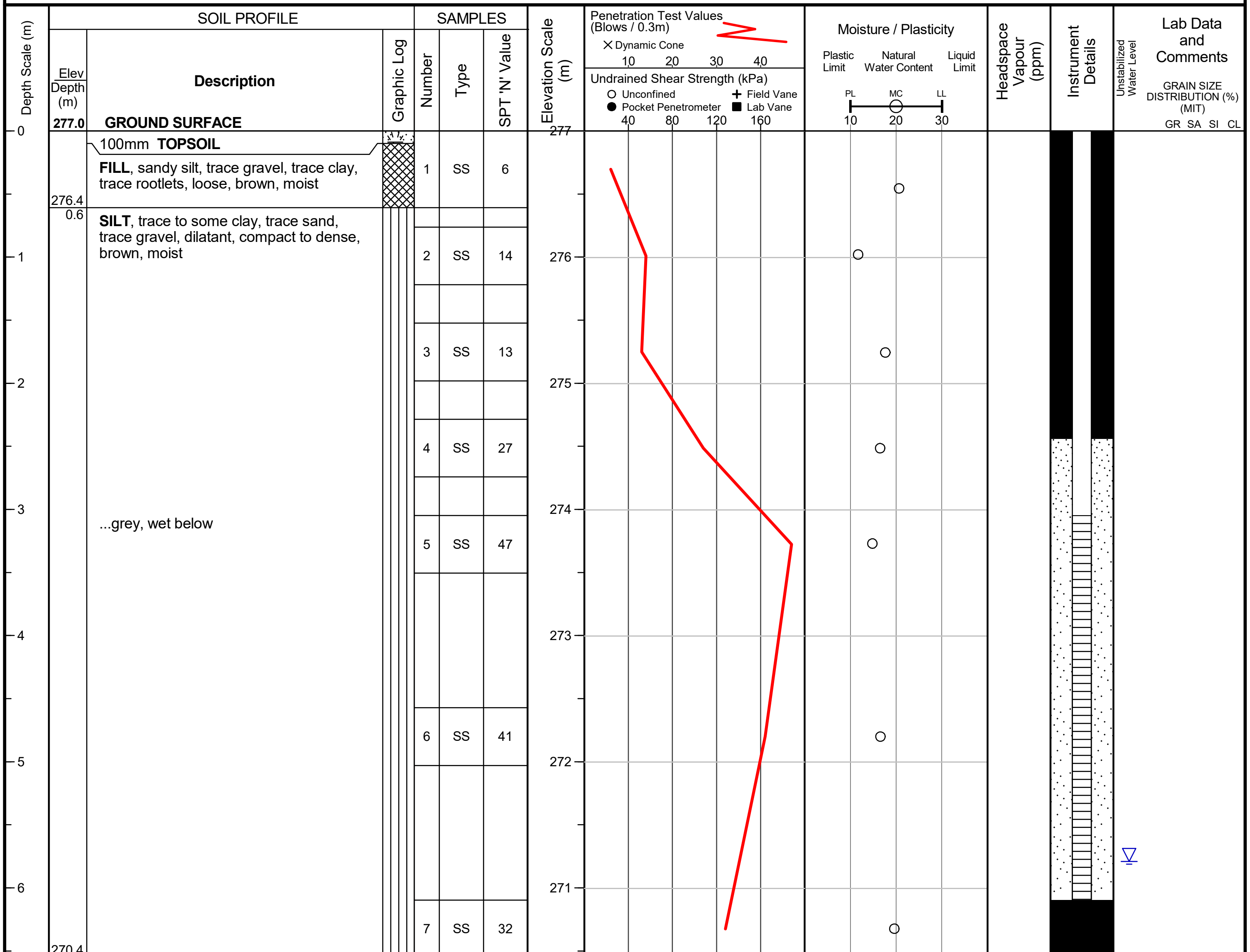
LOG OF BOREHOLE 16

Terraprobe

Project No. : 1-19-0022	Client : Uxbridge Health Centre	Originated by : AK
Date started : October 8, 2019	Project : 4 Campbell Dr	Compiled by : AR
Sheet No. : 1 of 1	Location : Uxbridge, Ontario	Checked by : SZ

Position : E: 649752, N: 4884917 (UTM 17T)
Elevation Datum : Geodetic
Rig type : Track-mounted
Drilling Method : Solid stem augers

Elev / Depth (m)	Description	Sample Number	Type	SPT 'N' Value
277.0	GROUND SURFACE			
	100mm TOPSOIL			
	FILL, sandy silt, trace gravel, trace clay, trace rootlets, loose, brown, moist	1	SS	6
276.4 / 0.6	**SILT**, trace to some clay, trace sand, trace gravel, dilatant, compact to dense, brown, moist	2	SS	14
		3	SS	13
		4	SS	27
	...grey, wet below	5	SS	47
		6	SS	41
270.4 / 6.6		7	SS	32



END OF BOREHOLE

Unstabilized water level measured at 5.8 m below ground surface; borehole was open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Oct 29, 2019	1.6	275.4

file: 1-19-0022 bh logs.gpj

Terraprobe

LOG OF BOREHOLE 17

Project No.	: 1-19-0022	Client	: Uxbridge Health Centre	Originated by	: AK
Date started	: October 8, 2019	Project	: 4 Campbell Dr	Compiled by	: AR
Sheet No.	: 1 of 1	Location	: Uxbridge, Ontario	Checked by	: SZ

Position : E: 649766, N: 4884877 (UTM 17T)   Elevation Datum : Geodetic

Rig type : Track-mounted   Drilling Method : Solid stem augers

Elev Depth (m)	Description	Sample Number	Type	SPT 'N' Value	Natural Water Content (%) (approx.)	Lab Data and Comments (Grain Size Distribution (%) (MIT) GR SA SI CL)
277.6	GROUND SURFACE					
	75mm TOPSOIL					
	FILL, sandy silt, trace gravel, trace clay, trace rootlets, compact, brown, moist	1	SS	22		
	...silt, some clay	2	SS	11		
276.1 / 1.5	SILT, trace to some clay, trace sand, trace gravel, dilatant, compact, brown, moist	3	SS	16		
		4	SS	24		
	...grey, wet below	5	SS	13		
	...some sand	6	SS	27		0 12 77 11
271.0 / 6.6		7	SS	28		

Penetration Test Values (Blows / 0.3m): X Dynamic Cone; 10 20 30 40. Undrained Shear Strength (kPa): O Unconfined, + Field Vane, ● Pocket Penetrometer, ■ Lab Vane; 40 80 120 160. Moisture / Plasticity: Plastic Limit, Natural Water Content, Liquid Limit (PL, MC, LL; 10 20 30). Headspace Vapour (ppm). Instrument Details. Unstabilized Water Level.

Elevation Scale (m): 277, 276, 275, 274, 273, 272. Depth Scale (m): 0, 1, 2, 3, 4, 5, 6.

END OF BOREHOLE

Unstabilized water level was measured at 5.3 m below grade; borehole was open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Oct 29, 2019	1.7	275.9

file: 1-19-0022 bh logs.gpj

APPENDIX F

TERRAPROBE INC.

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

CLIENT NAME: TERRAPROBE INC.
11 INDELL LANE
BRAMPTON, ON L6T3Y3
(905) 796-2650

ATTENTION TO: Jessie Wu

PROJECT: 1-19-0022-46

AGAT WORK ORDER: 19T438084

MICROBIOLOGY ANALYSIS REVIEWED BY: Rocio Morales, Inorganics Lab Supervisor

WATER ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

DATE REPORTED: Feb 27, 2019

PAGES (INCLUDING COVER): 14

VERSION*: 1

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

*NOTES

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

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

Certificate of Analysis

AGAT WORK ORDER: 19T438084
PROJECT: 1-19-0022-46

CLIENT NAME: TERRAPROBE INC.
ATTENTION TO: Jessie Wu
SAMPLING SITE:
SAMPLED BY:

Microbiological Analysis (water) (Using DC Media)

DATE RECEIVED: 2019-02-15
DATE REPORTED: 2019-02-27

			SAMPLE DESCRIPTION:	BH1		BH2	BH3
			SAMPLE TYPE:	Water		Water	Water
			DATE SAMPLED:	2019-02-15		2019-02-15	2019-02-15
Parameter	Unit	G / S	RDL	9905003	RDL	9905085	9905086
Escherichia coli	CFU/100mL		2	ND	1	ND	ND
Total Coliforms	CFU/100mL		2	ND	1	13	4
Background Colony Count	CFU/100mL		2	ND	1	ND	ND

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

9905003 RDL > 1 indicates dilutions of the sample.
ND - Not Detected.
The sample was diluted prior to filtration due to the presence of sediments.

9905085-9905086 ND - Not Detected.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Certificate of Analysis

AGAT WORK ORDER: 19T438084
PROJECT: 1-19-0022-46

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

CLIENT NAME: TERRAPROBE INC.
SAMPLING SITE:

ATTENTION TO: Jessie Wu
SAMPLED BY:

Reactive Silica

DATE RECEIVED: 2019-02-15

DATE REPORTED: 2019-02-27

			SAMPLE DESCRIPTION:	BH1	BH2	BH3
			SAMPLE TYPE:	Water	Water	Water
			DATE SAMPLED:	2019-02-15	2019-02-15	2019-02-15
Parameter	Unit	G / S	RDL	9905003	9905085	9905086
Reactive Silica as SiO2	mg/L		0.5	20.6	9.2	11.8

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard
Analysis performed at AGAT Halifax (unless marked by *)

Certified By: Nivine Basily

Results relate only to the items tested. Results apply to samples as received.

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

CLIENT NAME: TERRAPROBE INC.
ATTENTION TO: Jessie Wu
SAMPLING SITE:
SAMPLED BY:

Water Quality Assessment - PWQO

DATE RECEIVED: 2019-02-15
DATE REPORTED: 2019-02-27

			SAMPLE DESCRIPTION:	BH1		BH2		BH3
			SAMPLE TYPE:	Water		Water		Water
			DATE SAMPLED:	2019-02-15		2019-02-15		2019-02-15
Parameter	Unit	G / S	RDL	9905003	RDL	9905085	RDL	9905086
Electrical Conductivity	µS/cm		2	11600	2	8390	2	6710
pH	pH Units	6.5-8.5	NA	7.39	NA	7.93	NA	7.88
Saturation pH				5.82		6.89		6.47
Langelier Index				1.57		1.04		1.41
Total Hardness (as CaCO3)	mg/L		0.5	2990	0.5	365	0.5	606
Total Dissolved Solids	mg/L		20	7170	20	4560	20	3850
Alkalinity (as CaCO3)	mg/L		5	401	5	279	5	443
Bicarbonate (as CaCO3)	mg/L		5	401	5	279	5	443
Carbonate (as CaCO3)	mg/L		5	<5	5	<5	5	<5
Hydroxide (as CaCO3)	mg/L		5	<5	5	<5	5	<5
Fluoride	mg/L		10	<10	1.0	<1.0	1.0	<1.0
Chloride	mg/L		20	4620	10	2990	10	2200
Nitrate as N	mg/L		10	<10	1.0	<1.0	1.0	<1.0
Nitrite as N	mg/L		10	<10	1.0	<1.0	1.0	<1.0
Bromide	mg/L		10	<10	1.0	<1.0	1.0	<1.0
Sulphate	mg/L		20	90	2.0	87.4	2.0	76.6
Ortho Phosphate as P	mg/L		20	24	2.0	<2.0	2.0	<2.0
Ammonia as N	mg/L		0.02	0.13	0.02	0.34	0.02	0.14
Ammonia-Un-ionized	mg/L	0.02	NA	0.0016	NA	0.015	NA	0.0054
Total Phosphorus	mg/L	0.030	0.02	0.03	0.02	0.05	0.02	0.08
Total Organic Carbon	mg/L		1.0	5.2	1.0	7.8	0.5	5.6
Colour	TCU		5	<5	5	6	5	<5
Turbidity	NTU		0.5	42.5	0.5	190	0.5	132
Calcium	mg/L		0.5	984	0.5	131	0.5	216
Magnesium	mg/L		0.5	130	0.5	9.1	0.5	16.2
Sodium	mg/L		0.5	1310	0.5	1650	0.5	1220
Potassium	mg/L		0.5	7.4	0.5	3.3	0.5	5.3
Aluminum (dissolved)	mg/L	0.075	0.004	0.006	0.004	0.088	0.004	0.086
Antimony	mg/L	0.020	0.003	<0.003	0.003	<0.003	0.003	<0.003
Arsenic	mg/L	0.1	0.003	0.005	0.003	<0.003	0.003	<0.003

Certified By: Nivine Basily

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

Certificate of Analysis

AGAT WORK ORDER: 19T438084
PROJECT: 1-19-0022-46

CLIENT NAME: TERRAPROBE INC.
SAMPLING SITE:

ATTENTION TO: Jessie Wu
SAMPLED BY:

Water Quality Assessment - PWQO

DATE RECEIVED: 2019-02-15

DATE REPORTED: 2019-02-27

		SAMPLE DESCRIPTION:		BH1		BH2		BH3
		SAMPLE TYPE:		Water		Water		Water
		DATE SAMPLED:		2019-02-15		2019-02-15		2019-02-15
Parameter	Unit	G / S	RDL	9905003	RDL	9905085	RDL	9905086
Barium	mg/L		0.002	1.95	0.002	0.237	0.002	0.087
Beryllium	mg/L	0.011	0.001	<0.001	0.001	<0.001	0.001	<0.001
Boron	mg/L	0.20	0.010	0.028	0.010	0.040	0.010	0.054
Cadmium	mg/L	0.0002	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001
Chromium	mg/L		0.003	0.012	0.003	0.008	0.003	0.006
Cobalt	mg/L	0.0009	0.0005	0.0014	0.0005	<0.0005	0.0005	0.0010
Copper	mg/L	0.005	0.001	0.002	0.001	0.002	0.001	0.006
Iron	mg/L	0.3	0.01	32.0	0.01	<0.01	0.01	0.05
Lead	mg/L	**	0.001	<0.001	0.001	<0.001	0.001	<0.001
Manganese	mg/L		0.002	0.280	0.002	0.026	0.002	0.148
Dissolved Mercury	mg/L	0.0002	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001
Molybdenum	mg/L	0.04	0.002	<0.002	0.002	0.005	0.002	0.002
Nickel	mg/L	0.025	0.003	<0.003	0.003	<0.003	0.003	<0.003
Selenium	mg/L	0.1	0.004	<0.004	0.004	<0.004	0.004	<0.004
Silver	mg/L	0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001
Strontium	mg/L		0.005	2.69	0.005	0.556	0.005	0.594
Thallium	mg/L	0.0003	0.0003	<0.0003	0.0003	<0.0003	0.0003	<0.0003
Tin	mg/L		0.002	<0.002	0.002	<0.002	0.002	<0.002
Titanium	mg/L		0.002	0.003	0.002	0.003	0.002	0.003
Tungsten	mg/L	0.03	0.010	<0.010	0.010	<0.010	0.010	<0.010
Uranium	mg/L	0.005	0.002	<0.002	0.002	<0.002	0.002	<0.002
Vanadium	mg/L	0.006	0.002	<0.002	0.002	<0.002	0.002	0.006
Zinc	mg/L	0.03	0.005	0.009	0.005	0.006	0.005	0.009
Zirconium	mg/L	0.004	0.004	<0.004	0.004	<0.004	0.004	<0.004
Cation Sum	meq/L		NA	117	NA	79.1	NA	65.3
Anion Sum	meq/L			140		91.7		72.5
% Difference/ Ion Balance	%		NA	9.02	NA	7.37	NA	5.22

Certified By: Nivine Basily

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CLIENT NAME: TERRAPROBE INC.

ATTENTION TO: Jessie Wu

SAMPLING SITE:

SAMPLED BY:

Water Quality Assessment - PWQO

DATE RECEIVED: 2019-02-15

DATE REPORTED: 2019-02-27

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to PWQO (mg/L) **Dependent on alkalinity
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9905003-9905086 Elevated RDL indicates the degree of sample dilution prior to the analysis in order to keep analytes within the calibration range of the instrument and to reduce matrix interference.

The calculation of Un-ionized Ammonia was based on lab measured parameters (pH and temperature) rather than the field parameters; these were not provided to the lab. The temperature is recorded at the time of pH measurement. Values are reported as calculated.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By: Nivine Basily

Guideline Violation

AGAT WORK ORDER: 19T438084

PROJECT: 1-19-0022-46

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SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
9905003	BH1	ON PWQO 2015 (mg/L)	Water Quality Assessment - PWQO	Cobalt	mg/L	0.0009	0.0014
9905003	BH1	ON PWQO 2015 (mg/L)	Water Quality Assessment - PWQO	Iron	mg/L	0.3	32.0
9905085	BH2	ON PWQO 2015 (mg/L)	Water Quality Assessment - PWQO	Aluminum (dissolved)	mg/L	0.075	0.088
9905085	BH2	ON PWQO 2015 (mg/L)	Water Quality Assessment - PWQO	Total Phosphorus	mg/L	0.030	0.05
9905086	BH3	ON PWQO 2015 (mg/L)	Water Quality Assessment - PWQO	Aluminum (dissolved)	mg/L	0.075	0.086
9905086	BH3	ON PWQO 2015 (mg/L)	Water Quality Assessment - PWQO	Cobalt	mg/L	0.0009	0.0010
9905086	BH3	ON PWQO 2015 (mg/L)	Water Quality Assessment - PWQO	Copper	mg/L	0.005	0.006
9905086	BH3	ON PWQO 2015 (mg/L)	Water Quality Assessment - PWQO	Total Phosphorus	mg/L	0.030	0.08

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Quality Assurance

CLIENT NAME: TERRAPROBE INC.
PROJECT: 1-19-0022-46
SAMPLING SITE:

AGAT WORK ORDER: 19T438084
ATTENTION TO: Jessie Wu
SAMPLED BY:

Microbiology Analysis

RPT Date: Feb 27, 2019			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper
Microbiological Analysis (water) (Using DC Media)															
Escherichia coli	9905003	9905003	ND	ND	NA	< 1									
Total Coliforms	9905003	9905003	ND	ND	NA	< 1									
Background Colony Count	9905003	9905003	ND	ND	NA	< 1									

Comments: ND - Not Detected, NA - % RPD Not Applicable

Certified By:

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Quality Assurance

CLIENT NAME: TERRAPROBE INC. | AGAT WORK ORDER: 19T438084
PROJECT: 1-19-0022-46 | ATTENTION TO: Jessie Wu
SAMPLING SITE: | SAMPLED BY:

Water Analysis

RPT Date: Feb 27, 2019			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper
Water Quality Assessment - PWQO															
Electrical Conductivity	9899237		1130	1130	0.0%	< 2	95%	80%	120%						
pH	9899237		7.90	7.89	0.1%	NA	100%	90%	110%						
Total Dissolved Solids	9899237		746	770	3.2%	< 20	100%	80%	120%						
Alkalinity (as CaCO3)	9899237		183	168	8.5%	< 5	90%	80%	120%						
Bicarbonate (as CaCO3)	9899237		183	168	8.5%	< 5									
Carbonate (as CaCO3)	9899237		<5	<5	NA	< 5									
Hydroxide (as CaCO3)	9899237		<5	<5	NA	< 5									
Fluoride	9903241		0.06	0.06	NA	< 0.05	100%	90%	110%	101%	90%	110%	106%	80%	120%
Chloride	9903241		35.9	35.6	0.8%	< 0.10	108%	90%	110%	109%	90%	110%	94%	80%	120%
Nitrate as N	9903241		0.38	0.41	7.6%	< 0.05	90%	90%	110%	109%	90%	110%	117%	80%	120%
Nitrite as N	9903241		<0.05	<0.05	NA	< 0.05	NA	90%	110%	110%	90%	110%	111%	80%	120%
Bromide	9903241		<0.05	<0.05	NA	< 0.05	104%	90%	110%	109%	90%	110%	106%	80%	120%
Sulphate	9903241		24.2	24.3	0.4%	< 0.10	103%	90%	110%	107%	90%	110%	93%	80%	120%
Ortho Phosphate as P	9903241		<0.10	<0.10	NA	< 0.10	105%	90%	110%	104%	90%	110%	116%	80%	120%
Ammonia as N	9913978		0.02	0.02	NA	< 0.02	99%	90%	110%	94%	90%	110%	88%	80%	120%
Total Phosphorus	9903221		0.18	0.18	0.0%	< 0.02	101%	90%	110%	99%	90%	110%	110%	70%	130%
Total Organic Carbon	9905003	9905003	5.2	4.6	12.2%	< 0.5	100%	90%	110%	96%	90%	110%	104%	80%	120%
Colour	9905003	9905003	<5	6	NA	< 5	107%	90%	110%						
Turbidity	9904541		<0.5	<0.5	NA	< 0.5	97%	90%	110%						
Calcium	9895878		114	114	0.0%	< 0.05	93%	90%	110%	93%	90%	110%	91%	70%	130%
Magnesium	9895878		21.3	21.3	0.0%	< 0.05	91%	90%	110%	92%	90%	110%	89%	70%	130%
Sodium	9895878		9.82	9.84	0.2%	< 0.05	94%	90%	110%	95%	90%	110%	90%	70%	130%
Potassium	9895878		0.63	0.62	1.6%	< 0.05	96%	90%	110%	96%	90%	110%	92%	70%	130%
Aluminum (dissolved)	9905085	9905085	0.088	0.079	10.8%	< 0.004	103%	90%	110%	99%	90%	110%	95%	70%	130%
Antimony	9903241		<0.003	<0.003	NA	< 0.003	105%	90%	110%	103%	90%	110%	105%	70%	130%
Arsenic	9903241		<0.003	<0.003	NA	< 0.003	101%	90%	110%	100%	90%	110%	101%	70%	130%
Barium	9903241		0.025	0.024	4.1%	< 0.002	105%	90%	110%	100%	90%	110%	101%	70%	130%
Beryllium	9903241		<0.001	<0.001	NA	< 0.001	101%	90%	110%	101%	90%	110%	106%	70%	130%
Boron	9903241		0.025	0.026	NA	< 0.010	106%	90%	110%	103%	90%	110%	107%	70%	130%
Cadmium	9903241		<0.0001	<0.0001	NA	< 0.0001	100%	90%	110%	101%	90%	110%	122%	70%	130%
Chromium	9903241		<0.003	<0.003	NA	< 0.003	107%	90%	110%	101%	90%	110%	101%	70%	130%
Cobalt	9903241		<0.0005	<0.0005	NA	< 0.0005	104%	90%	110%	96%	90%	110%	96%	70%	130%
Copper	9903241		0.018	0.017	5.7%	< 0.001	103%	90%	110%	102%	90%	110%	96%	70%	130%
Iron	9903241		<0.01	<0.01	NA	< 0.01	104%	90%	110%	90%	90%	110%	80%	70%	130%
Lead	9903241		<0.001	<0.001	NA	< 0.001	105%	90%	110%	100%	90%	110%	100%	70%	130%
Manganese	9903241		<0.002	<0.002	NA	< 0.002	103%	90%	110%	97%	90%	110%	97%	70%	130%
Dissolved Mercury	9905003	9905003	<0.0001	<0.0001	NA	< 0.0001	101%	90%	110%	101%	90%	110%	106%	70%	130%
Molybdenum	9903241		<0.002	<0.002	NA	< 0.002	100%	90%	110%	97%	90%	110%	99%	70%	130%
Nickel	9903241		<0.003	<0.003	NA	< 0.003	107%	90%	110%	99%	90%	110%	98%	70%	130%

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Quality Assurance

CLIENT NAME: TERRAPROBE INC. AGAT WORK ORDER: 19T438084
PROJECT: 1-19-0022-46 ATTENTION TO: Jessie Wu
SAMPLING SITE: SAMPLED BY:

Water Analysis (Continued)

RPT Date: Feb 27, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper
Selenium	9903241		<0.004	<0.004	NA	< 0.004	102%	90%	110%	102%	90%	110%	107%	70%	130%
Silver	9903241		<0.0001	<0.0001	NA	< 0.0001	103%	90%	110%	103%	90%	110%	113%	70%	130%
Strontium	9903241		0.180	0.178	1.1%	< 0.005	102%	90%	110%	101%	90%	110%	97%	70%	130%
Thallium	9903241		<0.0003	<0.0003	NA	< 0.0003	103%	90%	110%	94%	90%	110%	95%	70%	130%
Tin	9903241		<0.002	<0.002	NA	< 0.002	103%	90%	110%	94%	90%	110%	98%	70%	130%
Titanium	9903241		<0.002	<0.002	NA	< 0.002	102%	90%	110%	96%	90%	110%	98%	70%	130%
Tungsten	9903241		<0.010	<0.010	NA	< 0.010	93%	90%	110%	91%	90%	110%	94%	70%	130%
Uranium	9903241		<0.002	<0.002	NA	< 0.002	97%	90%	110%	93%	90%	110%	97%	70%	130%
Vanadium	9903241		<0.002	<0.002	NA	< 0.002	102%	90%	110%	96%	90%	110%	98%	70%	130%
Zinc	9903241		0.006	<0.005	NA	< 0.005	105%	90%	110%	101%	90%	110%	104%	70%	130%
Zirconium	9903241		<0.004	<0.004	NA	< 0.004	97%	90%	110%	95%	90%	110%	94%	70%	130%

Comments: NA signifies Not Applicable.
Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Reactive Silica															
Reactive Silica as SiO2	1	9922814	14.3	14.2	0.7%	< 0.5	98%	80%	120%		80%	120%	104%	80%	120%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Nivine Basily

Certified By:

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Method Summary

CLIENT NAME: TERRAPROBE INC.
AGAT WORK ORDER: 19T438084
PROJECT: 1-19-0022-46
ATTENTION TO: Jessie Wu
SAMPLING SITE:
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Microbiology Analysis			
Escherichia coli	MIC-93-7010	EPA 1604	Membrane Filtration
Total Coliforms	MIC-93-7010	EPA 1604	Membrane Filtration
Background Colony Count	MIC-93-7010	MOE Method E3407	Membrane Filtration

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Method Summary

CLIENT NAME: TERRAPROBE INC.
PROJECT: 1-19-0022-46
SAMPLING SITE:

AGAT WORK ORDER: 19T438084
ATTENTION TO: Jessie Wu
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Reactive Silica as SiO2	INOR-121-6027	SM 4110 B	COLORIMETER
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE
Saturation pH		SM 2320 B	CALCULATION
Langelier Index		SM 2330B	CALCULATION
Total Hardness (as CaCO3)	MET-93-6105	EPA SW-846 6010C & 200.7	CALCULATION
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE
Alkalinity (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Bicarbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Carbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Hydroxide (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Fluoride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Bromide	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Ortho Phosphate as P	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH3-F	LACHAT FIA
Ammonia-Un-ionized		MOE REFERENCE, PWQOs Tab 2	CALCULATION
Total Phosphorus	INOR-93-6022	SM 4500-P B&E	SPECTROPHOTOMETER
Total Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310 B	SHIMADZU CARBON ANALYZER
Colour	INOR-93-6046	SM 2120 B	SPECTROPHOTOMETER
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Aluminum (dissolved)	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Iron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Manganese	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Dissolved Mercury	MET-93-6100	EPA SW 846 7470 & 245.1	CVAAS
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Strontium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Thallium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS

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Method Summary

CLIENT NAME: TERRAPROBE INC. | AGAT WORK ORDER: 19T438084

PROJECT: 1-19-0022-46 | ATTENTION TO: Jessie Wu

SAMPLING SITE: | SAMPLED BY:

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

AGAT Laboratories

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Laboratory Use Only

Work Order #: 19T438084

Cooler Quantity:

Arrival Temperatures: 8.5 | 7.9 | 7.6

Custody Seal Intact: ☐Yes ☐No ☐N/A

Notes: ice

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: Terraprobe
Contact: Jesse Wu
Address: 11 Indell Lane, Brampton, ON L6T 3Y3
Phone: Fax:
Reports to be sent to:
1. Email: jwu@terraprobe.ca
2. Email:

Regulatory Requirements:

☐ No Regulatory Requirement

(Please check all applicable boxes)

☐ Regulation 153/04
Table ____ *Indicate One*
☐ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture *(Check One)*
☐ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region ____ *Indicate One*
☐ MISA

☐ Regulation 558
☐ CCME
☒ Prov. Water Quality Objectives (PWQO)
☐ Other
____ *Indicate One*

Is this submission for a Record of Site Condition? ☐ Yes ☒ No

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: 1-19-0022-46
Site Location: Uxbridge
Sampled By: AK
AGAT Quote #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI Y/N
BH1	2/15/19		8	GW		Y
BH2	2/15/19		8	GW		Y
BH3	2/15/19		8	GW		Y

Sample	O. Reg 153: Metals and Inorganics	☐ All Metals ☐ 153 Metals (excl. Hydrides)	☐ Hydride Metals ☐ 153 Metals (incl. Hydrides)	ORPs: ☐ B-HWS ☐ Cl⁻ ☐ CN ☐ Cr^{6+} ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☐ VOC ☐ BTEX ☐ THM	PHCs F1 - F4	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use	~~MWQA~~ WQA + Dissolved Al + Dissolved Hg
BH1																X
BH2																X
BH3																X

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Adil Khan [signature]	2/15/19	3:20 PM	Sima Z	19/2/15	3:25

Page ____ of ____

Nº: T 084427

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

CLIENT NAME: TERRAPROBE INC.
11 INDELL LANE
BRAMPTON, ON L6T3Y3
(905) 796-2650

ATTENTION TO: Jessie Wu

PROJECT: 1-19-0022-43.1

AGAT WORK ORDER: 19T537511

WATER ANALYSIS REVIEWED BY: Jacky Zhu, Spectroscopy Technician

DATE REPORTED: Nov 05, 2019

PAGES (INCLUDING COVER): 5

VERSION*: 1

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

*NOTES

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

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

Certificate of Analysis

AGAT WORK ORDER: 19T537511
PROJECT: 1-19-0022-43.1

CLIENT NAME: TERRAPROBE INC. ATTENTION TO: Jessie Wu
SAMPLING SITE: SAMPLED BY:

O. Reg. 153(511) - Metals & Inorganics (Water)

DATE RECEIVED: 2019-10-30 DATE REPORTED: 2019-11-05

			SAMPLE DESCRIPTION:	BH 14		BH 15		BH 16	BH 17
			SAMPLE TYPE:	Water		Water		Water	Water
			DATE SAMPLED:	2019-10-29		2019-10-29		2019-10-29	2019-10-29
Parameter	Unit	G / S	RDL	667000	RDL	667001	RDL	667002	667003
Antimony	µg/L	6	1.0	<1.0	1.0	<1.0	1.0	<1.0	<1.0
Arsenic	µg/L	25	1.0	<1.0	1.0	<1.0	1.0	<1.0	<1.0
Barium	µg/L	1000	2.0	254	2.0	197	2.0	273	328
Beryllium	µg/L	4.0	0.5	<0.5	0.5	<0.5	0.5	<0.5	<0.5
Boron	µg/L	5000	10.0	34.4	10.0	13.7	10.0	24.3	25.3
Cadmium	µg/L	2.7	0.2	<0.2	0.2	<0.2	0.2	<0.2	<0.2
Chromium	µg/L	50	2.0	<2.0	2.0	5.0	2.0	<2.0	<2.0
Cobalt	µg/L	3.8	0.5	<0.5	0.5	<0.5	0.5	<0.5	<0.5
Copper	µg/L	87	1.0	<1.0	1.0	<1.0	1.0	<1.0	<1.0
Lead	µg/L	10	0.5	<0.5	0.5	<0.5	0.5	<0.5	0.8
Molybdenum	µg/L	70	0.5	2.3	0.5	4.8	0.5	13.9	6.3
Nickel	µg/L	100	1.0	3.4	1.0	1.5	1.0	1.1	1.8
Selenium	µg/L	10	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0
Silver	µg/L	1.5	0.2	<0.2	0.2	<0.2	0.2	<0.2	<0.2
Thallium	µg/L	2	0.3	1.7	0.3	1.7	0.3	0.8	1.7
Uranium	µg/L	20	0.5	0.8	0.5	1.2	0.5	5.9	1.7
Vanadium	µg/L	6.2	0.4	<0.4	0.4	0.6	0.4	<0.4	0.9
Zinc	µg/L	1100	5.0	7.4	5.0	<5.0	5.0	<5.0	<5.0
Mercury	µg/L		0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.02
Chromium VI	µg/L	25	5	<5	5	<5	5	<5	<5
Cyanide	µg/L	66	2	<2	2	<2	2	<2	<2
Sodium	µg/L	490000	500	24700	500	21100	500	53700	141000
Chloride	µg/L	790000	500	37400	200	25900	500	7410	247000
Electrical Conductivity	uS/cm		2	874	2	612	2	870	1580
pH	pH Units		NA	7.97	NA	7.94	NA	8.03	7.81

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Potable Ground Water - All Types of Property Uses - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

667000-667003 Elevated RDL indicates the degree of sample dilution prior to the analysis in order to keep analytes within the calibration range of the instrument and to reduce matrix interference.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

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

Quality Assurance

CLIENT NAME: TERRAPROBE INC.
PROJECT: 1-19-0022-43.1
SAMPLING SITE:

AGAT WORK ORDER: 19T537511
ATTENTION TO: Jessie Wu
SAMPLED BY:

Water Analysis

RPT Date: Nov 05, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper
O. Reg. 153(511) - Metals & Inorganics (Water)															
Antimony	667000	667000	<1.0	<1.0	NA	< 1.0	104%	70%	130%	97%	80%	120%	102%	70%	130%
Arsenic	667000	667000	1.0	<1.0	NA	< 1.0	107%	70%	130%	95%	80%	120%	108%	70%	130%
Barium	667000	667000	254	247	2.8%	< 2.0	100%	70%	130%	94%	80%	120%	100%	70%	130%
Beryllium	667000	667000	<0.5	<0.5	NA	< 0.5	103%	70%	130%	99%	80%	120%	101%	70%	130%
Boron	667000	667000	34.4	33.0	NA	< 10.0	100%	70%	130%	97%	80%	120%	98%	70%	130%
Cadmium	667000	667000	<0.2	<0.2	NA	< 0.2	101%	70%	130%	97%	80%	120%	97%	70%	130%
Chromium	667000	667000	<2.0	<2.0	NA	< 2.0	100%	70%	130%	97%	80%	120%	97%	70%	130%
Cobalt	667000	667000	<0.5	<0.5	NA	< 0.5	101%	70%	130%	97%	80%	120%	96%	70%	130%
Copper	667000	667000	<1.0	<1.0	NA	< 1.0	103%	70%	130%	98%	80%	120%	96%	70%	130%
Lead	667000	667000	2.2	2.1	NA	< 0.5	98%	70%	130%	90%	80%	120%	96%	70%	130%
Molybdenum	667000	667000	2.3	2.3	NA	< 0.5	103%	70%	130%	98%	80%	120%	101%	70%	130%
Nickel	667000	667000	3.4	3.7	NA	< 1.0	103%	70%	130%	97%	80%	120%	96%	70%	130%
Selenium	667000	667000	<1.0	<1.0	NA	< 1.0	100%	70%	130%	92%	80%	120%	104%	70%	130%
Silver	667000	667000	<0.2	<0.2	NA	< 0.2	103%	70%	130%	95%	80%	120%	96%	70%	130%
Thallium	667000	667000	1.7	1.7	0.0%	< 0.3	104%	70%	130%	94%	80%	120%	102%	70%	130%
Uranium	667000	667000	0.8	0.8	NA	< 0.5	106%	70%	130%	97%	80%	120%	105%	70%	130%
Vanadium	667000	667000	<0.4	<0.4	NA	< 0.4	101%	70%	130%	97%	80%	120%	99%	70%	130%
Zinc	667000	667000	7.4	<5.0	NA	< 5.0	102%	70%	130%	98%	80%	120%	99%	70%	130%
Mercury	667000	667000	<0.02	<0.02	NA	< 0.02	103%	70%	130%	96%	80%	120%	96%	70%	130%
Chromium VI	667000	667000	<5	<5	NA	< 5	102%	70%	130%	99%	80%	120%	98%	70%	130%
Cyanide	667000	667000	<2	<2	NA	< 2	99%	70%	130%	92%	80%	120%	101%	70%	130%
Sodium	653917		1600	1590	NA	< 500	96%	70%	130%	95%	80%	120%	96%	70%	130%
Chloride	668140		113000	110000	2.7%	< 100	90%	70%	130%	98%	70%	130%	90%	70%	130%
Electrical Conductivity	666888		587	587	0.0%	< 2	101%	90%	110%						
pH	666888		7.72	7.67	0.6%	NA	100%	90%	110%						

Comments: NA signifies Not Applicable.
Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By:

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

Method Summary

CLIENT NAME: TERRAPROBE INC.
AGAT WORK ORDER: 19T537511
PROJECT: 1-19-0022-43.1
ATTENTION TO: Jessie Wu
SAMPLING SITE:
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Thallium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Mercury	MET-93-6100	EPA SW 846 7470 & 245.1	CVAAS
Chromium VI	INOR-93-6034	SM 3500-Cr B	SPECTROPHOTOMETER
Cyanide	INOR-93-6052	MOE METHOD CN- 3015 & SM 4500 CN- I	TECHNICON AUTO ANALYZER
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE

AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only

Work Order #: 19TS37511

Cooler Quantity: 1 cart

Arrival Temperatures: 4.4 | 4.1 | 3.9
3.3 | 3 | 2.8

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes:

Report Information:

Company: Terraprobe
Contact: Jessie Wu
Address: 11 Fridolfone, Brampton. L6T 3Y3.

Phone: Fax:

Reports to be sent to:
1. Email: jwu@terraprobe.ca
2. Email: uarshad@terraprobe.ca

Regulatory Requirements: ☐ No Regulatory Requirement

(Please check all applicable boxes)

☐ Regulation 153/04
Table 2 (Indicate One)
☐ Ind/Com
☒ Res/Park
☐ Agriculture
Soil Texture (Check One)
☒ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region ____ (Indicate One)
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
(Indicate One)

Is this submission for a **Record of Site Condition?** ☐ Yes ☒ No

Report Guideline on *Certificate of Analysis* ☐ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: 1-19-0022-46.1
Site Location: Uxbridge, ON
Sampled By: Usman Arshad.
AGAT Quote #: PO:

Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics (Na & Cl)	☐ All Metals ☐ 153 Metals (excl Hydrides)	☐ Hydride Metals ☐ 153 Metals (incl Hydrides)	ORPs: ☐ B-HWS ☒ Cl⁻ ☐ CN ☒ Cr^{6+} ☐ EC ☐ FOC ☒ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☐ VOC ☐ BTEX ☐ THM	PHCs F1 - F4	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use						Potentially Hazardous or High Concentration (Y/N)
BH 14	10-29-19		5	GW		Y	✓			✓																	
BH 15	10-29-19		5	GW		Y	✓			✓																	
BH 16	10-29-19		5	GW		Y	✓			✓																	
BH 17	10-29-19		5	GW		Y	✓			✓																	

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Usman Arshad	10-29-19	06:00 pm	[signature]	Oct 30/19	10:06
[signature]	Oct 30/19	3:38			

Page 01 of 01

Nº: T 096730

APPENDIX G

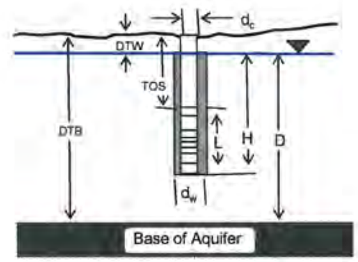
TERRAPROBE INC.

WELL ID: BH3

Local ID:
Date:
Time:

INPUT

Construction:	
Casing dia. (d_c)	0.05 Meter
Annulus dia. (d_w)	0.05 Meter
Screen Length (L)	3.05 Meter
Depths to:	
water level (DTW)	1.98 Meter
top of screen (TOS)	4.55 Meter
Base of Aquifer (DTB)	7.6 Meter
Annular Fill:	
across screen -- Coarse Sand	
above screen -- Bentonite	
Aquifer Material -- Silt, Loess	



COMPUTED

L_{wetted}	3.05 Meter
D =	5.62 Meter
H =	5.62 Meter
L/r_w =	122.00
$y_{0\text{-DISPLACEMENT}}$ =	0.50 Meter
$y_{0\text{-SLUG}}$ =	0.51 Meter

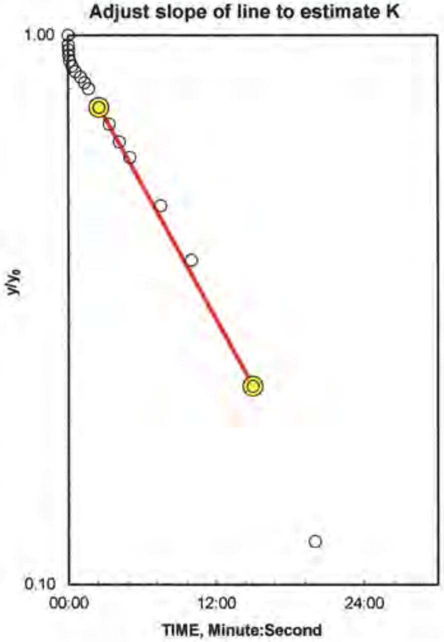
From look-up table using L/r_w

Fully penetrate C =	5.075
ln(Re/rw) =	4.086
Re =	4.88 Meter
Slope =	0.000113 $\log_{10}$/sec
$t_{90\%}$ recovery =	8867 sec

Input is consistent.

K = 1.1E-07 Meter/Second

Adjust slope of line to estimate K



Reduced Data

Entry	Time, Hr:Min:Sec	Water Level
1	0:00:00.0	2.48
2	0:00:10.0	2.46
3	0:00:15.0	2.45
4	0:00:20.0	2.44
5	0:00:45.0	2.43
6	0:01:45.0	2.42
7	0:03:30.0	2.41
8	0:06:00.0	2.40
9	0:08:00.0	2.39
10	0:10:00.0	2.38
11	0:15:00.0	2.35
12	0:20:00.0	2.33
13	0:25:00.0	2.30
14	0:30:00.0	2.28
15	0:45:00.0	2.23
16	1:00:00.0	2.18
17	1:30:00.0	2.10
18	2:00:00.0	2.04

REMARKS:

Bouwer and Rice analysis of slug test, WRR 1976

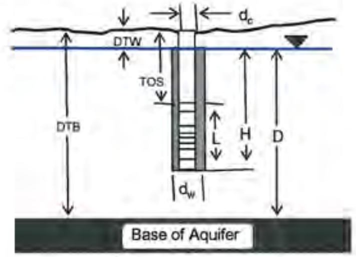
Assumed fully penetrating condition. K reduces to 9.7E-8 m/s if an aquifer base of 9.14 m, based on conditions at Well 6, is used.

WELL ID: BH13

Local ID:
Date:
Time:

INPUT

Construction:		
Casing dia. (d_c)	0.05	Meter
Annulus dia. (d_w)	0.05	Meter
Screen Length (L)	3.05	Meter
Depths to:		
water level (DTW)	0.73	Meter
top of screen (TOS)	3.2	Meter
Base of Aquifer (DTB)	6.25	Meter
Annular Fill:		
across screen -- Coarse Sand		
above screen -- Bentonite		
Aquifer Material -- Silt, Loess		



COMPUTED

L_{wetted}	3.05	Meter
D =	5.52	Meter
H =	5.52	Meter
L/r_w =	122.00	
$y_{0\text{-DISPLACEMENT}}$ =	0.50	Meter
$y_{0\text{-SLUG}}$ =	0.51	Meter

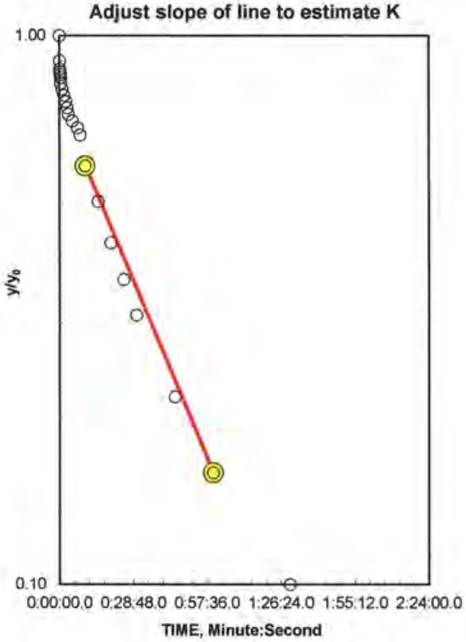
From look-up table using L/r_w

Fully penetrate C =	5.075	
ln(Re/rw) =	4.075	
Re =	4.83	Meter
Slope =	0.000186	$\log_{10}$/sec
$t_{90\%}$ recovery =	5364	sec

Input is consistent.

K = 1.8E-07 Meter/Second

Adjust slope of line to estimate K



Reduced Data

Entry	Time, Hr:Min:Sec	Water Level
1	0:00:00.0	1.23
2	0:00:05.0	1.18
3	0:00:10.0	1.17
4	0:00:15.0	1.16
5	0:00:20.0	1.16
6	0:00:25.0	1.15
7	0:00:30.0	1.14
8	0:01:00.0	1.13
9	0:01:45.0	1.12
10	0:02:30.0	1.11
11	0:03:00.0	1.10
12	0:03:30.0	1.09
13	0:05:00.0	1.08
14	0:07:00.0	1.07
15	0:08:00.0	1.06
16	0:10:00.0	1.02
17	0:15:00.0	0.98
18	0:20:00.0	0.94
19	0:25:00.0	0.91
20	0:30:00.0	0.89
21	0:45:00.0	0.84
22	1:00:00.0	0.81

REMARKS:

Bouwer and Rice analysis of slug test, WRR 1976

Assumed fully penetrating condition. K reduces to 1.6E-7 m/s if an aquifer base of 9.14 m, based on conditions at Well 6, is used.

APPENDIX H

TERRAPROBE INC.

Terraprobe
Consulting Environmental Engineers & Hydrogeologists
Environmental Investigation, Remediation & Inspection

FIELD INSPECTION RECORD

Project: 4 Campbell Drive	File / Report No. 1-19-0022-46.1
Location: Uxbridge	Date / Time: Oct 4/19
Client:	Inspector: B. Racher
Contractor: Cannington	Weather: Cloudy 11 °C,

NOTES: Guelph permeameter @ 4 locations

TP #1 : Free water present @ 1.4 mbg, ∴ test performed @ 1.0 mbg
Soil is a silty SAND, trace gravel.

TP #2 : test depth = 1.7 mbg
SILT trace to some fine sand.

TP #3 : test depth = 1.5 mbg
silty fine SAND v. moist.

BH 8 (added test)
Depth @ 1.3 mbg (gravelly layer, impossible to auger to 1.5 mbg)
Sand, some silt, trace gravel.

SKETCH

Samples obtained at each location for 't' time including wet sample at TP 1

Results combining Two Head method.

TP #1	1.0 mbg					
R_1	0.01666	cm/sec	k_{fs}=	2.00E-04 cm/sec	7.21E+00 mm/hr	1.20E-02 cm/min
R_2	0.02333	cm/sec				
X	35.22	cm^2	Φ_m=	1.41E-02 cm^2/s		
TP #2	**1.7 mbg**					
R_1	0.0333	cm/sec	k_{fs}=	5.44E-05 cm/sec	1.96E+00 mm/hr	3.26E-03 cm/min
R_2	0.05	cm/sec				
X	2.16	cm^2	Φ_m=	1.55E-03 cm^2/s		
TP #3	**1.5 mbg**					
R_1	0.06	cm/sec	k_{fs}=	6.71E-05 cm/sec	2.42E+00 mm/hr	4.03E-03 cm/min
R_2	0.0866	cm/sec				
X	2.16	cm^2	Φ_m=	2.98E-03 cm^2/s		

Enter numbers in	RED	cells only. Do not change the value of	GREY	cells.

Variable Glossary

R_1 **1)** is the steady state rate of flow per minute at a head height of 5 cm

2) determined by timing the drop of water in the Guelph Permeameter

R_2 **1)** is the steady state rate of flow per minute at a head height of 10 cm

2) determined by timing the drop of water in the Guelph Permeameter

X **1)** is the resevoir constant

2) determined by the reservoir knob at the top of the unit

- if the knob is up X = 35.22 (outer and inner reservoir)
- if the knob is down X = 2.16 (inner reservoir)

Equation Glossary

k_{fs} is the field saturated hydraulic conductivity of the soil

Φ_m is an indicator of the capillary pull exerted by the unsaturated soil on the water

If either k_{fs} or Φ_m are negative then dismiss the calculation and use the average of the single head test.

Results combining two Head method.

BH 8 **1.3 mbg**

R_1	0.01	cm/sec	k_{fs}=	1.87E-05 cm/sec	→ 6.72E-01 mm/hr	→ 1.12E-03 cm/min
R_2	0.0133	cm/sec				
X	35.22	cm^2	Φ_m=	9.04E-03 cm^2/s		

R_1		cm/sec	k_{fs}=	0.00E+00 cm/sec	→ 0.00E+00 mm/hr	→ 0.00E+00 cm/min
R_2		cm/sec				
X		cm^2	Φ_m=	0.00E+00 cm^2/s		

R_1		cm/sec	k_{fs}=	0.00E+00 cm/sec	→ 0.00E+00 mm/hr	→ 0.00E+00 cm/min
R_2		cm/sec				
X		cm^2	Φ_m=	0.00E+00 cm^2/s		

Enter numbers in RED cells only. Do not change the value of GREY cells.

Variable Glossary

R_1 **1)** is the steady state rate of flow per minute at a head height of 5 cm

2) determined by timing the drop of water in the Guelph Permeameter

R_2 **1)** is the steady state rate of flow per minute at a head height of 10 cm

2) determined by timing the drop of water in the Guelph Permeameter

X **1)** is the resevoir constant

2) determined by the reservoir knob at the top of the unit

- if the knob is up X = 35.22 (outer and inner reservoir)
- if the knob is down X = 2.16 (inner reservoir)

Equation Glossary

k_{fs} is the field saturated hydraulic conductivity of the soil

Φ_m is an indicator of the capillary pull exerted by the unsaturated soil on the water

If either k_{fs} or Φ_m are negative then dismiss the calculation and use the average of the single head test.

Individual Head Results
For 5 cm + 10 cm.

TP #1	1.0 mbg									
α*=	0.12	cm^{-1}	Ha=	1.666667		(●) C1	0.803154	k_{fs}=	1.07E-03 cm/sec	⟶ 3.84E+01 mm/hr ⟶ 6.40E-02 cm/min
H=	5	cm	Q1=	0.586765	cm^3/sec	( ) C2				
a=	3	cm				( ) C3		Φ_m=	8.89E-03 cm^2/s	
X=	35.22	cm^2								
R=	0.01666	cm/sec								

TP #1	1.0 mbg									
α*=	0.12	cm^{-1}	Ha=	3.333333		(●) C1	1.287543	k_{fs}=	8.89E-04 cm/sec	⟶ 3.20E+01 mm/hr ⟶ 5.33E-02 cm/min
H=	10	cm	Q1=	0.820626	cm^3/sec	( ) C2				
a=	3	cm				( ) C3		Φ_m=	7.41E-03 cm^2/s	
X=	35.22	cm^2								
R=	0.0233	cm/sec								

a		cm^{-1}	Ha=	#DIV/0!		(●) C1	#DIV/0!	k_{fs}=	#DIV/0! cm/sec	⟶ #DIV/0! mm/hr ⟶ #DIV/0! cm/min
H=		cm	Q1=	0	cm^3/sec	( ) C2				
a=		cm				( ) C3		Φ_m=	#DIV/0! cm^2/s	
X=		cm^2								
R=		cm/sec								

Enter numbers in RED cells only. Do not change the value of GREY cells.

Variable Glossary

α*	**1)** is the ratio of gravity to capillarity forces during infiltration or drainage.
	2) determined from table 1 on page 47 of the manual (or the adjacent page)
H	**1)** is the water head in the BH
	2) determined by the height that the inner tube is pulled up during field operation
a	**1)** is the radius of the borehole
	2) determine by the size of the auger
X	**1)** is the resevoir constant
	2) determined by the reservoir knob at the top of the unit
	• if the knob is up X = 35.22 (outer and inner reservoir)
	• if the knob is down X = 2.16 (inner reservoir)
R	**1)** is the steady state rate of flow per minute
	2) is determined by timing the drop of water in the Guelph Permeameter

Equation Glossary

Ha	is the ratio of head to borehole radius
Q1	is the flow rate
$C_{(1, 2 or 3)}$	is the shape factor which accounts for the saturated area of the soil.
	• Select C_1 if α* is ≥ 0.12 cm^{-1}
	• Select C_2 if α* = 0.04 cm^{-1}
	• Select C_3 if α* = 0.01 cm^{-1}
k_{fs}	is the field saturated hydraulic conductivity of the soil
Φ_m	is an indicator of the capillary pull exerted by the unsaturated soil on the water

Table 1. Soil texture-structure categories for site-estimation of α* (adapted from Elrick et al., 1989)

Soil Texture - Structure Category	α* (cm^{-1})
Compacted, structureless, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.	0.01
Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.	0.04
Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.	0.12
Coarse and gravelly sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc.	0.36

Individual Result for 5 cm & 10 cm Head.

TP #2 1.7 mbg

α*=	0.04	cm^{-1}	Ha=	1.666667		C1	0.842059	
H=	5	cm	Q1=	0.071993	cm^3/sec	◉ C2		
a=	3	cm				C3		
X=	2.16	cm^2						
R=	0.03333	cm/sec						

k_{fs}= 6.27E-05 cm/sec ⟶ 2.26E+00 mm/hr ⟶ 3.76E-03 cm/min

Φ_m= 1.57E-03 cm^2/s

TP #2 1.7 mbg

α*=	0.04	cm^{-1}	Ha=	3.333333		C1	1.290234	
H=	10	cm	Q1=	0.108	cm^3/sec	◉ C2		
a=	3	cm				C3		
X=	2.16	cm^2						
R=	0.05	cm/sec						

k_{fs}= 6.23E-05 cm/sec ⟶ 2.24E+00 mm/hr ⟶ 3.74E-03 cm/min

Φ_m= 1.56E-03 cm^2/s

a		cm^{-1}	Ha=	#DIV/0!		◉ C1	#DIV/0!
H=		cm	Q1=	0	cm^3/sec	C2	
a=		cm				C3	
X=		cm^2					
R=		cm/sec					

k_{fs}= #DIV/0! cm/sec ⟶ #DIV/0! mm/hr ⟶ #DIV/0! cm/min

Φ_m= #DIV/0! cm^2/s

Enter numbers in RED cells only. Do not change the value of GREY cells.

Variable Glossary

α* 1) is the ratio of gravity to capillarity forces during infiltration or drainage.
2) determined from table 1 on page 47 of the manual (or the adjacent page)

H 1) is the water head in the BH
2) determined by the height that the inner tube is pulled up during field operation

a 1) is the radius of the borehole
2) determine by the size of the auger

X 1) is the resevoir constant
2) determined by the reservoir knob at the top of the unit
- if the knob is up X = 35.22 (outer and inner reservoir)
- if the knob is down X = 2.16 (inner reservoir)

R 1) is the steady state rate of flow per minute
2) is determined by timing the drop of water in the Guelph Permeameter

Equation Glossary

Ha is the ratio of head to borehole radius

Q1 is the flow rate

$C_{(1, 2 or 3)}$ is the shape factor which accounts for the saturated area of the soil.
- Select C_1 if α* is ≥ 0.12 cm^{-1}
- Select C_2 if α* = 0.04 cm^{-1}
- Select C_3 if α* = 0.01 cm^{-1}

k_{fs} is the field saturated hydraulic conductivity of the soil

Φ_m is an indicator of the capillary pull exerted by the unsaturated soil on the water

Table 1. Soil texture-structure categories for site-estimation of α* (adapted from Elrick et al., 1989)

Soil Texture - Structure Category	α* (cm^{-1})
Compacted, structureless, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.	0.01
Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.	0.04
Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.	0.12
Coarse and gravelly sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc.	0.36

Individual Head Results
For 5 & 10 cm Head.

TP #3 **1.5 mbg**

α*=	0.04	cm^{-1}	Ha=	1.666667		
H=	5	cm	Q1=	0.1296	cm^3/sec	
a=	3	cm				
X=	2.16	cm^2				
R=	0.06	cm/sec				

○ C1 0.842059
◉ C2
○ C3

k_{fs}= 1.13E-04 cm/sec ⟶ 4.07E+00 mm/hr ⟶ 6.78E-03 cm/min

Φ_m= 2.82E-03 cm^2/s

TP #3 **1.5 mbg**

α*=	0.04	cm^{-1}	Ha=	3.333333		
H=	10	cm	Q1=	0.187186	cm^3/sec	
a=	3	cm				
X=	2.16	cm^2				
R=	0.08666	cm/sec				

○ C1 1.290234
◉ C2
○ C3

k_{fs}= 1.08E-04 cm/sec ⟶ 3.89E+00 mm/hr ⟶ 6.48E-03 cm/min

Φ_m= 2.70E-03 cm^2/s

a		cm^{-1}	Ha=	#DIV/0!		
H=		cm	Q1=	0	cm^3/sec	
a=		cm				
X=		cm^2				
R=		cm/sec				

◉ C1 #DIV/0!
○ C2
○ C3

k_{fs}= #DIV/0! cm/sec ⟶ #DIV/0! mm/hr ⟶ #DIV/0! cm/min

Φ_m= #DIV/0! cm^2/s

Enter numbers in RED cells only. Do not change the value of GREY cells.

Variable Glossary

α* **1)** is the ratio of gravity to capillarity forces during infiltration or drainage.
2) determined from table 1 on page 47 of the manual (or the adjacent page)

H **1)** is the water head in the BH
2) determined by the height that the inner tube is pulled up during field operation

a **1)** is the radius of the borehole
2) determine by the size of the auger

X **1)** is the resevoir constant
2) determined by the reservoir knob at the top of the unit
- if the knob is up X = 35.22 (outer and inner reservoir)
- if the knob is down X = 2.16 (inner reservoir)

R **1)** is the steady state rate of flow per minute
2) is determined by timing the drop of water in the Guelph Permeameter

Equation Glossary

Ha is the ratio of head to borehole radius

Q1 is the flow rate

$C_{(1, 2 \text{ or } 3)}$ is the shape factor which accounts for the saturated area of the soil.
- Select C_1 if $\alpha^* \geq 0.12\ cm^{-1}$
- Select C_2 if $\alpha^* = 0.04\ cm^{-1}$
- Select C_3 if $\alpha^* = 0.01\ cm^{-1}$

k_{fs} is the field saturated hydraulic conductivity of the soil

Φ_m is an indicator of the capillary pull exerted by the unsaturated soil on the water

Table 1. Soil texture-structure categories for site-estimation of α* (adapted from Elrick et al., 1989)

Soil Texture - Structure Category	α* (cm^{-1})
Compacted, structureless, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.	0.01
Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.	0.04
Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.	0.12
Coarse and gravelly sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc.	0.36

Individual Head Results
For 5 cm + 10 cm.

BH 8 **1.3 mbg**

α*=	0.12	cm^{-1}	Ha=	1.666667		◉ C1	0.803154	k_{fs}=	6.41E-04 cm/sec	→ 2.31E+01 mm/hr	→ 3.84E-02 cm/min
H=	5	cm	Q1=	0.3522	cm^3/sec	○ C2					
a=	3	cm				○ C3		Φ_m=	5.34E-03 cm^2/s		
X=	35.22	cm^2									
R=	0.01	cm/sec									

BH 8 **1.3 mbg**

α*=	0.12	cm^{-1}	Ha=	3.333333		◉ C1	1.287543	k_{fs}=	5.08E-04 cm/sec	→ 1.83E+01 mm/hr	→ 3.05E-02 cm/min
H=	10	cm	Q1=	0.468426	cm^3/sec	○ C2					
a=	3	cm				○ C3		Φ_m=	4.23E-03 cm^2/s		
X=	35.22	cm^2									
R=	0.0133	cm/sec									

a		cm^{-1}	Ha=	#DIV/0!		◉ C1	#DIV/0!	k_{fs}=	#DIV/0! cm/sec	→ #DIV/0! mm/hr	→ #DIV/0! cm/min
H=		cm	Q1=	0	cm^3/sec	○ C2					
a=		cm				○ C3		Φ_m=	#DIV/0! cm^2/s		
X=		cm^2									
R=		cm/sec									

Enter numbers in RED cells only. Do not change the value of GREY cells.

Variable Glossary

α* 1) is the ratio of gravity to capillarity forces during infiltration or drainage.
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- if the knob is up X = 35.22 (outer and inner reservoir)
- if the knob is down X = 2.16 (inner reservoir)

R 1) is the steady state rate of flow per minute
2) is determined by timing the drop of water in the Guelph Permeameter

Equation Glossary

Ha is the ratio of head to borehole radius

Q1 is the flow rate

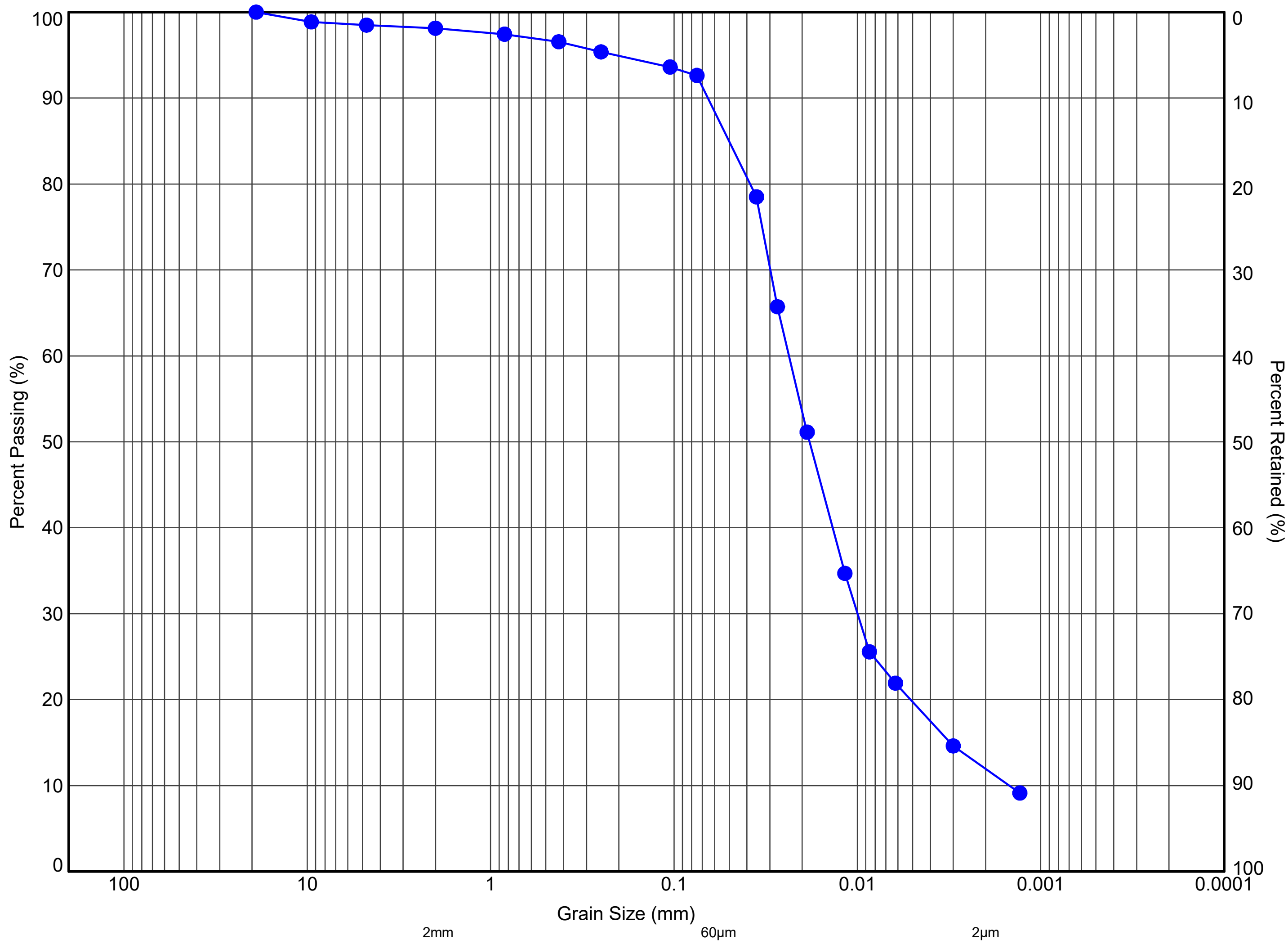
$C_{(1, 2 \text{ or } 3)}$ is the shape factor which accounts for the saturated area of the soil.
- Select C_1 if α* is ≥ 0.12 cm^{-1}
- Select C_2 if α* = 0.04 cm^{-1}
- Select C_3 if α* = 0.01 cm^{-1}

k_{fs} is the field saturated hydraulic conductivity of the soil

Φ_m is an indicator of the capillary pull exerted by the unsaturated soil on the water

Table 1. Soil texture-structure categories for site-estimation of α* (adapted from Elrick et al., 1989)

Soil Texture - Structure Category	α* (cm^{-1})
Compacted, structureless, clayey or silty materials such as landfill caps and liners, lacustrine or marine sediments, etc.	0.01
Soils which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.	0.04
Most structured soils from clays through loams; also includes unstructured medium and fine sands. The category most frequently applicable for agricultural soils.	0.12
Coarse and gravelly sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc.	0.36



MIT SYSTEM	COBBLES	GRAVEL			SAND			SILT	CLAY
		COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

MIT SYSTEM

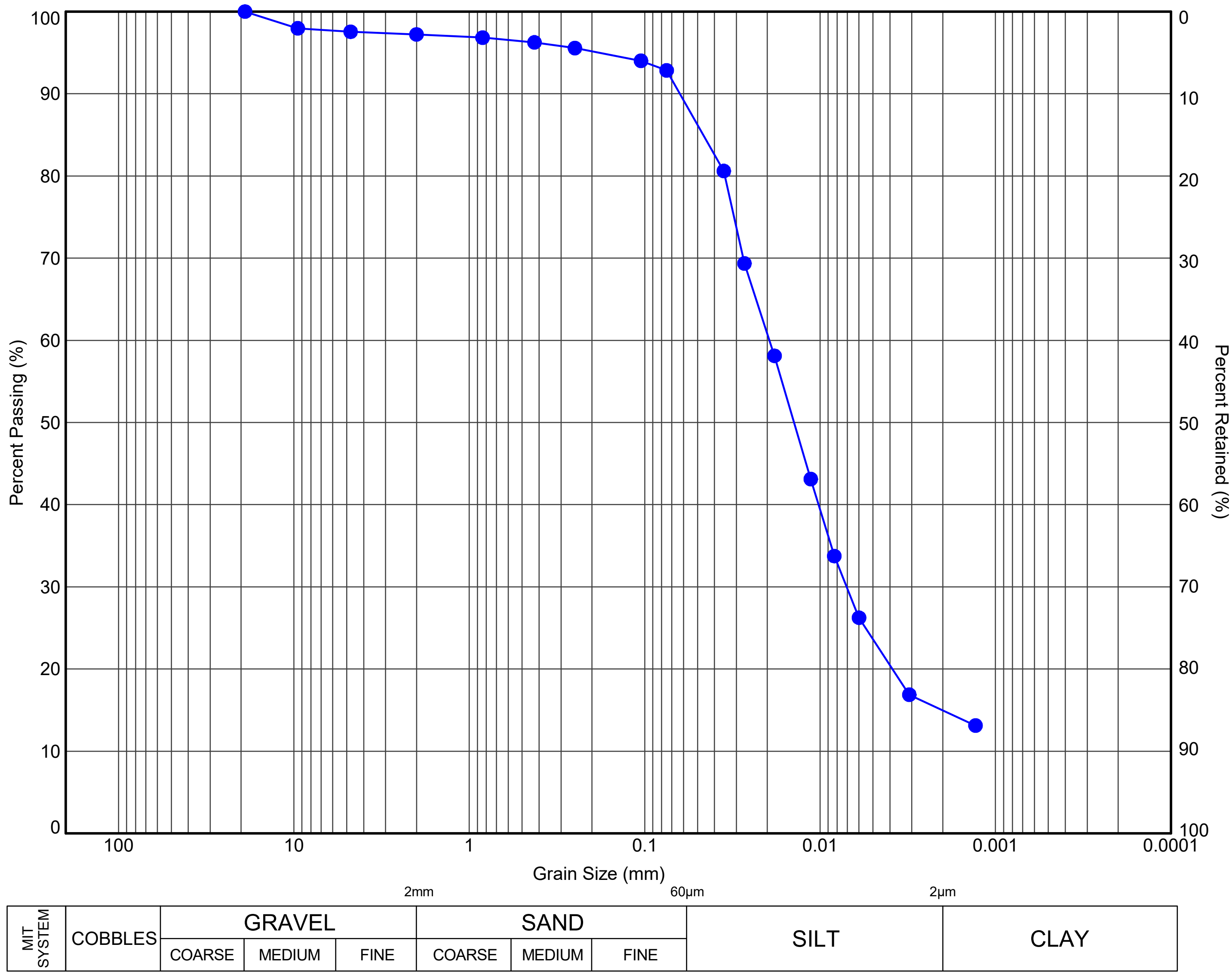
	Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
●	**1**	SS3	1.8	275.8	2	9	77	12	

Terraprobe
11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title:

GRAIN SIZE DISTRIBUTION
SILT, SOME CLAY, TRACE SAND, TRACE GRAVEL

File No.: **1-19-0022-46**



MIT SYSTEM

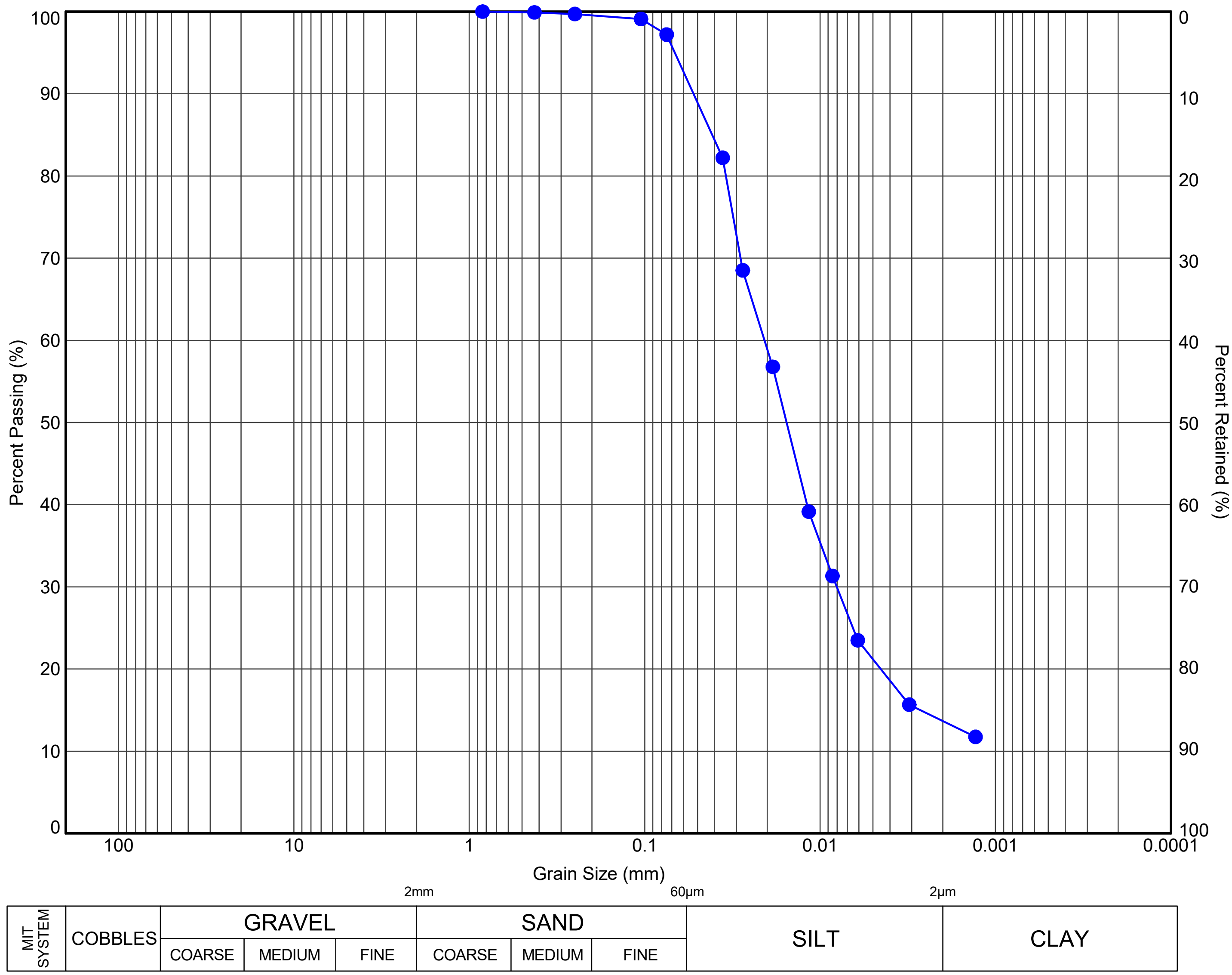
	Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
●	**2**	SS3	1.8	275.7	3	8	74	15	

Terraprobe
11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title:

GRAIN SIZE DISTRIBUTION
SILT, SOME CLAY, TRACE SAND, TRACE GRAVEL

File No.: **1-19-0022-46**



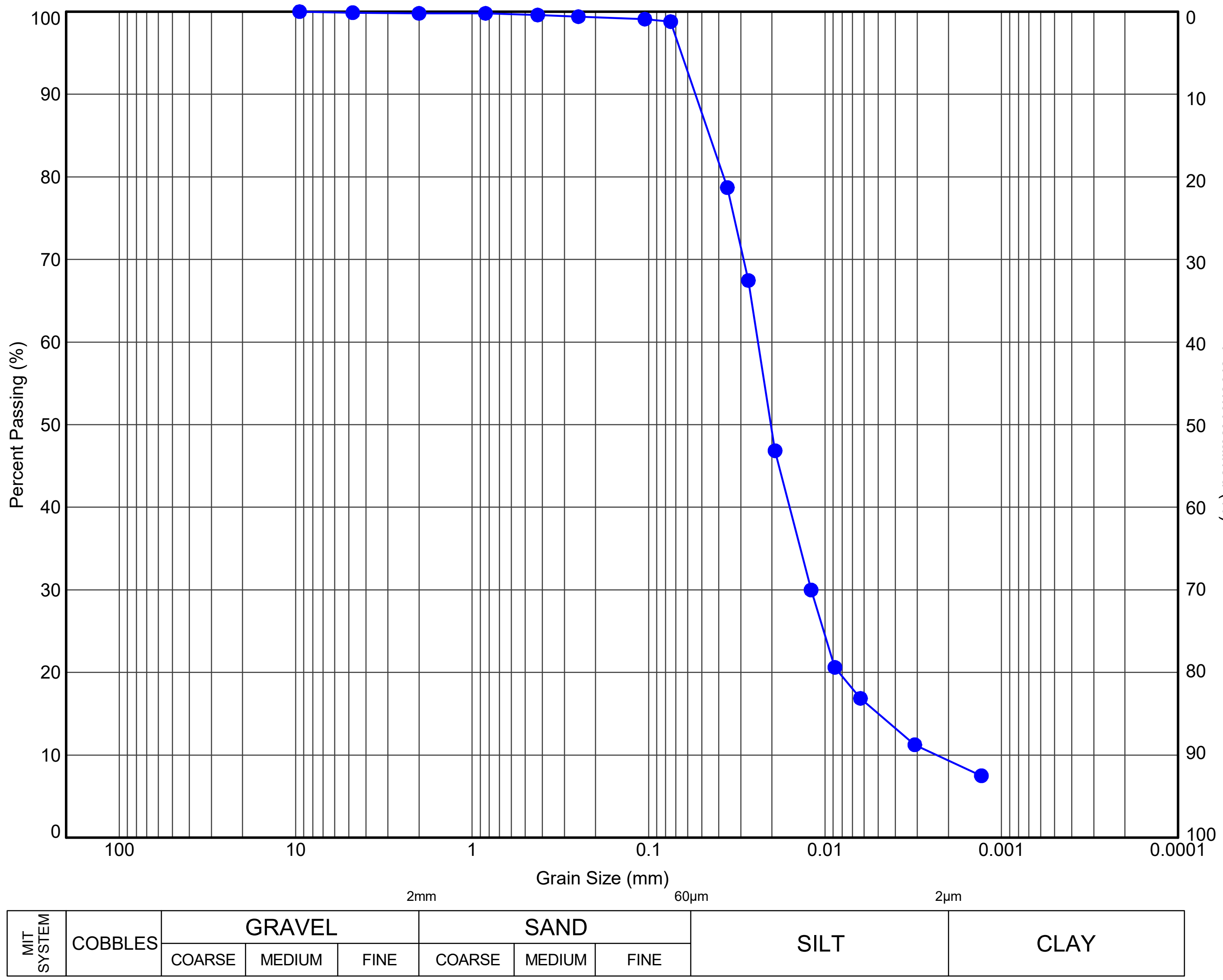
MIT SYSTEM

	Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
●	**3**	SS4	2.5	275.0	0	7	79	14	

Terraprobe
11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title: **GRAIN SIZE DISTRIBUTION**
SILT, SOME CLAY, TRACE SAND

File No.: **1-19-0022-46**



MIT SYSTEM

	Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
●	**4**	SS6	4.8	272.8	0	8	83	9	

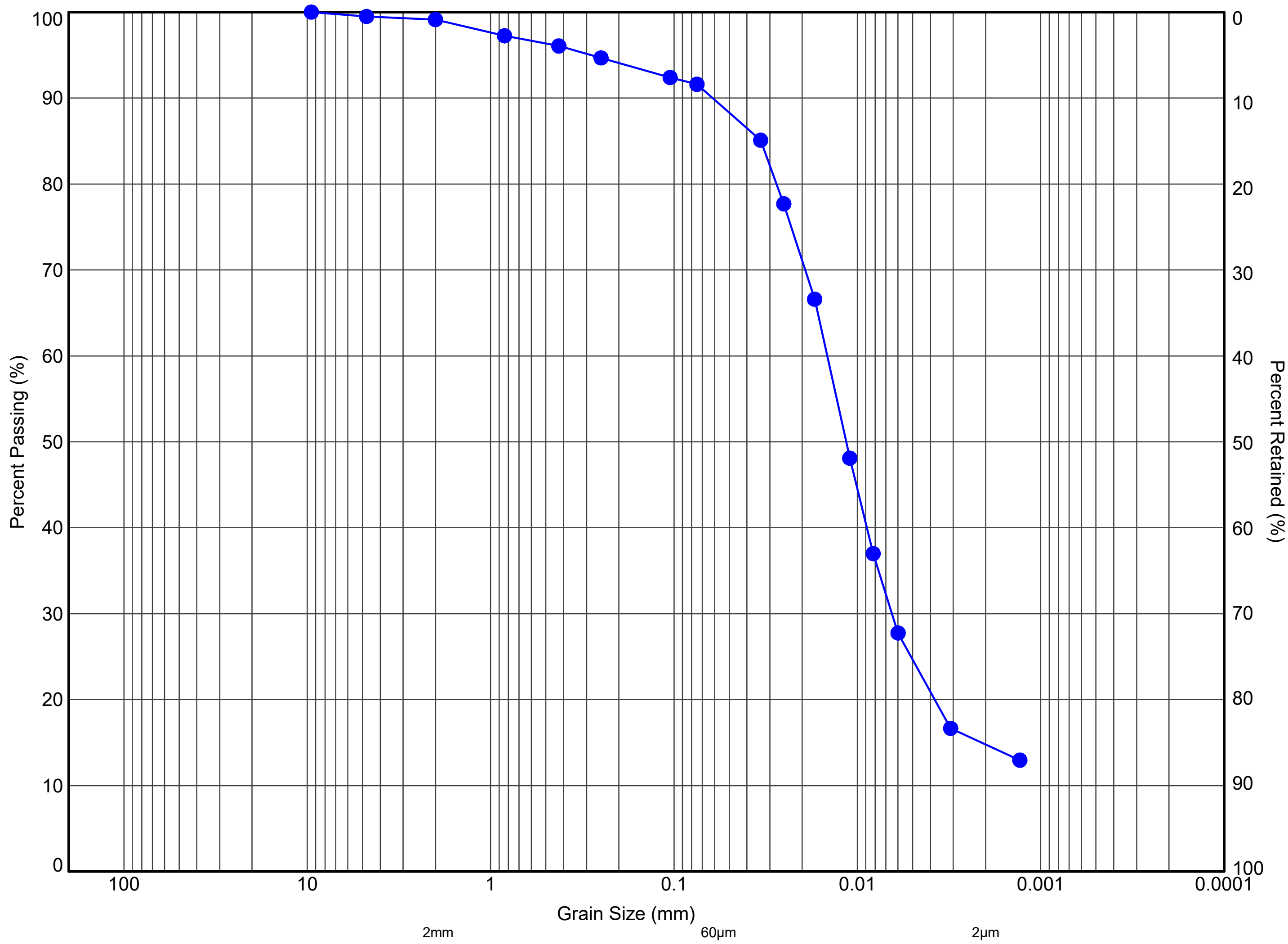
Terraprobe

11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title:

GRAIN SIZE DISTRIBUTION
SILT, TRACE CLAY, TRACE SAND

File No.: **1-19-0022-46**



MIT SYSTEM	COBBLES	GRAVEL			SAND			SILT	CLAY
		COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

MIT SYSTEM

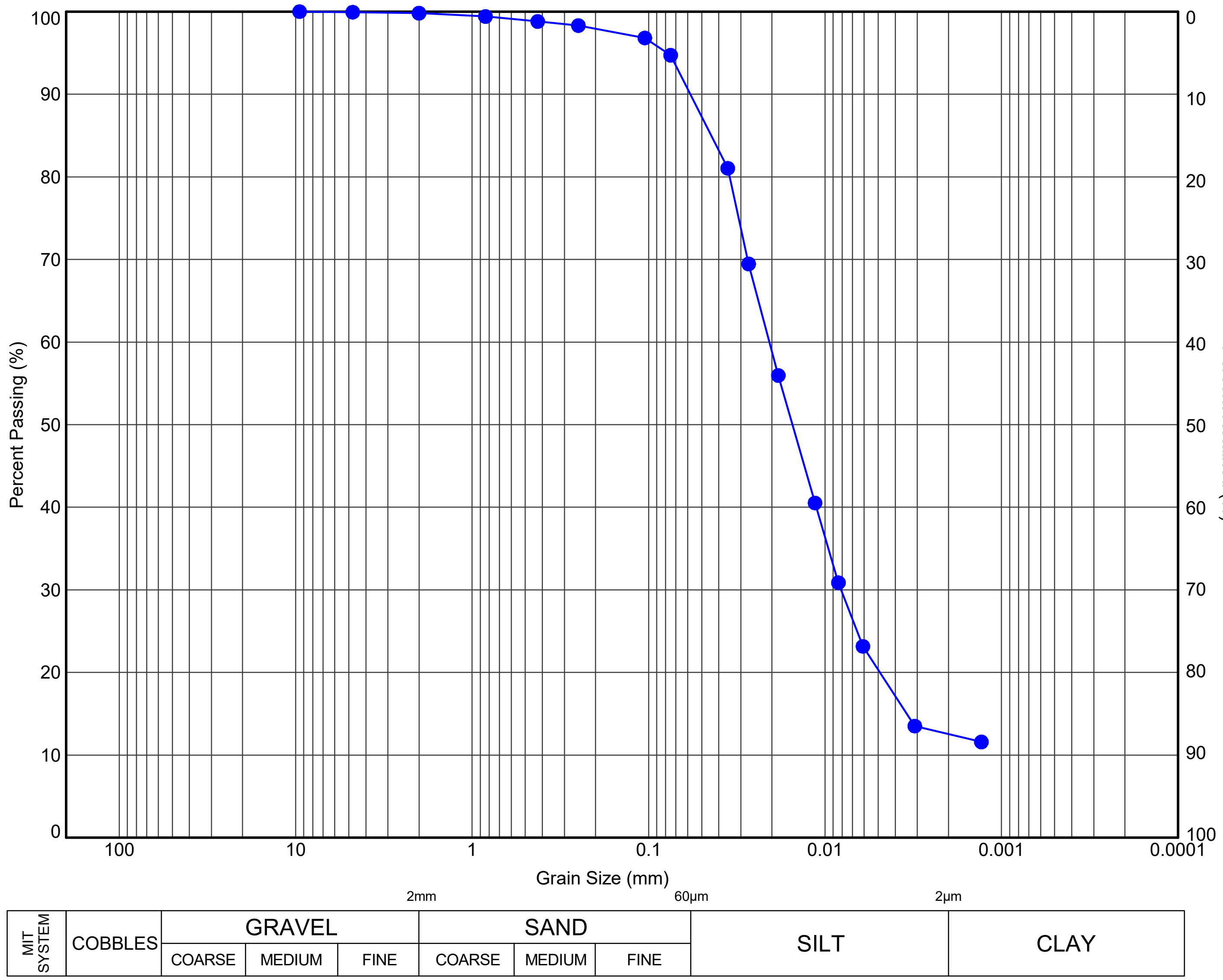
	Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
●	**5**	SS4	2.5	275.2	1	9	75	15	

Terraprobe
11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title:

GRAIN SIZE DISTRIBUTION
SILT, SOME CLAY, TRACE SAND, TRACE GRAVEL

File No.: **1-19-0022-46**



MIT SYSTEM

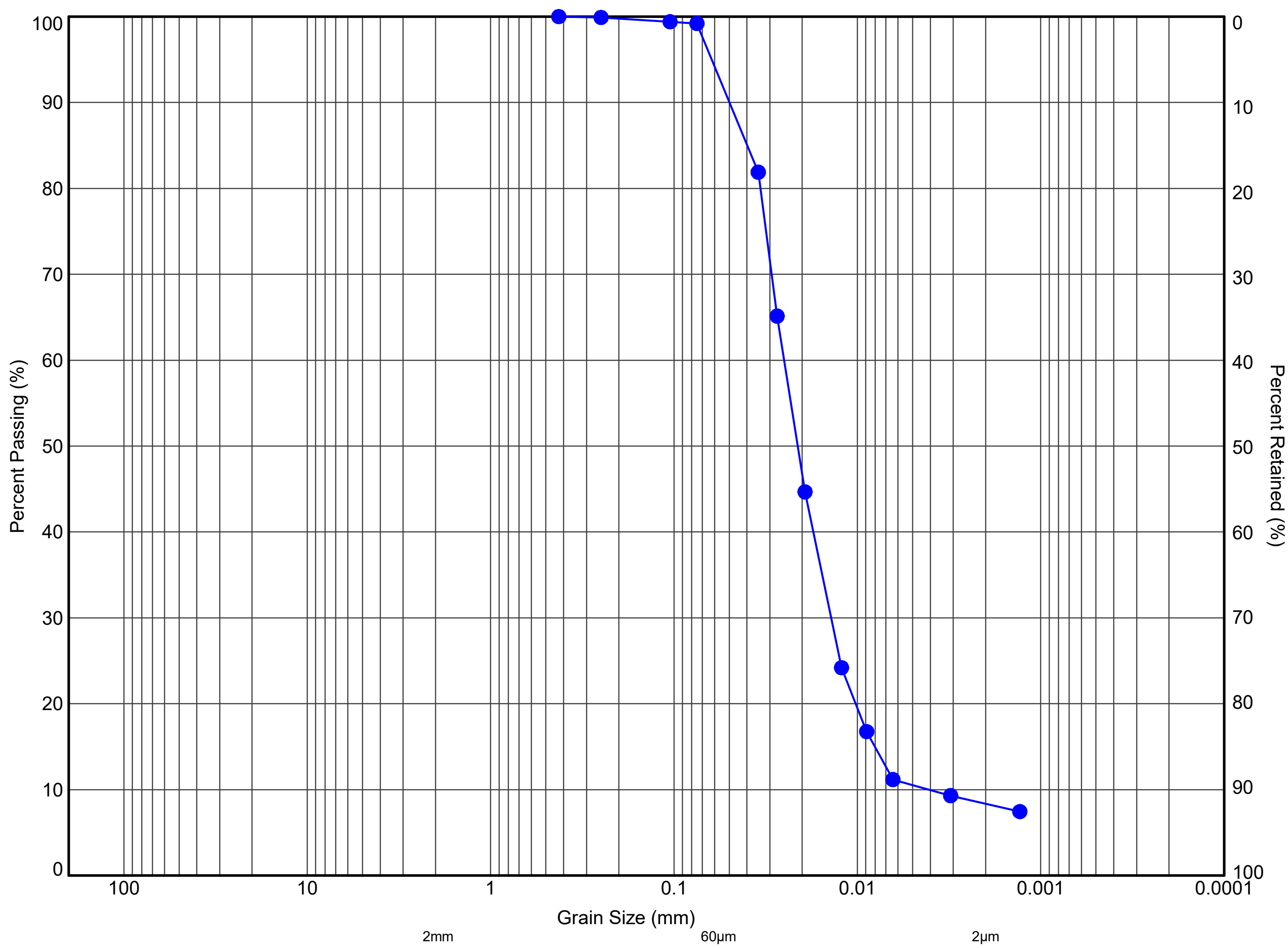
	Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
●	**8**	SS5	3.3	274.4	0	9	78	13	

Terraprobe
11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title:

GRAIN SIZE DISTRIBUTION
SILT, SOME CLAY, TRACE SAND

File No.: **1-19-0022-46**



MIT SYSTEM	COBBLES	GRAVEL			SAND			SILT	CLAY
		COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

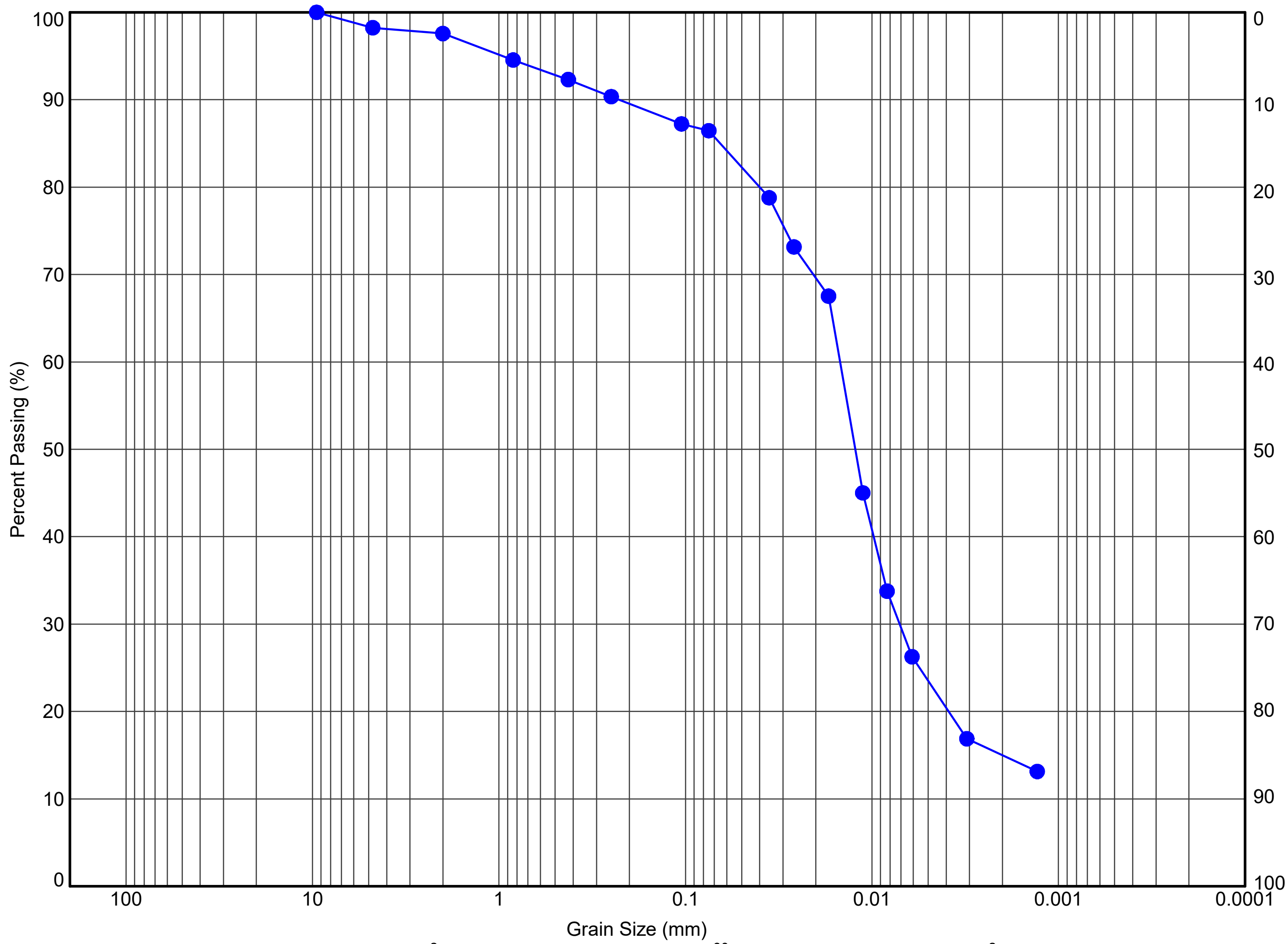
MIT SYSTEM

	Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
●	**9**	SS6	4.8	272.4	0	6	86	8	

Terraprobe
11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title: **GRAIN SIZE DISTRIBUTION**
SILT, TRACE CLAY, TRACE SAND

File No.: **1-19-0022-46**



MIT SYSTEM	COBBLES	GRAVEL			SAND			SILT	CLAY
		COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE		

MIT SYSTEM

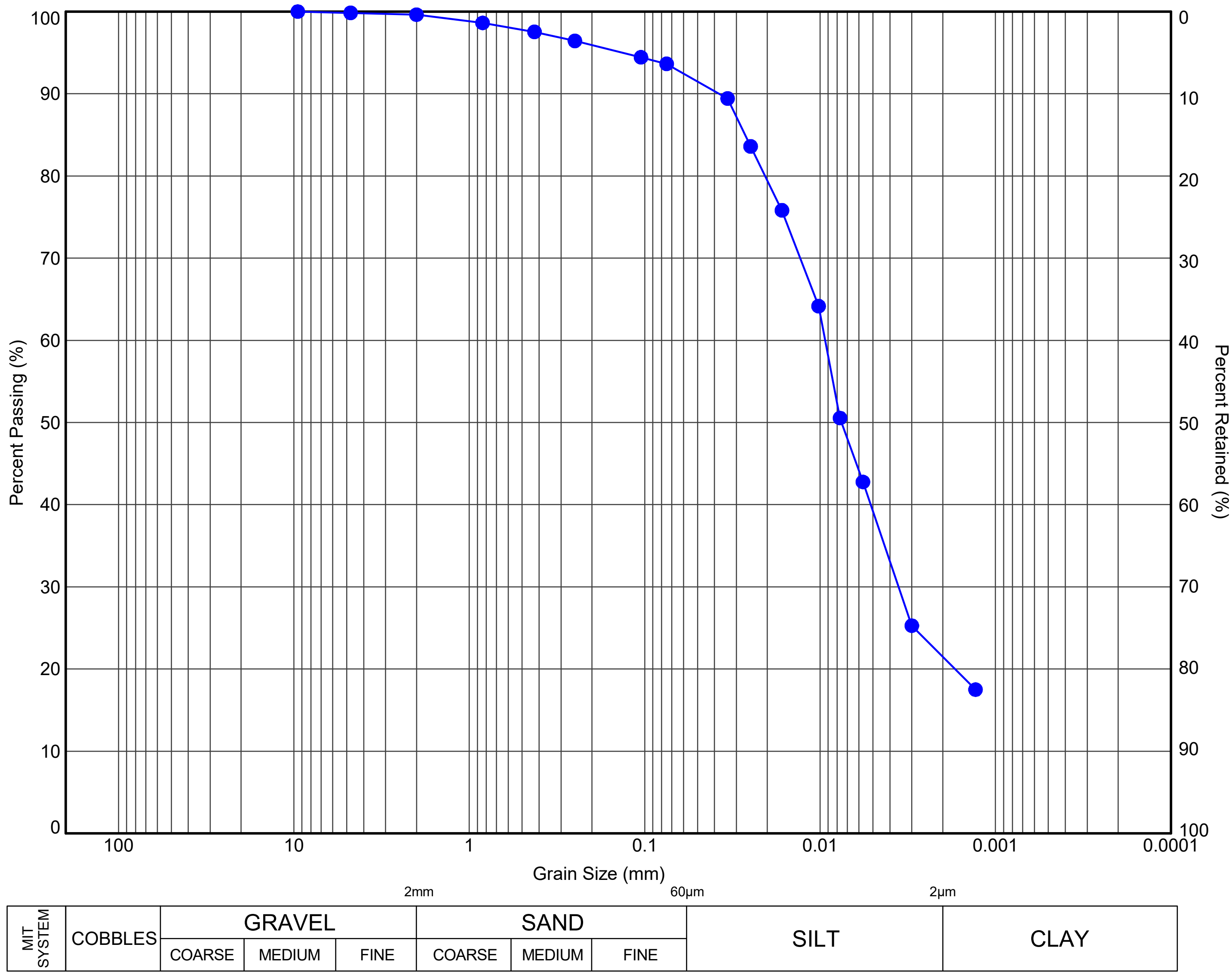
	Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
●	**10**	SS3	1.5	276.4	2	13	69	15	

Terraprobe

11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title: **GRAIN SIZE DISTRIBUTION**
SILT, SOME CLAY, SOME SAND, TRACE GRAVEL

File No.: **1-19-0022-46**



MIT SYSTEM

	Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
●	**14**	SS6	4.8	272.3	0	7	71	22	

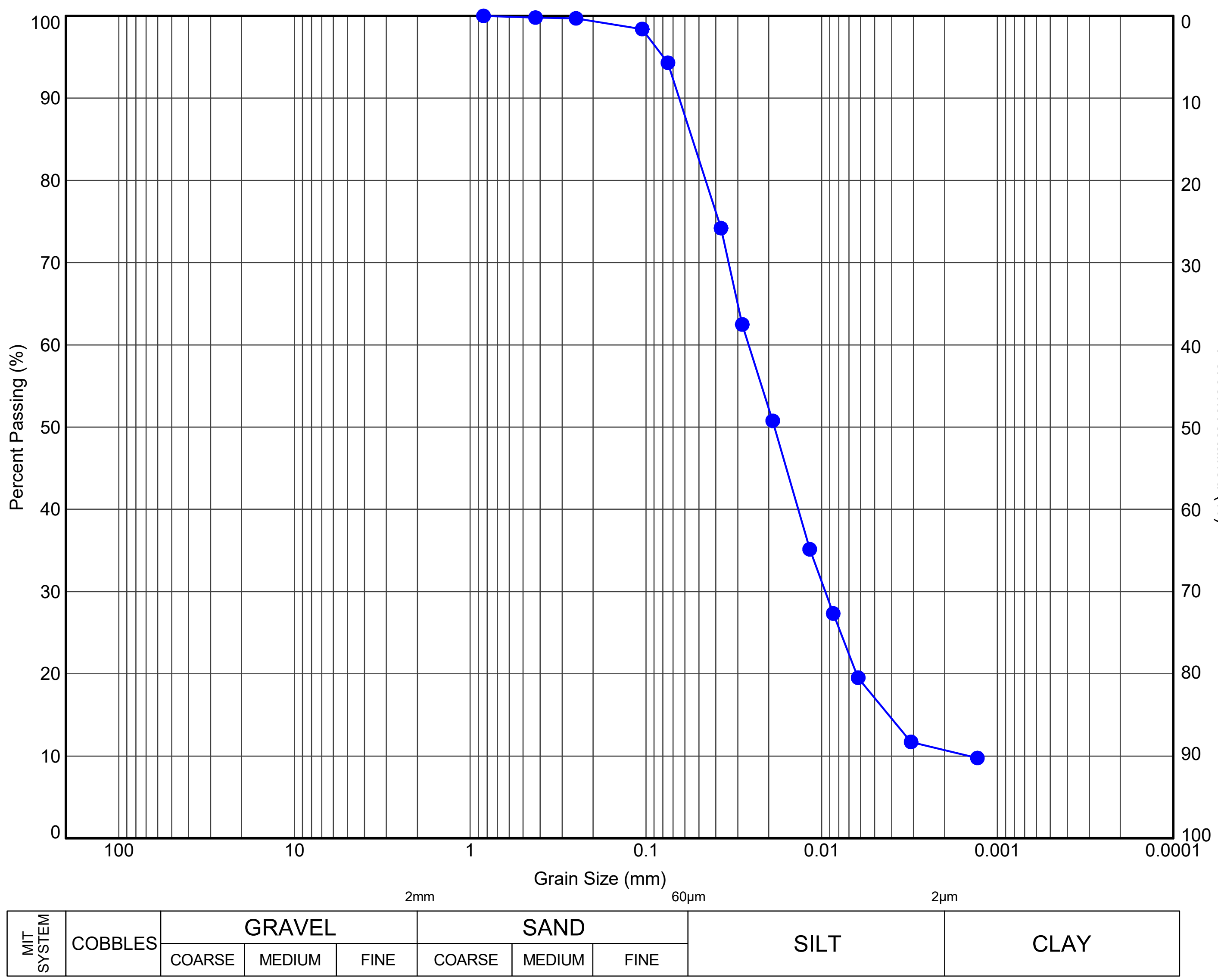
Terraprobe

11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title:

GRAIN SIZE DISTRIBUTION
CLAYEY SILT, TRACE SAND

File No.: **1-19-0022-46**



				MIT SYSTEM				
Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	*(Fines, %)*
● **17**	SS6	4.8	272.8	0	12	77	11	

Terraprobe
11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title:

GRAIN SIZE DISTRIBUTION
SILT, SOME SAND, SOME CLAY

File No.: **1-19-0022-46**

APPENDIX I

TERRAPROBE INC.

Ontario

Source Protection Information Atlas
Ministry of the Environment, Conservation and Parks

[Français]

Water Quality | Policy Search by SPA | Water Quantity

Location Information

Zoom in to confirm your location and results.

Latitude: **44.10256** Longitude: **-79.12758**
UTM Zone: **17** Easting: **649861.32**
Northing: **4884968.12**
Upper Tier Municipality: **REGIONAL MUNICIPALITY OF DURHAM**
Lower/Single Tier Municipality: **TOWNSHIP OF UXBRIDGE**
Township Concession and Lot: **UXBRIDGE CON 6, LOT 29**
Assessment Parcel Address: **4 CAMPBELL DR**
Assessment Roll #: **18290400042360000000**
MECP District: **York-Durham**
MECP Region: **Central**

Source Protection Details for Location

Source Protection Area: **Lakes Simcoe and Couchiching/Black River**
Wellhead Protection Area: C ; score is **4**
Wellhead Protection Area E (GUDI): **No**
Intake Protection Zone: **No**
Issue Contributing Area: **No**
Significant Groundwater Recharge Area: **No**
Highly Vulnerable Aquifer: **Yes** ; score is **6**
Event Based Area: **No**
Wellhead Protection Area Q1: **Yes** ; Stress: **Moderate**
Wellhead Protection Area Q2: **Yes** ; Stress: **Moderate**
Intake Protection Zone Q: **No**

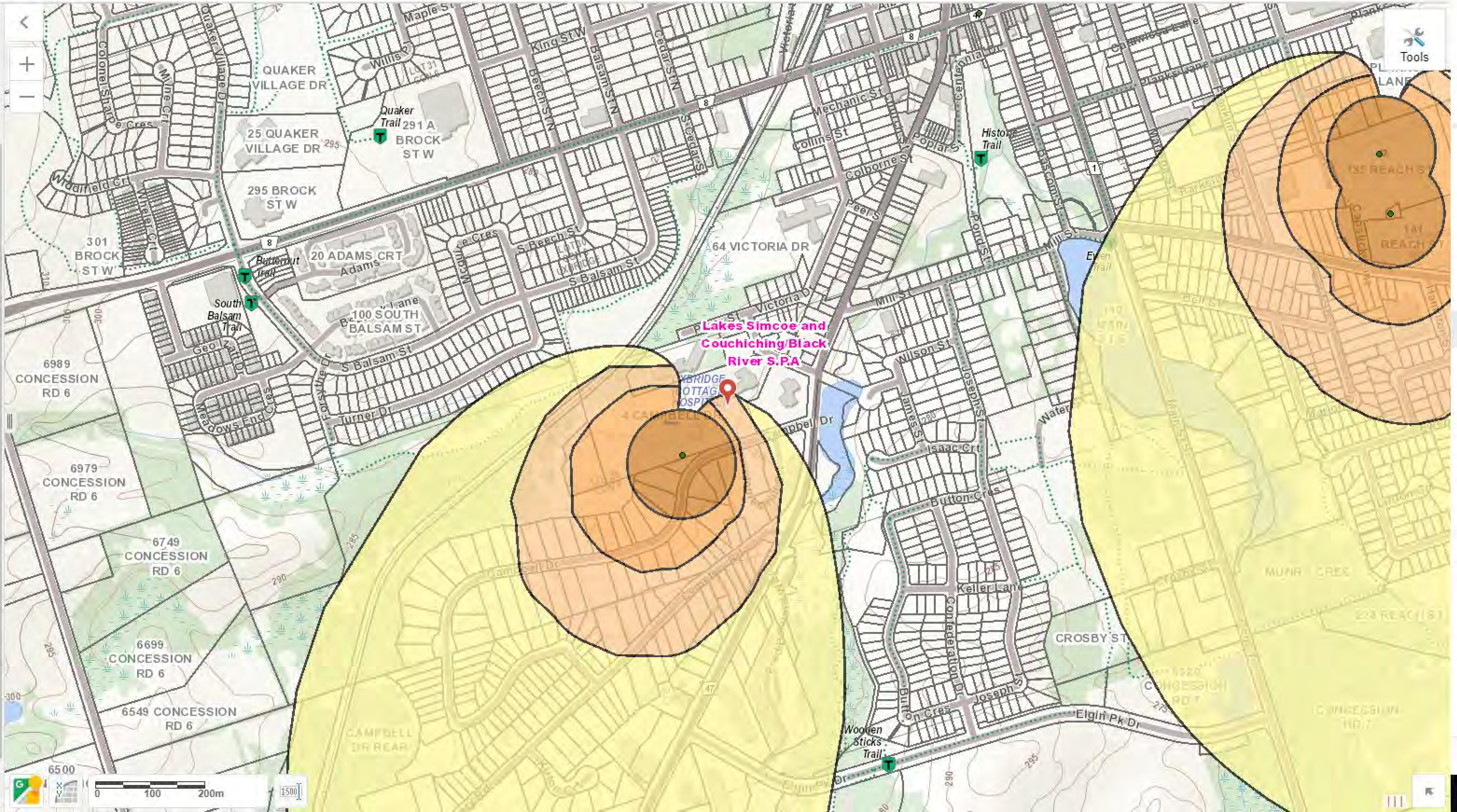
The Significant threats for the vulnerable areas at this location can be found at this link.

Use the Policy search tab to see if any policies apply – for more details see the source protection plan

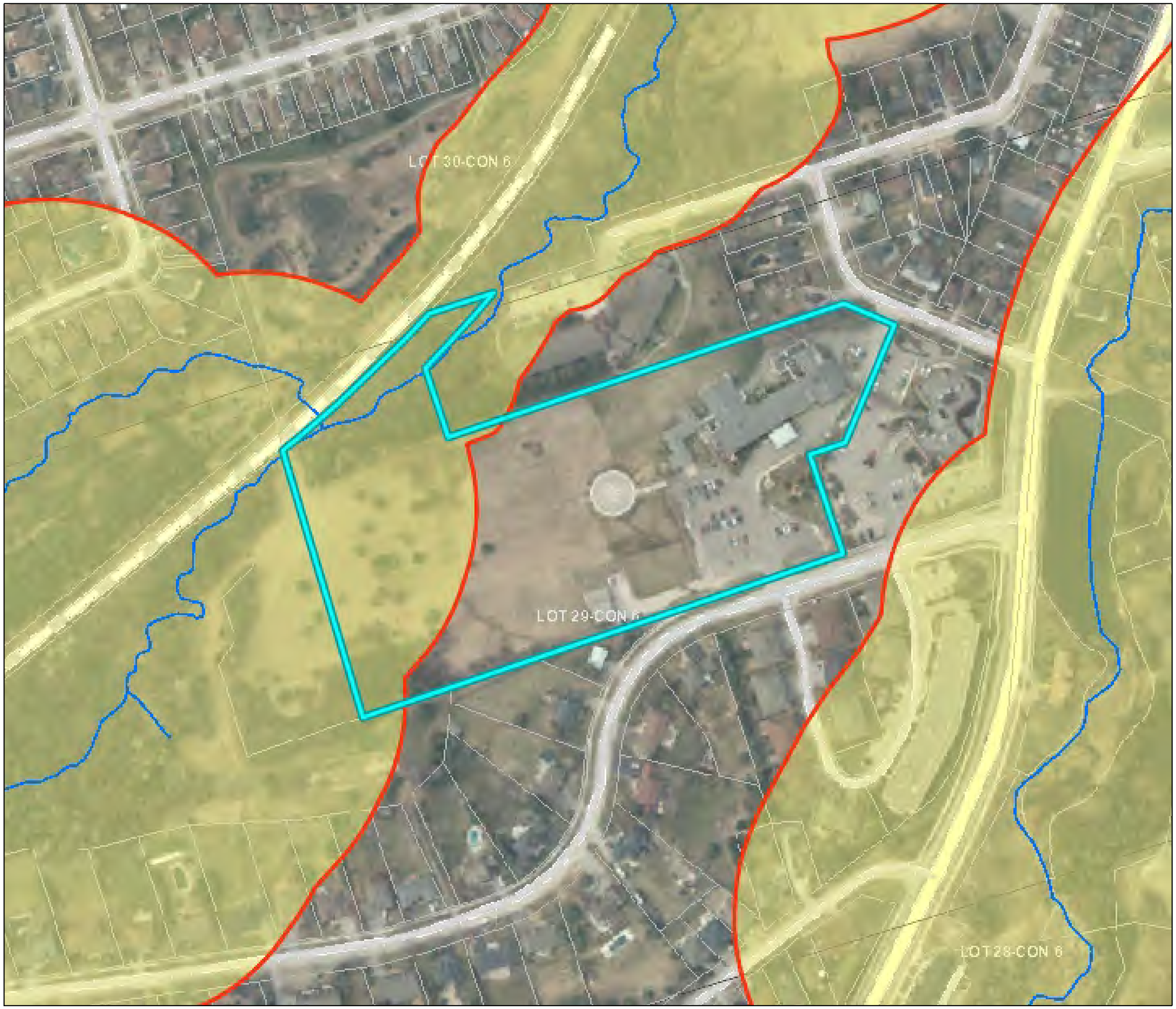
Information is current as of: **January 31st, 2019**

Map Legend

Help and Resources



Lake Simcoe Region conservation authority



Features

- Regulation Map Index
- LSRCA Watershed Boundary
- Watercourse
- Regulated Area Boundary
- Regulated Area
- Address Labels
- Assessment Parcel
- Lot and Concession
- Roads
  - Hwy 400 Series
  - Highway, Arterials
  - Local Road
- Railway

Printed On:
3/20/2020

WGS_1984_Web_Mercator_Auxiliary_Sphere

Mapped By:

Scale 1: 3,539

180 0 90 180 Meters

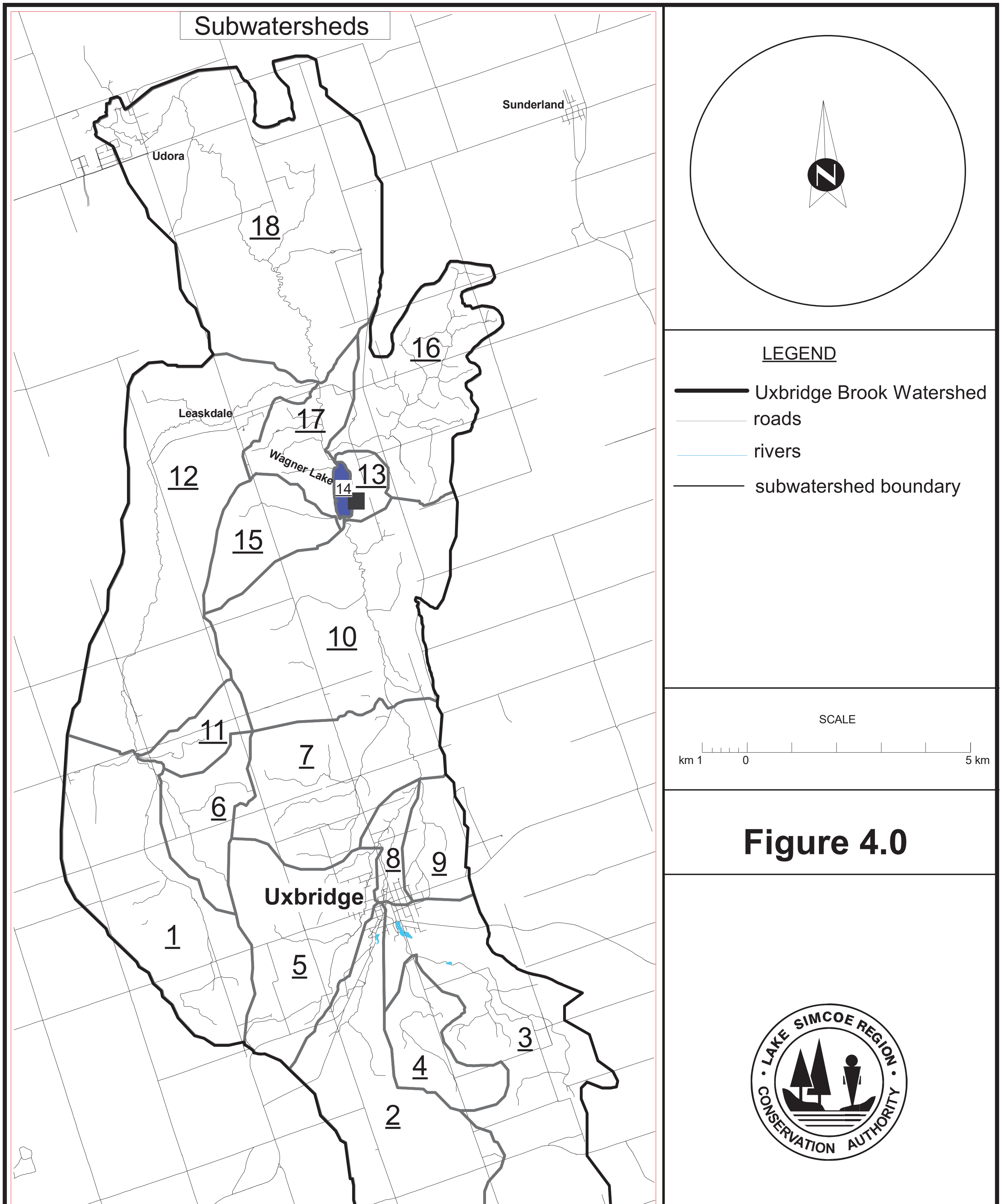


Figure 4.0

Project: Uxbridge Brook Watershed Study

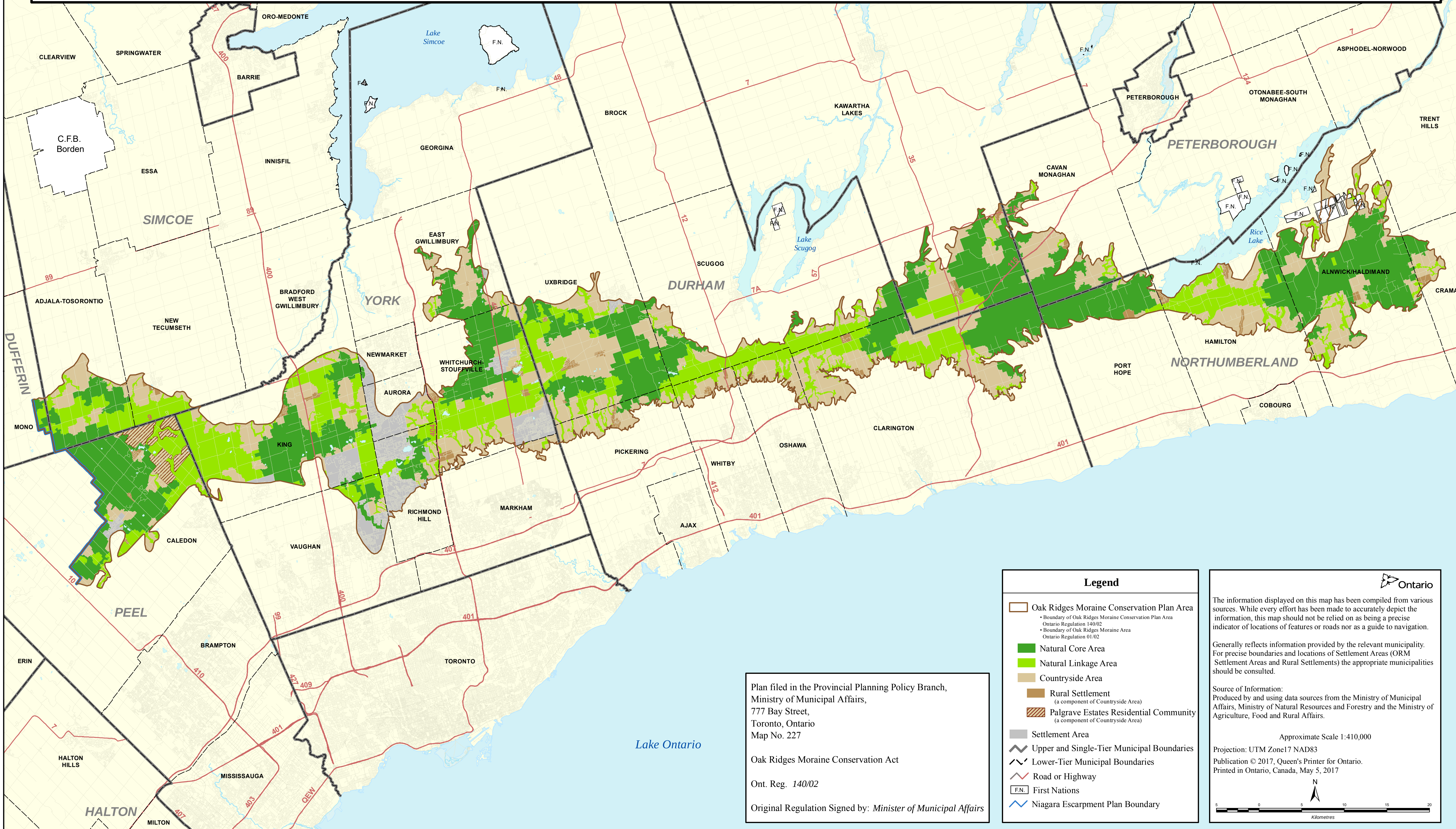
Subwatershed Map

Data Source: LSRCA & OBM Maps

LSRCA GIS gp

Oak Ridges Moraine Conservation Plan Land Use Designation Map

Ontario Regulation 140/02



Legend

- Oak Ridges Moraine Conservation Plan Area
  - Boundary of Oak Ridges Moraine Conservation Plan Area Ontario Regulation 140/02
  - Boundary of Oak Ridges Moraine Area Ontario Regulation 01/02
- Natural Core Area
- Natural Linkage Area
- Countryside Area
  - Rural Settlement (a component of Countryside Area)
  - Palgrave Estates Residential Community (a component of Countryside Area)
- Settlement Area
- Upper and Single-Tier Municipal Boundaries
- Lower-Tier Municipal Boundaries
- Road or Highway
- F.N. First Nations
- Niagara Escarpment Plan Boundary

Plan filed in the Provincial Planning Policy Branch,
Ministry of Municipal Affairs,
777 Bay Street,
Toronto, Ontario
Map No. 227

Oak Ridges Moraine Conservation Act

Ont. Reg. *140/02*

Original Regulation Signed by: *Minister of Municipal Affairs*

Ontario

The information displayed on this map has been compiled from various sources. While every effort has been made to accurately depict the information, this map should not be relied on as being a precise indicator of locations of features or roads nor as a guide to navigation.

Generally reflects information provided by the relevant municipality. For precise boundaries and locations of Settlement Areas (ORM Settlement Areas and Rural Settlements) the appropriate municipalities should be consulted.

Source of Information:
Produced by and using data sources from the Ministry of Municipal Affairs, Ministry of Natural Resources and Forestry and the Ministry of Agriculture, Food and Rural Affairs.

Approximate Scale 1:410,000

Projection: UTM Zone17 NAD83

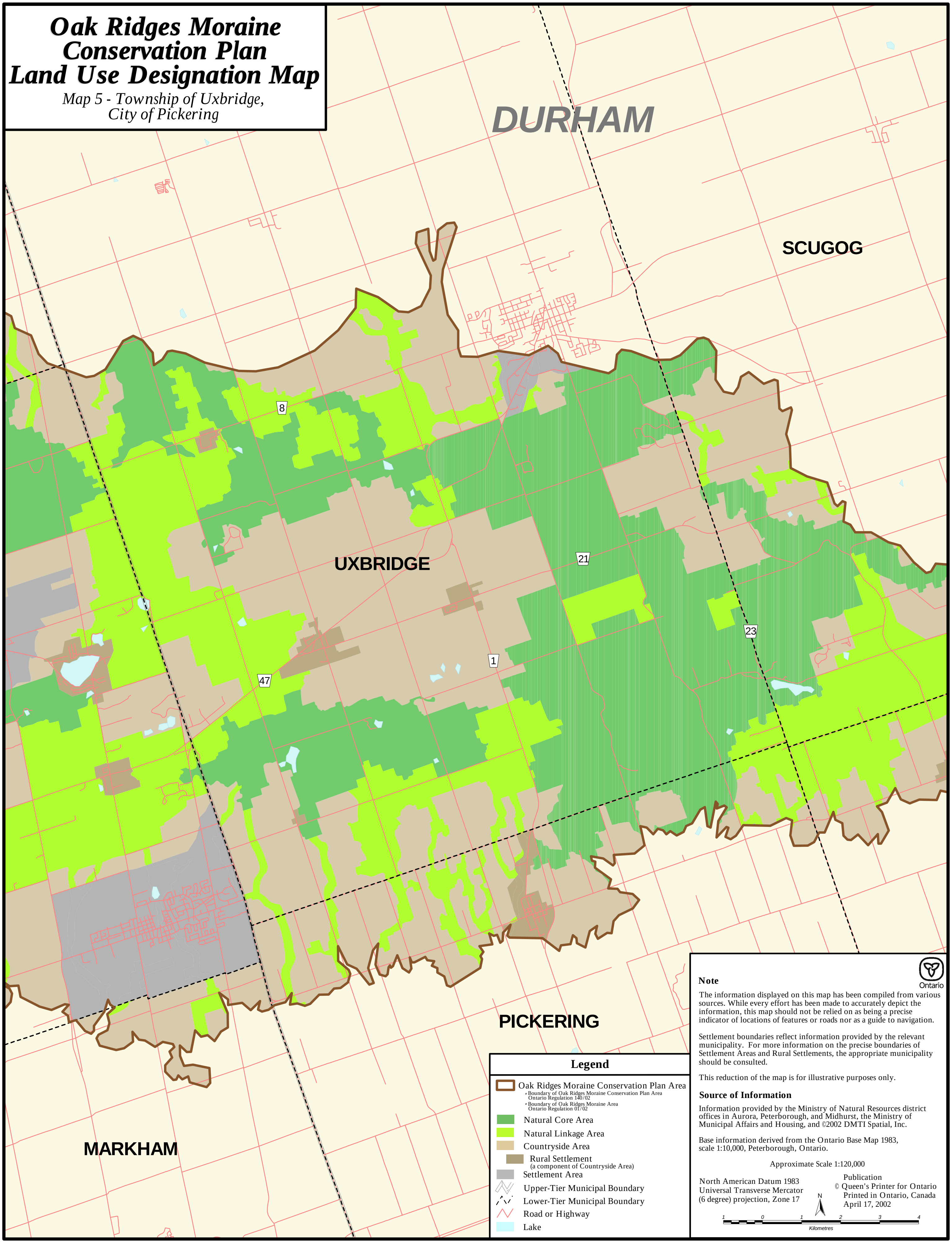
Printed in Ontario, Canada, May 5, 2017

N

5 0 5 10 15 20
Kilometres

Oak Ridges Moraine Conservation Plan Land Use Designation Map

Map 5 - Township of Uxbridge, City of Pickering



Note

The information displayed on this map has been compiled from various sources. While every effort has been made to accurately depict the information, this map should not be relied on as being a precise indicator of locations of features or roads nor as a guide to navigation.

Settlement boundaries reflect information provided by the relevant municipality. For more information on the precise boundaries of Settlement Areas and Rural Settlements, the appropriate municipality should be consulted.

This reduction of the map is for illustrative purposes only.

Source of Information

Information provided by the Ministry of Natural Resources district offices in Aurora, Peterborough, and Midhurst, the Ministry of Municipal Affairs and Housing, and ©2002 DMTI Spatial, Inc.

Base information derived from the Ontario Base Map 1983, scale 1:10,000, Peterborough, Ontario.

Approximate Scale 1:120,000

North American Datum 1983
Universal Transverse Mercator
(6 degree) projection, Zone 17

Publication
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Printed in Ontario, Canada
April 17, 2002

APPENDIX J

TERRAPROBE INC.

Table J-1

Evapotranspiration, Thornthwaite-Mather Method

Month	Average Temperature (degrees C)	Monthly Heat Index	Potential Evapotranspiration (mm)	Latitude Adjustment Factor (44 degrees; Chow, 1964)	Adjusted Potential Evapotranspiration (mm)
Jan	-7.0	0	0	0.81	0
Feb	-6.6	0	0	0.81	0
Mar	-1.3	0	0	1.02	0
Apr	5.7	1.22	26.3	1.13	29.7
May	12.2	3.86	59.1	1.27	75.1
Jun	18.0	6.95	89.5	1.28	114.6
Jul	19.9	8.10	99.6	1.30	129.5
Aug	19.3	7.73	96.4	1.20	115.7
Sep	15.1	5.33	74.2	1.04	77.2
Oct	8.6	2.27	40.7	0.94	38.3
Nov	2.4	0.33	10.5	0.80	8.4
Dec	-4.0	0	0	0.76	0.0
Heat Index TE=		35.8			
a=		1.07			
Total PET (mm)			496.4		588.4
Annual Precipitation (mm)					886.2
Precipitation Surplus (mm)					297.8

Source: Canadian Climate Normals, 1981 to 2010, Udora Station

Table J-2

Evapotranspiration, Thornthwaite-Mather Method

Month	Average Temperature (degrees C)	Monthly Heat Index	Potential Evapotranspiration (mm)	Latitude Adjustment Factor (44 degrees; Chow, 1964)	Adjusted Potential Evapotranspiration (mm)
Jan	-6.2	0	0	0.81	0
Feb	-4.9	0	0	0.81	0
Mar	-0.3	0	0	1.02	0
Apr	6.9	1.63	29.9	1.13	33.8
May	13.3	4.40	62.4	1.27	79.3
Jun	18.7	7.37	91.5	1.28	117.1
Jul	21.4	9.04	106.4	1.30	138.4
Aug	20.3	8.34	100.3	1.20	120.4
Sep	15.9	5.76	76.3	1.04	79.3
Oct	9.1	2.48	40.8	0.94	38.3
Nov	3.1	0.48	12.2	0.80	9.8
Dec	-2.7	0	0	0.76	0.0
Heat Index TE=		39.5			
a=		1.12			
Total PET (mm)			519.9		616.4
Annual Precipitation (mm)					895.2
Precipitation Surplus (mm)					278.8

Source: Canadian Climate Normals, 1981 to 2010, Richmond Hill Station

This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension, x as the long dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.
Cells highlighted in yellow are values that can be changed by the user. Cells highlighted in red are output values based on user-specified inputs. The user MUST click the blue "Re-Calculate Now" button each time ANY of the user-specified inputs are changed otherwise necessary iterations to converge on the correct solution will not be done and values shown will be incorrect. Use consistent units for all input values (for example, feet and days)

use consistent units (e.g. feet & days **or** inches & hours)

Input Values				
0.1310	***R***	**Recharge (infiltration) rate (feet/day)**		
0.080	**Sy**	**Specific yield, Sy (dimensionless, between 0 and 1)**		
0.0275	**K**	**Horizontal hydraulic conductivity, Kh (feet/day)***		
16.400	**x**	**1/2 length of basin (x direction, in feet)**		
49.200	**y**	**1/2 width of basin (y direction, in feet)**		
1.000	**t**	**duration of infiltration period (days)**		
24.436	**hi(0)**	**initial thickness of saturated zone (feet)**		

Conversion Table

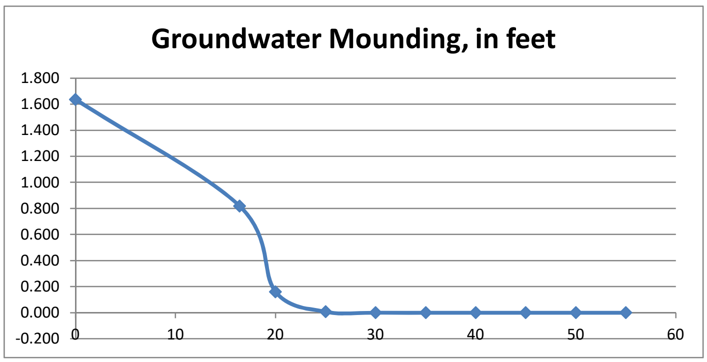
inch/hour	**feet/day**
0.67	1.33
2.00	4.00
hours	**days**
36	1.50

In the report accompanying this spreadsheet (USGS SIR 2010-5102), vertical soil permeability (ft/d) is assumed to be one-tenth horizontal hydraulic conductivity (ft/d).

26.073	**h(max)**	**maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
1.637	**Δh(max)**	**maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	**Distance from center of basin in x direction, in feet**
1.637	**0**
0.819	**16.4**
0.162	**20**
0.008	**25**
0.001	**30**
0.001	**35**
0.001	**40**
0.001	**45**
0.001	**50**
0.001	**55**

Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

Table J-3: 2017 Conditions

Date/Time	Total Precip (mm)	Avail mm (0.5 m)
4/3/2017	6.4	6.4
4/4/2017	17.2	6.72
4/5/2017	0.4	0.4
4/6/2017	25.8	6.72
4/10/2017	8	6.72
4/11/2017	6.2	6.2
4/15/2017	8.2	6.72
4/16/2017	1	1
4/19/2017	2	2
4/20/2017	12.4	6.72
4/25/2017	4	4
4/27/2017	5.2	5.2
4/29/2017	2	2
4/30/2017	15.2	6.72
5/1/2017	20.2	6.72
5/2/2017	8.4	6.72
5/4/2017	27	6.72
5/5/2017	16.8	6.72
5/6/2017	6.4	6.4
5/18/2017	2.6	2.6
5/21/2017	23.4	6.72
5/24/2017	3.6	3.6
5/25/2017	13.2	6.72
5/28/2017	1.4	1.4
5/29/2017	4.8	4.8
5/30/2017	3	3
6/1/2017	2.2	2.2
6/3/2017	3.6	3.6
6/4/2017	7.4	6.72
6/5/2017	3.4	3.4
6/6/2017	0.8	0.8
6/12/2017	0.2	0.2
6/13/2017	10.2	6.72
6/15/2017	10.6	6.72
6/16/2017	0.4	0.4
6/17/2017	20.6	6.72
6/18/2017	17.8	6.72
6/19/2017	2.8	2.8
6/20/2017	2.2	2.2
6/22/2017	50.4	6.72
6/23/2017	1.8	1.8
6/25/2017	4.1	4.1
6/26/2017	9.2	6.72
6/27/2017	3	3
6/28/2017	6	6
6/29/2017	3.6	3.6
6/30/2017	2	2
7/2/2017	10.6	6.72
7/9/2017	5.2	5.2
7/12/2017	2.6	2.6
7/13/2017	18.2	6.72
7/14/2017	1.6	1.6
7/16/2017	0.2	0.2
7/20/2017	6.2	6.2
7/24/2017	0.4	0.4

Date/Time	Total Precip (mm)	Avail mm (0.5 m)
7/26/2017	3.4	3.4
8/2/2017	11	6.72
8/3/2017	22.4	6.72
8/4/2017	5.4	5.4
8/5/2017	1	1
8/6/2017	3.8	3.8
8/7/2017	0.8	0.8
8/10/2017	0.4	0.4
8/11/2017	4.2	4.2
8/12/2017	1.2	1.2
8/17/2017	2.2	2.2
8/18/2017	0.4	0.4
8/22/2017	12.4	6.72
8/23/2017	1	1
8/30/2017	5.4	5.4
9/2/2017	7.8	6.72
9/3/2017	1.2	1.2
9/4/2017	21.2	6.72
9/5/2017	12	6.72
9/7/2017	1	1
9/19/2017	1.2	1.2
9/29/2017	12	6.72
10/3/2017	1.8	1.8
10/4/2017	10.8	6.72
10/5/2017	1	1
10/6/2017	2	2
10/7/2017	7.1	6.72
10/8/2017	6	6
10/10/2017	0.8	0.8
10/11/2017	13.6	6.72
10/13/2017	1	1
10/14/2017	17.2	6.72
10/15/2017	5.8	5.8
10/23/2017	6.2	6.2
10/24/2017	0.8	0.8
10/26/2017	0.6	0.6
10/27/2017	1.8	1.8
10/28/2017	7.4	6.72
10/29/2017	0.4	0.4
10/30/2017	1	1
10/31/2017	1	1
11/1/2017	10.4	6.72
11/2/2017	20.8	6.72
11/4/2017	2.2	2.2
11/5/2017	2.6	2.6
11/9/2017	4.4	4.4
11/12/2017	0.2	0.2
11/15/2017	4.4	4.4
11/17/2017	5.8	5.8
11/18/2017	3	3
11/19/2017	1	1
11/24/2017	3.4	3.4
11/30/2017	4.8	4.8
Total infiltration (mm)		431.1
Infiltration over 1,782 m^2 (m^3/yr)		768

Table J-4: 2019 Conditions

Date/Time	Total Precip (mm)	Avail mm (0.5 m)
4/5/2019	1.8	1.8
4/7/2019	3.8	3.8
4/8/2019	2.2	2.2
4/14/2019	19	6.72
4/17/2019	0.8	0.8
4/18/2019	16.2	6.72
4/19/2019	24.2	6.72
4/20/2019	6.8	6.72
4/23/2019	10.6	6.72
4/25/2019	11.8	6.72
4/26/2019	5	5
4/29/2019	1.8	1.8
4/30/2019	7.6	6.72
5/1/2019	5.4	5.4
5/2/2019	13.6	6.72
5/3/2019	1.6	1.6
5/9/2019	25.8	6.72
5/10/2019	0.6	0.6
5/11/2019	0.4	0.4
5/12/2019	10.6	6.72
5/13/2019	6.8	6.72
5/16/2019	3.2	3.2
5/19/2019	4.6	4.6
5/23/2019	3.4	3.4
5/24/2019	1	1
5/25/2019	5.8	5.8
5/27/2019	11	6.72
5/28/2019	4.2	4.2
5/31/2019	10.2	6.72
6/1/2019	7.2	6.72
6/4/2019	5	5
6/5/2019	18.4	6.72
6/9/2019	3.6	3.6
6/10/2019	18.6	6.72
6/12/2019	4	4
6/13/2019	9	6.72
6/14/2019	0.6	0.6
6/15/2019	3	3
6/20/2019	7	6.72
6/24/2019	18.4	6.72
6/25/2019	5	5
6/26/2019	3.2	3.2
6/28/2019	2.6	2.6
7/5/2019	51	6.72
7/10/2019	0.8	0.8
7/11/2019	1.2	1.2
7/13/2019	1.2	1.2
7/15/2019	8.8	6.72
7/16/2019	2	2
7/20/2019	1	1
7/29/2019	2.8	2.8

Date/Time	Total Precip (mm)	Avail mm (0.5 m)
8/6/2019	3.4	3.4
8/8/2019	10	6.72
8/9/2019	1	1
8/15/2019	0.6	0.6
8/17/2019	25	6.72
8/21/2019	1.4	1.4
8/27/2019	8.8	6.72
8/29/2019	0.4	0.4
9/1/2019	3.6	3.6
9/2/2019	2	2
9/3/2019	5.4	5.4
9/6/2019	3.8	3.8
9/7/2019	0.4	0.4
9/19/2019	16.4	6.72
9/21/2019	1.2	1.2
9/22/2019	9.2	6.72
9/23/2019	0.4	0.4
9/25/2019	1.6	1.6
9/26/2019	4	4
9/27/2019	5.4	5.4
9/28/2019	2.4	2.4
9/30/2019	7	6.72
10/1/2019	11.6	6.72
10/2/2019	0.4	0.4
10/3/2019	1.4	1.4
10/5/2019	0.4	0.4
10/11/2019	3.4	3.4
10/12/2019	2.2	2.2
10/15/2019	10.4	6.72
10/16/2019	13.2	6.72
10/21/2019	6.6	6.6
10/22/2019	5	5
10/26/2019	30.2	6.72
10/27/2019	4	4
10/30/2019	21	6.72
10/31/2019	21	6.72
11/2/2019	2.4	2.4
11/3/2019	1	1
11/6/2019	6	6
11/10/2019	1	1
11/11/2019	8	6.72
11/12/2019	4	4
11/13/2019	6	6
11/14/2019	1	1
11/17/2019	1	1
11/18/2019	5	5
11/21/2019	4.2	4.2
11/25/2019	1.2	1.2
11/27/2019	9.4	6.72
Total infiltration (mm)		410
Infiltration over 1,782 sq m (m3/yr)		705