HYDROGEOLOGICAL REVIEW- UPDATE

Townhouse Developments
2660 to 2680 Brock Road, and
Part of Lot 19, Concession 3; Part 3 and Part 4 on Plan 40R-27228
Pickering, Ontario

Terrapex Project: CT2694.03

FINAL REPORT
26 May 2022

Distribution
The Brock Zents Partnership, 1 copy
Terrapex Environmental Ltd., 1 copy

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EXECUTIVE SUMMARY

Terrapex Environmental Ltd. (Terrapex) was retained by The Brock Zents Partnership to prepare a hydrogeological review in support of the development of a property on lots addressed as 2660, 2670 and 2680 Brock Road, and Part of Lot 19, Concession 3; Part 3 and Part 4 on Plan 40R-27228 (site) in the south-central part of the City of Pickering. The proposed development will consist of thirteen blocks of 3-storey above ground townhouses constructed as slab-on grade structures. Parts 3 and 4 of Plan 40R-27228 are currently owned by the City of Pickering, and are being considered for purchase by The Brock Zents Partnership. The whole of Part 4, and the northeast corner of Part 3 would then be subsequently conveyed to the municipality for a road right-of-way and daylight triangle, respectively.

Fourteen groundwater monitoring wells were installed at ten locations, broadly distributed across the site. One groundwater sample was obtained and analysed for water quality parameters listed by the Durham Region sewers bylaw criteria. One suite of groundwater levels was observed in April 2021, and a further three suites were measured in October 2021. Eight rounds of groundwater levels were measured in 2018 and 2019, and single well response falling head tests were performed in 2018.

The water table was encountered at an average depth of 1.7 metres below ground and an average elevation of 129.2 metres above sea level. The shallowest water table depth encountered was 0.19 metres below grade. Foundation excavations and utility trenches will likely intercept the water table. It is recommended that foundation plans and servicing plans be provided for Terrapex's review when they become available so that the need for Ministry of Environment, Conservation and Parks permitting (Environmental Activities and Sector Registry (EASR) or Permit to Take Water (PTTW)) can be evaluated.

The reported concentrations of the groundwater complied with the chemical criteria specified under the Region of Durham bylaw for sanitary sewer discharge. Total suspended solids exceeded the chemical criteria for storm sewer discharge, therefore construction dewatering would need treatment before discharging to storm. Durham Region approval would be required to discharge to their sewers.

The site in pre-construction conditions is covered by pervious surfaces of open soil and grass. The site in post-construction will be dominantly covered by impervious surfaces of the proposed buildings, roadways and laneways. Low impact development infiltration systems should be considered to offset the reduction in post-development groundwater recharge.

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1.0 BACKGROUND

Terrapex Environmental Ltd. (Terrapex) was retained by The Brock Zents Partnership to prepare a hydrogeological review for development of the property on lots addressed as 2660, 2670 and 2680 Brock Road, and Part of Lot 19, Concession 3; Part 3 and Part 4 on Plan 40R-27228 (site) in the south-central part of the City of Pickering. Parts 3 and 4 of Plan 40R-27228 are currently owned by the City of Pickering, and are being considered for purchase by The Brock Zents Partnership. The whole of Part 4, and the northeast corner of Part 3 would then be subsequently conveyed to the municipality for a road right-of-way and daylight triangle, respectively. The site location is presented on Figure 1. The locations of the conveyances are presented on Figure 2.

We understand that this report will be submitted to the Regional Municipality of Durham in support of the development application process.

A companion geotechnical assessment for the same site was concurrently undertaken by Terrapex. The geotechnical report is being submitted under separate cover.

2.0 LOCATION AND SETTING

2.1 LOCATION AND PROPERTY DIMENSIONS

The site consists of the three adjoining lots with addresses of 2660, 2670 and 2680 Brock Road, which is in the centre of the City of Pickering. The northern portion of the site, which extends to Zents Street, is a City-owned parcel designated as Part of Lot 19, Concession 3; Part 3 and Part 4 on Plan 40R-27228. The site fronts on the west side of Brock Road, with the northern property line fronting on Zents Drive. The location is shown on Figure 1. The UTM location is approximately 17T 653575 m easting, 4860160 m northing.

The site spans an L-shaped area, as shown on Figure 2. The approximate dimensions in the east-west orientation are 120 m in the northern portion and 160 m in the southern portion, and the north-south orientation is 180 m, covering an area of 2.59 hectares.

2.2 PRESENT LAND USE

The current land use consists of the following features.

- 2660 Brock Road lot. Hosts an unoccupied single family dwelling and garage building. Mostly open soil or grass with a few trees on the east side, with forest dominating the west side.
- 2670 Brock Road lot. Currently hosts no structures. Mostly open soil or grass with a few trees.
- 2680 Brock Road lot. Hosts an unoccupied single family dwelling and garage, with minor structures and storage of several boats. Mostly open soil or grass with a few trees on the east side, with forest along the west property line.
- Part of Lot 19, Concession 3; Part 3 and Part 4 on Plan 40R-27228. Currently hosts no structures. Mostly vegetated with grass and trees.

Land use in the 500 m vicinity is variable. The following is a summary.

- **North:** Residential dwellings on large lots, along with vacant lots with forest and cleared open soil areas. A railway track line that trends southwest to northeast.
- **East:** A subdivision neighbourhood of single-family dwellings and townhouses. Residential subdivisions under construction. Pickering Golf Club with large club building and fairways. Forested areas and vacant lots.
- **South:** Forest, a Hindu Temple, vacant lots with open soil and grass, single family residential dwellings on large lots.
- **West:** Forest / wood lot, with a subdivision neighbourhood of single-family dwellings and townhouses west of Tillings Road. A City of Pickering Operations Centre with salt domes is located approximately 350 m to the southwest.

2.3 PROPOSED DEVELOPMENT

The proposed development portion will cover most of the 2.59 ha lot. Thirteen (13) blocks of 3-storey townhouses are proposed. The development area will be constructed with slab-on grade foundation. The spaces between townhouse blocks will consist of driving lanes, parking slots, walking areas and landscaped areas. The undeveloped portion will consist of the western 38 m wide area of the 2660 and 2670 Brock Road lots, which will include strips for a road allowance and for forest (18 m wide).

2.4 SITE TOPOGRAPHY

Relief in the site vicinity consists of a broad north-south trending ridge (Vumap, 2018) that forms a regional watershed divide, with the site on the eastern flank. The lowest part of the vicinity is a ravine for Urfe Creek that is approximately 450 m to the east, which is at an elevation of approximately 110 metres above sea level (masl). The highest part of the vicinity is a broad ridge to the north that is at approximately 136 masl.

Relief on the site itself consists of a sloping plain to the east. The highest elevation is approximately 133 masl at a mound in the west central side. Generally, the west side ranges from about 131 to 132 masl and the east side elevation ranges from 129 to 130 masl (Krcmar, 2018).

The ground at points adjacent to monitoring wells were surveyed by Terrapex using a Topcon HiPEr V instrument with $\pm$ 0.1 centimetre level accuracy.

2.5 DRAINAGE

There are no watercourses, ponds, or other surface water features on the site.

A tributary of Urfe Creek is located approximately 300 m to the southeast with several ponds further south. The main branch of Urfe Creek is located approximately 450 m to the east. This watercourse ultimately drains to Lake Ontario.

2.6 REGIONAL GEOLOGY

A surficial geological map prepared by Geology Ontario (2018) shows the site as being set on coarse-textured glacial lake deposits of sand and gravel, along with minor silt and clay.

A bedrock geological map prepared by Geology Ontario (2018) shows that the site is underlain by the Blue Mountain Formation, which is comprised of shale with minor limestone interbeds. Shale bedrock was encountered in several local wells in the MOECC well records at depths ranging from 15 to 44 metres below ground (mbg), with the range of 24 to 27 mbg being more common. Bedrock is likely too deep to affect the shallow groundwater regime at the site.

Additional information on subsurface conditions of the site vicinity is also available from reports of wells and boreholes in the database maintained by the Ministry of the Environmental and Climate Change (MOECC, 2021). The database listings for wells within approximately 500 m of the site are provided in Appendix IV.

2.7 SENSITIVE ECOLOGICAL RECEIVERS

Designated sensitive ecological areas such as Areas of Natural and Scientific Interest (ANSI), Provincially Significant Wetlands (PSW) or Environmentally Significant Areas (ESA's) are absent within 500 m of the site (MNRF 2018). Several wetlands without special designation are mapped as being 350 m to the west, but the area is now a residential subdivision. Woodlands without special designation are mapped within the site, and along the Urfe Creek corridor which is approximately 450 m East of the site. The site is not situated on a designated Source Protection groundwater classification area (MOECC, 2018a)

2.8 GROUNDWATER SUPPLY WELLS

The area is partially urbanized and is provided with piped municipal water supplies sourced from Lake Ontario. The MOECC water well database lists 25 wells as having domestic supply purpose within 500 m of the site. Some of these wells may be historic and since abandoned.

The existing lots of the site have a rural character and were likely serviced by private supply wells. The existing residential dwellings are abandoned, so wells are not in active use. The location of the water wells observed in the field are shown on Figure 2. The wells mapped as being located at the site are at the following UTM coordinates on the indicated lots.

- 2680 Brock Road. 2 wells. (a) 653601 m easting, 4861066 m northing. (b) 653608 m easting, 4860186 m northing.
- 2670 Brock Road. 1 well. 653615 m easting, 4860127 m northing.
- 2660 Brock Road. 1 well. 653625 m easting, 4860088 m northing.

The MOECC water well database indicates well IDs 4604136, 4601378, and 4601379 as being on or near the site. These are large diameter dug wells with depths between 8 and 10 mbg. Prior to construction, these wells must be abandoned in accordance with Regulation 903 and its amendments by a licensed water well contractor.

The site is not located within a designated well head protection area for any municipal well (Durham Region, 2017).

3.0 FIELD PROGRAM

3.1 DRILLING AND BOREHOLES

Drilling programs were conducted from April 30th 2018 to May 7th 2018, July 12th 2019, and from October 4th to October 5th 2021. The drilling program served the purposes of this hydrogeological review and update, the geotechnical assessment (Alston, 2018; Alston 2019), and the Phase Two environmental site assessment (Terrapex, 2021). Boreholes without monitoring wells were drilled at eight locations (BH designations). Fourteen monitoring wells (MW designations) were installed at ten locations. The locations drilled in 2018 and 2019 were selected to provide broad areal coverage, and the locations drilled in 2021 were also selected to serve the purpose for the Phase Two assessment completed under separate cover (Terrapex, 2021).

Soils were logged in the field by a qualified geotechnical technician and then confirmed by a Professional Engineer at Terrapex's Toronto facilities.

3.2 MONITORING WELLS

Fourteen monitoring wells were installed at the ten locations designated MW1, MW3, MW4, MW5 MW8, MW10, MW101, MW102, MW203, and MW206. Four locations (MW1, MW3, MW8, and MW102) were constructed as a cluster of two adjacent monitoring wells with screens at separated depths. The well components and their relationships to adjacent stratigraphy are shown in the borehole records of Appendix III and dimensions are reported in Table 1. UTM locations were measured using a Topcon-500 with centimetre scale accuracy.

The monitoring wells were constructed using environmental grade, 50 mm diameter, Schedule 40, PVC piping with machine slotted (10 slot) screens at the bottom that were open for a 1.5 m length. The wells are completed with monument-style above-grade casing. The tops of pipe are plugged with removable J-caps.

Monitoring wells, when no longer useful, must be abandoned by a licensed water well contractor. Abandonment must proceed in accordance with Regulation 903 and amendments issued under the Ontario Water Resources Act. The monitoring wells should remain until substantial construction is completed to be available for observing future seasonal conditions and for monitoring of potential effects due to dewatering, if ever required.

3.3 GROUNDWATER LEVEL MEASUREMENTS

Groundwater level measurement events occurred on the 13th , 18th and 27th of October 2021. Groundwater level measurement events also occurred in April 2021, April to July 2019, and May 2018, to fulfill earlier hydrogeological investigations at this site, which were based on the previously proposed development plans. Water levels were measured using an electric tape sounder device. The reported elevations for the monitoring well rims, from which levels are referenced, are based on the ground elevation plus stick up of the PVC pipe.

3.4 GROUNDWATER SAMPLING

A groundwater sample was obtained from the monitoring well MW206 on October 18, 2021 for the purpose of evaluating suitability for discharge to the Region of Durham sewers. The well was purged one week prior to sampling. The sample was collected using low-flow sampling techniques, including a peristaltic pump and quarter-inch tubing. Samples were discharged directly to pre-cleaned bottles supplied by the laboratory with preservatives as appropriate for parameters. These bottles were iced and held in a cooler prior to delivery.

The sample was submitted to Paracel Laboratories Ltd. (Paracel) of Hamilton, Ontario, which is an independent laboratory and is certified by the Canadian Association for Laboratory Accreditation (CALA). Paracel completed analysis for the suite of parameters specified under the Region of Durham bylaw 55-2013 for sanitary and storm sewer discharges.

3.5 SINGLE WELL HYDRAULIC TESTS

Single well response tests to assess the hydraulic conductivity of adjacent formations were performed on five monitoring wells: MW1D, MW3D, and MW4 in May 2018 and MW101 and MW102D in June 2019. The monitoring wells were selected for having a screen interval being set dominantly within a single dominant soil texture, for having a water level above the screen top and for representing different soil types. The hydraulic response tests employed the bail method, which is a rapid removal of a volume of water using an elongated bailer. The ensuing rising recovery to static level is observed over time. Data were analysed using the Aqtesolv software package by the Bouwer and Rice method.

Solinst levelogger brand dataloggers were installed to measure groundwater levels. The levelloggers recorded data at an interval of 5 minutes for MW1D, MW3D, and MW4, and an interval of 30 seconds for MW101 and MW102D. A barometric logger was installed on site to allow correct for effects of atmospheric presssure on the levelogger water values.

4.0 OBSERVATIONS

4.1 SUBSURFACE MATERIALS AND HYDROSTRATIGRAPHY

The subsurface conditions that were encountered are shown on the borehole records of Appendix III.

A fill layer is present at most drilled locations, which is predominantly the eastern portion of the site, with a thickness range from 0.3 to 1.5 m. A topsoil layer with thickness of less than 0.6 m is present at most areas throughout the site.

Below the topsoil and fill across most of the site, soils are predominantly (clayey) sandy silt till. Layers of silty sand to sandy silt were encountered between the till soil, with no particular sequence pattern throughout the locations.

Layers of gravelly sand to sandy gravel occur at depths below 8.5 mbg to 12 mbg at several boreholes locations. These granular layers, ranging in thickness from 1 to 3 m, may be isolated lenses or may be hydraulically interconnected. These granular zones occur below the anticipated depth of excavation so would not contribute water directly to the excavation.

Past approximately 12 mbg, both silty sand layers and (clayey) silt till layers are observed again.

The conditions described above are known at borehole locations only. Texture, thickness and presence of layer may vary between boreholes. Lenses of alternate textures may be present between boreholes.

4.2 GROUNDWATER LEVELS AND TEMPERATURES

Groundwater level observations are presented as depth and as elevation on Table 2. Only 2021 monitoring data will be referred to for this section of the hydrogeological review, however, all monitoring data collected by Terrapex to date is presented on Table 2. Elevations of the water table observations of October 27, 2021 are posted on the map of Figure 3.

The average depth to shallow water level was 1.7 mbg. The shallowest depth to groundwater observed was in MW1(S) at 0.7 mbg. The deepest depth to groundwater observed was at MW5 at 8.0 mbg. As observed, the average elevation of shallow groundwater was 129.24 masl, with the highest elevation in MW1(S) at 131.33 masl and the lowest in MW5 at 123.62 masl.

Groundwater elevations from the shallow water table saw a relatively large decrease of approximately 1.25 meters from the first monitoring event (October 13, 2021) to the second (October 18, 2021). Groundwater elevations from the shallow water table saw an increase of the same magnitude from the second monitoring event to the third monitoring event (October 27, 2021). This may have been due to a particularly dry period, and suggests the water table in this area can vary to such magnitudes depending on rain events.

Groundwater levels naturally fluctuate in response to seasons, to annual variations and to major storm events. The shallowest groundwater level was observed in a spring monitoring event (April 2019).

5.0 ANALYSIS

5.1 HYDRAULIC CONDUCTIVITY

Hydraulic conductivity, relates to the relative ability of a soil unit to transmit water. Values for this parameter are necessary for formula used in predicting the rates of groundwater seepage. In general, coarser soils (e.g. sand, gravel, and with low fines) have higher hydraulic conductivity than do fine-grained soils (e.g. silt, clay). Other factors can influence hydraulic conductivity beyond grain size distribution.

The hydraulic conductivity interpreted from single well response tests are presented in the analysis curves in Appendix VI. The software analysis considered the wells as being screened in an unconfined aquifer. The interpreted hydraulic conductivity values for MW1(D), MW3(D), MW4, MW101 and MW102D are: $9x10^{-9}$, $3 x10^{-7}$, $7 x10^{-6}$, $1 x10^{-8}$, and $4 x10^{-8}$ respectively.

The hydraulic conductivity values interpreted from grain size analysis and the Hazen formula are presented Table 4. Grain size distribution curves are presented in Appendix V. The Hazen formula uses the d_{10} value, which is the particle radius with 10% finer by weight, to predict the hydraulic conductivity. The hydraulic conductivity range for tested samples ranged from $3x10^{-7}$ m/s to $3x10^{-4}$ m/s. Only the sample with hydraulic conductivity of $3x10^{-7}$ m/s was in the depth range (3.3 m bgs) representative of soil that would be encountered during excavations for the proposed development.

5.2 HYDRAULIC GRADIENTS

The water table surface is commonly a subdued reflection of the overlying ground surface. Shallow groundwater will follow the general ground surface grade, with preferential movement toward watercourses. Based on this interpretation, shallow groundwater in the vicinity of the site is anticipated to move generally eastward.

The groundwater level measurements for October 27, 2021 are posted on Figure 3, which are based on observations from wells shallower than 8 mbg. Groundwater contours were interpreted using Surfer software. The estimated magnitude of the gradient in the northern part of the site is 0.06 m/m (southerly) towards the centre of the site. Measurements in wells of shallow groundwater in the southern part of the site indicate gradients ranging from 0.02 to 0.09 m/m (northerly) towards the centre of the site.

The two monitoring well clusters indicated a downward vertical hydraulic gradient at MW1 and MW3 with magnitudes of 1.04 m/m and 0.15 m/m, respectively. These results indicate that the site functions as a groundwater recharge area. The steeper gradient at MW1 reflects the relatively lower permeability soils.

5.3 GROUNDWATER QUALITY

Concentrations of tested parameters as reported for the groundwater sample obtained from MW206 on October 18, 2021, are provided in the attached Certificate of Analysis in Appendix VII and are summarized on Table 3. The reported concentrations of the groundwater complied with the chemical criteria specified under the Region of Durham bylaw for sanitary sewers. The reported

concentrations of the groundwater complied with the chemical criteria specified under the Region of Durham bylaw for storm sewers, with exception of total suspended solids (TSS).

The TSS result was 17 mg/L, which exceeds the storm sewer criteria of 15 mg/L but is acceptable under the sanitary/combined sewer criteria of 350 mg/L.

6.0 DEWATERING RATES

The water table was observed at an average depth of 1.6 mbg, with some locations deeper and others locations shallower by up to 1.4 m (i.e. 0.19 mbg). The proposed construction will be at grade, however, foundation excavations may extend below the water table, depending upon the season of construction. Piped infrastructure is likely to require trenches with depth of 3.0 mbg or more. Thus, the building excavation and utility pipe installation trenches will likely experience seepage during construction that will need to be controlled by pumping from adjacent soils or the interior of the excavation. Because the buildings are to be constructed as slab-on-grade, they will not require foundation drains in post-construction.

6.1 SEEPAGE RATES TO CONSTRUCTION EXCAVATION AND FOUNDATION

The Ministry of the Environment Conservation and Parks (MECP) requires a Permit to Take Water (PTTW) or an Environmental Activity and Sector Registry (EASR) for groundwater takings exceeding 50,000 litres per day (L/day). For the purpose of construction, a PTTW is required for dewatering extraction rates that exceed 400,000 L/day. An EASR is required for a rate between 50,000 and 400,000 L/day. A PTTW for managing foundation drainage may also be required for amount exceeding 50,000 L/day.

Estimation of the rate of dewatering to counteract groundwater inflows is based on simplification to analogy of a linear trench (Powers et al, 2007) with a width of 1 m. The calculations anticipate that conditions similar to an unconfined aquifer will likely prevail. The formula anticipated geometric conditions and input values are specified on Table 5. A hydraulic conductivity value of $7x10^{-6}$ m/s was input which is representative of the highest hydraulic conductivity observed in the anticipated depth horizon of the foundation excavations and utility trenches. The calculations predict that the dewatering rate of approximately 31,500 L/day to counteract groundwater seepage in a 20 m long trench excavated 1.9 m into the water table. This rate would not require MECP permitting. However, when a factor of safety of 2.0 is added, the dewatering rate is estimated to be 63,000 L/day, which would require an EASR.

It is recommended that foundation plans and servicing plans be provided for Terrapex's review when they become available so that the need for MECP permitting (EASR or PTTW) can be evaluated.

Approval will have to be obtained from the Region of Durham to allow construction dewatering discharge to the storm sewer or sanitary sewer if this type of outlet is proposed. Discharge to the storm sewer would require pre-treatment. The Central Lake Ontario Conservation Authority should be consulted about the possibility of discharging dewatering to the adjacent offsite forests, but the adjacent local slope is back toward the site so excess waters would return to the site.

Because the proposed buildings are to be constructed at grade, there are no long-term (i.e. post-construction) dewatering requirements.

6.2 RADIUS OF INFLUENCE AND SENSITIVE RECEIVERS

The radius of influence is the distance range beyond which the drawdown on groundwater caused by dewatering is practically undetectable. The radius of influence is predicted using the common formula of Sichart and Kryieleis (Powers et al 2007), as noted on Table 5. The predicted radius of influence is approximately 15 m for the construction excavation beyond the excavation boundary.

No off-site ecologically sensitive receivers or private water supply wells are known to be located within the radius of influence that could be negatively affected by construction dewatering.

There are no known zones of groundwater contamination on-site or off-site that could be shifted or collected on-site by dewatering activity. Also, there are no adjacent structures that would be affected by possible settlement induced by dewatering.

6.3 WATER QUALITY OF DISCHARGE

In reference to Region of Durham bylaw 55-2013 and as noted in Section 5.3, the water quality is considered suitable for discharge to sanitary sewers and is suitable for discharge to storm sewers with the exception of TSS.

The elevated total suspended solids concentration is likely due to the sample being obtained from a well screen completed in silty soils. Most mineral soils here have a fine-grained component so dewatering should be anticipated to produce elevated suspended solids that will need to be filtered and / or settled to meet storm sewers criterion. Dewatering extraction systems should be thoroughly developed prior to connection to sewers to reduce the production of particulates.

7.0 WATER BALANCE ASPECTS

Nominally, infiltration of incident precipitation through a pervious soil surface moves through the unsaturated zone and recharges the shallow groundwater. In turn, this shallow groundwater moves toward local or regional watercourses to contribute to baseflow. Infiltration does not occur through impervious surfaces of buildings or paving because runoff is directed to storm sewers.

The pre-construction land uses consists entirely of open soil and vegetation surfaces that permit infiltration without obstruction. Minor impervious surfaces such as the existing dwellings and driveways will mostly runoff to adjacent ground to infiltrate. In the post-construction configuration, the majority of the property will be covered by impervious features such as buildings, roadways and laneways that would permit no infiltration.

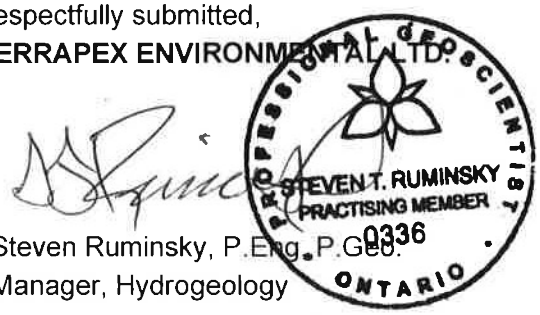
There are potential opportunities for Low Impact Development (LID) systems to offset reductions in groundwater recharge. Consideration should be given to directing roof drainage or clean runoff from paved terraces or walkways toward LID infiltration features or to the adjacent forest to the west (if permissible; and where grading permits).

8.0 CLOSURE

This hydrogeological review was prepared in accordance with the terms of reference for this project as agreed upon by The Brock Zents Partnership and generally accepted engineering or environmental consulting practices in this area. The reported information is believed to provide a reasonable representation of the general hydrogeological conditions at the site, however, the data were collected at specific locations and conditions may vary at other locations and with the passage of time.

This report has been prepared for the sole uses of The Brock Zents Partnership. Terrapex Environmental Ltd. accepts no liability for claims arising from the use of this report, or from actions taken or decisions made as a result of this report, by parties other than The Brock Zents Partnership.

Respectfully submitted,
TERRAPEX ENVIRONMENTAL LTD.



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Manager, Hydrogeology

9.0 REFERENCES

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APPENDIX I

FIGURES

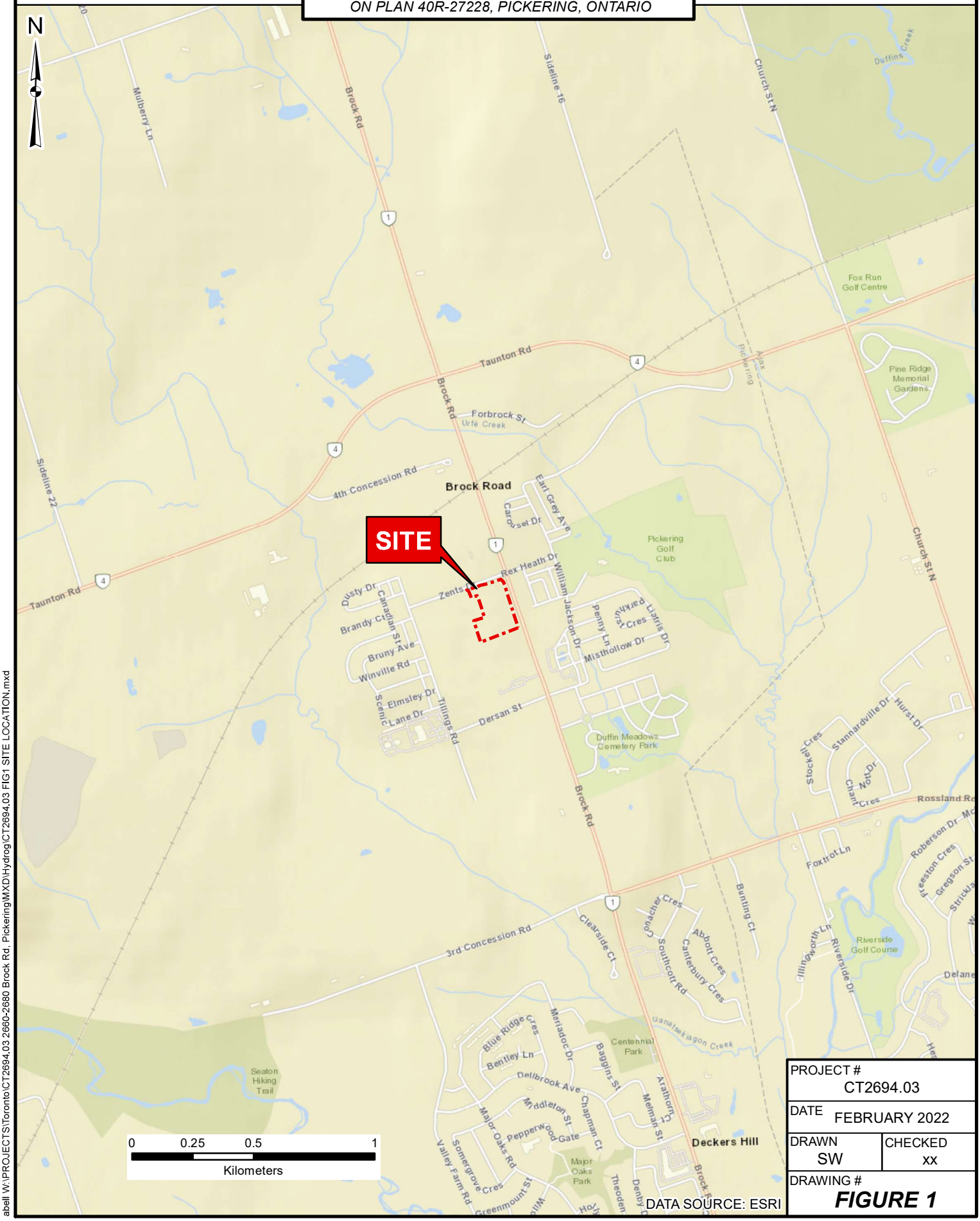
TERRAPEX

SITE LOCATION

2660 TO 2680 BROCK ROAD AND
PART OF LOT 19, CONCESSION 3; PART 3 AND PART 4
ON PLAN 40R-27228, PICKERING, ONTARIO

CLIENT

THE BROCK ZENTS PARTNERSHIP



DATA SOURCE: ESRI

PROJECT #	CT2694.03
DATE	FEBRUARY 2022
DRAWN	SW
CHECKED	xx
DRAWING #	**FIGURE 1**

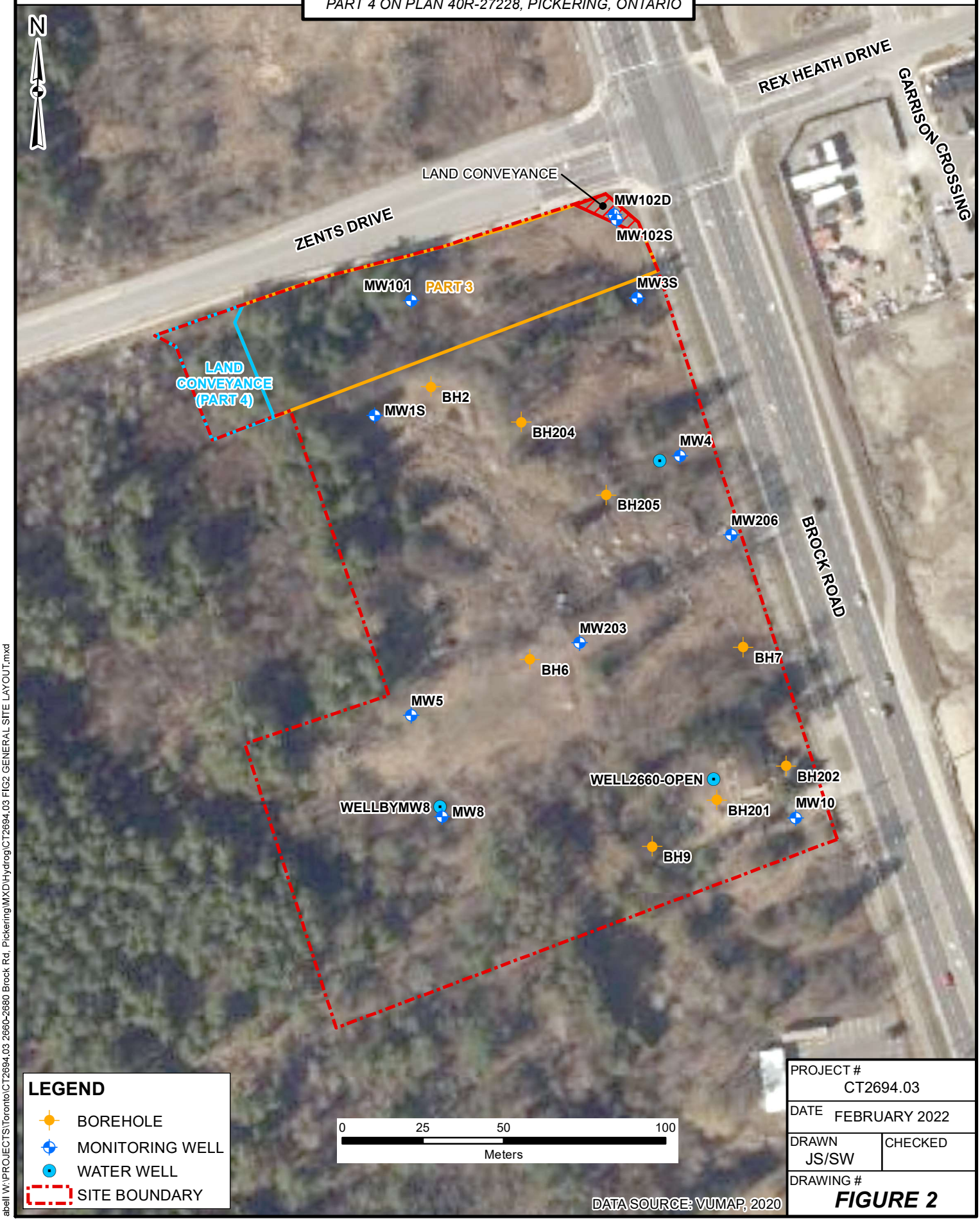
abell W:\PROJECTS\Toronto\CT2694.03 2660-2680 Brock Rd, Pickering\MXD\Hydrog\CT2694.03 FIG1 SITE LOCATION.mxd

TERRAPEX

GENERAL SITE LAYOUT

2660 TO 2680 BROCK ROAD AND
PART OF LOT 19, CONCESSION 3; PART 3 AND
PART 4 ON PLAN 40R-27228, PICKERING, ONTARIO

CLIENT
THE BROCK ZENTS PARTNERSHIP



LEGEND

- BOREHOLE
- MONITORING WELL
- WATER WELL
- SITE BOUNDARY

PROJECT #	CT2694.03
DATE	FEBRUARY 2022
DRAWN	JS/SW
CHECKED	
DRAWING #	**FIGURE 2**

abell W:\PROJECTS\Toronto\CT2694.03 2660-2680 Brock Rd. Pickering\MXD\Hydrog\CT2694.03 FIG2 GENERAL SITE LAYOUT.mxd

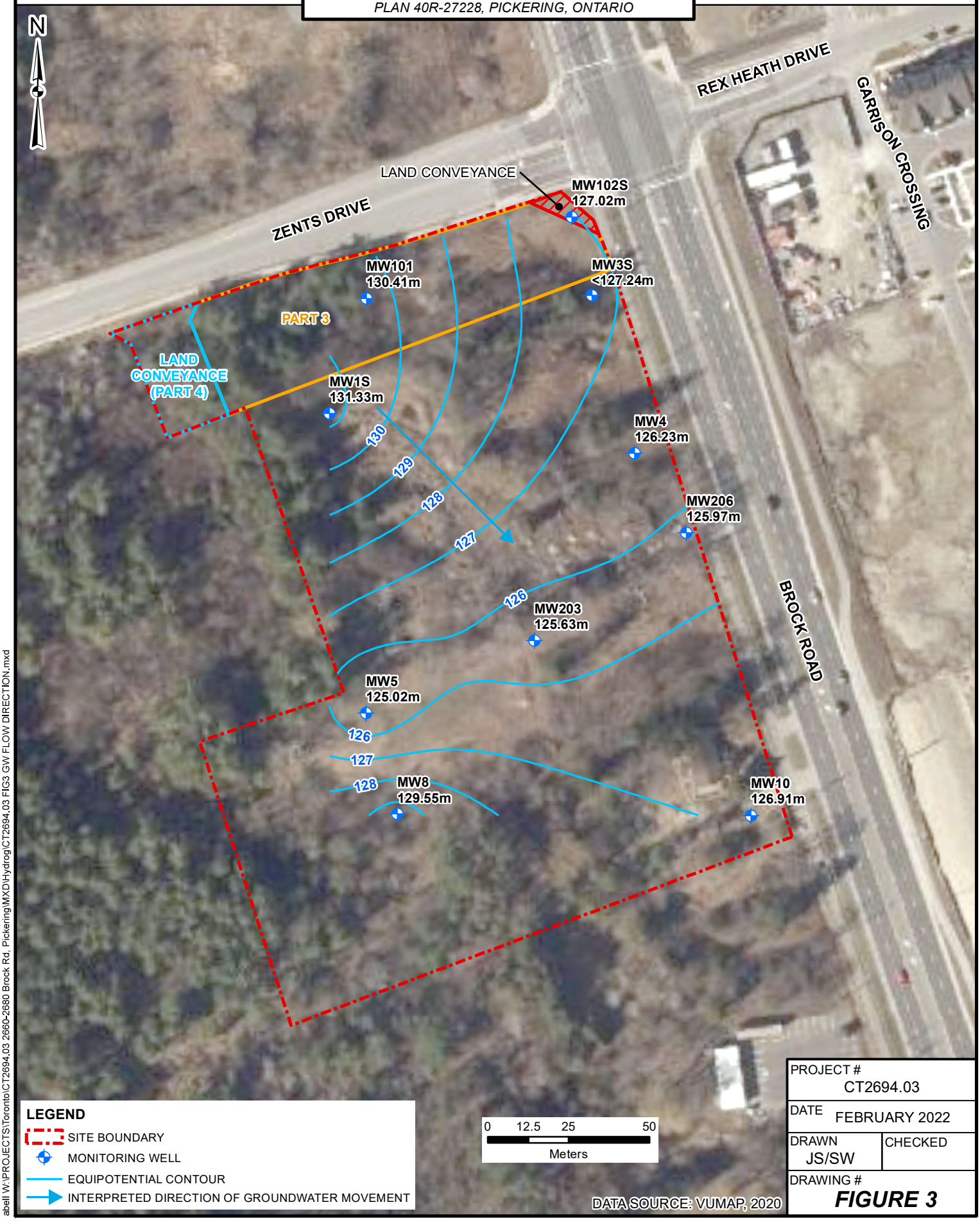
TERRAPEX

GROUNDWATER FLOW DIRECTION (AS OF OCTOBER 27, 2021)

2660 TO 2680 BROCK ROAD AND PART OF LOT 19, CONCESSION 3; PART 3 AND PART 4 ON PLAN 40R-27228, PICKERING, ONTARIO

CLIENT

THE BROCK ZENTS PARTNERSHIP



LEGEND

- SITE BOUNDARY
- MONITORING WELL
- EQUIPOTENTIAL CONTOUR
- INTERPRETED DIRECTION OF GROUNDWATER MOVEMENT

PROJECT #	CT2694.03
DATE	FEBRUARY 2022
DRAWN	JS/SW
CHECKED	
DRAWING #	**FIGURE 3**

abell W:\PROJECTS\Toronto\CT2694.03 2660-2680 Brock Rd, Pickering\MXD\Hydrog\CT2694.03 FIG3 GW FLOW DIRECTION.mxd

APPENDIX II

TABLES

TABLE 1
Monitoring Well Construction Details
2660 to 2680 Brock Road and Part of Lot 19, Concession 3; Part 3 and Part 4 on Plan 40R-27228, Pickering, Ontario

Position and Depth

Well Desig.	UTM Easting	UTM Northing	Date of Construct	Stick Up	Depth of Borehole	Depth to Well Bottom	Screen Length	Depth to Screen Bottom	Depth to Screen Top	Depth to Top Sand
(m)	(m)	(m)		(m)	(m bg)	(m bg)	(m)	(m bg)	(m bg)	(m bg)
MW1(S)	653520	4860199	07-May-18	1.09	4.70	4.70	1.52	4.60	3.08	2.48
MW1(D)	653521	4860200	04-May-18	0.85	14.00	9.10	1.52	9.00	7.48	7.18
MW3(S)	653602	4860237	07-May-18	0.95	3.10	3.10	1.52	3.00	1.48	1.18
MW3(D)	653604	4860238	03-May-18	1.01	14.00	7.40	1.52	7.30	5.78	5.48
MW4	653615	4860188	03-May-18	0.97	14.00	7.60	1.52	7.50	5.98	5.68
MW5	653532	4860108	01-May-18	0.93	9.30	9.00	1.52	8.90	7.38	7.08
MW8(D)	653546	4860063	02-May-18	0.93	15.40	11.00	1.52	10.90	9.38	8.38
MW8(S)	653542	4860076	12-Jun-19	1.02	4.27	3.96	1.52	3.86	2.34	9.86
MW10	653642	4860074	07-May-18	0.99	13.80	3.90	1.52	3.80	2.28	1.98
MW101	653533	4860236	12-Jun-19	0.99	8.80	4.11	1.52	4.01	2.49	2.19
MW102(D)	653595	4860262	12-Jun-19	0.96	8.70	7.62	1.52	7.52	6.00	5.70
MW102(S)	653596	4860261	12-Jun-19	0.95	3.70	3.66	1.52	3.56	2.04	1.74
MW203	653584	4860130	05-Oct-21	0.95	6.70	6.10	3.05	6.00	2.95	2.65
MW206	653631	4860163	05-Oct-21	0.87	6.10	5.85	3.05	5.75	2.70	2.40

Key Elevations

Well Desig.	Ground Elev. (m asl)	End of Borehole Elev. (m asl)	Top of Pipe Elev. (m asl)	Screen Bottom Elev. (m asl)	Screen Top Elev. (m asl)
MW1(S)	132.03	127.33	133.12	127.43	128.95
MW1(D)	132.03	118.03	132.88	123.03	124.55
MW3(S)	130.34	127.24	131.29	127.34	128.86
MW3(D)	130.37	116.37	131.38	123.07	124.59
MW4	129.77	115.77	130.74	122.27	123.79
MW5	131.59	122.29	132.52	122.69	124.21
MW8(D)	131.64	116.24	132.57	120.74	122.26
MW8(S)	131.03	126.76	132.06	127.17	128.69
MW10	129.29	115.49	130.28	125.49	127.01
MW101	131.24	122.44	132.23	127.23	128.75
MW102(D)	130.70	122.00	131.65	123.18	124.70
MW102(S)	130.68	126.98	131.63	127.12	128.64
MW203	130.65	123.95	131.61	124.65	127.70
MW206	129.69	123.59	130.56	123.94	126.99

Notes:

1. m asl = metres above sea level
2. m bg = metres below ground (or grade)
3. UTM locations obtained from GPS survey, with 2 cm accuracy

TABLE 2
Observed Groundwater Levels
2660 to 2680 Brock Road and Part of Lot 19, Concession 3;
Part 3 and Part 4 on Plan 40R-27228, Pickering, Ontario

Well Desig.	Date	Ground Elev. (m asl)	Top Pipe Elev. (m asl)	Well Depth (m bg)	Groundwater Depth (m bmp)	Groundwater Depth (m bg)	Groundwater Elev. (m asl)
MW1(S) *Shallow*	17-May-18	132.03	133.12	4.70	1.58	0.49	131.54
	23-May-18				1.76	0.67	131.36
	29-May-18				2.06	0.96	131.06
	23-Apr-19				1.29	0.19	131.84
	16-May-19				1.34	0.25	131.78
	19-Jun-19				1.83	0.73	131.30
	26-Jun-19				1.98	0.89	131.14
	02-Jul-19				2.19	1.10	130.93
	26-Apr-21				1.74	0.65	131.38
	13-Oct-21				1.94	0.84	131.18
	18-Oct-21				2.15	1.06	130.97
	27-Oct-21				1.80	0.70	131.33
MW1(D) *Deep*	17-May-18	132.03	132.88	9.10	5.35	4.50	127.53
	23-May-18				5.19	4.34	127.69
	29-May-18				*5.36*	4.51	127.53
	23-Apr-19				4.95	4.10	127.94
	16-May-19				4.81	3.96	128.07
	19-Jun-19				5.07	4.22	127.82
	26-Jun-19				5.16	4.31	127.73
	02-Jul-19				5.23	4.38	127.65
	26-Apr-21				6.11	5.26	126.77
	13-Oct-21				6.13	5.28	126.75
	18-Oct-21				6.11	5.26	126.78
	27-Oct-21				6.13	5.28	126.75
MW3(S) *Shallow*	17-May-18	130.34	131.29	3.10	2.15	1.20	129.15
	23-May-18				2.47	1.52	128.82
	29-May-18				2.72	1.77	128.57
	23-Apr-19				not monitored		
	16-May-19				2.87	1.92	128.42
	19-Jun-19				2.73	1.78	128.56
	26-Jun-19				2.91	1.96	128.39
	02-Jul-19				3.02	2.07	128.27
	26-Apr-21				Dry	>3.10	<127.24
	13-Oct-21				Dry	>3.10	<127.24
	18-Oct-21				Dry	>3.10	<127.24
	27-Oct-21				Dry	>3.10	<127.24
MW3(D) *Deep*	17-May-18	130.37	131.38	7.40	3.53	2.52	127.85
	23-May-18				3.64	2.63	127.74
	29-May-18				3.78	2.77	127.60
	23-Apr-19				not monitored		
	16-May-19				3.24	2.23	128.14
	19-Jun-19				3.61	2.60	127.78
	26-Jun-19				3.69	2.68	127.70
	02-Jul-19				3.75	2.74	127.64
	26-Apr-21				4.02	3.01	127.36
	13-Oct-21				5.04	4.03	126.34
	18-Oct-21				6.35	5.34	125.04
	27-Oct-21				5.02	4.01	126.36

TABLE 2
Observed Groundwater Levels
2660 to 2680 Brock Road and Part of Lot 19, Concession 3;
Part 3 and Part 4 on Plan 40R-27228, Pickering, Ontario

Well Desig.	Date	Ground Elev. (m asl)	Top Pipe Elev. (m asl)	Well Depth (m bg)	Groundwater Depth (m bmp)	Groundwater Depth (m bg)	Groundwater Elev. (m asl)
MW4	17-May-18	129.77	130.74	7.60	3.29	2.32	127.45
	23-May-18				3.38	2.41	127.37
	29-May-18				3.51	2.54	127.23
	23-Apr-19				3.11	2.14	127.64
	16-May-19				3.04	2.07	127.71
	19-Jun-19				3.32	2.35	127.42
	26-Jun-19				3.41	2.44	127.34
	02-Jul-19				3.48	2.51	127.27
	26-Apr-21				4.34	3.37	126.40
	13-Oct-21				4.52	3.55	126.22
	18-Oct-21				5.85	4.88	124.90
	27-Oct-21				4.51	3.54	126.23
MW5	17-May-18	131.59	132.52	9.00	6.31	5.37	126.22
	23-May-18				6.45	5.52	126.07
	29-May-18				6.69	5.76	125.83
	23-Apr-19				6.05	5.11	126.48
	16-May-19				6.20	5.26	126.33
	19-Jun-19				6.43	5.50	126.09
	26-Jun-19				6.59	5.65	125.94
	02-Jul-19				6.70	5.76	125.83
	26-Apr-21				7.52	6.59	125.00
	13-Oct-21				7.42	6.48	125.11
	18-Oct-21				8.90	7.97	123.62
	27-Oct-21				7.50	6.57	125.02
MW8(D) *Deep*	17-May-18	131.64	132.57	11.00	5.80	4.87	126.77
	23-May-18				5.94	5.01	126.63
	29-May-18				6.18	5.25	126.39
	23-Apr-19				5.58	4.64	127.00
	16-May-19				5.70	4.76	126.88
	19-Jun-19				5.93	5.00	126.64
	26-Jun-19				6.09	5.15	126.49
	02-Jul-19				6.20	5.26	126.38
	26-Apr-21				6.99	6.06	125.58
	13-Oct-21				6.93	5.99	125.65
	18-Oct-21				8.31	7.37	124.27
	27-Oct-21				6.94	6.01	125.63
MW8(S) *Shallow*	19-Jun-19	131.03	132.06	3.96	4.39	3.36	127.67
	26-Jun-19				3.74	2.72	128.32
	02-Jul-19				3.41	2.39	128.65
	26-Apr-21				Dry	>3.96	<127.07
	27-Oct-21				2.51	1.49	129.55

TABLE 2
Observed Groundwater Levels
2660 to 2680 Brock Road and Part of Lot 19, Concession 3;
Part 3 and Part 4 on Plan 40R-27228, Pickering, Ontario

Well Desig.	Date	Ground Elev. (m asl)	Top Pipe Elev. (m asl)	Well Depth (m bg)	Groundwater Depth (m bmp)	Groundwater Depth (m bg)	Groundwater Elev. (m asl)
MW10	17-May-18	129.29	130.28	3.90	2.06	1.08	128.22
	23-May-18				2.25	1.26	128.03
	29-May-18				2.50	1.51	127.79
	23-Apr-19				1.40	0.41	128.89
	16-May-19				1.34	0.35	128.94
	19-Jun-19				1.84	0.85	128.44
	26-Jun-19				1.89	0.90	128.39
	02-Jul-19				2.00	1.01	128.28
	26-Apr-21				1.86	0.87	128.42
	13-Oct-21				inaccessible		
	18-Oct-21				Dry	>3.90	<125.49
	27-Oct-21				3.37	2.38	126.91
MW101	19-Jun-19	131.24	132.23	4.11	1.35	0.36	130.88
	26-Jun-19				1.50	0.50	130.73
	02-Jul-19				1.73	0.74	130.50
	26-Apr-21				1.28	0.29	130.95
	13-Oct-21				1.93	0.94	130.30
	18-Oct-21				3.55	2.56	128.68
	27-Oct-21				1.82	0.83	130.41
MW102(D) *Deep*	19-Jun-19	130.70	131.65	7.62	3.84	2.88	127.82
	26-Jun-19				3.90	2.94	127.75
	02-Jul-19				3.97	3.01	127.69
	26-Apr-21				5.21	4.25	126.45
	13-Oct-21				5.26	4.30	126.39
	18-Oct-21				6.62	5.66	125.04
	27-Oct-21				5.24	4.28	126.41
MW102(S) *Shallow*	19-Jun-19	130.68	131.63	3.66	3.39	2.44	128.24
	26-Jun-19				3.48	2.53	128.15
	02-Jul-19				3.55	2.60	128.08
	26-Apr-21				Dry	>3.66	<127.02
	13-Oct-21				Dry	>3.66	<127.02
	18-Oct-21				Dry	>3.66	<127.02
	27-Oct-21				Dry	>3.66	<127.02
MW203	13-Oct-21	130.65	131.61	6.10	5.96	5.01	125.65
	18-Oct-21				Dry	>6.10	<125.51
	27-Oct-21				5.98	5.03	125.63
MW206	13-Oct-21	129.69	130.56	5.85	4.62	3.75	125.94
	18-Oct-21				4.52	3.65	126.04
	27-Oct-21				4.59	3.72	125.97

Notes
1. Ground elevation interpolated between points on earlier site survey
2. Tops of pipe elevation based on stick up elevation in relation to ground elevation
3. m asl = metres above sea level
4. m bmp = metres below measurement point (Top of pipe)
5. m bg = metres below ground
6. >, < values are based on screen bottom depth and elevation

TABLE 3
Summary of Groundwater Quality
2660 to 2680 Brock Road and Part of Lot 19, Concession 3;
Part 3 and Part 4 on Plan 40R-27228, Pickering, Ontario

	Units	Sewers Bylaw		MW206
		Table 1	Table 2	18-Oct-21
MISCELLANEOUS INORGANIC PARAMETERS				
Fluoride	mg/L	10	-	<0.10
pH	pH units	6.0 - 11.5	6.0 - 9.5	7.50
Total Suspended Solids	mg/L	350	***15***	***17***
Cyanide - Total (CN)	mg/L	2	0.02	<0.01
METALS (Total)				
Aluminium (Al)	mg/L	50	-	0.50
Antimony (Sb)	mg/L	5	-	<0.0010
Arsenic (As)	mg/L	1	0.02	<0.01
Cadmium (Cd)	mg/L	0.7	0.008	<0.001
Chromium (Cr)	mg/L	2	0.08	<0.05
Cobalt (Co)	mg/L	5	-	<0.001
Copper (Cu)	mg/L	3	0.05	<0.005
Lead (Pb)	mg/L	1	0.12	0.001
Manganese (Mn)	mg/L	5	0.15	0.07
Mercury (Hg)	mg/L	0.01	0.0004	<0.0001
Molybdenum (Mo)	mg/L	5	-	<0.005
Nickel (N)	mg/L	2	0.08	<0.005
Selenium (Se)	mg/L	1	0.02	<0.005
Silver (Ag)	mg/L	5	0.12	<0.001
Tin (Sn)	mg/L	5	-	<0.01
Titanium (Ti)	mg/L	5	-	0.02
Zinc (Zn)	mg/L	2	0.04	<0.02
MICROBIOLOGICAL AND NUTRIENTS				
Escherichia coli	CFU/100 mL	-	200	40
Oil & Grease: Animal and Vegetable	mg/L	150	-	<0.500
Oil & Grease: Mineral and Synthetic	mg/L	15	-	<0.5
Biological Oxygen Demand (BOD)	mg/L	300	15	<2.0
Phenols (4AAP)	mg/L	1	0.008	<0.001
Sulfate (SO4)	mg/L	1500	-	44
Total Kjeldahl Nitrogen (TKN)	mg/L	100	1	0.2

Notes

1. Table 1 is the specified criteria for sanitary and combined sewers
2. Table 2 is the specified criteria for storm sewer
3. Values based on Durham sanitary sewer bylaw (55-2013).
4. Bold and italic values at least exceed either Table 1 or Table 2, as highlighted
5. mg/L = milligrams per litre
6. CFU/100mL = colony forming units per 100 millilitres
8. "-" indicates no established criteria for the parameter

TABLE 3
Summary of Groundwater Quality
2660 to 2680 Brock Road and Part of Lot 19, Concession 3;
Part 3 and Part 4 on Plan 40R-27228, Pickering, Ontario

	Units	Sewers Bylaw		MW206
		Table 1	Table 2	18-Oct-21
VOLATILE ORGANIC COMPOUNDS				
Benzene	ug/L	10	2	<0.5
Chloroform	ug/L	40	2	<0.5
Dichlorobenzene, 1,2-	ug/L	50	5.6	<0.5
Dichlorobenzene,1,4-	ug/L	80	6.8	<0.5
Dichloroethylene, cis-1,2-	ug/L	4000	5.6	<0.5
Dichloropropene, trans-1,3-	ug/L	140	5.6	<0.5
Ethylbenzene	ug/L	160	2	<0.5
Methyl Ethyl Ketone	ug/L	8000	-	<5.0
Styrene	ug/L	200	-	<0.5
Tetrachloroethane, 1,1,2,2-	ug/L	1400	17	<0.5
Tetrachloroethylene	ug/L	1000	4.4	<0.5
Toluene	ug/L	270	2	<0.5
Trichloroethylene	ug/L	400	8	<0.5
o-Xylenes	ug/L	-	-	<0.5
m+p-Xylenes	ug/L	-	-	-
Xylenes (Total)	ug/L	1400	4.4	<0.5
Surrogate :2-Fluorobiphenyl	%			-
Surrogate :p-Terphenyl d14	%			101%
SEMIVOLATILE ORGANIC COMPOUNDS				
Bis (2-ethylexyl) phthalate	ug/L	12	8.8	<1.0
Di-N-Butyl phthalate	ug/L	80	15	<1.0
MISCELLANEOUS ORGANIC PARAMETERS				
Nonylphenols (Total)	ug/L	20	-	<1.0
Nonylphenol Ethoxylate (Total)	ug/L	200	-	<10.0
PCBs	ug/L	1	0.4	<0.1

Notes

1. Table 1 is the specified criteria for sanitary and combined sewers
2. Table 2 is the specified criteria for storm sewer
3. Values based on Chapter 681 sewers bylaw of the Toronto Municipal Code
4. Bold and italic values at least exceed either Table 1 or Table 2, as highlighted
5. mg/L = milligrams per litre
6. CFU/100mL = colony forming units per 100 millilitres
7. ND = below laboratory reported detection limits. See laboratory report for detailed values.
8. "-" indicates no established criteria for the parameter

TABLE 4
Summary of Hydraulic Conductivity by Grain Size
2660 to 2680 Brock Road and P art of Lot 19, Concession 3;
Part 3 and Part 4 on Plan 40R-27228, Pickering, Ontario

Designation	Sample Depth (m bg)	Grain Size Distribution D50 (mm)	D10 (mm)	Cu	Hydraulic Conductivity (m/s)	Textural description
MW1, Sa4	2.5	0.0512	<0.002	n/a	<1e-08	Clayey silt and sand, trace gravel
MW4, Sa5	3.3	0.665	0.0054	14.2	3E-07	Silt and fine sand, trace clay
MW5, Sa6	4.8	0.1052	<0.002	n/a	<1e-08	Silty fine to co sand, some clay, trace gravel
MW6, Sa7	5.8	0.1401	0.0034	n/a	1E-07	Silty fine to co sand, some clay, trace gravel
MW8, Sa9	9.2	0.1393	0.0547	3.1	3E-05	Fine sand, some silt, some gravel
BH7, Sa7	6.4	0.1064	0.0557	2.1	3E-05	Silty fine sand
BH9, Sa8	6.4	0.0676	<0.002	n/a	<1e-08	Sand and silt, some clay, tr gravel

Note

1. m bg = metres below ground
2. Hydraulic conductivity for grain size determined using Hazen formula that applies d10 value
3. d10, d50 = grain size where, by weight, 10% and 50% of sample pass through
4. Cu = coefficient of uniformity = d60/d10

TABLE 5
Example Construction Dewatering Rate - 20m Trench
2660 to 2680 Brock Road and Part of Lot 19, Concession 3;
Part 3 and Part 4 on Plan 40R-27228, Pickering, Ontario

Parameter		Value	Units	Symbol	Origin of Value
Aquifer Hydraulic Conditions					
Hydraulic conductivity		7E-06	m/s	K	Highest observed in field tests
Hydraulically connected to water table					Unconfined is anticipated
Analogous Dewatering Array Dimensions					
Analogous shape		Trench			
Long axis along excavation		20.0	m	X	Example trench or footing excavation
Short axis along exavation		1.0	m	J	= A / X (ie average length)
Trench area to be dewatered		20	m^2	A	Example trench or footing excavation
Radius of equivalent wells at short sides		0.5	m	R_W	= J / 2
Subsurface Vertical Dimensions					
Surface grade (general average)		130.8	masl	E_G	Site Survey
Excavation		1		N	
Depth of excavation		1.5	m	C	Estimated
Excavation base, depth		1.5	mbg	D_F	Estimated
Excavation base, elevation		129.3	masl	E_F	= E_G - N * C
Over-excavation, depth		0.3	m		Assumed
Excavation base (bases of footings), elevation		129.0	masl	E_{EX}	Assumed 0.3 m lower than foundation slab surface
Excavation base (bases of footings), depth		1.8	mbg	D_{EX}	Assumed 0.3 m deeper than foundation slab surface
Assumed elevation difference between excavation base and reference datum		3.0	m		
Reference datum (for calculation)		126.0	masl	E_{RD}	Set at 3 m below base of excavation
Dewatering Levels and Dimensions					
Water table observed, elevation		130.6	masl	EW_{HIGH}	Highest of field measurements.
Average water table observed, depth		0.19	m	DW_{SHALL}	= E_G - EW_{HIGH}
Buffer for seasonal fluctuation		0.19	m	B	Based on water levels mostly observed in late winter
Water table elevation (pre-pumping level)		130.8	masl	$EW_{HIGHEST}$	= EW_{HIGH} + B. Allows for seasonal fluctuation
Height of water table above reference datum		4.8	m	H	= $EW_{HIGHEST}$ - E_{RD}
Target dewatering level, elevation		128.9	m asl	EW_{TARG}	Target is 1 m lower than excavation base. = E_{EX} - 1.0
Target dewatering level, depth		1.9	mbg	DW_{TARG}	Target is 1 m deeper than excavation base. = D_{EX} + 1
Height of target water level above datum		2.9	m	h_T	
Radius of Influence					
Applied equation	$R_O = 3000 * (H - h_T) * (K)^{0.5}$				Sichart and Kryieleis (1930)
Radius of Influence		15	m	R_O	As measured from excavation edge
Equivalent line source		8	m	L	Half of radius of influence
Incident Stormwater					
Excavation open area		20	m^2	A	Excavation design
Typical large storm		25	mm/day	P_T	Assumed. Typically 4-5 events/year. Larger is possible.
Stormwater (i.e. from precipitation)		1	m^3/day	Q_{STORM}	= A * P_T
Change of units (rounded)		500	litres/day	Q_{STORM}	
Estimated Flows to be Managed					
Applied equation for trench long sides	$Q_{GW} = 2 * X * K * (H^2 - h_T^2) / (3.34 \times 10^{-5} * L)$				Powers et. al, 2007
Applied equation for trench short sides	$Q_{GW} = K * (H^2 - h_T^2) / (5.31 \times 10^{-6} * \ln((R_O+R_W/R_{W1})$				Powers et. al, 2007
Groundwater seepage from long sides		16.3	litres/min	Q_{GW-LS}	Calculated from values in this sheet.
Groundwater seepage from short sides		5.6	litres/min	Q_{GW-ShS}	Calculated from values in this sheet.
Groundwater seepage from all sides		21.9	litres/min	Q_{GW-ShS} + Q_{GW-LS}	
Change of units		31,497	litres/day		
Safety factor		2.0			Allow for unknown conditions between boreholes or beyond the excavation walls
Groundwater seepage, with safety factor		62,995	litres/day		= Safety Factor x Q_{GW}
Groundwater seepage plus storm water		63,495	litres/day		= Safety Factor x Q_{GW} + Q_{STORM}
Applicable Regulatory Instrument		**EASR**			MECP, O.Reg 245/11, O.Reg 387/04; OWRA S.41
Value to specify in regulatory instrument		***63,500***		litres/day	Value includes stormwater.

Notes.
1 Patrick Powers, Arthur Corwin, Paul Schmall, Walter Kaeck. 2007. Construction Dewatering and Groundwater Control. Third Edition.
2 mbg = metres below ground level
3 masl = metres above sea level
Terrapex Environmental Ltd.

APPENDIX III

BOREHOLE RECORDS

CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: MW1D**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 132.03	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
	Topsoil (400 mm)	0	132	3		1		3		Borehole cave-in at 12.1 m below ground surface (mbgs) and the groundwater measured at 7.3 mbgs on complition.
		0.5	131.5							
		1	131	46		2		46		Groundwater measured at 4.36 mbgs on May 23, 2018.
		1.5	130.5							
		2	130	83/275		3		83/275		
	brown damp to moist with oxidization	2.5	129.5	50/125		4		50/125		
	-----	3	129							
		3.5	128.5	50/150		5		50/150		
		4	128							
	grey moist	4.5	127.5							
	hard SANDY CLAYEY SILT trace gravel (TILL)	5	127	75		6		75		
		5.5	126.5							
		6	126							Bentonite
		6.5	125.5	60		7		60		
		7	125							
	with sand seams	7.5	124.5							sand
		8	124	35		8		35		sand + screen
		8.5	123.5							
		9	123							
		9.5	122.5	40		9		40		

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: MW1D**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 132.03	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) 40 80 120 160 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		very dense, wet, grey SAND AND SILT trace gravel, trace clay (TILL) with sand seams and layers	10	122							Augering through rock/ boulder
			10.5	121.5	50/150		10		50/ 150		
			11	121							
			11.5	120.5							
		very dense, wet, grey SANDY GRAVEL	12	120	50/150		11		50/ 150		
			12.5	119.5							
		hard, damp, grey CLAYEY SILT	13	119							Augering through rock/ boulder
			13.5	118.5	50/100		12		50/ 100		
		END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: MW1S**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 132.03	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) 40 80 120 160 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT (N)	Well Construction	REMARKS
▽		Straight auger to install the monitoring well	0 0.5 1 1.5 2 2.5 3 3.5 4 4.5	132 131.5 131 130.5 130 129.5 129 128.5 128 127.5						Bentonite Sand Sand + Screen	Groundwater measured at 0.81 mbgs on May 23, 2018.
		END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: BH2**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 131.44	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		Topsoil (300 mm)	0		24		1A				Borehole cave-in at 7.6 mbgs and the groundwater measured at 6.7 mbgs on complition.
		compact, moist, brown SANDY SILT	0.5	131			1B		24		
		hard, damp, brown SANDY CLAYEY SILT trace gravel (TILL)	1	130.5	60		2		60		
			1.5	130	50/150		3		50/150		
			2	129.5							
		brown damp to moist with oxidization	2.5	129	50/125		4		50/125		
			3	128.5	50/100		5		50/100		
		-----	3.5	128							
			4	127.5							
		grey moist to wet	4.5	127							
		very dense SANDY SILT trace gravel trace to some clay (TILL) with sand seams and layers	5	126.5	52		6		52		
			5.5	126							Augering through rock/ boulder
			6	125.5	50/100		7		50/100		
▼			6.5	125							
			7	124.5							
			7.5	124	50/150		8		50/150		
			8	123.5							Augering refusal due to a boulder
		END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: MW3D**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 130.37	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		Topsoil (600 mm)	0	130	3		1		3		Borehole cave-in at 4.3 mbgs and the groundwater measured at 2.4 mbgs on complition.
		compact to dense, moist, brown silty sand, trace gravel, trace clay (Probable FILL)	0.5 – 1.5	129.5 – 129	25		2		25		Groundwater measured at 2.67 mbgs on May 23, 2018.
▼		very dense, brown, moist SANDY SILT with slight cohesion intermixed with TILL layers	2 – 4.5	128.5 – 126	42 – 52 – 57		3 – 4 – 5		42 – 52 – 57		
			4.5	125.5	50/125		6		50/125		Bentonite
			5 – 5.5	125 – 124.5							sand
		brown wet	6	124	71/275		7		71/275		sand + screen
		very dense SANDY SILT to SILTY SAND trace gravel	6.5 – 7	123.5 – 123							
		grey wet	7.5 – 8	122.5 – 122	50/125		8		50/125		Straight auger to install the monitoring well.
			8.5 – 9	121.5							
			9.5	121	50/150		9		50/150		

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: MW3D**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 130.37	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) 40 80 120 160 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		very dense, wet, grey SILTY SAND	10	120.5							
			10.5	120							
			11	119.5	96/250		10		96/250		
			11.5	119							
			12	118.5							
			12.5	118	50/125		11		50/125		
			13	117.5							
			13.5	117							
				116.5	50/125		12		50/125		
		END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: MW3S**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 130.34	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) 40 80 120 160 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT (N)	Well Construction	REMARKS
▽		Straight auger to install the monitoring well	0 0.5 1 1.5 2 2.5 3	130 129.5 129 128.5 128 127.5							Groundwater measured at 1.62 mbgs on May 23, 2018. Sand Sand + Screen Bentonite
		END OF BOREHOLE									

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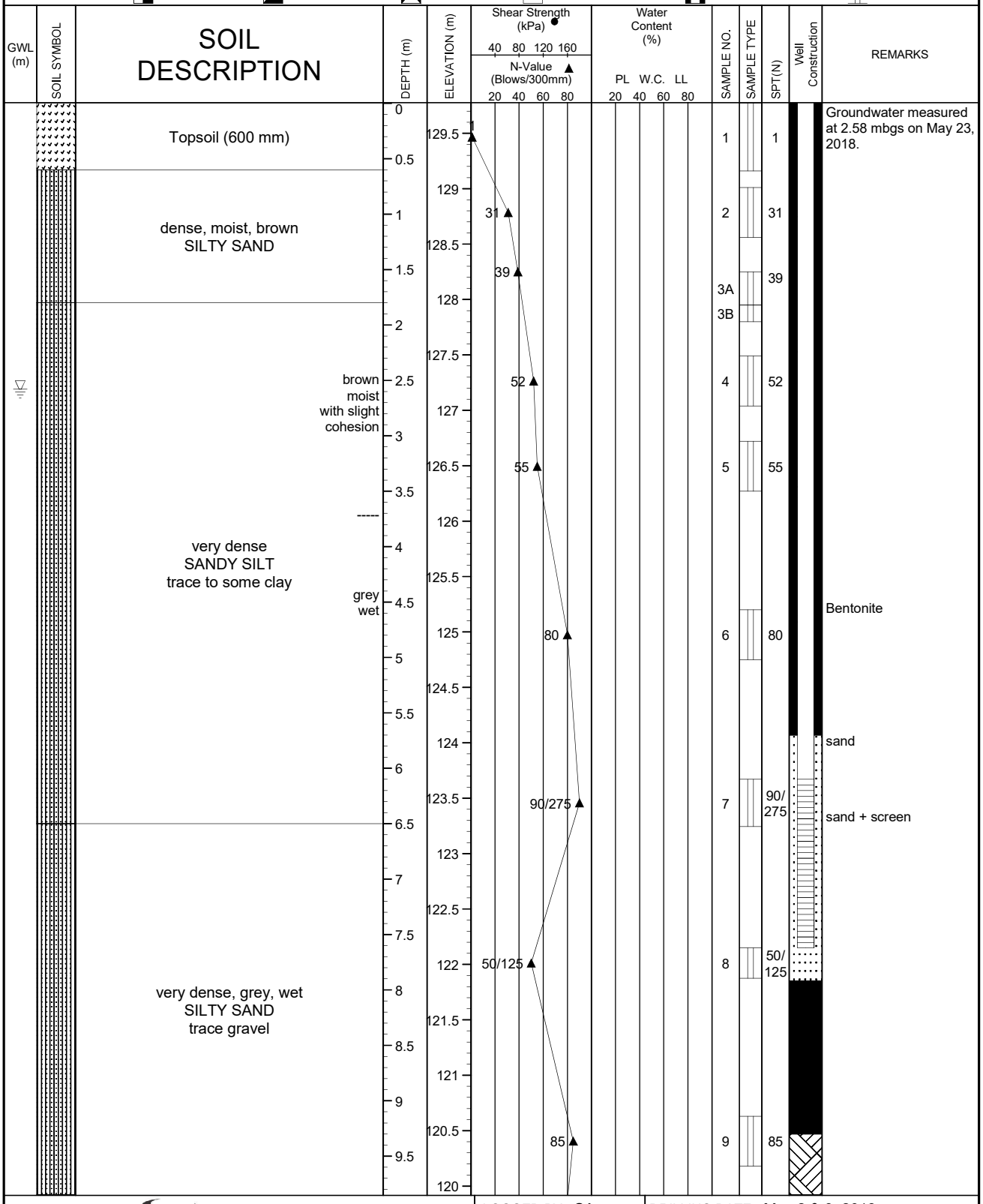
CLIENT: The Brock Zents Partnership	METHOD: Hollow Stem Auger and Split Spoon		**BH No.: MW4**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 129.77	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON



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CLIENT: The Brock Zents Partnership	METHOD: Hollow Stem Auger and Split Spoon		**BH No.: MW4**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 129.77	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) 40 80 120 160 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		very dense, wet, grey SAND trace to some gravel trace silt	10	119.5			10		71		
			10.5								
			11	119	71						
			11.5	118.5							
			12	118							
			12.5	117.5	50/125		11		50/125		Augering through rock/ boulder
			13	117							
		hard, grey, moist CLAYEY SILT	13.5	116.5							
			14	116	50/150		12		50/150		
		END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Hollow Stem Auger and Split Spoon		**BH No.: MW5**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 131.59	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
	black, moist, sand and gravel (FILL)	0	131.5	8		1		8		Groundwater measured at 5.56 mbgs on May 23, 2018.
		0.5	131							
		1	130.5	30		2		30		
		1.5	130							
				66		3		66		
		2	129.5							
	brown damp	2.5	129	50/150		4		50/150		
		3	128.5							
				72		5		72		
	-----	3.5	128							
	grey moist	4	127.5							
		4.5	127							
	very dense SAND and SILT trace gravel, trace clay (TILL)			52		6		52		
		5	126.5							
▽		5.5	126							
		6	125.5							Bentonite
				46		7		46		
		6.5	125							Augering through rock/ boulder
		7	124.5							
		7.5	124	50/150		8		50/150		sand
		8	123.5							sand + screen
		8.5	123							Augering through rock/ boulde
		9	122.5	50/125		9		50/125		
	END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: BH6**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 130.94	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		Topsoil (600 mm)	0	130.5	8		1		8		Borehole cave-in at 11.3 mbgs and the groundwater measured at 0.6 mbgs on complition.
		compact to dense	0.5	130	17		2		17		
			1	129.5							
			1.5	129	40		3		40		
		-----	2	128.5							
		brown moist	2.5	128	51		4		51		
			3	127.5	50/125		5		50/125		
		-----	3.5	127							
		grey moist to wet	4	126.5	75/275		6		75/275		
		very dense SAND AND SILT trace gravel, trace clay (TILL) with sand layers and seams	4.5	126	70		7		70		
			5	125.5							
			5.5	125	50/125		8		50/125		
			6	124.5							
			6.5	124							
			7	123.5	50/125		9		50/125		
			7.5	123							
			8	122.5							
			8.5	122							
		very dense, wet, grey GRAVELLY SAND	9	121.5	91/275		10		91/275		
			9.5								

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: BH6**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 130.94	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) 40 80 120 160 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		very dense, wet, grey SAND AND SILT trace gravel, trace clay (TILL) with sand seams and layers	10	121							
			10.5	120.5							
			11	120	50/150		11		50/150		
			11.5	119.5							
			12	119							
		very dense, wet, grey SANDY GRAVEL	12.5	118.5	50/275		12		50/275		
			13	118							
		hard, damp, grey SAND AND SILT trace gravel, trace clay (TILL) with shale pieces	13.5	117.5	50/20		13		50/20		(Possible BEDROCK)
		END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Hollow Stem Auger and Split Spoon		**BH No.: BH7**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 129.91	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
	Topsoil (150 mm)	0	129.5	7	23	1		7		Borehole cave-in at 4.5 mbgs and the groundwater measured at 1.8 mbgs on complition.
	firm, dark brown , moist clayey silt (FILL) with sandy gravell layer	0.5								
		1	129	6	18	2		6		
		1.5	128.5							
▼	compact	2	128	20	15	3		20		The borehole moved 3 m south due to an existing concrete foundation
	moist, brown SANDY SILT trace gravel, trace clay (TILL) with oxidization	2.5	127.5	26	10	4		26		
	----- very dense	3	127							
		3.5	126.5	55	8	5		55		
		4	126							
	brown moist with clayey silt seams	4.5	125.5							
		5	125	50/250	12	6		50/250		
		5.5	124.5							
		6	124							
		6.5	123.5	34	19	7		34		
	very dense, wet SILTY SAND	7	123							
	-----	7.5	122.5							
	grey moist to wet	8	122	50/125	18	8		50/125		
		8.5	121.5							
		9	121							
		9.5	120.5	50/125	16	9		50/125		

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CLIENT: The Brock Zents Partnership	METHOD: Hollow Stem Auger and Split Spoon		**BH No.: BH7**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 129.91	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) 40 80 120 160 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		very dense, wet, grey SILTY SAND	10	120	50/125	13	10		50/125		
			10.5	119.5							
			11	119							
			11.5	118.5							
			12	118							
			12.5	117.5	78	16	11		78		
			13	117							
			13.5	116.5							
			14	116	68	17	12		68		
		END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: MW8D**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 131.64	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		Topsoil (600 mm)	0 – 0.5	131.5 – 131	3	30	1		3		Borehole cave-in at 12.2 mbgs and the groundwater measured at 2.7 mbgs on complition.
		hard, damp to moist, brown SANDY CLAYEY SILT trace gravel (TILL)	0.5 – 4	131 – 127	13	11	2		13		Groundwater measured at 5.11 mbgs on May 23, 2018.
					39	9	3		39		
▼					67	10	4		67		
					84	9	5		84		
		very dense, moist to wet, grey SAND AND SILT trace gravel, trace clay (TILL)	4 – 7	127 – 124.5	50/150	8	6		50/ 150		
▽					73	10	7		73		
					50/125	8	8		50/ 125		Bentonite
		very dense, wet, grey SILTY SAND trace gravel	7 – 9.5	124.5 – 122	50/75	12	9		50/ 75		sand
											sand + screen

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: MW8D**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 131.64	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) 40 80 120 160 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		very dense, wet, grey GRAVELLY SAND	10	121.5	50/100	6	10		50/100		Sand + Screen
			10.5	121							
			11	120.5							
			11.5	120							
		very dense, wet, grey SAND AND SILT trace gravel, trace clay (TILL) with occasional sand semas and layers	12	119.5	50/150	11	11		50/150		Augering through rock/ boulder
			12.5	119							
			13	118.5							
			13.5	118	50/275	13	12		50/275		
			14	117.5							
			14.5	117							
			15	116.5	50/125	6	13		50/125		POSSIBLE BEDROCK
		END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Augering and Split Spoon		**BH No.: MW8S**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 131.033	
LOCATION: 2660-2680 Brock Road, Pickering, ON	NORTHING:	EASTING:	PROJECT NO.: CA18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		Straight auger to 2.28 m	0	131							Borehole open and dry on completion. Groundwater was measured at 2.72 m on June 26, 2019.
			0.5	130.5							
			1	130							
			1.5	129.5							
			2	129							Bentonite
			2.5	128.5	50/125		1		50/125		Sand
		hard, damp CLAYEY SANDY SILT trace gravel (TILL) brown	3	128	72		2		72		
			3.5	127.5							Sand and Screen
		-----									
		grey	4	127	71		3		71		
		END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: BH9**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 130.22	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
	Topsoil (300 mm)	0	130	3		1		3		Borehole cave-in at 3.35 mbgs and the groundwater measured at 1.5 mbgs on complition.
	soft, dark brown, moist clayey silt, trace gravel trace organics (FILL)	0.5	129.5	19		2A 2B		19		
	hard, damp, brown SANDY CLAYEY SILT trace gravel (TILL) with sand seams and layers	1	129							
▼		1.5	128.5	32		3		32		
		2	128							
	very dense, wet, brown SILTY SAND with occasional clay layers	2.5	127.5	46		4		46		
		3	127	52		5		52		
		3.5	126.5							
	hard, moist, grey SANDY CLAYEY SILT trace gravel (TILL) with wet sand seams and layers	4	126	64		6		64		
		4.5	125.5	47		7		47		
		5	125							
		5.5	124.5							
	very dense, moist to wet, grey SAND AND SILT trace gravel, trace clay (TILL)	6	124	52		8		52		
		6.5	123.5							
		7	123							
		7.5	122.5	69		9		69		
		8	122							
		8.5	121.5							
		9	121	78		10		78		
	END OF BOREHOLE	9.5								

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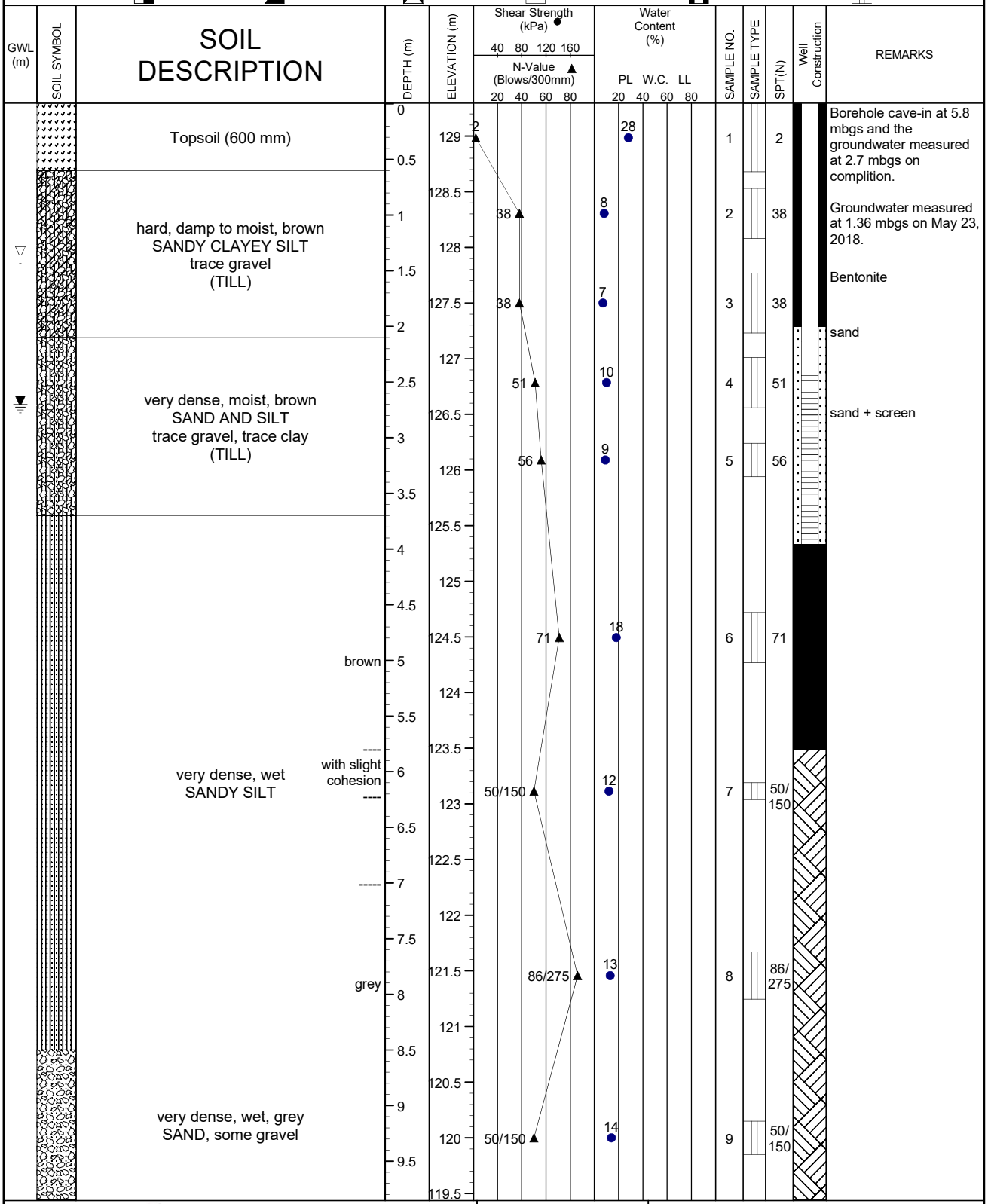
CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: MW10**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 129.29	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON



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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Auger and Split Spoon		**BH No.: MW10**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 129.29	
LOCATION: 2660 - 2680 Brock Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) 40 80 120 160 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		very dense, wet, grey SANDY SILT	10	119							
			10.5		50/150 ▲	16 ●	10		50/150		
			11	118.5							
			11.5	118							
			12	117.5							
		very dense, wet, grey SAND AND SILT trace gravel, trace clay (TILL) with sand layers	12.5	117	50/100 ▲	9 ●	11		50/100		
			13	116.5							
			13.5	116							
				115.5	50/150 ▲	11 ●	12		50/150		
		END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Augering and Split Spoon		**BH No.: MW101**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 131.238	
LOCATION: 2660-2680 Brock Road, Pickering, ON	NORTHING:	EASTING:	PROJECT NO.: CA18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
		Topsoil (250 mm)	0	131	32		1A		32		Borehole open and groundwater measured at 1.83 mbgs on completion.
			0.5	130.5			1B				
			1		54		2		54		Groundwater was measured at 0.5 m on June 26, 2019.
			1.5	130							
			2	129.5	82/150		3		82/150		Bentonite
		brown		129							
			2.5		81/150		4		81/150		Sand
			3	128.5							
		-----		128	66		5		66		
			3.5								Sand and Screen
		grey	4	127.5	70		6		70		
		hard, damp to moist CLAYEY SANDY SILT trace gravel (TILL)		127							
			4.5								
				126.5	71		7		71		
			5	126							
			5.5								
				125.5							
			6	125	48		8		48		
			6.5								
				124.5							
			7	124							
			7.5								
				123.5	55		9		55		
			8	123							
		very dense, moist, grey SAND, trace silt	8.5	122.5	78/125		10		78/125		
		END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Augering and Split Spoon		**BH No.: MW102D**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 130.695	
LOCATION: 2660-2680 Brock Road, Pickering, ON	NORTHING:	EASTING:	PROJECT NO.: CA18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
	Topsoil (230 mm)	0	130.5	18		1A		18		Borehole open and groundwater measured at 5.7 mbgs oncompletion.
		0.5				1B				
	compact	1	130	22		2		22		Groundwater was measured at 2.94 m on June 26, 2019.
	-----	1.5	129.5							
	dense moist to wet, brown SANDY SILT	2	129	41		3		41		
		2.5	128.5	47		4		47		
▽		3	128							Bentonite
		3.5	127.5	41		5		41		
	brown ----	4	127	69		6		69		
	hard, moist CLAYEY SANDY SILT grey	4.5	126.5							
		5	126	50/150		7		50/150		
▼		5.5	125.5							
		6	125							Sand
		6.5	124.5	85		8		85		
	very dense, wet, grey GRAVELLY SAND	7	124							Sand and Screen
		7.5	123.5							
		8	123	74		9		74		
		8.5	122.5	50/150		10A 10B		50/150		
	hard, moist, grey CLAYEY SANDY SILT, trace gravel (TILL)									
	END OF BOREHOLE									

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CLIENT: The Brock Zents Partnership	METHOD: Solid Stem Augering and Split Spoon	**BH No.: MW102S**
PROJECT: Proposed Residential Development	PROJECT ENGINEER: VN	ELEV. (m) 130.683
LOCATION: 2660-2680 Brock Road, Pickering, ON	NORTHING:	EASTING: PROJECT NO.: CA18-041

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Shear Strength (kPa) / N-Value (Blows/300mm)	Water Content (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	SPT(N)	Well Construction	REMARKS
▼		Straight auger to 3.66 m to install the monitoring well	0 0.5 1 1.5 2 2.5 3 3.5	130.5 130 129.5 129 128.5 128 127.5	40 80 120 160 20 40 60 80	20 40 60 80				Bentonite Sand Sand and Screen	Borehole open and groundwater measured at 2.53 mbgs on completion. Groundwater was measured at 2.53 m on June 26, 2019.
		END OF BOREHOLE									

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CLIENT: Patheon Developers(Ontario) Inc.	PROJECT NO.: CT2694.03	**RECORD OF: BH201**
ADDRESS: 2660-2680 Brock Rd, Pickering ON		
CITY/PROVINCE: 2660-2680 Brock Rd, Pickering ON	NORTHING (m): 4860080.93	EASTING (m): 653626.84 / ELEV. (m) 129.65
CONTRACTOR: Pontil	METHOD: Solid Stem Auger and Spilt Spoon	
BOREHOLE DIAMETER (cm): 16.51 / WELL DIAMETER (cm):	SCREEN SLOT #: / SAND TYPE:	SEALANT TYPE:

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		FILL moist, brown clayey silt, trace sand trace rootlets	0	129.5	5		1		37	<5p/0p	PAHs, M&I, PHCs, VOCs		
		stiff to hard moist, brown CLAYEY SANDY SILT trace gravel (TILL)	0.5	129									
			1	128.5	19		2A		100	<5p/0p			
							2B		100	<5p/0p	Boron		
			1.5	128	13		3		100	<5p/0p			
			2	127.5									
			2.5	127	35		4		100	<5p/0p			
			3	126.5									
					44		5		100	<5p/1p			
		very dense, wet, grey SILTY SAND	3.5	126									
			4	125.5	67		6		100	<5p/0p			
		very dense, wet, grey SANDY SILT	4.5	125									
▼			5	124.5	75		7		100	<5p/0p			
			5.5	124	75		8		100	<5p/0p			
			6	123.5									
			6.5	123	85		9		100	<5p/0p			
		END OF BOREHOLE											

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LOGGED BY: SJ	DRILLING DATE: 04-Oct-2021
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CLIENT: Patheon Developers(Ontario) Inc.	PROJECT NO.: CT2694.03	**RECORD OF: BH202**
ADDRESS: 2660-2680 Brock Rd, Pickering ON		
CITY/PROVINCE: 2660-2680 Brock Rd, Pickering ON	NORTHING (m):	EASTING (m): ELEV. (m)
CONTRACTOR: Pontil	METHOD:	
BOREHOLE DIAMETER (cm):	WELL DIAMETER (cm):	SCREEN SLOT #: SAND TYPE: SEALANT TYPE:

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) 40 80 120 160 / N-VALUE (Blows/300mm) 20 40 60 80	WATER CONTENT (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		FILL moist, brown clayey silt, trace sand, trace rootlets layer of crushed limestone	0		12		1		70	<5p/0p	M&I, PAHs		
		FILL moist, light brown silty sand, trace gravel layer of crushed limestone	0.5 1		43		2		66	<5p/0p			
		hard, moist, brown CLAYEY SANDY SILT trace gravel (TILL)	1.5		42		3A		100	<5p/0p	BTEX F1-F4		
			2				3B		100	<5p/1p			
			2.5		34		4		100	<5p/0p			
			3										
			3.5		64		5		100	<5p/0p			
			4								pH, VOCs, PHCs, PAHs		
▼					44		6		100	<5p/0p			
		dense to very dense wet, brown SAND	4.5										
			5		42		7		100	<5p/0p			
			5.5		94/6"		8		100	<5p/0p			
		very dense, wet, grey SANDY SILT	6										
			6.5		90/6"		9		100	<5p/0p			
		END OF BOREHOLE											

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CLIENT: Patheon Developers(Ontario) Inc.		PROJECT NO.: CT2694.03	**RECORD OF: MW203**
ADDRESS: 2660-2680 Brock Rd, Pickering ON			
CITY/PROVINCE: 2660-2680 Brock Rd, Pickering ON	NORTHING (m): 4860130.02	EASTING (m): 653584.45	ELEV. (m) 131.61
CONTRACTOR: Pontil	METHOD: Solid Stem Auger and Spilt Spoon		
BOREHOLE DIAMETER (cm): 12.7	WELL DIAMETER (cm): 5.08	SCREEN SLOT #: 10	SAND TYPE: Silica #2	SEALANT TYPE: bentonite

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) / N-VALUE (Blows/300mm)	WATER CONTENT (%) PL W.C. LL	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		TOPSOIL 70mm	0	131.5	13		1A		65	<5p/1p			Borehole dry at completion
		SAND AND GRAVEL 100mm											
		FILL moist, brown clayey sandy silt, trace gravel	0.5	131	13		1B		100	<5p/1p	PAHs		
		very stiff to hard moist, brown CLAYEY SANDY SILT trace gravel (TILL)	1	130.5	16		2		100	<5p/1p	M&I		
			1.5	130									
			2	129.5	35		3		100	<5p/0p			
			2.5	129	36		4		100	<5p/1p	BTEX, PHCs		
			3	128.5									
		dense to very dense moist, brown SILTY SAND	3.5	128	39		5		100	<5p/0p			
			4				6A		100	<5p/1p			
		very dense to dense moist, grey SANDY SILT trace clay, trace gravel (TILL)		127.5	87/6"		6B		100	<5p/1p			
			4.5	127									
			5		50		7		100	<5p/0p	PAHs, PHCs, VOCs, pH		
				126.5									
			5.5	126	46		8		100	<5p/1p			
			6	125.5									
			6.5	125	48		9		100	<5p/1p			
		END OF BOREHOLE											

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LOGGED BY: SJ	DRILLING DATE: 05-Oct-2021
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CLIENT: Patheon Developers(Ontario) Inc.	PROJECT NO.: CT2694.03	**RECORD OF: BH204**
ADDRESS: 2660-2680 Brock Rd, Pickering ON		
CITY/PROVINCE: 2660-2680 Brock Rd, Pickering ON	NORTHING (m): 4860198.21	EASTING (m): 653566.49 / ELEV. (m) 131.08
CONTRACTOR: Pontil	METHOD: Solid Stem Auger and Spite Spoon	
BOREHOLE DIAMETER (cm): -	WELL DIAMETER (cm):	SCREEN SLOT #: / SAND TYPE: / SEALANT TYPE:

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) 40 80 120 160 / N-VALUE (Blows/300mm) 20 40 60 80	WATER CONTENT (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		TOPSOIL 100mm FILL loose, moist, brown sandy silt	0	131	4		1		98	<5p/0p	PAHs, M&I, PHCs, VOCs		Borehole dry at completion
		very stiff to hard moist, brown CLAYEY SANDY SILT trace gravel (TILL)	0.5 1 1.5 2 2.5 3	130.5 130 129.5 129 128.5 128	27 33 57 43		2 3 4 5		98 98 98 98	<5p/1p <5p/1p <5p/1p <5p/1p			
		very dense, moist, grey SANDY SILT trace clay, trace gravel (TILL)	3.5 4 4.5 5 5.5 6 6.5	127.5 127 126.5 126 125.5 125 124.5	77 88/6" 85/6" 88/6"		6 7 8 9		100 100 100 100	<5p/1p <5p/1p <5p/1p <5p/1p			
		END OF BOREHOLE											

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CLIENT: Patheon Developers(Ontario) Inc.	PROJECT NO.: CT2694.03	**RECORD OF:**	
ADDRESS: 2660-2680 Brock Rd, Pickering ON		**BH205**	
CITY/PROVINCE: 2660-2680 Brock Rd, Pickering ON	NORTHING (m): 4860175.78	EASTING (m): 653592.76	ELEV. (m) 130.07
CONTRACTOR: Pontil	METHOD: Solid Stem Auger and Spilt Spoon		
BOREHOLE DIAMETER (cm): 16.51	WELL DIAMETER (cm):	SCREEN SLOT #:	SAND TYPE:	SEALANT TYPE:

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) 40 80 120 160 / N-VALUE (Blows/300mm) 20 40 60 80	WATER CONTENT (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		TOPSOIL 100mm	0	130									
		FILL firm, moist, dark brown sandy clayey silt	0.5	129.5	7		1		49	5p/0p	PHCs, VOCs		Borehole dry at completion
		FILL compact, moist, brown sand, trace gravel	1	129	16		2		65	<5p/0p	PAHs, M&I		
		hard, moist, brown CLAYEY SANDY SILT, tr. gravel (TILL)	1.5	128.5			3A		98	<5p/1p			
		dense to very dense moist, brown GRAVELLY SAND	2	128	35		3B			<5p/1p			
		very dense, moist, brown SANDY SILT trace clay, trace gravel (TILL)	2.5	127.5	76		4		92	5p/1p			
			3	127									
			3.5	126.5	52		5		50	5p/1p			
		hard, moist, grey CLAYEY SANDY SILT trace gravel (TILL)	4	126	84/6"		6		100	<5p/1p			
		dense to very dense wet, grey SANDY SILT trace clay, trace gravel (TILL)	4.5	125.5									
			5	125	92/6"		7		100	<5p/0p			
			5.5	124.5	43		8		100	<5p/0p			
			6	124									
			6.5	123.5	71		9		100	5p/1p			
		END OF BOREHOLE											

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LOGGED BY: SJ	DRILLING DATE: 04/5-Oct-2021
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CLIENT: Patheon Developers(Ontario) Inc.		PROJECT NO.: CT2694.03	**RECORD OF: MW206**
ADDRESS: 2660-2680 Brock Rd, Pickering ON			
CITY/PROVINCE: 2660-2680 Brock Rd, Pickering ON	NORTHING (m): 4860163.27	EASTING (m): 653631.28	ELEV. (m) 130.56
CONTRACTOR: Pontil	METHOD: Solid Stem Auger and Spilt Spoon		
BOREHOLE DIAMETER (cm): 12.7	WELL DIAMETER (cm): 5.08	SCREEN SLOT #: 10	SAND TYPE: Silica #2	SEALANT TYPE: Bentonite

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SHEAR STRENGTH (kPa) 40 80 120 160 / N-VALUE (Blows/300mm) 20 40 60 80	WATER CONTENT (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	RECOVERY (%)	SV/TOV (ppm or %LEL) (new title)	LABORATORY TESTING	WELL INSTALLATION	REMARKS
		TOPSOIL 70mm	0	130.5	12		1A		98	<5p/1p	PHCs, VOCs		
		FILL, moist, brown, sand and gravel											
		FILL, moist, brown, clayey silty sand trace rootlets	0.5	130			1B			<5p/1p	M&I, PAHs		
		compact, moist, brown SANDY SILT	1	129.5	21		2		100	<5p/1p			
			1.5	129									
			2	128.5	28		3		100	<5p/1p			
		very stiff, moist, brown CLAYEY SANDY SILT trace gravel (TILL)	2.5	128	21		4		66	<5p/1p			
		very dense, moist, grey SANDY SILT occasional layers of clayey silt	3	127.5									
			3.5	127	70/6"		5		83	<5p/1p			
			4	126.5	72		6		100	<5p/1p			
			4.5	126									
			5	125.5	72		7		100	<5p/1p			
			5.5	125	58		8		100	<5p/1p			
			6	124.5									
		END OF BOREHOLE											

TERRAPEX

LOGGED BY: SJ	DRILLING DATE: 05-Oct-2021
INPUT BY: MW	MONITORING DATE: 27-Oct-21
REVIEWED BY: VN	PAGE 1 OF 1

APPENDIX IV

MECP WATER WELL RECORDS

Water Well Records

July 23, 2019
9:50:30 AM

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
AJAX TOWN CON 04 015	17 653136 4859608 W	1987-11 2662				NU		1909056 (10074)	LOAM 0001 FSND GRVL 0006 BRWN CLAY GRVL STNS 0013 GREY CLAY SLTY GRVL 0035 GREY CLAY SLTY GRVL 0054 GREY CLAY DNSE STNS 0072
AJAX TOWN CON 04 015	17 653186 4859600 W	1987-10 2662				NU	0001	1909057 (10073)	LOAM 0001 FSND GRVL 0004 BRWN CLAY GRVL STNS 0037 GREY CLAY GRVL STNS 0094 BRWN FSND SLTY 0108 GREY CLAY DNSE 0133 GREY SAND CLAY SLTY 0147
AJAX TOWN CON 04 015	17 653188 4859684 W	1987-11 2662				MN		1909058 (10090) A	LOAM 0001 FSND STNS 0008 FGVL STNS 0012 GREY MGVL CLAY SAND 0023 CGVL SAND 0049 SAND 0051
AJAX TOWN CON 04 016	17 653309 4859589 W	1987-11 2662	6	FR 0030 FR 0050	20//2/4:0	MN	0032 15	1909054 (10066)	BRWN SAND STNS 0002 CSND 0008 FSND MSND FGVL 0036 SAND SLTY FSND 0041 GREY SAND FSND SLTY 0047
PICKERING TOWN	17 653753 4860416 W	2014-07 7472	2.04			MO	0015 10	7230444 (Z195420) A168405	BRWN CLAY SILT LOOS 0007 GREY CLAY PCKD 0012 GREY FSND CLAY PCKD 0025
PICKERING TOWN	17 653785 4860448 W	6490						7178977 (Z117524) A091044 A	
PICKERING TOWN	17 653786 4860447 W	6490						7178978 (Z117523) A	
PICKERING TOWN	17 653786 4860404 W	2012-08 7241	2			MT	0003 10	7186323 (Z154507) A135020	BRWN FILL 0002 BRWN LOAM 0004 BRWN TILL SILT WBRG 0013
PICKERING TOWN	17 653643 4860450 W	2012-08 7241	2			MT	0005 10	7186324 (Z154508) A109845	BRWN FILL 0003 BRWN TILL SILT 0008 BRWN SAND SILT 0010 BRWN SAND 0012 GREY SAND SILT WBRG 0015
PICKERING TOWN	17 653758 4860640 W	2012-08 7241	2			MT	0003 9	7186325 (Z154506) A135023	BRWN TILL 0005 GREY TILL SILT 0012
PICKERING TOWN	17 653681 4860616 W	2011-05 4011				OT		7164019 (Z126670) A	
PICKERING TOWN	17 653814 4859711 W	2013-12 7472	2.04			MO	0020 10	7218791 (Z183812) A161395	BRWN FILL LOOS 0005 BRWN SILT GRVL DNSE 0015 GREY GRVL DNSE 0030
PICKERING TOWN	17 653677 4860458 W	2011-05 4011	4.5			OT		7164015 (Z126674) A	
PICKERING TOWN	17 653641 4860382 W	2014-07 7472	2.04			MO	0010 10	7230445 (Z195419) A168404	BRWN CLAY SILT LOOS 0007 GREY FSND PCKD 0012 GREY CLAY PCKD 0020

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
PICKERING TOWN	17 653709 4860353 W	2014-07 7472	2.04			MO	0008 4	7230446 (Z195418) A168401	BRWN CLAY SILT LOOS 0007 GREY FSND PCKD 0012
PICKERING TOWN	17 653794 4860648 W	2012-08 7241	2			MT	0003 10	7186326 (Z154505) A135025	BRWN SILT SAND WBRG 0005 GREY SILT SAND WBRG 0010 GREY SILT CLAY 0013
PICKERING TOWN	17 653784 4860645 W	2011-05 4011	1.76			OT		7164018 (Z126671) A085577 A	
PICKERING TOWN	17 653777 4860385 W	2014-07 7472	2.04			MO	0008 9	7230447 (Z195421) A168406	BRWN CLAY SILT LOOS 0007 GREY FSND CLAY PCKD 0017
PICKERING TOWN	17 653612 4860520 W	2011-05 4011	1.97			OT		7164016 (Z126673) A	0008 SAND 0012
PICKERING TOWN	17 653797 4860631 W	2010-02 7241	1.5			MT	0009 5	7142121 (Z100137) A091035	BRWN SAND SILT LOOS 0008 GREY SILT CLAY DNSE 0014
PICKERING TOWN	17 653865 4860525 W	2011-05 4011	1.97			OT		7164014 (Z126682) A	
PICKERING TOWN	17 653864 4860525 W	2011-05 4011	1.97			OT		7164013 (Z126681) A	
PICKERING TOWN	17 653876 4860538 W	2011-05 4011	1.97			OT		7164012 (Z126675) A	0020 SAND 0025
PICKERING TOWN	17 653784 4860437 W	2010-02 7241	1.5			MT	0009 5	7142123 (Z100138) A091045	BRWN SAND SILT LOOS 0008 GREY SILT CLAY DNSE 0014
PICKERING TOWN	17 653801 4860631 W	2010-02 7241	4.03			MT	0010 5	7142122 (Z100136) A085577	BRWN SAND SILT SOFT 0008 GREY SILT DNSE 0015
PICKERING TOWN	17 653789 4859585 W	2017-08 7215						7294555 (C38956) A232297 P	
PICKERING TOWN	17 653229 4859574 W	2009-07 7247	1.97	UT 0007		NU MO	0005 5	7130476 (Z94005) A087578	BRWN LOAM SAND SLTY 0002 BRWN TILL SAND GRVL 0007 GREY SILT TILL SNDY 0010 BRWN SAND TILL GRVL 0013 BRWN SAND DNSE 0016
PICKERING TOWN	17 653041 4859945 W	2006-06 6809	2				0030 5	1918341 (Z45789) A031420	BRWN LOAM 0001 BRWN SILT SAND 0020 GREY CLAY SILT SAND 0035
PICKERING TOWN	17 653808 4860651 W	2011-05 4011	1.97			OT		7164017 (Z126672) A	

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
PICKERING TOWN	17 653823 4859820 W	2016-02 7247	2			TH MO	0020 20	7281320 (Z228879) A178968	BRWN CLAY SLTY HARD 0040
PICKERING TOWN	17 653695 4860132 W	2017-05 7383	2			TH	0045 10	7290301 (Z257766) A226526	SAND GRVL SHLE 0055
PICKERING TOWN	17 653570 4860334 W	2016-06 7230						7282153 (C35896) A203340 P	
PICKERING TOWN	17 653504 4860301 W	2016-09 7523	36		15///:			7271724 (Z236437) A	
PICKERING TOWN	17 653688 4860243 W	2017-05 7383	2			TH	0015 10	7290302 (Z257765) A226527	
PICKERING TOWN	17 653492 4860308 W	2016-09 7523			7///:			7271723 (Z236436) A	
PICKERING TOWN	17 653564 4860330 W	2016-06 7230						7267980 (C33913) A203340 P	
PICKERING TOWN	17 653714 4860352 W	2016-05 7147						7263270 (C32458) A168401 P	
PICKERING TOWN	17 653892 4859890 W	2016-02 7247	2			MT	0015 10	7261559 (Z214121) A187628	BRWN SILT CLAY LOOS 0002 GREY SILT SAND 0025
PICKERING TOWN	17 653539 4860078 W	2016-01 7501	2			MO	0015 10	7258995 (Z224066) A196850	BRWN LOAM SOFT 0003 BRWN SAND SOFT 0012 GREY CLAY SILT SOFT 0025
PICKERING TOWN	17 653595 4860472 W	2015-04 7241	2			MT	0003 10	7242048 (Z208069) A180506	BRWN SAND GRVL SILT 0013
PICKERING TOWN	17 653627 4860481 W	2015-04 7241	2			MT	0003 10	7242047 (Z208068) A180504	BRWN SILT SAND GRVL 0010 GREY SILT SAND GRVL 0013
PICKERING TOWN	17 653649 4860450 W	2015-04 7241	2			MT	0003 10	7242046 (Z208067) A180350	BRWN SILT SAND 0010 GREY SILT SAND ROCK 0013
PICKERING TOWN	17 653624 4860452 W	2015-04 7241	2			MT	0003 10	7242045 (Z208070) A180319	BRWN SAND 0010 GREY SILT SAND GRVL 0013
PICKERING TOWN	17 653786 4860407 W	2013-01 6490						7231822 (C08462) P	

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
PICKERING TOWN	17 653733 4860370 W	2014-12 7241	2			MT	0010 10	7236455 (Z201946) A176523	BRWN SAND CLAY 0003 BRWN CLAY 0016 GREY CLAY 0020
PICKERING TOWN	17 653733 4860370 W	2014-12 7241	2			MT	0024 10	7236454 (Z201945) A176556	BRWN SAND CLAY 0003 BRWN CLAY 0016 GREY CLAY 0034
PICKERING TOWN	17 653671 4860323 W	2014-12 7241	2			MT	0010 10	7236453 (Z201944) A176555	BRWN SAND SILT 0020
PICKERING TOWN	17 653617 4860345 W	2017-05 7383	2			TH	0020 10	7290303 (Z257763) A226246	SAND WBRG 0030
PICKERING TOWN	17 653600 4860360 W	2017-05 7383	2			TH	0020 10	7290304 (Z257764) A226247	SAND WBRG 0050
PICKERING TOWN	17 653594 4860413 W	2017-05 7383	2			TH	0030 10	7290305 (Z257762) A226250	SAND WBRG 0044
PICKERING TOWN	17 653597 4860434 W	2015-04 7241	2			MT	0003 10	7242044 (Z208066) A180318	BRWN SAND 0011 GREY SILT SAND WBRG 0013
PICKERING TOWN 03 019	17 653735 4859843 W	1992-09 3129	6	FR 0150	5/150/4/2:30	PS		1911577 (119132)	LOAM 0001 CLAY GRVL 0025 BLDR 0027 GRVL CLAY 0037 BLDR 0039 GRVL CLAY 0053 SAND 0058 SHLE SOFT 0150
PICKERING TOWN 03 019	17 653732 4860078 W	2006-12 3406						7040465 (Z56845) A	
PICKERING TOWN 03 020	17 653027 4860476 W	2006-12 3406						7040464 (Z56846) A	
PICKERING TOWN CON 03 017	17 654027 4860619 W	2010-02 7067	6.26 6.26	GS 0150	42/183/8/1:0	IR		7147452 (Z107441) A067899	BRWN LOAM 0002 BRWN SAND SOFT 0012 GREY CLAY GRVL STNS 0023 GREY CLAY SOFT 0055 GREY CLAY GRVL HARD 0092 BLCK SHLE SOFT 0215 GREY LMSN HARD 0234
PICKERING TOWN CON 03 018	17 653949 4859949 L	2001-01 2662				DO		1914932 (216699) A	BRWN LOAM 0001 BRWN CLAY SNDY 0004 BRWN CLAY BLDR 0016 GREY HPAN 0026 GREY HPAN GRVL STNS 0042 GREY CLAY GRVL SLTY 0056 GREY SILT WBRG DRTY 0066 GREY CLAY 0080 GREY SILT WBRG 0088 BLCK SHLE 0145
PICKERING TOWN CON 03 018	17 653949 4859949 L	2002-01 2662						1915902 (236760) A	
PICKERING TOWN CON 03 018	17 653949 4859949 L	2001-01 2662	6 6	FR 0050	21/33/4/3:	DO	0046 4	1914931 (228234)	BRWN LOAM 0001 BRWN CLAY SNDY 0004 BRWN CLAY STNS 0006 BRWN CLAY BLDR 0020 GREY HPAN 0040 BRWN SAND GRVL WBRG 0050
PICKERING TOWN CON 03 018	17 653949 4859949 L	2000-12 2662	6 6	FR 0066	6/18/6/2:	DO	0063 3	1914965 (216689)	BLCK LOAM 0001 BRWN SAND CLAY GRVL 0009 GREY CLAY SLTY GRVL 0029 GREY SAND SLTY 0042 GREY SAND SLTY GRVL 0062 GREY SAND GRVL 0066

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
PICKERING TOWN CON 03 018	17 653949 4859949 L	2003-01 6974				DO		1916257 (250276) A	
PICKERING TOWN CON 03 018	17 653650 4860322 W	2014-08 4645	36			NU		7230704 (Z193415) A	
PICKERING TOWN CON 03 018	17 653949 4859949 L	2002-10 6874	30	FR 0029	29/43/25/2:0	DO		1916160 (252933)	BLUE CLAY 0043
PICKERING TOWN CON 03 018	17 653949 4859949 L	2002-09 5459						1916076 (248694) A	BRWN FILL 0002 BRWN CLAY SNDS 0014 GREY CLAY STNY HARD 0020 GREY CLAY SNDY 0049 BLCK SHLE 0055
PICKERING TOWN CON 03 018	17 653737 4860096 W	2014-08 4645	6			NU		7230705 (Z193411) A	
PICKERING TOWN CON 03 018	17 653949 4859949 L	2002-02 2662						1915903 (236759) A	BRWN CLAY GRVL SNDY 0001 BLCK LOAM 0002 BRWN CLAY GRVL SNDY 0009 GREY CLAY GRVL 0015 GREY CLAY 0082 GREY SHLE 0116
PICKERING TOWN CON 03 018	17 653691 4860264 W	6874	30	FR	17/17/3/1:0	DO		1912381 (158021)	CHRT 0013 CHRT 0017
PICKERING TOWN CON 03 018	17 653949 4859949 L	2001-02 2662	6 6	FR 0086 FR 0154	49/100/3/3:10	DO		1915273 (228260)	BRWN LOAM SOFT 0002 BRWN SAND GRVL CLAY 0015 GREY CLAY GRVL BLDR 0030 GREY SAND GRVL SILT 0054 GREY SAND SILT 0064 GREY CLAY GRVL LOOS 0086 BLCK SHLE SOFT 0125 BLCK LMSN SOFT 0165
PICKERING TOWN CON 03 018	17 653949 4859949 L	2001-06 2662				NU		1915291 (228320) A	
PICKERING TOWN CON 03 018	17 653949 4859949 L	2001-05 2662						1915300 (228795) A	
PICKERING TOWN CON 03 018	17 653949 4859949 L	2002-03 3136						1915680 (242093) A	
PICKERING TOWN CON 03 018	17 653949 4859949 L	2002-02 2662						1915905 (236758) A	BRWN SAND GRVL 0001 BLCK LOAM 0002 BRWN CLAY GRVL SNDY 0009 GREY CLAY GRVL 0014 GREY SAND GRVL SLTY 0040 GREY CLAY 0083 GREY SHLE 0090
PICKERING TOWN CON 03 018	17 653724 4860085 W	1991-10 5459				DO		1911297 (85088)	BRWN CLAY 0003 BRWN GRVL 0009 GREY CLAY 0024 GREY SILT CLAY 0035
PICKERING TOWN CON 03 018	17 653650 4860322 W	2014-10 4645	36					7234107 (Z183974) A	
PICKERING TOWN CON 03 018	17 653753 4860416 W	7147						7270829 (C34011) A168405 P	
PICKERING TOWN CON 03 018	17 653737 4860096 W	2014-08 4645	36			NU		7230708 (Z193413) A	
PICKERING TOWN CON 03 018	17 653783 4860044 W	1991-10 5459				DO		1911296 (85089)	BRWN CLAY 0012 GREY CLAY 0026 GREY SAND CLAY 0033 GREY CLAY HARD 0075

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
PICKERING TOWN CON 03 018	17 653706 4860251 W	2014-08 4645	36			NU		7230707 (Z193414) A	
PICKERING TOWN CON 03 018	17 653733 4860370 W	7147						7271771 (C34017) A176323 P	
PICKERING TOWN CON 03 018	17 653625 4860463 W	1963-05 2801				IR		4601376 ()	CLAY GRVL BLDR 0004 BLUE CLAY 0011 BLUE CLAY MSND 0014 SILT FSND 0025 GRVL CLAY 0028 GRVL 0030 CLAY 0092 SHLE 0095
PICKERING TOWN CON 03 018	17 653949 4859949 L	2001-12 3136	6	FR 0103	11/15/15/1:0	DO	0106 3	1915533 (229182)	BRWN LOAM 0001 BRWN SAND CLAY STNS 0012 GREY CLAY STNS 0033 GREY CLAY SOFT 0103 GREY MSND CSND 0109 GREY CLAY 0109
PICKERING TOWN CON 03 018	17 653617 4860276 W	1974-11 1413	5 5	FR 0043	14/17/6/2:0	DO		4606020 ()	BRWN CLAY 0008 BRWN SAND CLAY 0016 BLUE CLAY 0042 GREY SAND 0043 GREY CLAY STNS 0085 BLCK SHLE 0136
PICKERING TOWN CON 03 018	17 653735 4860173 W	1968-06 5420	6	FR 0028	0/28/7/2:0	IR	0029 4	4603768 ()	LOAM 0002 CLAY GRVL STNS 0028 MSND 0033
PICKERING TOWN CON 03 018	17 653675 4860243 W	1985-12 2214			0/3/7/15:0	DO		1907556 ()	BRWN CLAY PCKD 0006 BRWN SAND 0008 GREY CLAY SILT PCKD 0016 BRWN GRVL 0018
PICKERING TOWN CON 03 018	17 653822 4859786 W	1998-07 6874				DO		1913702 (187690)	
PICKERING TOWN CON 03 018	17 653421 4860679 W	1998-09 6463	48		9/20//:			1913844 (108722)	
PICKERING TOWN CON 03 018	17 653626 4860380 W	2014-08 4645	5			NU		7230706 (Z193412) A	
PICKERING TOWN CON 03 019	17 653551 4859811 L	2000-11 6874	36	UK 0041	16/40/25/3:	DO		1914879 (222390)	UNKN CMTD 0015 GREY SAND 0041
PICKERING TOWN CON 03 019	17 653677 4859720 W	1995-09 6874	30	FR 0027	0/27//:	DO		1912561 (160730)	BRWN SAND 0028
PICKERING TOWN CON 03 019	17 653551 4859811 L	2000-12 2662	6	FR 0054	11/15/6/3:	DO		1914966 (216681)	BRWN SAND GRVL 0001 BRWN CLAY SNDY 0012 GREY CLAY GRVL 0026 GREY SILT SNDY GRVL 0043 GREY SAND GRVL SILT 0053 GREY GRVL WBRG 0054
PICKERING TOWN CON 03 019	17 653492 4860719 W	1998-09 6463	36		9/25//:			1913843 (196721)	
PICKERING TOWN CON 03 019	17 653644 4859734 W	1966-06 5412	30	FR 0025	15//5/:	DO		4601381 ()	BRWN CLAY 0010 BLUE CLAY 0025 FSND 0028
PICKERING TOWN CON 03 019	17 653304 4859962 W	2010-07 2662						7156177 (Z117968) A062241 A	
PICKERING TOWN CON 03 019	17 653303 4859963 W	2010-07 2662						7156176 (Z117967) A062241 A	

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
PICKERING TOWN CON 03 019	17 653310 4860693 W	1971-11 1556	30	FR 0020	11/25/6/1:0	DO		4605069 ()	BRWN MSND FILL 0001 BRWN LOAM 0002 BRWN MSND STNS 0009 GREY CLAY STNS 0020 GREY MSND GRVL 0026
PICKERING TOWN CON 03 019	17 653485 4860543 W	1970-10 5459	34	FR 0020	15///:	DO		4604690 ()	LOAM 0001 BRWN CLAY STNS 0010 BLUE CLAY STNS 0020 BLCK MSND 0023 BLUE CLAY STNS 0028
PICKERING TOWN CON 03 019	17 653685 4859983 W	1969-06 2214	30	FR 0024	2/20/4/1:0	DO		4604136 ()	BLCK LOAM 0001 BRWN CLAY 0010 GREY CLAY STNS 0024
PICKERING TOWN CON 03 019	17 653638 4860202 W	1955-12 2615	36	FR 0020	15///:	DO		4601378 ()	LOAM CLAY 0002 GREY CLAY STNS 0020 GRVL 0024
PICKERING TOWN CON 03 019	17 653497 4859673 W	1967-09 3102	30					4601383 () A	LOAM 0001 BRWN CLAY 0020 BLUE CLAY 0062
PICKERING TOWN CON 03 019	17 653596 4859888 W	1966-10 5412	30	FR 0020	10//10/:	DO		4601380 ()	LOAM 0001 BRWN CLAY 0008 BRWN CLAY MSND 0015 BLUE CLAY 0020 GRVL 0022
PICKERING TOWN CON 03 019	17 653619 4860005 W	1954-08 2615	36	FR 0028	26///:	DO		4601379 ()	FILL 0003 LOAM GRVL 0006 CLAY MSND 0029 MSND 0032
PICKERING TOWN CON 03 019	17 653551 4859811 L	2003-11 6974				DO		1916807 (265421) A	
PICKERING TOWN CON 03 019	17 653551 4859811 L	2003-01 6974				DO		1916258 (250277) A	
PICKERING TOWN CON 03 019	17 653551 4859811 L	2003-11 6974				DO		1916808 (265420) A	
PICKERING TOWN CON 03 020	17 653162 4859679 L	2002-03 7099				DO		1915728 (231645) A	
PICKERING TOWN CON 03 020	17 653210 4859965 W	2011-11 7219	7.86			NU		7190520 (Z144175) A116518 A	
PICKERING TOWN CON 03 020	17 653162 4859679 L	2002-01 3367	6	UK 0073	13/55/4/2:10	DO	0070 3	1915513 (241021)	BRWN LOAM LOOS 0002 BRWN SAND GRVL CLAY 0012 GREY CLAY SAND STNS 0030 GREY SAND GRVL PCKD 0055 GREY CLAY SAND GRVL 0060 GREY FSND LOOS 0070 GREY GRVL SAND LOOS 0073
PICKERING TOWN CON 03 020	17 653162 4859679 L	2002-03 3367						1915695 (241052)	
PICKERING TOWN CON 03 020	17 653275 4859623 W	1975-04 2104	6	FR 0078	2/72/5/8:0	MN	0073 4	4606580 ()	BRWN BLDR CLAY GRVL 0035 GREY CLAY GRVL 0078 GREY SAND GRVL 0081 GREY SHLE 0082
PICKERING TOWN CON 03 020	17 653182 4860155 W	1998-10 6874	30	FR 0012	3/30//:	DO		1913810 (187702)	BRWN SAND 0030
PICKERING TOWN CON 03 020	17 653162 4859679 L	2001-05 2662						1915279 (228793) A	
PICKERING TOWN CON 03 020	17 653228 4860058 W	1996-11 6874	16 36	FR 0026	7/30/25/2:0	DO		1913052 (174465)	BRWN SAND 0030

TOWNSHIP CON LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION
PICKERING TOWN CON 03 020	17 653162 4859679 L	2001-03 2662	6 6	FR 0084	12/17/5/2:0	DO	0081 3	1915263 (228270)	BRWN LOAM SOFT 0002 BRWN SAND STNS PCKD 0010 GREY SAND CLAY PCKD 0020 GREY CLAY GRVL PCKD 0035 GREY CLAY SAND PCKD 0078 GREY GRVL SAND LOOS 0080 GREY GRVL STNS LOOS 0084
PICKERING TOWN CON 03 020	17 653162 4859679 L	2001-11 7099	6 6	FR 0068	18/58/5/2:0	DO	0069 4	1915523 (231652)	BRWN CLAY SAND 0015 BLUE CLAY 0024 GREY SAND GRVL CLAY 0068 GREY SAND GRVL 0073
PICKERING TOWN CON 03 020	17 653162 4859679 L	2002-03 3367						1915696 (241053)	
PICKERING TOWN CON 04 018	17 653835 4860703 W	1964-10 5412	30	FR 0015 FR 0018	10//1/:	DO		4601431 ()	LOAM 0001 FSND 0006 BLUE CLAY STNS 0018 FSND 0025
PICKERING TOWN CON 04 019	17 653614 4859757 W	2012-11 4102						7193231 (Z154818) A	
PICKERING TOWN CON 04 019	17 653683 4859807 W	2012-11 4102						7193232 (Z154817) A	
PICKERING TOWN CON 08 018	17 653665 4860692 W	1998-11 6874	30	FR 0027	19/27/25/2:30	DO		1913889 (187726)	BRWN GRVL 0027

TOWNSHIP	CON	LOT	UTM	DATE CNTR	CASING DIA	WATER	PUMP TEST	WELL USE	SCREEN	WELL	FORMATION

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		

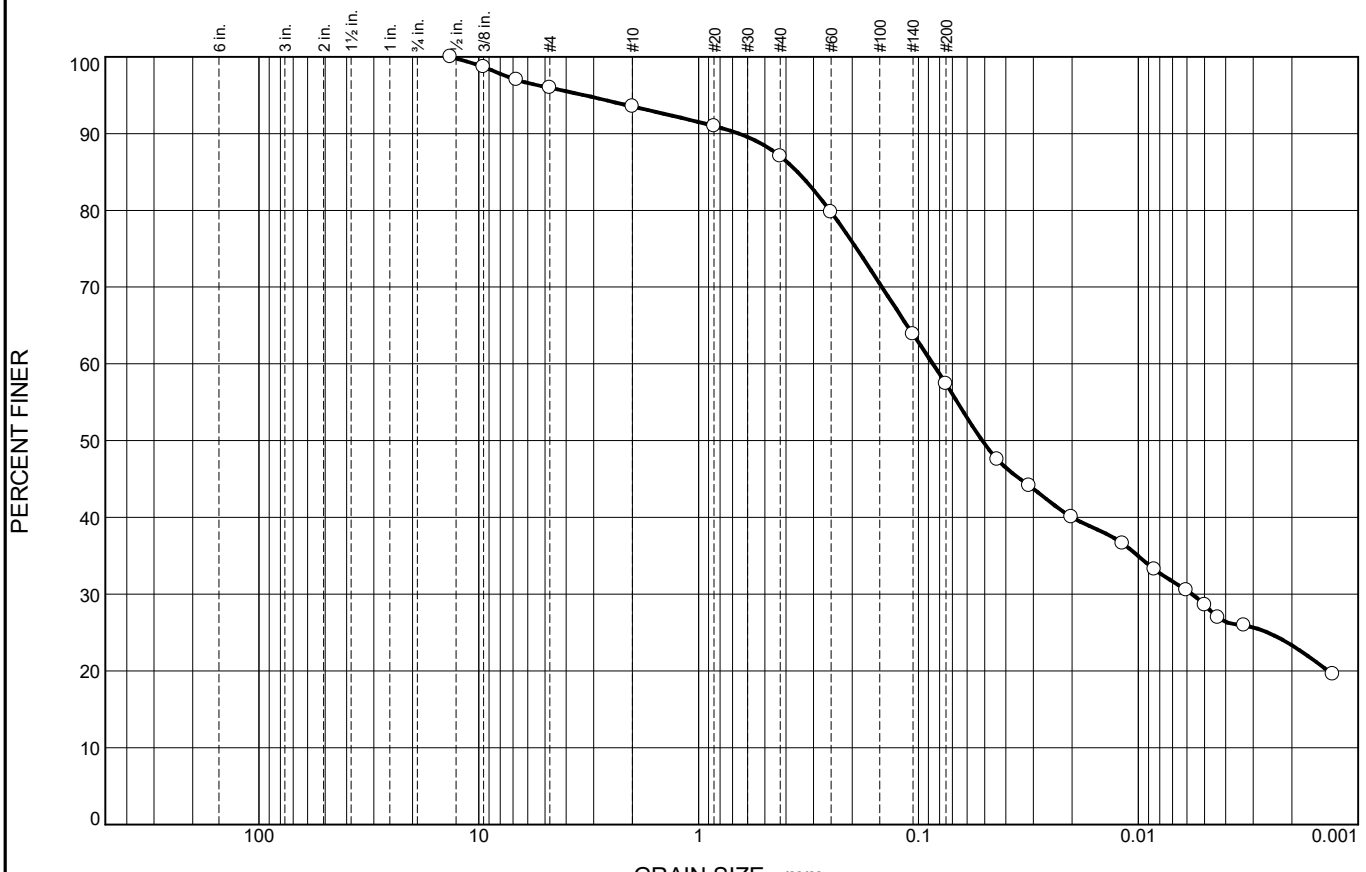
4. Water Detail

Code	Description	Code	Description
FR	Fresh	GS	Gas
SA	Salty	IR	Iron
SU	Sulphur		
MN	Mineral		
UK	Unknown		

APPENDIX V

GRAIN SIZE ANALYSES DISTRIBUTIONS

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	4.0	2.5	6.5	29.6	34.1	23.3

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3551	0.0859	0.0512	0.0057				

Material Description	USCS	AASHTO
○ CLAYEY SILT and SAND, trace Gravel		

Project No. 18-041 **Client:** The Brock Zents Partnership

Project: 2660 - 2680 Brock road, Pickering

○ **Sample Number:** MW1, Sample 4

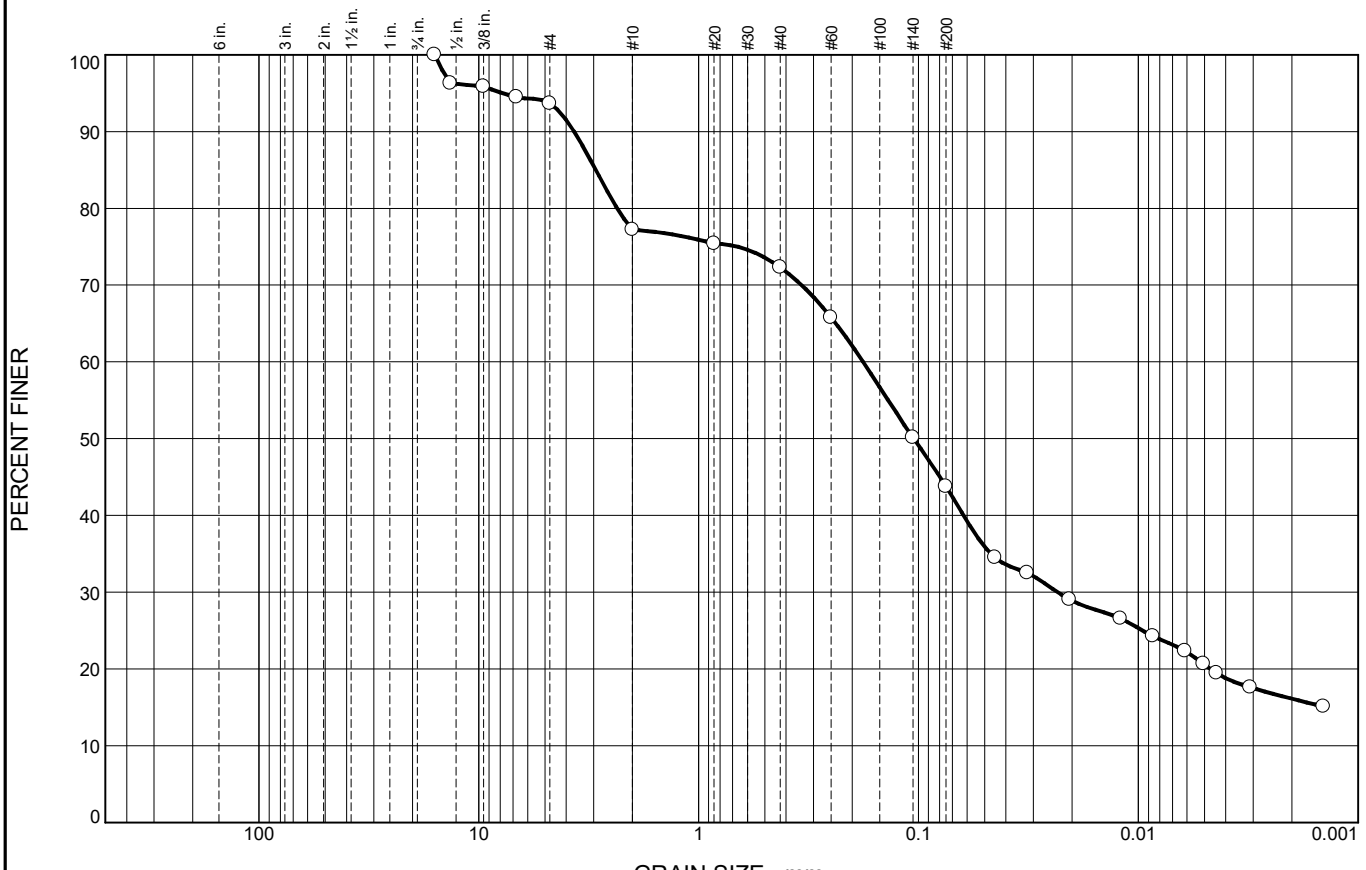
alston associates inc.
consulting engineers

Remarks:

Figure D-1

Tested By: VP **Checked By:** DM

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	6.3	16.5	4.9	28.5	27.7	16.1

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_C	C_u
○			2.9366	0.1786	0.1052	0.0233				

Material Description	USCS	AASHTO
○ SILTY SAND, some Clay, trace Gravel		

Project No. 18-041 **Client:** The Brock Zents Partnership

Project: 2660 - 2680 Brock road, Pickering

○ **Sample Number:** MW5, Sample 6

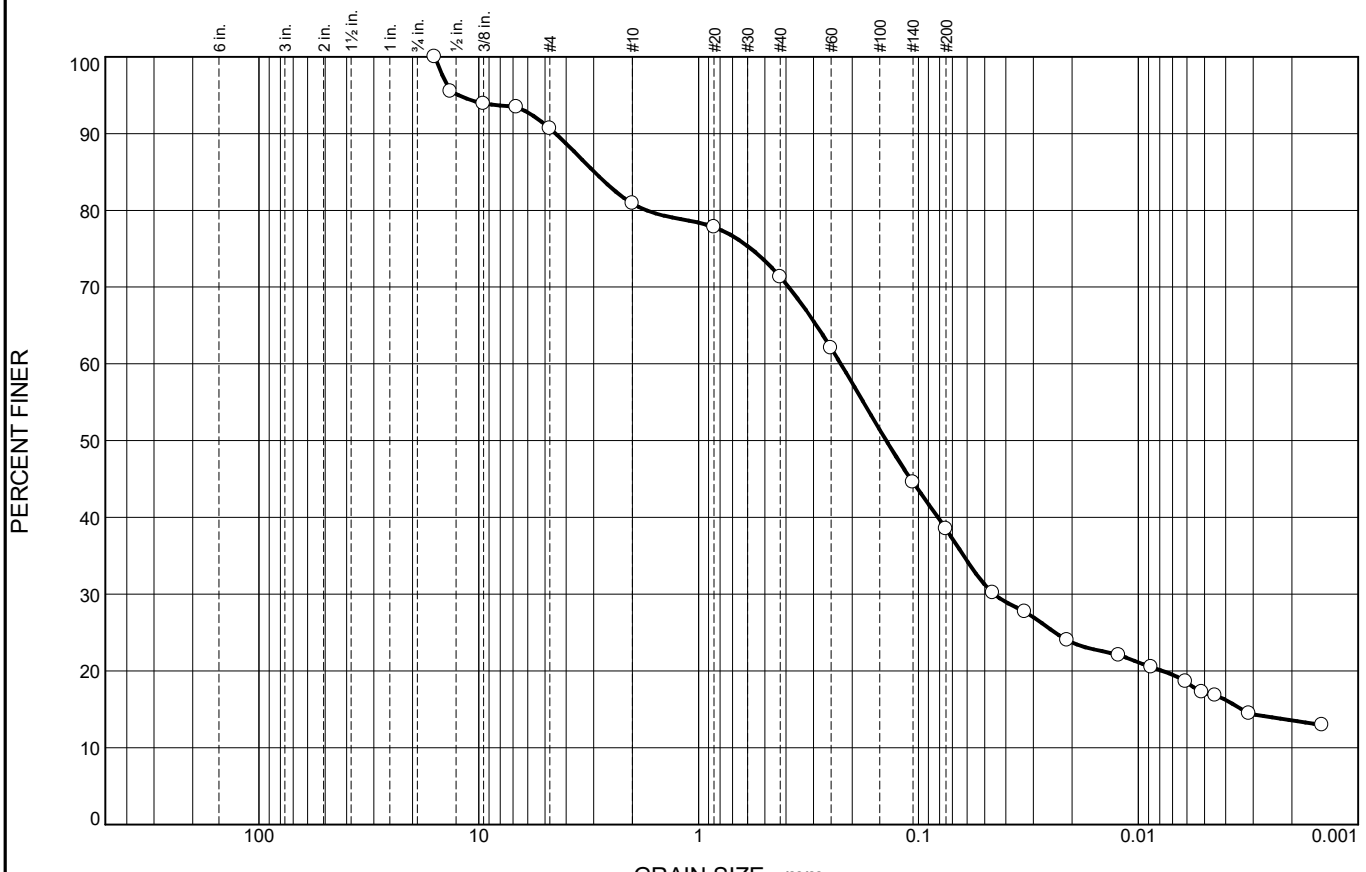
Remarks:

alston associates inc.
consulting engineers

Figure D-2

Tested By: VP **Checked By:** DM

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	9.3	9.8	9.6	32.8	24.9	13.6

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_C	C_u
○			2.9816	0.2258	0.1401	0.0452	0.0034			

Material Description	USCS	AASHTO
○ SILTY SAND, some Clay, trace Gravel		

Project No. 18-041 **Client:** The Brock Zents Partnership

Project: 2660 - 2680 Brock road, Pickering

○ **Sample Number:** BH6, Sample 7

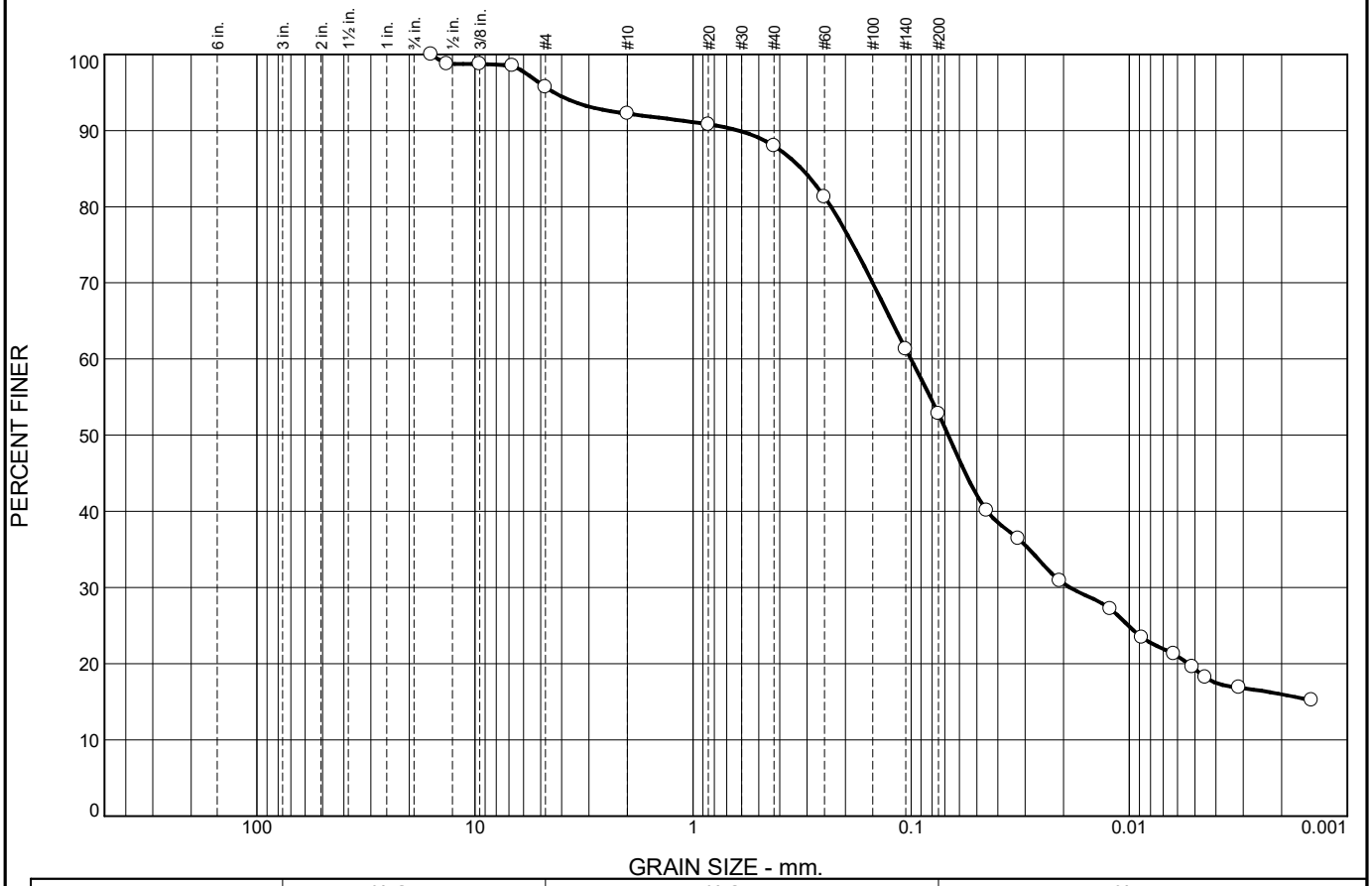
Remarks:

alston associates inc.
consulting engineers

Figure D-3

Tested By: VP **Checked By:** DM

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	4.3	3.5	4.2	35.2	36.8	16.0

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_C	C_u
○			0.3183	0.1003	0.0676	0.0187				

Material Description	USCS	AASHTO
○ SAND and SILT, some Clay, trace Gravel		

Project No. 18-041 **Client:** The Brock Zents Partnership

Project: 2660 - 2680 Brock road, Pickering

○ **Sample Number:** BH9, Sample 8

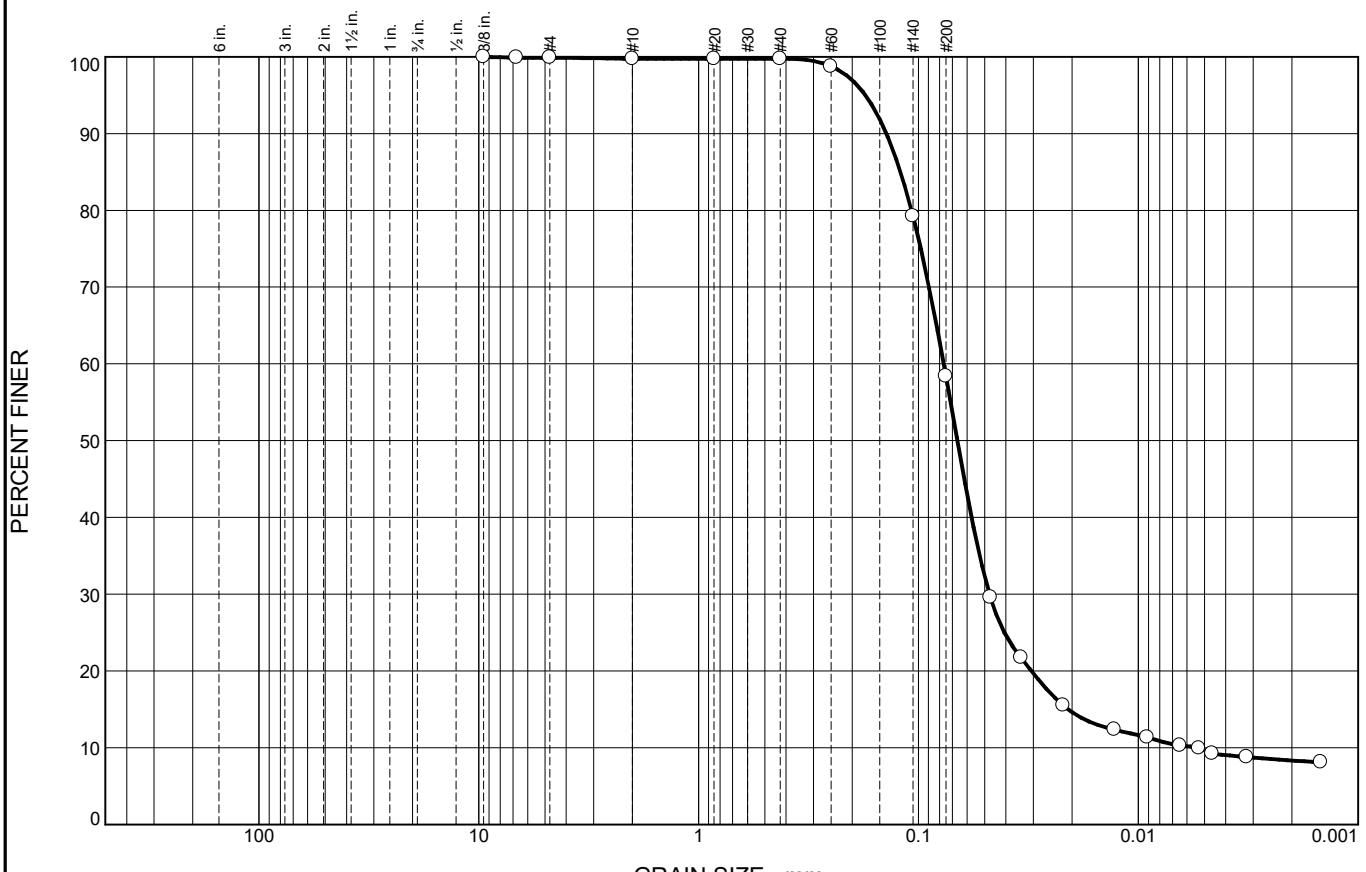
Remarks:

alston associates inc.
consulting engineers

Figure D-4

Tested By: VP **Checked By:** DM

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.1	0.2	0.0	41.3	50.1	8.3

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_C	C_u
○			0.1208	0.0768	0.0665	0.0476	0.0209	0.0054	5.46	14.22

Material Description	USCS	AASHTO
○ SILT and SAND, trace Clay		

Project No. 18-041 **Client:** The Brock Zents Partnership

Project: 2660 - 2680 Brock road, Pickering

○ **Sample Number:** MW4, Sample 5

Remarks:

alston associates inc.
consulting engineers

Figure D-5

Tested By: VP **Checked By:** DM

Particle Size Distribution Report

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	79.7	20.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_C	C_U
○			0.1580	0.1175	0.1064	0.0860	0.0671	0.0557	1.13	2.11

	Material Description	USCS	AASHTO
○	SILTY SAND		

Project No. 18-041 **Client:** The Brock Zents Partnership

Project: 2660 - 2680 Brock road, Pickering

○ **Sample Number:** BH7, Sample 7

Remarks:

alston associates inc.
consulting engineers

Figure D-6

Tested By: VP **Checked By:** DM

Particle Size Distribution Report

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	5.7	5.6	2.4	2.9	63.8	19.6	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_C	C_u
○			0.8440	0.1679	0.1393	0.0954	0.0654	0.0547	0.99	3.07

Material Description	USCS	AASHTO
○ SILTY SAND, some Gravel		

Project No. 18-041 **Client:** The Brock Zents Partnership

Project: 2660 - 2680 Brock road, Pickering

○ **Sample Number:** MW8, Sample 9

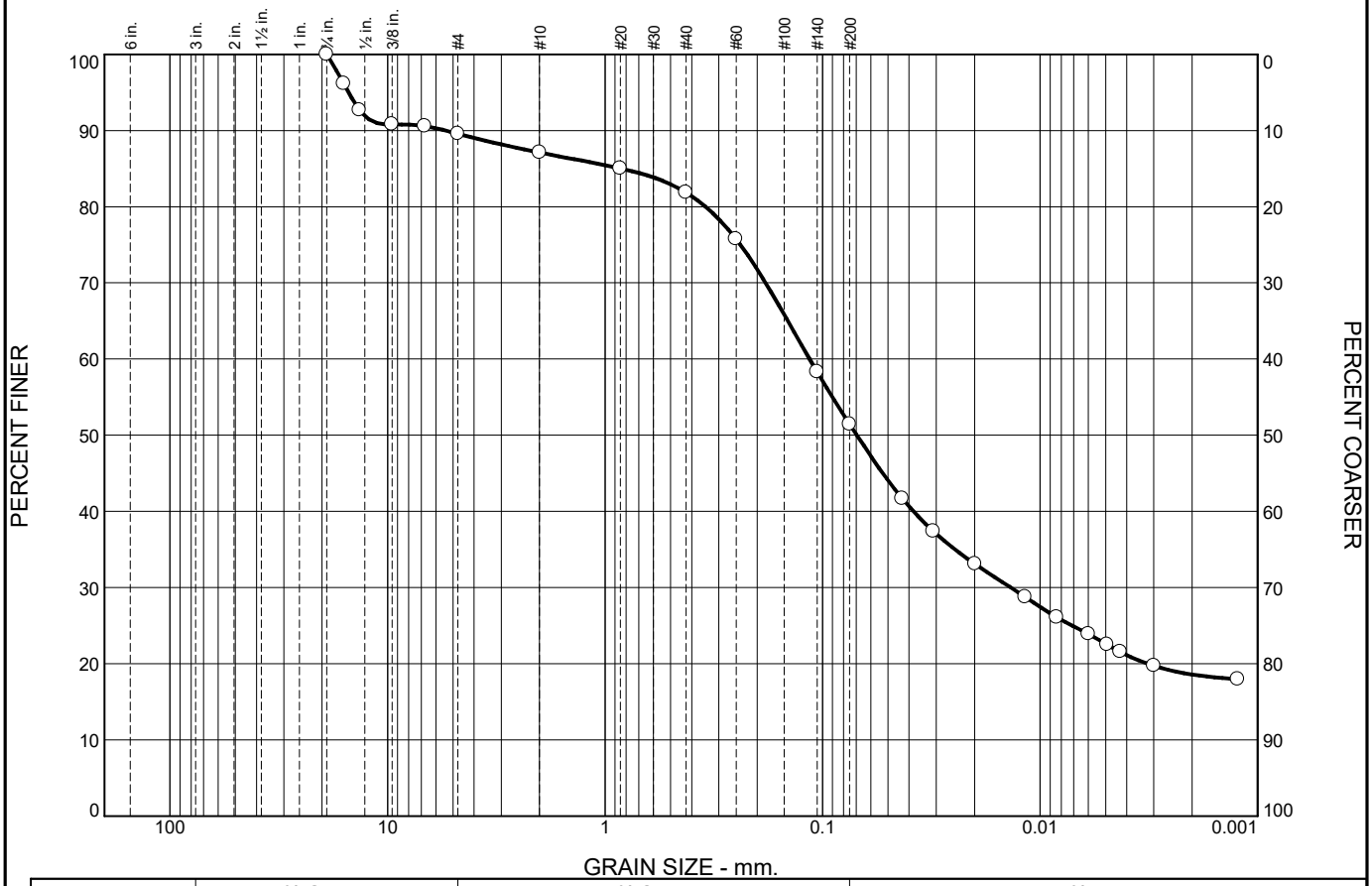
Remarks:

alston associates inc.
consulting engineers

Figure D-7

Tested By: VP **Checked By:** DM

Grain Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	10.4	2.5	5.2	30.4	32.9	18.6

	Colloids	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_C	C_u
○				0.8445	0.1148	0.0695	0.0136				

Material Description	USCS	AASHTO
○ SILTY SAND some clay some gravel		

Project No. 18-041 **Client:** The Brock Zents Partnership

Project: 2660 - 2680 Brock road, Pickering

○ **Sample Number:** MW101, Sample 7

Date: ○ 17 July 2019

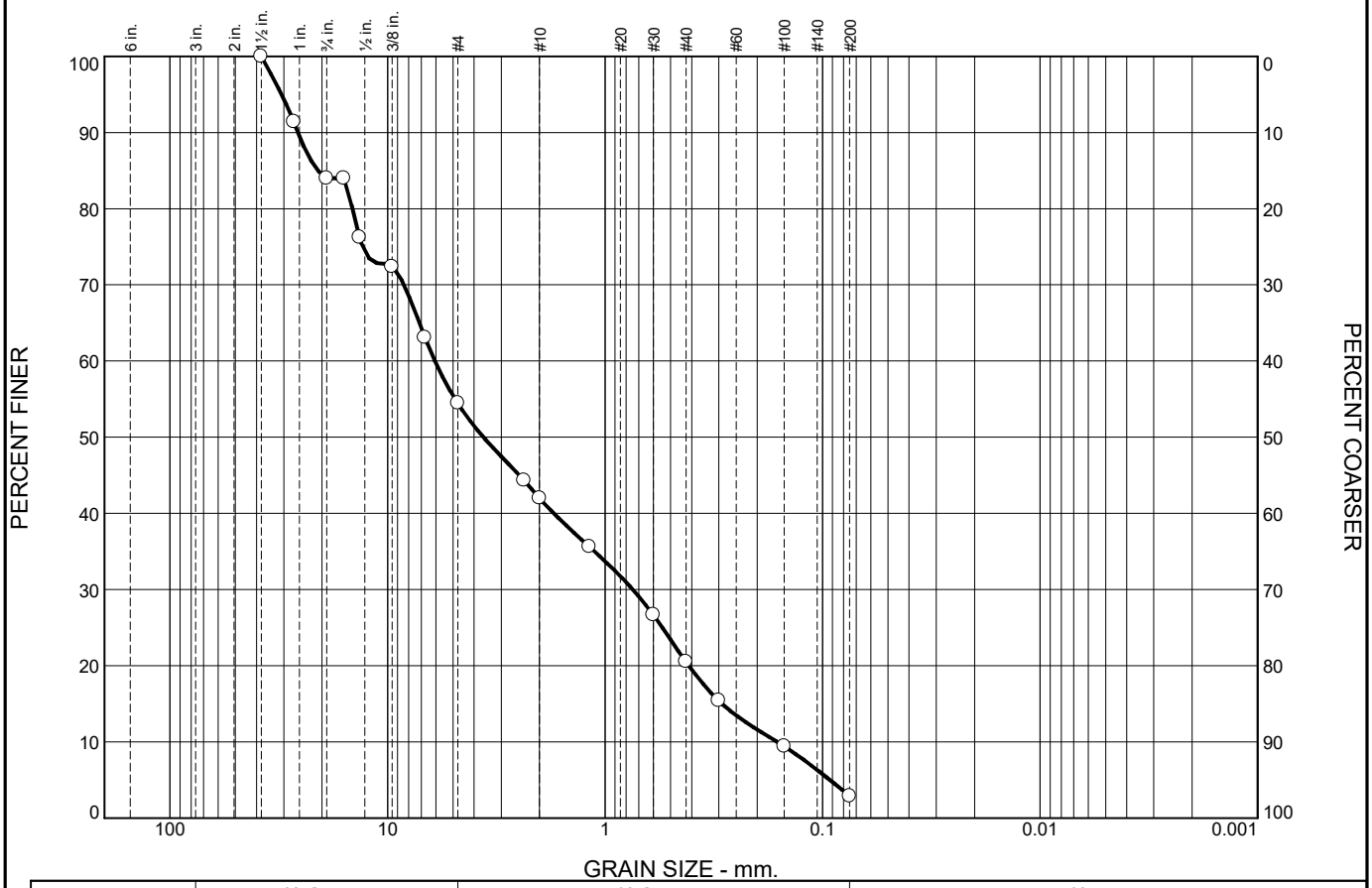
Remarks:

Terrapex

Figure D-8

Tested By: PG **Checked By:** DM

Grain Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	16.0	29.6	12.4	21.5	17.6	2.9	

	Colloids	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_C	C_u
○				20.8576	6.0554	3.6214	0.7460	0.2896	0.1616	0.57	37.47

Material Description	USCS	AASHTO
○ GRAVEL and SAND, trace silt	SP	

Project No. 18-041 **Client:** The Brock Zents Partnership

Project: 2660 - 2680 Brock road, Pickering

○ **Sample Number:** MW102, Sample 8

Date: ○ 19 July 2019

Remarks:

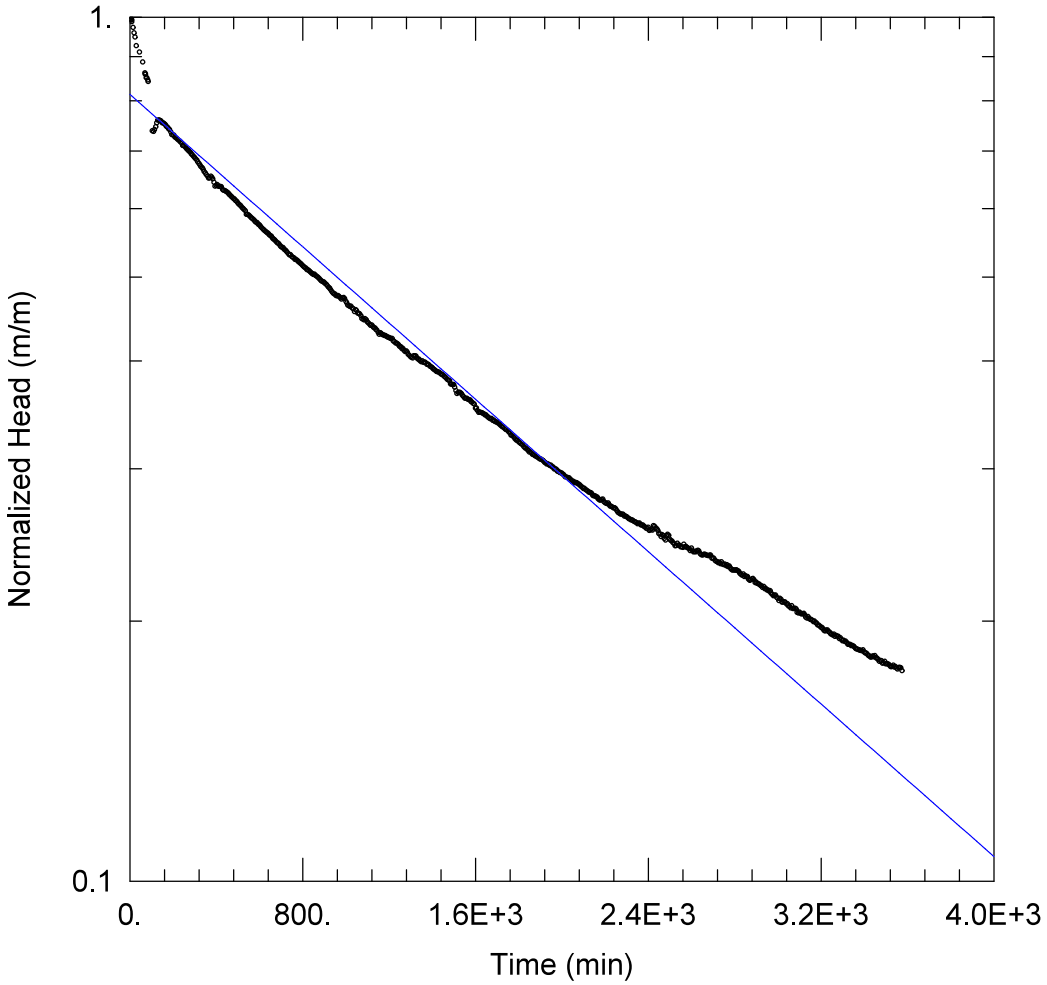
Terrapex

Figure D-9

Tested By: PG **Checked By:** DM

APPENDIX VI

HYDRAULIC CONDUCTIVITY TESTS



HYDROGEOLOGICAL REVIEW

Data Set: I:\Projects_Open\CT2694 2680 Brock Rd Pickering\Analysis\Bail Test\MW1D Test.aqt
Date: 07/03/18 Time: 13:06:49

PROJECT INFORMATION

Company: Terrapex Environmental Ltd
Client: The Brock Zents Partnership
Project: CT2694.00
Location: 2660-2680 Brock Rd, Pickering
Test Well: MW1(D)
Test Date: May 23, 2018

AQUIFER DATA

Saturated Thickness: 4.9 m Anisotropy Ratio (Kz/Kr): 0.2

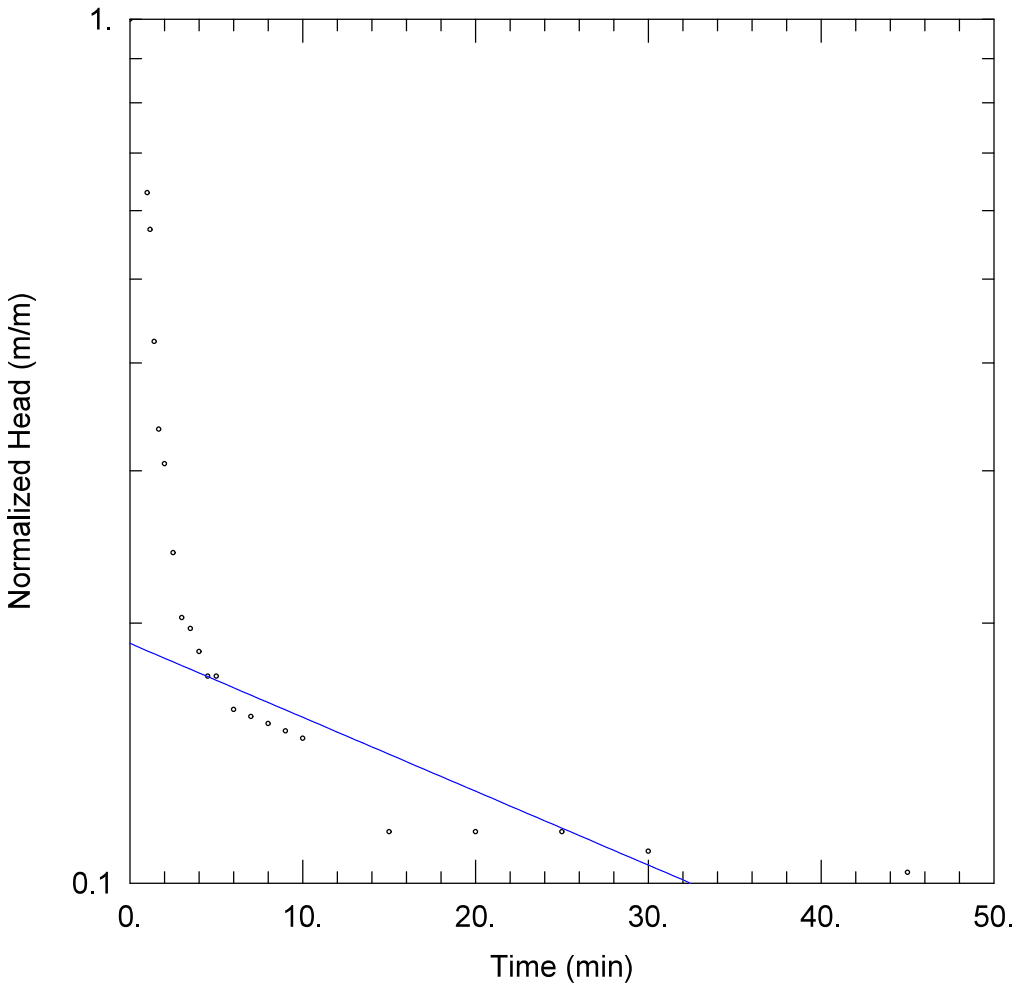
WELL DATA (MW1(D))

Initial Displacement: 0.83 m
Total Well Penetration Depth: 5.36 m
Casing Radius: 0.0263 m
Static Water Column Height: 5.4 m
Screen Length: 1.5 m
Well Radius: 0.0302 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 8.638E-9 m/sec y0 = 0.6754 m



HYDROGEOLOGICAL REVIEW

Data Set: I:\Projects_Open\CT2694 2680 Brock Rd Pickering\Analysis\Bail Test\MW3D Test.aqt
Date: 07/03/18 Time: 13:01:03

PROJECT INFORMATION

Company: Terrapex Environmental Ltd
Client: The Brock Zents Partnership
Project: CT2694.00
Location: 2660-2680 Brock Rd, Pickering
Test Well: MW3(D)
Test Date: May 17, 2018

AQUIFER DATA

Saturated Thickness: 5.1 m Anisotropy Ratio (Kz/Kr): 0.2

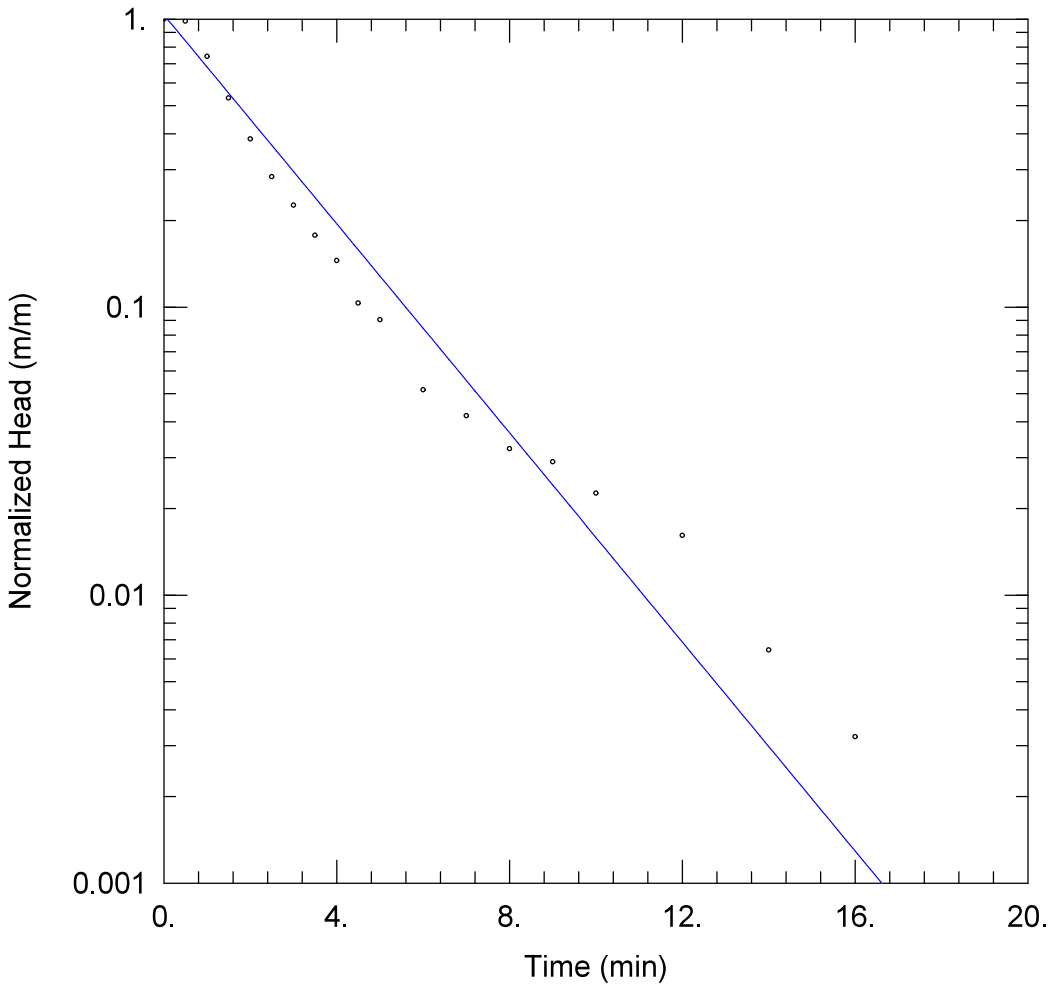
WELL DATA (MW3(D))

Initial Displacement: 0.34 m
Total Well Penetration Depth: 5.62 m
Casing Radius: 0.0263 m
Static Water Column Height: 5.6 m
Screen Length: 1.5 m
Well Radius: 0.0302 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 3.372E-7 m/sec y0 = 0.0644 m



HYDROGEOLOGICAL REVIEW

Data Set: I:\Projects_Open\CT2694 2680 Brock Rd Pickering\Analysis\Bail Test\MW4 Test.aqt
Date: 07/03/18 Time: 13:01:23

PROJECT INFORMATION

Company: Terrapex Environmental Ltd
Client: The Brock Zents Partnership
Project: CT2694.00
Location: 2660-2680 Brock Rd, Pickering
Test Well: MW4
Test Date: May 23, 2018

AQUIFER DATA

Saturated Thickness: 5.4 m Anisotropy Ratio (Kz/Kr): 0.2

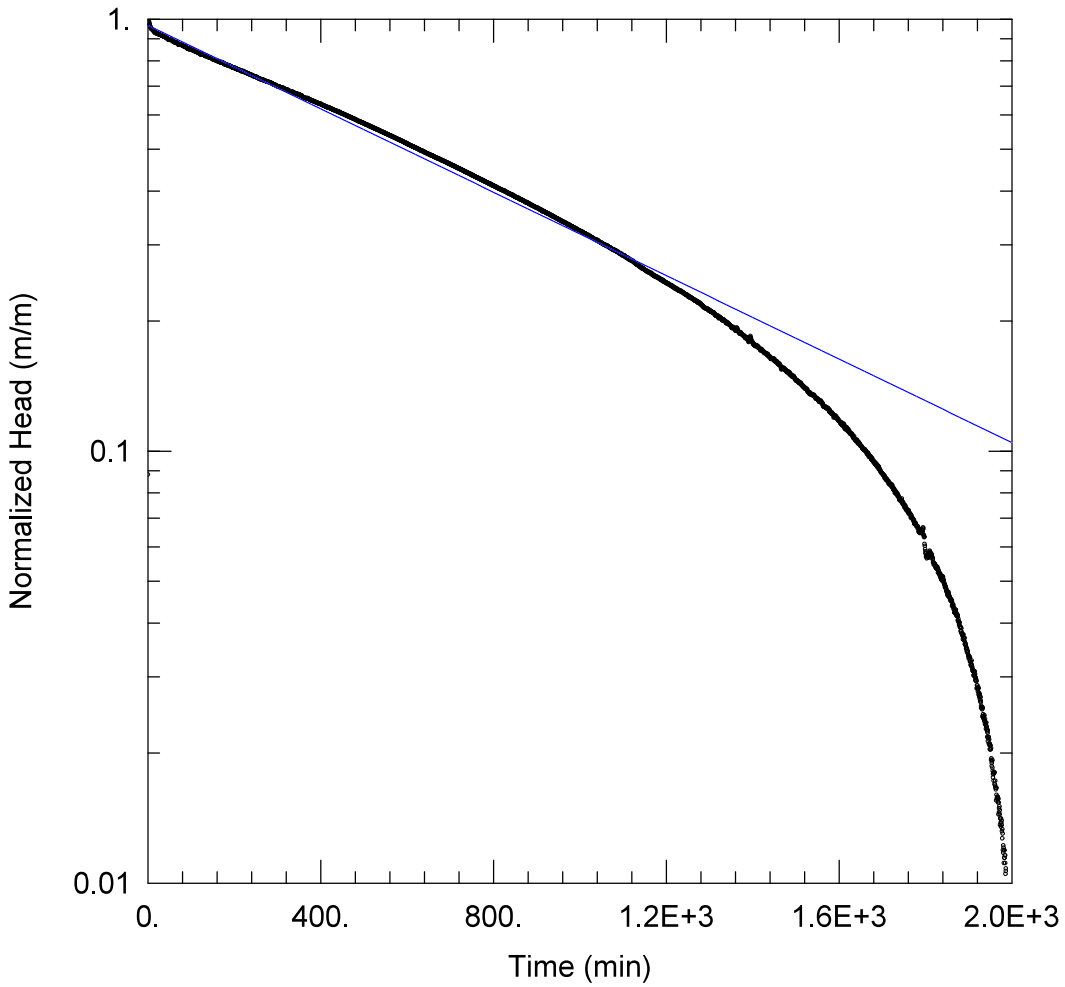
WELL DATA (MW4)

Initial Displacement: 0.31 m
Total Well Penetration Depth: 5.94 m
Casing Radius: 0.0263 m
Static Water Column Height: 6. m
Screen Length: 1.5 m
Well Radius: 0.0302 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 7.204E-6 m/sec
y0 = 0.3205 m



HYDROGEOLOGICAL REVIEW

Data Set: I:\...\MW101.aqt
Date: 02/02/22 Time: 11:43:14

PROJECT INFORMATION

Company: Terrapex Environmental Ltd.
Client: The Brock Zents Partnership
Project: CT2694.02
Location: 2660 to 2710 Brock Road North
Test Well: MW101
Test Date: June 26, 2019

AQUIFER DATA

Saturated Thickness: 5.5 m Anisotropy Ratio (Kz/Kr): 0.1

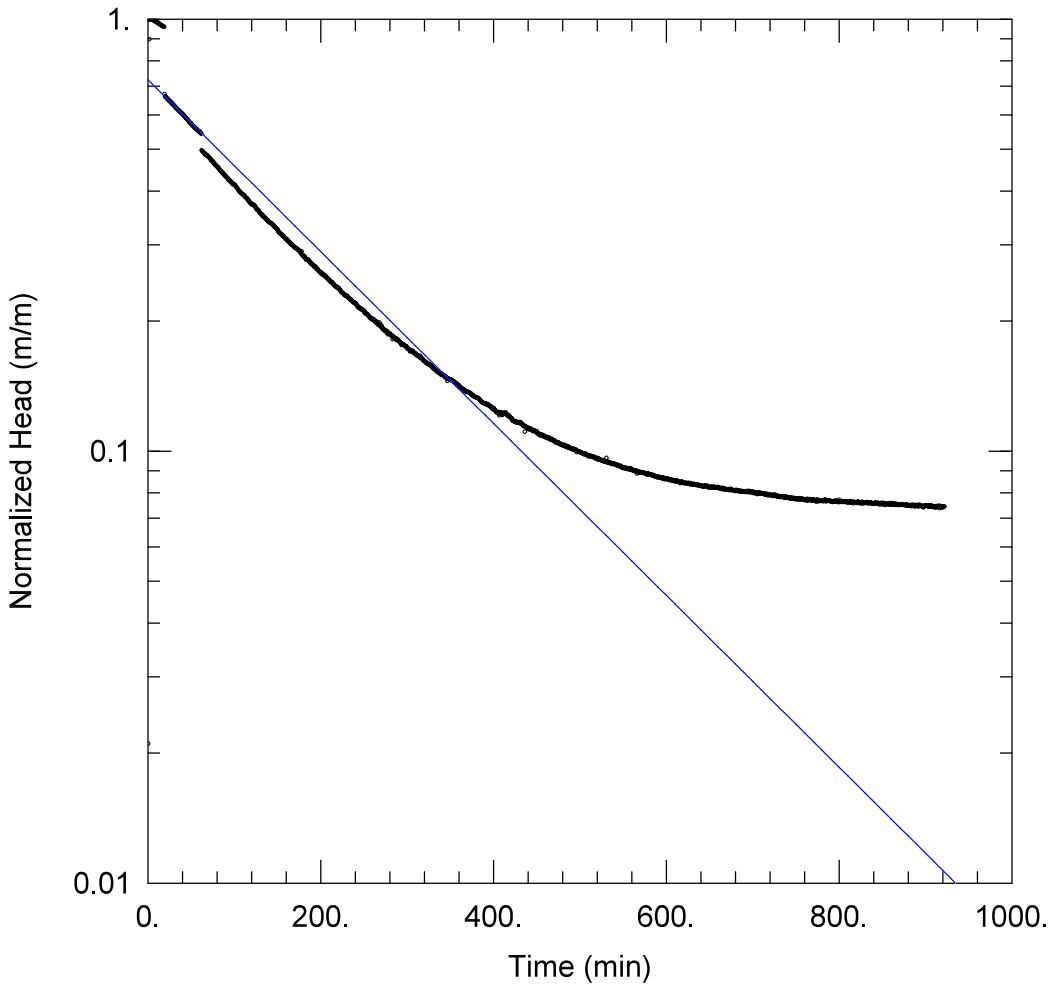
WELL DATA (MW101)

Initial Displacement: 0.638 m
Total Well Penetration Depth: 3.51 m
Casing Radius: 0.0254 m
Static Water Column Height: 3.5 m
Screen Length: 1.52 m
Well Radius: 0.1 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.163E-8 m/sec
y0 = 0.617 m



HYDROGEOLOGICAL REVIEW

Data Set: I:\...\MW102(D) V2.aqt
Date: 02/02/22 Time: 11:46:03

PROJECT INFORMATION

Company: Terrapex Environmental Ltd.
Client: The Brock Zents Partnership
Project: CT2694.02
Location: 2660 to 2710 Brock Road North
Test Well: MW102(D)
Test Date: June 26, 2019

AQUIFER DATA

Saturated Thickness: 6.6 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW102(D))

Initial Displacement: 1.228 m
Total Well Penetration Depth: 4.58 m
Casing Radius: 0.0254 m
Static Water Column Height: 4.58 m
Screen Length: 1.52 m
Well Radius: 0.1 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 4.973E-8 m/sec y0 = 0.8887 m

APPENDIX VII

LABORATORY REPORT

PARACEL LABORATORIES LTD.

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1-800-749-1947
www.paracellabs.com

Certificate of Analysis

Terrapex Environmental Ltd. (Toronto)

90 Scarsdale Road
Toronto, ON M3B 2R7
Attn: Sara Sutherland

Client PO:
Project: CT2694.03
Custody: 53224

Report Date: 25-Oct-2021
Order Date: 18-Oct-2021

Order #: 2143090

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2143090-01	MW206

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis

Report Date: 25-Oct-2021

Client: Terrapex Environmental Ltd. (Toronto)

Order Date: 18-Oct-2021

Client PO:

Project Description: CT2694.03

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC	22-Oct-21	23-Oct-21
Biochemical Oxygen Demand	SM 5210B - DO Probe	20-Oct-21	25-Oct-21
Cyanide, total	MOE E3015 - Auto Colour	21-Oct-21	21-Oct-21
Oil & Grease, animal/vegetable	SM5520 - Gravimetric	25-Oct-21	25-Oct-21
Durham - Sanitary: VOCs	EPA 624 - P&T GC-MS	20-Oct-21	20-Oct-21
E. coli	MOE E3407	19-Oct-21	19-Oct-21
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	19-Oct-21	20-Oct-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	19-Oct-21	19-Oct-21
Oil & Grease, mineral/synthetic	SM5520F - Gravimetric	25-Oct-21	25-Oct-21
Oil & Grease, total	SM5520B - Gravimetric, hexane soluble	25-Oct-21	25-Oct-21
PCBs, total	EPA 608 - GC-ECD	20-Oct-21	21-Oct-21
pH	EPA 150.1 - pH probe @25 °C	19-Oct-21	19-Oct-21
Phenolics	EPA 420.2 - Auto Colour, 4AAP	22-Oct-21	22-Oct-21
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	20-Oct-21	21-Oct-21
Sewer Use By Law - Phthalates	EPA 625	19-Oct-21	19-Oct-21
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	20-Oct-21	21-Oct-21
Total Suspended Solids	SM 2540D - Gravimetric	20-Oct-21	20-Oct-21

Certificate of Analysis

Report Date: 25-Oct-2021

Client: **Terrapex Environmental Ltd. (Toronto)**

Order Date: 18-Oct-2021

Client PO:

Project Description: CT2694.03

	Client ID:	MW206	-	-	-
	Sample Date:	18-Oct-21 11:45	-	-	-
	Sample ID:	2143090-01	-	-	-
	MDL/Units	Ground Water	-	-	-
Microbiological Parameters					
E. coli	1 CFU/100 mL	40 [1]	-	-	-
General Inorganics					
BOD	2 mg/L	<2	-	-	-
Cyanide, total	0.01 mg/L	<0.01	-	-	-
pH	0.1 pH Units	7.5	-	-	-
Phenolics	0.001 mg/L	<0.001	-	-	-
Phosphorus, total	0.01 mg/L	0.04	-	-	-
Total Suspended Solids	2 mg/L	17	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.2	-	-	-
Anions					
Fluoride	0.1 mg/L	<0.1	-	-	-
Sulphate	1 mg/L	44	-	-	-
Metals - Total					
Aluminum	0.01 mg/L	0.50	-	-	-
Antimony	0.001 mg/L	<0.001	-	-	-
Arsenic	0.01 mg/L	<0.01	-	-	-
Cadmium	0.001 mg/L	<0.001	-	-	-
Chromium	0.05 mg/L	<0.05	-	-	-
Cobalt	0.001 mg/L	<0.001	-	-	-
Copper	0.005 mg/L	<0.005	-	-	-
Lead	0.001 mg/L	0.001	-	-	-
Manganese	0.05 mg/L	0.07	-	-	-
Mercury	0.0001 mg/L	<0.0001	-	-	-
Molybdenum	0.005 mg/L	<0.005	-	-	-
Nickel	0.005 mg/L	<0.005	-	-	-
Selenium	0.005 mg/L	<0.005	-	-	-
Silver	0.001 mg/L	<0.001	-	-	-
Tin	0.01 mg/L	<0.01	-	-	-
Titanium	0.01 mg/L	0.02	-	-	-
Zinc	0.02 mg/L	<0.02	-	-	-
Volatiles					
Benzene	0.0005 mg/L	<0.0005	-	-	-
Chloroform	0.0005 mg/L	<0.0005	-	-	-
1,2-Dichlorobenzene	0.0005 mg/L	<0.0005	-	-	-
1,4-Dichlorobenzene	0.0005 mg/L	<0.0005	-	-	-

Certificate of Analysis

Report Date: 25-Oct-2021

Client: **Terrapex Environmental Ltd. (Toronto)**

Order Date: 18-Oct-2021

Client PO:

Project Description: CT2694.03

	Client ID:	MW206	-	-	-
	Sample Date:	18-Oct-21 11:45	-	-	-
	Sample ID:	2143090-01	-	-	-
	MDL/Units	Ground Water	-	-	-
cis-1,2-Dichloroethylene	0.0005 mg/L	<0.0005	-	-	-
trans-1,3-Dichloropropylene	0.0005 mg/L	<0.0005	-	-	-
Ethylbenzene	0.0005 mg/L	<0.0005	-	-	-
Methyl Ethyl Ketone (2-Butanone)	0.0050 mg/L	<0.0050	-	-	-
Methylene Chloride	0.0050 mg/L	<0.0050	-	-	-
Styrene	0.0005 mg/L	<0.0005	-	-	-
1,1,2,2-Tetrachloroethane	0.0005 mg/L	<0.0005	-	-	-
Tetrachloroethylene	0.0005 mg/L	<0.0005	-	-	-
Toluene	0.0005 mg/L	<0.0005	-	-	-
Trichloroethylene	0.0005 mg/L	<0.0005	-	-	-
Xylenes, total	0.0005 mg/L	<0.0005	-	-	-
4-Bromofluorobenzene	Surrogate	107%	-	-	-
Dibromofluoromethane	Surrogate	102%	-	-	-
Toluene-d8	Surrogate	85.0%	-	-	-
Hydrocarbons					
Oil & Grease, animal/vegetable	0.500 mg/L	<0.500	-	-	-
Oil & Grease, mineral/synthetic	0.5 mg/L	<0.5	-	-	-
Oil & Grease, total	0.5 mg/L	<0.5	-	-	-
Semi-Volatiles					
Bis(2-ethylhexyl)phthalate	0.001 mg/L	<0.001	-	-	-
Di-n-butylphthalate	0.001 mg/L	<0.001	-	-	-
Terphenyl-d14	Surrogate	101%	-	-	-
PCBs					
PCBs, total	0.0001 mg/L	<0.0001	-	-	-
Decachlorobiphenyl	Surrogate	67.4%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Fluoride	ND	0.1	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
BOD	ND	2	mg/L						
Cyanide, total	ND	0.01	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Suspended Solids	ND	2	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Hydrocarbons									
Oil & Grease, mineral/synthetic	ND	0.5	mg/L						
Oil & Grease, total	ND	0.5	mg/L						
Metals - Total									
Aluminum	ND	0.01	mg/L						
Antimony	ND	0.001	mg/L						
Arsenic	ND	0.01	mg/L						
Cadmium	ND	0.001	mg/L						
Chromium	ND	0.05	mg/L						
Cobalt	ND	0.001	mg/L						
Copper	ND	0.005	mg/L						
Lead	ND	0.001	mg/L						
Mercury	ND	0.0001	mg/L						
Manganese	ND	0.05	mg/L						
Molybdenum	ND	0.005	mg/L						
Nickel	ND	0.005	mg/L						
Selenium	ND	0.005	mg/L						
Silver	ND	0.001	mg/L						
Tin	ND	0.01	mg/L						
Titanium	ND	0.01	mg/L						
Zinc	ND	0.02	mg/L						
Microbiological Parameters									
E. coli	ND	1	CFU/100 mL						
PCBs									
PCBs, total	ND	0.0001	mg/L						
Surrogate: Decachlorobiphenyl	*).000507*		*mg/L*		*101*	*60-140*			
Semi-Volatiles									
Bis(2-ethylhexyl)phthalate	ND	0.001	mg/L						
Di-n-butylphthalate	ND	0.001	mg/L						
Surrogate: 2-Fluorobiphenyl	*0.0208*		*mg/L*		*104*	*76-125*			
Surrogate: Nitrobenzene-d5	*0.0156*		*mg/L*		*78.2*	*68-125*			
Surrogate: Terphenyl-d14	*0.0169*		*mg/L*		*84.6*	*70-125*			
Volatiles									
Benzene	ND	0.0005	mg/L						
Chloroform	ND	0.0005	mg/L						
1,2-Dichlorobenzene	ND	0.0005	mg/L						
1,4-Dichlorobenzene	ND	0.0005	mg/L						
cis-1,2-Dichloroethylene	ND	0.0005	mg/L						
trans-1,3-Dichloropropylene	ND	0.0005	mg/L						
Ethylbenzene	ND	0.0005	mg/L						
Methyl Ethyl Ketone (2-Butanone)	ND	0.0050	mg/L						
Methylene Chloride	ND	0.0050	mg/L						
Styrene	ND	0.0005	mg/L						
1,1,2,2-Tetrachloroethane	ND	0.0005	mg/L						
Tetrachloroethylene	ND	0.0005	mg/L						
Toluene	ND	0.0005	mg/L						

Certificate of Analysis

Client: Terrapex Environmental Ltd. (Toronto)

Client PO:

Report Date: 25-Oct-2021

Order Date: 18-Oct-2021

Project Description: CT2694.03

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Trichloroethylene	ND	0.0005	mg/L						
Xylenes, total	ND	0.0005	mg/L						
Surrogate: 4-Bromofluorobenzene	*0.0864*		*mg/L*		*108*	*50-140*			
Surrogate: Dibromofluoromethane	*0.0792*		*mg/L*		*99.0*	*50-140*			
Surrogate: Toluene-d8	*0.0677*		*mg/L*		*84.6*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Fluoride	ND	0.1	mg/L	ND			NC	10	
Sulphate	36.6	1	mg/L	35.9			1.9	10	
General Inorganics									
BOD	62	2	mg/L	62			0.0	20	
Cyanide, total	ND	0.01	mg/L	ND			NC	11	
pH	7.9	0.1	pH Units	7.9			0.4	3.3	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Phosphorus, total	ND	0.01	mg/L	0.013			NC	15	
Total Suspended Solids	37.0	2	mg/L	39.0			5.3	10	
Total Kjeldahl Nitrogen	0.22	0.1	mg/L	0.24			7.8	16	
Metals - Total									
Aluminum	0.50	0.01	mg/L	0.47			5.9	20	
Antimony	0.009	0.001	mg/L	0.009			2.3	20	
Arsenic	ND	0.01	mg/L	ND			NC	20	
Cadmium	ND	0.001	mg/L	ND			NC	20	
Chromium	ND	0.05	mg/L	ND			NC	20	
Cobalt	0.002	0.001	mg/L	0.002			15.1	20	
Copper	ND	0.005	mg/L	ND			NC	20	
Lead	0.003	0.001	mg/L	0.002			14.5	20	
Mercury	ND	0.0001	mg/L	ND			NC	20	
Manganese	0.081	0.05	mg/L	0.076			6.2	20	
Molybdenum	0.011	0.005	mg/L	0.010			9.3	20	
Nickel	0.007	0.005	mg/L	0.007			8.6	20	
Selenium	ND	0.005	mg/L	ND			NC	20	
Silver	ND	0.001	mg/L	ND			NC	20	
Tin	ND	0.01	mg/L	ND			NC	20	
Titanium	0.012	0.01	mg/L	ND			NC	20	
Zinc	ND	0.02	mg/L	ND			NC	20	
Microbiological Parameters									
E. coli	720	10	CFU/100 mL	760			5.4	30	BAC12
Volatiles									
Benzene	ND	0.0005	mg/L	ND			NC	30	
Chloroform	ND	0.0005	mg/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.0005	mg/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.0005	mg/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.0005	mg/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.0005	mg/L	ND			NC	30	
Ethylbenzene	ND	0.0005	mg/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	0.0050	mg/L	ND			NC	30	
Methylene Chloride	ND	0.0050	mg/L	ND			NC	30	
Styrene	ND	0.0005	mg/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.0005	mg/L	ND			NC	30	
Tetrachloroethylene	0.137	0.0005	mg/L	0.134			2.1	30	
Toluene	ND	0.0005	mg/L	ND			NC	30	
Trichloroethylene	0.316	0.0005	mg/L	0.307			2.9	30	
m,p-Xylenes	ND	0.0005	mg/L	ND			NC	30	
o-Xylene	ND	0.0005	mg/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*0.0820*		*mg/L*		*102*	*50-140*			
Surrogate: Dibromofluoromethane	*0.0789*		*mg/L*		*98.6*	*50-140*			
Surrogate: Toluene-d8	*0.0682*		*mg/L*		*85.2*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Fluoride	0.92	0.1	mg/L	ND	91.8	79-121			
Sulphate	45.4	1	mg/L	35.9	95.2	74-126			
General Inorganics									
BOD	213	2	mg/L	ND	107	71-121			
Cyanide, total	0.098	0.01	mg/L	ND	98.0	53-130			
Phenolics	0.024	0.001	mg/L	ND	97.2	69-132			
Phosphorus, total	0.501	0.01	mg/L	0.013	97.7	80-120			
Total Suspended Solids	23.0	2	mg/L	ND	115	75-125			
Total Kjeldahl Nitrogen	2.30	0.1	mg/L	0.24	103	81-126			
Hydrocarbons									
Oil & Grease, mineral/synthetic	8.10	0.5	mg/L	ND	81.0	65-110			
Oil & Grease, total	20.0	0.5	mg/L	ND	100	85-110			
Metals - Total									
Aluminum	61.9	0.01	mg/L	ND	124	80-120			QS-02
Antimony	53.4	0.001	mg/L	0.914	105	80-120			
Arsenic	58.6	0.01	mg/L	0.146	117	80-120			
Cadmium	53.7	0.001	mg/L	0.047	107	80-120			
Chromium	58.6	0.05	mg/L	ND	117	80-120			
Cobalt	58.4	0.001	mg/L	0.192	117	80-120			
Copper	57.3	0.005	mg/L	0.216	114	80-120			
Lead	52.6	0.001	mg/L	0.233	105	80-120			
Mercury	0.0032	0.0001	mg/L	ND	108	70-130			
Manganese	57.6	0.05	mg/L	ND	115	80-120			
Molybdenum	56.2	0.005	mg/L	0.983	110	80-120			
Nickel	58.9	0.005	mg/L	0.685	116	80-120			
Selenium	52.6	0.005	mg/L	0.180	105	80-120			
Silver	49.1	0.001	mg/L	0.057	98.1	80-120			
Tin	54.9	0.01	mg/L	0.220	109	80-120			
Titanium	60.6	0.01	mg/L	0.968	119	80-120			
Zinc	55.2	0.02	mg/L	0.859	109	80-120			
PCBs									
PCBs, total	0.0009	0.0001	mg/L	ND	85.5	60-140			
Surrogate: Decachlorobiphenyl	*0.000552*		*mg/L*		*110*	*60-140*			
Semi-Volatiles									
Bis(2-ethylhexyl)phthalate	0.0130	0.001	mg/L	ND	130	50-140			
Di-n-butylphthalate	0.0094	0.001	mg/L	ND	93.9	50-140			
Surrogate: 2-Fluorobiphenyl	*0.0237*		*mg/L*		*118*	*76-125*			
Surrogate: Nitrobenzene-d5	*0.0171*		*mg/L*		*85.3*	*68-125*			
Surrogate: Terphenyl-d14	*0.0208*		*mg/L*		*104*	*70-125*			
Volatiles									
Benzene	0.0310	0.0005	mg/L	ND	77.5	60-130			
Chloroform	0.0310	0.0005	mg/L	ND	77.4	60-130			
1,2-Dichlorobenzene	0.0393	0.0005	mg/L	ND	98.3	60-130			
1,4-Dichlorobenzene	0.0385	0.0005	mg/L	ND	96.2	60-130			
cis-1,2-Dichloroethylene	0.0414	0.0005	mg/L	ND	104	60-130			
trans-1,3-Dichloropropylene	0.0332	0.0005	mg/L	ND	83.0	60-130			
Ethylbenzene	0.0292	0.0005	mg/L	ND	73.0	60-130			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Methyl Ethyl Ketone (2-Butanone)	0.0952	0.0050	mg/L	ND	95.2	50-140			
Methylene Chloride	0.0352	0.0050	mg/L	ND	87.9	60-130			
Styrene	0.0324	0.0005	mg/L	ND	80.9	60-130			
1,1,2,2-Tetrachloroethane	0.0294	0.0005	mg/L	ND	73.5	60-130			
Tetrachloroethylene	0.0356	0.0005	mg/L	ND	89.0	60-130			
Toluene	0.0332	0.0005	mg/L	ND	83.0	60-130			
Trichloroethylene	0.0410	0.0005	mg/L	ND	102	60-130			
m,p-Xylenes	0.0525	0.0005	mg/L	ND	65.6	60-130			
o-Xylene	0.0328	0.0005	mg/L	ND	82.0	60-130			
Surrogate: 4-Bromofluorobenzene	*0.0608*		*mg/L*		*76.0*	*50-140*			
Surrogate: Dibromofluoromethane	*0.0760*		*mg/L*		*95.0*	*50-140*			
Surrogate: Toluene-d8	*0.0596*		*mg/L*		*74.4*	*50-140*			

Qualifier Notes:

Sample Qualifiers :

1 : Confluent background colonies on filter: may interfere with target reactions and the analysts' ability to count E. coli & Total Coliform. The target colonies may be under-represented.

QC Qualifiers :

BAC12 : Confluent background colonies on filter: may interfere with target reactions and the analysts' ability to count E. coli & Total Coliform. The target colonies may be under-represented.

QS-02 : Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

PARA LABORATOR

Paracel ID: 2143090

ce
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'49-1947
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icellabs.com

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
	Nº 53224

Client Name: Terrapex Environmental Ltd	Project Ref: CT2694.03	Page 1 of 1
Contact Name: Sara Sutherland	Quote #: S/O	Turnaround Time
Address: 90 Scarsdale Rd, Toronto M3B 2R7	PO #:	☐ 1 day ☐ 3 day
	E-mail: ssutherland@terrapex.com	☐ 2 day ☒ Regular
Telephone: 416 254 9215		Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☐ Table 3 ☐ Agri/Other	☒ SU - Sani ☒ SU - Storm
☐ Table ___	Mun: Durham Region
For RSC: ☐ Yes ☐ No	☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analysis: Durham Region Storm/Sanitary Sewer Use Criteria
1	MW206	GW	/	15	Oct 18/21	11:45am	X
2							
3							
4							
5							
6							
7							
8							
9							
10							

Comments:

Method of Delivery: WALK IN

Relinquished By (Sign): Mira Wang	Received By Driver/Depot: SS	Received at Lab:	Verified By:
Relinquished By (Print): Mira Wang	Date/Time: 10/18/2021 15:20	Date/Time: Oct 19/21 1000	Date/Time: Oct 19/21 1000
Date/Time: Oct 18 2021 / 3:18	Temperature: 12.6 °C	Temperature: 5.4 °C	pH Verified: ☐