1134 and 1140 Yonge Street, Toronto, Ontario

Hydrogeological Investigation

Client:
1140 Yonge Inc.
31 Scarsdale Road, Unit 5
Toronto, Canada

Attention: Mr. Andrew Murphy

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EXP Services Inc.
1595 Clark Boulevard
Brampton, ON, L6T 4V1
t: 905.793.9800
f: 905.793.0641

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1. Introduction

1.2 Project Description

EXP Services Inc. (EXP) was retained by 1140 Yonge Inc. to prepare a Hydrogeological Investigation Report associated with the proposed development located at 1134 and 1140 Yonge Street, Toronto, Ontario (hereinafter referred to as the 'Site').

It is our understanding that the proposed development plan consists of a thirteen (13) storey structure with three (3) levels of underground parking. The Site location plan is shown on Figure 1. The architectural drawings are provided in Attachment F.

EXP conducted a drilling campaign at the Site on April 26, 2019. Alston Geotechnical Consultants Inc. completed the geotechnical studies based on the results of the EXP's field operation on May 16, 2019. The pertinent information gathered from the geotechnical studies is utilized for this report.

1.2 Project Objectives

The main objectives of the Hydrogeological Investigation are as follows:

- Establish the local hydrogeological settings within the Site;
- Assess construction dewatering flow rate (short-term);
- Assess post-construction dewatering flow rate (long-term);
- Assess groundwater quality; and
- Prepare a Hydrogeological Investigation Report.

1.3 Scope of Work

To achieve the investigation objectives, EXP has completed the following scope of work:

- Review available geological and hydrogeological information for the Site;
- Drill and install four (4) 50-mm diameter monitoring wells at three (3) locations across the Site, including three (3) shallow and one (1) deep to approximate depths of 12 and 20 meters below ground surface, respectively where a pair of shallow and deep wells are in a nested configuration;
- Develop and conduct Single Well Response Tests (SWRT) on all onsite monitoring wells to assess hydraulic conductivities of the saturated soils at the Site;
- Conduct an elevation survey at the monitoring wells locations;
- Complete six (6) rounds of groundwater level measurements at all monitoring wells;
- Collect one (1) groundwater sample to be analyzed for parameters, as stated in the City of Toronto Sanitary and Storm Sewer Use By-Law;
- Evaluate the information collected during the field investigation program, including borehole geological information, Water Well Records (WWR), SWRT results, groundwater level measurements and groundwater water quality;
- Prepare site plans, cross sections, geological mapping and groundwater contour mapping for the Site;
- Estimate construction dewatering flow rates (short-term);
- Estimate post-construction dewatering flow rates (long-term);

- Provide recommendations on the Water-Taking Permits, as required by the Ministry of Environment, Conservation and Parks (MECP) and on Sewer Discharge Agreements (SDA) for the construction and post-construction phases, as requested by the City of Toronto;
- Conduct three (3) months of groundwater monitoring as per the City's requirements; and
- Prepare a Hydrogeological Investigation Report.

It should be noted that the soil samples and corresponding field data collected during the drilling operation were provided to Alston Geotechnical Consultants Inc to prepare the Geotechnical Investigation report for the Site. The pertinent information provided in the noted geotechnical report is utilized for this Hydrogeological Investigation Report.

The hydrogeological investigation was prepared in accordance with the Ontario Water Resources Act, Ontario Regulation 387/04, and Toronto Municipal Code 681-Sewers. The scope of work outlined above is prepared to assess dewatering and does not include a review of Environmental Site Assessments (ESAs).

1.4 Review of Previous Reports

The following report was reviewed as part of this Hydrogeological Investigation:

- Alston Geotechnical Consultants Inc. (May 16, 2019), Draft Geotechnical Investigation, Proposed Building Development, 1140 Yonge Street, Toronto, ON, prepared for Watters Environmental Group Inc.
- Audax Architecture Inc. (July 27, 2020), Architectural Drawings, 1140 Yonge Street, Toronto, Ontario.

2 Hydrogeological Setting

2.1 Regional Setting

2.1.1 Regional Physiography

The Site is in a physiographic region named as the Iroquois Plain, and the physiographic landform is known as Sand Plains (Chapman & Putnam, 2007). The Iroquois Plain was created along the shores of former Lake Iroquois, an ancient glacial lake. The noted Plain primarily consists of shallow water sandy deposits. The topography of the Iroquois Plain is relatively flat with a gradual slope to the south, toward Lake Ontario. A shorecliff, roughly 550 m north of the Site, separates the Iroquois Plain from the South Slope.

2.1.2 Regional Geology and Hydrogeology

The surficial geology of the Site is described as coarse textured (foreshore-basinal) glaciolacustrine deposits, which consist of sand, gravel, minor silt and clay (Ministry of Northern Development and Mines, 2012). The surficial geology of the Site and surrounding areas is shown on Figure 2.

According to the Oak Ridges Moraine Groundwater Program (2019), the thickness of overburden within the Site boundary ranges between 38 meters. The subsurface stratigraphy of the Site from top to the bottom can be described in the following sequence (TRCA, 2009 and Oak Ridges Moraine Groundwater Program, 2019):

- **Halton Till**: This geologic unit has not been mapped within the Site boundary.
- **Oak Ridges Moraine (or equivalent)**: This lithologic unit has not been mapped within the Site boundary.
- **Newmarket Till**: This lithologic unit has not been mapped within the Site boundary.
- **Thorncliffe**: This geology formation generally consists of glaciofluvial (sand, silty sand) or glaciolacustrine deposits (silt, sand, pebbly silt and clay). Top elevation of this unit within the Site boundary is approximately at 118 masl.
- **Sunnybrook**: This lithologic unit predominately consists of silt and clay. Top elevation of this unit within the Site boundary is approximately at 110 masl.
- **Scarborough**: This geology unit consists of peat sand overlaying silt and clay deposits. Top elevation of this unit is approximately at 105 masl.
- **Bedrock**: Bedrock primarily consists of interbedded shale, limestone, dolostone, and siltstone, which corresponds to Georgian Bay Formation of Upper Ordovician age (Ministry of Northern Development and Mines, 2012). Bedrock surface elevation of this unit is approximately at 83 masl.

Regional groundwater across the area flows south, towards Rosedale Valley, to a nowadays buried tributary of the Don River, which eventually empties into the Lake Ontario (Oak Ridges Moraine Groundwater Program, 2018). Local deviation from the regional groundwater flow pattern may occur in response to changes in topography and/or soils, as well as the presence of surface water features and/or existing subsurface infrastructure.

2.1.3 Existing Water Well Survey

Well Records from the Ministry of the Environment, Conservation and Parks (MECP) Water Well Record (WWR) Database were reviewed to determine the number of water wells present within a 500-m radius of the Site centroid. The MECP WWR database indicates a total of forty-eight (48) well records, which are identified offsite. The locations of the MECP WWR within 500 m of the Site are shown on Figure 3. A summary of the WWR is included in Appendix A.

The database also indicates that the offsite wells are at an approximate distance of forth-five (45) meters or greater from the Site centroid. All offsite wells were reportedly identified as monitoring and observation wells, test holes, and/or listed with unknown use. There are no records of water supply wells. The reported water levels ranged from an approximate depth of 1.0 (one) to 11.6 meters below ground surface (mbgs).

2.2 Site Setting

2.2.1 Site Topography

The Site is in an urbanized area. The topography gradually slopes south-southeast towards Lake Ontario.

As part of this Hydrogeological Investigation, EXP surveyed the existing monitoring wells onsite. Based on the survey data, the surface elevation of the Site approximately ranges between 121.77 to 121.89 meters above sea level (masl).

2.2.2 Local Surface Water Features

The Site is located within the watershed of the Don River. No surface water bodies are located onsite. The nearest surface water feature is Yellow Creek, a tributary of the Don River named, which lies approximately 600 meters northeast of the Site boundary. Lake Ontario is approximately 4.5 km from the Site boundary to the southeast.

2.2.3 Local Geology and Hydrogeology

A summary of subsurface soil stratigraphy is provided in the following paragraphs. The soil descriptions are based on the geotechnical investigation report, which was prepared by Alston Geotechnical Consultants Inc. for Watters Environmental Group Inc. (Alston, 2019). The soil descriptions are summarized for the hydrogeological interpretations. As such, the information provided in this section shall not be used for construction design purposes.

The detailed soil profiles encountered in each borehole and the results of moisture content determinations are presented on the attached borehole logs (Appendix B). The interpreted geological cross-section is provided in Figure 5. The geologic boundaries shown on the cross-section are adjusted to the geodetic datum based on the EXP's survey data.

It should be noted that the soil boundaries indicated on the borehole logs are inferred from non-continuous sampling and observations during drilling. These boundaries are intended to reflect approximate transition zones for the purpose of hydrogeological investigation and shall not be interpreted as exact planes of geological change.

The "Notes on Sample Description" preceding the borehole logs should be read in conjunction with this report. Based on the results of the geotechnical investigation (Alston Geotechnical Consultants Inc., May 16, 2019), the general subsurface soil stratigraphy consists of the following units:

Asphalt and Fill

The asphalt layer, overlaying a granular fill is approximately 50-mm in thickness. The granular fill extends to an approximate depth of 0.2 mbgs

Layered Silty Clay

A layered silty clay unit underlies fill material. The noted layer apparently extends beyond the maximum depth of investigation onsite. Silty clay unit contains seems of silt and fine sand, with a varying thickness between 80 mm and 400 mm.

It is recommended that borehole investigation be conducted on the eastern part of the property to assess the presence of an aquifer in that portion of the site.

3 Results

3.1 Monitoring Well Details

The monitoring well network installed as part of the Geotechnical Investigations at the Site consists of the following:

- Three (3) shallow monitoring wells, including MW 101 through MW 103, which are installed to an approximate depth range between 11.42 and 12.35 mbgs.
- One (1) deep well (DMW 101) is installed to an approximate depth of 20 mbgs. It should be noted that MW101 and DMW101 are in a nested configuration;
- Each well is equipped with a 50-mm PVC casing and a three (3)-meters long screen; and
- Each well is equipped with flush-mount protective casing.

Borehole and monitoring well installation logs are provided in Appendix B. The monitoring well locations are shown on Figure 4.

3.2 Water Level Monitoring

As part of the Hydrogeological Investigation, static water levels in the monitoring wells were recorded in six (6) monitoring events, including May 13 and 27, June 19 and 25, as well as July 16 and 31 of 2019. A summary of all static water level data as it relates to the elevation survey is summarized in Table 3-1 below.

The groundwater elevation recorded in the shallow wells ranged from 115.55 masl (6.21 mbgs at MW 102 on July 16, 2019) to 117.13 masl (4.69 mbgs on May 13, 2019). The groundwater elevation recorded in the deep well ranged from 109.40 masl (12.41 mbgs on June 19, 2019) to 109.82 masl (11.99 mbgs on June 25, 2019).

The wells installed as part of this investigation assessed a deep groundwater level (piezometric level) and not the first groundwater table. For the design of water foundations without perimeter and foundation drainage systems, shallower wells will be required to evaluate the shallow groundwater table, and the hydrogeologist needs to be consulted during the design process.

Table 3-1: Summary of Measured Groundwater Elevations

Monitoring Well ID	Ground Surface Elevation (masl) *	Approximate Full Well Depth (mbgs)**	Depth	May 13, 2019	May 27, 2019	June 19, 2019	June 25, 2019	July 16, 2019	July 31, 2019
DMW 101	121.81	20.05	mbgs	18.40	17.16	12.41	11.99	11.25	10.93
			masl	103.41	104.65	109.40	109.82	110.56	110.88
MW 101	121.81	12.16	mbgs	4.69	4.94	5.02	4.90	5.04	5.02
			masl	117.13	116.87	116.79	116.91	116.77	116.79
MW 102	121.77	12.35	mbgs	6.14	6.13	6.14	6.16	6.21	6.18
			masl	115.63	115.63	115.63	115.60	115.55	115.59
MW 103	121.89	12.18	mbgs	5.07	5.05	5.07	5.28	5.18	5.15
			masl	116.82	116.84	116.82	116.61	116.71	116.74

Notes:
mbgs: meters below ground surface
masl: meters above sea level
* Based on survey data completed as part of this Hydrogeological Investigation
** Based on the field measurements

Groundwater contours of the shallow water-bearing zone are shown on Figure 6. Accordingly, at the Site, the horizontal groundwater flow direction in the shallow zone is interpreted to be southwest of the Site, towards Lake Ontario. According to the Oak Ridges Moraine Groundwater Program website, the regional groundwater flow direction is shown to be southward. The deviation of the local from the reginal groundwater flow direction is likely dictated by local underground features such as existing sewer and watermain systems.

Comparison of water levels measured in the nested wells (MW 101 and DMW 101) indicates a downward vertical groundwater gradient between the shallow and deep water-bearing zones.

It should be noted that groundwater levels are expected to show seasonal fluctuations and vary in response to prevailing climate conditions; this may also affect the direction and rate of flow. It is recommended to conduct seasonal groundwater level measurements to provide more information on seasonal groundwater level fluctuations.

3.3 Hydraulic Conductivity Testing

Four (4) Single Well Response Tests (SWRT's) were completed on monitoring wells DMW 101, MW 101, MW 102, and MW 103 on May 13, 2019. The tests were completed to estimate the saturated hydraulic conductivity (K) of the soils at the well screen depths.

The static water level within each monitoring well was measured prior to the start of testing. In advance of performing SWRTs, each monitoring well underwent development to remove fines introduced into the screens following construction. The development process involved purging of the monitoring wells to induce the flow of fresh formation water through the screen. Each monitoring well was permitted to fully recover prior to performing SWRTs.

Hydraulic conductivity values were calculated from the SWRT and constant rate test data as per Hvorslev's solution included in the AQTESOLV Pro. V.4.5 software package. The semi-log plots for normalized drawdown versus time are included in Appendix C.

A summary of the hydraulic conductivity (K) values estimated from the SWRTs are provided in Table 3-2.

Table 3-2: Summary of Hydraulic Conductivity Testing

Monitoring Well	Well Depth (mbgs)*	Screen Interval (mbgs)		Soil Formation Screened **	Estimated Hydraulic Conductivity (m/s)
		From	To		
DMW 101	20.05	17.05	20.05	Silty Clay	2.2×10^{-7}
MW 101	12.16	9.16	12.16	Silty Clay	7.2×10^{-7}
MW 102	12.35	9.35	12.35	Silty Clay	1.5×10^{-7}
MW 103	12.18	9.18	12.18	Silty Clay	1.5×10^{-6}
				Highest Estimated K Value	1.5×10^{-6}
				Geometric Mean of the Estimated K Values	4.4×10^{-7}

* Based on the field measurements
* Based on the geotechnical borehole logs (Alston, 2019)

SWRTs provide estimates of K for the geological formation in the immediate media zone surrounding the well screens and may not represent a bulk formation hydraulic conductivity. As shown in Table 3-2, the highest K for the tested water-bearing zones is estimated to be 1.5 x 10^{-6} m/s, and the geometric mean of the K values is to be 4.4 x 10^{-7} m/s.

3.4 Groundwater Quality

To assess the suitability for discharge of pumped groundwater to the sewers owned by the City of Toronto during dewatering activities, one (1) groundwater sample was collected from monitoring well MW101 on May 13, 2019 using a peristaltic pump.

The sample was collected unfiltered and placed into pre-cleaned laboratory-supplied vials and/or bottles provided with analytical test group specific preservatives, as required. Dedicated nitrile gloves were used during sample handling. The groundwater samples were submitted for analysis to Bureau Veritas (formerly Maxxam Analytics Inc.), a CALA certified independent laboratory in Mississauga, Ontario.

When compared to the Sanitary Sewer By-Law Limits (Table 1) the laboratory Certificate of Analysis (CofA) showed that all parameters conform the Sanitary By-Law limits (Table 1).

When compared to the Storm Sewer By-Law Limits (Table 2), the CofA showed that the concentrations of Total Suspended Solids (TSS), Total Manganese (Mn), and Total Zinc (Zn) were reported above the Storm Sewer Use By-Law criteria.

Analytical results are provided in Appendix D. A summary of the pertinent results is provided in Table 3-3 below.

Table 3-3: Summary of Analytical Results

Parameter	City of Toronto Sanitary and Combined Sewer Discharge Limit (Table 1)	City of Toronto Storm Sewer Discharge Limit (Table 2)	Concentration MW 101 May 13, 2019
Total Suspended Solids (mg/L)	350	15	**32**
Total Manganese (Mn) (µg/L)	5,000	50	**92**
Total Zinc (Zn) (µg/L)	2,000	40	**140**

For the short-term dewatering system (construction phase), it is anticipated that TSS levels and some other parameters (for example, Total Metals) in the pumped groundwater may become elevated and exceed both, Sanitary and Storm By-Law limits. To control the concentration of TSS and associated metals, it is recommended that a suitable treatment method be implemented (filtration or decantation facilities and/ or any other applicable treatment system) during construction dewatering activities to discharge to the applicable sewer system. The specifications of the treatment system will need to be adjusted to the reported water quality results by the treatment contractor/process engineer.

For the long-term dewatering discharge to the City of Toronto's Sewer system (post-development phase), and based on the water quality test results, the water is suitable to be released into the Sanitary Sewer system without using a treatment system. However, the water is not suitable to be discharged into the Storm Sewer system without using an appropriate pre-treatment system, as required.

It is noted that the water quality results presented in this report may not be representative of the long-term condition of groundwater quality onsite. As such, regular water quality monitoring is recommended for the post-construction phase, as required by the City of Toronto. Dewatering (short and long term) may induce migration of contaminants within the zone of influence and beyond due to changing hydraulic gradients, hydrogeological conditions beyond Site boundaries and preferential pathways in utility beddings etc. The water quality sampling conducted as part of this assessment was conducted under static conditions. As a result. monitoring may be required during dewatering activities (short and long term) to monitor potential migration, and this should be performed more frequently during early dewatering stages.

An agreement to discharge into the sewers owned by the City of Toronto will be required prior to releasing dewatering effluent.

The Environmental Site Assessment Report(s) shall be reviewed for more information on the groundwater quality conditions at the Site.

4 Construction and Post-Construction Dewatering Assessments

4.1 Dewatering Rate Assumptions

It is our understanding that the proposed development plan is to build a thirteen (13) storey structure with three (3) levels of underground parking. The architectural drawings are provided in Appendix F.

It should be noted that shoring drawings were not available at the time of writing this report. For this assessment, it was assumed that the proposed construction plans include an excavation with shoring extending to the Site boundaries. EXP should be retained to review the assumptions outlined in this section, should the proposed shoring design change. Table 4-1 shown below presents the assumptions used to calculate the dewatering rates of the Site.

Table 4-1 Dewatering Estimate Assumptions for Short-Term and Long-Term Dewatering

Input Parameter		Assumption	Notes
Ground Surface Elevation		121.89 masl	Approximate elevation based on the survey data completed by EXP in 2019
Groundwater Elevation		118.13 masl	The highest groundwater elevation measured at the Site (117.13 masl at MW 101 on May 13, 2019) plus one (1) meter to account for seasonal fluctuation (4.69 mbgs at MW 101 on May 13, 2019).
Lowest Finish Floor Elevation		110.11 masl	Based on the architectural drawings (Audax, 2020)
Lowest Footing Elevation		108.61 masl	Assumed to be 1.5 m below the lowest slab elevation
Dewatering Target Elevation	Short-Term	107.61 masl	Assumed to be approximately 1 m below the lowest footing elevation.
	Long-Term	109.61 masl	Assumed to be approximately 0.5 m below the lowest slab elevation
Bottom of Water-Bearing Zone		105.00 masl	Comparing the regional subsurface geology of the Site with the lowest footing elevation indicates that the lowest footing elevation to be installed within Sunnybrook Formation, therefore it is assumed that the bottom of the water-bearing zones is consistent with the top elevation of Scarborough Formation (refer to section 2.1.2).
Excavation Area		~3,157 m^2 (77 m x 41 m)	Based on the architectural drawings (Audax, 2020)
Hydraulic Conductivity (K)		1.5 x 10^{-6} m/s	Highest K value estimated for overburden

4.1.1 Dewatering Flow Rate Estimates (Short-Term and Long Term)

To estimate both, the groundwater flow rates in an open excavation during the construction phase (short-term) and future sub-drain with an open shoring system (soldier pile and lagging) during the post-construction phase, the Dupuit-Forcheimer equation was utilized, which is applicable for steady-state radial flow to the sides of a fully-penetrating excavation in an unconfined aquifer resting on a horizontal impervious surface. The dewatering flow rate according to Dupuit-Forcheimer's analytical solution is expressed as follows:

$$Q_w = \frac{\pi K\ (H^2 - h^2)}{Ln\ \left[\frac{R_o}{r_e}\right]}$$

$$r_e = \frac{a + b}{\pi}$$

Where:

Qw = Rate of pumping (m^3/sec)
K = Hydraulic conductivity (m/sec)
H = Saturated thickness of water-bearing zone beyond the influence of pumping (static groundwater elevation) (m)
h = Saturated thickness above the base of water-bearing zone in an excavation (m)
Rs = Sichardt Radius of influence (m)
Ro = Radius of influence (m) (Ro=Rs+re)
a, b = Sides of excavation (m)
re = Equivalent well radius (m)

During the construction phase (short-term), it is expected that the initial dewatering rate will be higher in order to remove groundwater from within the overburden formation. The dewatering rates are expected to decrease once the target water level is achieved in the excavation footprint as groundwater will have been removed, primarily from storage resulting in lower seepage rates into the excavation.

4.1.2 Sichardt's Radius of Influence (Short-Term and Long-Term)

The Sichardt's equation is used to predict the distance at which the drawdown resulting from pumping is negligible. This empirical formula was developed to provide representative flow rates using the steady state flow dewatering equations, as discussed below.

The estimated radius of influence (Ro) of pumping based on the Sichardt formula is expressed as follows:

$$\mathrm{R_s} = C(H - h)\sqrt{(K)}$$

Where:

Rs = Estimated radius of influence (m)
H = Saturated thickness of water-bearing zone (static water level) (m)
h = Dynamic water level above the base of water-bearing zone (m)
K = Hydraulic conductivity (m/sec)
C = Constant 3,000 (unitless)

4.1.3 Stormwater

During the construction phase, additional pumping capacity may be required to maintain dry conditions within the excavation during and following significant precipitation events. Therefore, the dewatering rates at the Site should also include removing stormwater from the excavation. A 15 mm precipitation event was utilized to estimate the additional water volume.

It is noted that a two (2) year storm event over a 24-hour period is approximately 57 mm. During large precipitation events, the water should be retained onsite to conform the allowable water taking and discharge limits, as permitted.

4.2 Estimated Dewatering Rates (Short-Term and Long-Term) and Associated Water-Taking Permits

4.2.1 Construction Phase (Short-Term)

Based on the assumptions provided in this report, the estimated construction dewatering rates are summarized in Table 4-2. The dewatering calculations are provided in Appendix E.

The peak dewatering flow rates account for accumulation of some precipitation, seasonal fluctuations in the groundwater table, flow from beddings of existing sewers, and variation in hydrogeological properties beyond those encountered during this study. Further, the peak dewatering flow rates provide additional capacity for the dewatering contractor.

It is noted that the maximum flow rate, which was calculated with the highest K value, provides conservative estimate to account for higher than expected flow during the construction dewatering. It is the responsibility of the contractor to ensure that dry conditions are always maintained within the excavation at all costs.

In accordance with the Ontario Water Resources Act, if the water taking for the construction dewatering is anticipated to be more than 50 m^3/day but less than 400 m^3/day, an application for the Environmental Activity and Sector Registry (EASR) with MECP will be required. If onsite groundwater dewatering rates exceed 400 m^3/day, a Category 3 Permit to Take Water (PTTW) will be required from the MECP.

Table 4-2 Summary of Construction Dewatering Estimates (Short-Term) and Associated Water-Taking Permits

Location	Proposed Levels Below Grade	Dewatering Rate (m^3/day)		Water-Taking Permits to be Obtained from MECP
		With Rain Collection Volume and Without Safety Factor	With Rain Collection Volume and Safety Factor	
Site Extent	3	135	220	EASR

Based on the assumptions of this report, it is inferred that the radius of influence (Ro) due to construction dewatering activities can grow up to 70 meters from the sides of the excavation.

Pressure relief wells may be required to depressurize the sand seams to mitigate basal heave during excavation, subject to the geotechnical engineer's recommendations.

4.2.2 Post-Construction Phase (Long-Term)

Based on the assumptions provided in this report, the result of the sub-drain discharge volume estimate is preliminary and summarized in Table 4-3. The dewatering calculations are provided in Appendix E. It should be noted that the long-term dewatering flow estimate indicates an averaged discharge volume. The estimated volume must be confirmed once the sub-drain system (s) is operational. Seasonal and daily fluctuations are expected. These estimates may be affected by hydrogeological conditions beyond those encountered at this time, fluctuations in groundwater regimes, surrounding site alterations, and existing and future infrastructures. Intermittent cycling of sump pumps and seasonal fluctuation in groundwater regimes should be considered for pump specifications. A safety factor was applied to the flow rate to accommodate the variability in seasonal water level fluctuations.

It is noted that the estimated volume is considered preliminary. Additionally, it should be noted that the estimated sub-drain discharge volume is based on the assumptions outlined in this report, and that any variations in hydrogeological conditions beyond those encountered as part of this investigation may significantly influence the sub-drain discharge volume. As a result, the exact discharge rate will be confirmed once the sub-drain system (s) is operational. It is recommended that once the sub-drain system(s) is in place, that a flow meter be installed at the sump (s) to record daily discharge volumes to provide more representative estimates during the commissioning stage of the system.

In accordance with the Ontario Water Resources Act, if the water taking for the post-construction dewatering will be more than 50 m^3/day, application for a Category 3 Permit to Take Water (PTTW) would be required from the MECP. Individual PTTW will be required for each underground structure where rates exceed the 50 m^3/day.

For designing a watertight foundation without perimeter and foundation drainage systems, shallow wells are required to assess the shallow groundwater table and the hydrostatic pressure.

Pressure relief wells may be required to depressurize the sand seams to mitigate basal heave, subject to the geotechnical engineer's recommendations.

Table 4-3 Summary of Post-Construction Dewatering Estimates (Long-Term) and Associated Water-Taking Permits

Location	Proposed Levels Below Grade	Dewatering Rate for Sub-Drain System (m^3/day)	Water-Taking Permits to be Obtained from MECP
Site Extent	3	140	Category 3 PTTW

5 Environmental Impact

5.1 Surface Water Features

The Site is located within the watershed of the Don River. No surface water bodies are located onsite.

The nearest surface water feature is Yellow Creek, a tributary of the Don River, which lies approximately 600 meters northeast of the Site boundary. The Lake Ontario is approximately 4.5 km from the Site boundary to the southeast.

Due to the limited extent of zone of influence and the distance of the nearest surface water feature, no impacts to surface water features are expected during construction activities.

5.2 Groundwater Sources

Well Records from the MECP Water Well Record (WWR) Database were reviewed to determine the number of water supply wells present within a 500 m radius of the Site boundaries. No dewatering related impact is expected on water supply wells, as there are no records of water supply wells in the area.

5.3 Geotechnical Considerations

Under certain conditions, dewatering activities can cause settlements due to an increase in the effective stress in the dewatered soil.

A letter related to geotechnical issues (i.e. settlement) as it pertains to the Site is recommended to be completed under a separate cover.

5.4 Groundwater Quality

It is our understanding that the potential discharge from the dewatering system during the construction will be directed to the municipal sewer system. As such, the quality of groundwater discharge is required to conform the City of Toronto Sewer Use By-Law.

For the short-term dewatering system (construction phase), it is anticipated that TSS levels and some other parameters (for example, Total Metals) in the pumped groundwater may become elevated and exceed the both Sanitary and Storm By-Law limits. To control the concentration of TSS and associated metals, it is recommended that a suitable treatment method be implemented (filtration or decantation facilities and/ or any other applicable treatment system) during construction dewatering activities to discharge to the applicable sewer system. The specifications of the treatment system will need to be adjusted to the reported water quality results by the treatment contractor/process engineer.

For the long-term dewatering discharge to the City of Toronto's Sewer system (post-development phase), and based on the water quality test results, the water is suitable to be discharged into the Sanitary Sewer system without using a treatment system. However, the water is not suitable to be discharged into the Storm Sewer system without using an appropriate pre-treatment system, as required.

It is noted that the water quality results presented in this report may not be representative of the long-term condition of groundwater quality onsite. As such, regular water quality monitoring is recommended for the post-construction phase, as required by the City of Toronto. Dewatering (short and long term) may induce migration of contaminants within the zone of influence and beyond due to changing hydraulic gradients, hydrogeological conditions beyond site boundaries and preferential pathways in utility beddings etc. The water quality sampling conducted as part of this assessment was carried out under static conditions. As a result. monitoring may be required during dewatering activities (short and long term) to examine potential migration, and this should be performed more frequently during early dewatering stages.

5.5 Well Decommissioning

In conformance with Regulation 903 of the Ontario Water Resources Act, the installation and eventual decommissioning of any dewatering system wells or monitoring wells must be completed by a licensed well contractor. This will be required for all wells that are no longer in use.

6 Conclusions and Recommendations

Based on the findings of the Hydrogeological Investigation, the following conclusions and recommendations are provided:

- The laboratory CofA showed that all parameters conform the Sanitary and Combined Sewer Use By-Law limits (Table 1 of the By-Law).
- When compared to the Storm Sewer Use By-Law Limits (Table 2), the CofA concentrations of Total Suspended Solids (TSS), Total Manganese (Mn) and Total Zinc (Zn) were reported above the Storm Sewer Use By-Law criteria.
- Based on the assumptions outlined in this report, the estimated peak dewatering pumping rate for proposed construction activities is approximately 220 m^3/day. As the dewatering flow rate estimate is between 50 m^3/day and 400 m^3/day, an EASR would be required to facilitate the construction dewatering program for the Site.
- The preliminary long-term flow rate of the foundation sub-drain is estimated to be approximately 140 m^3/day. The exact volume discharged can be confirmed once the system is operational. It is recommended that once the sub-drain system is in place, a flow meter be installed at the sump(s) to record daily discharge volumes to provide more representative estimates during the commissioning stage of the system. Regular maintenance/cleaning of the sub-drain system is recommended to ensure its proper operation. A Category 3 PTTW would be required for the long-term discharge.
- The estimated construction dewatering and long-term dewatering volumes are based on the assumptions outlined in this report. Any variations in hydrogeological conditions beyond those encountered as part of this preliminary investigation may significantly influence the discharge volumes.
- For the short-term dewatering system (construction phase), it is anticipated that TSS levels and some other parameters (for example, Total Metals) in the pumped groundwater may become elevated and exceed the both Sanitary and Storm Sewer Use By-Law limits. To control the concentration of TSS and associated metals, it is recommended that a suitable treatment method be implemented (filtration or decantation facilities and/ or any other applicable treatment system) during construction dewatering activities to discharge to the applicable sewer system. The specifications of the treatment system will need to be adjusted to the reported water quality results by the treatment contractor/process engineer.
- For the long-term dewatering discharge to the City of Toronto's Sewer system (post-development phase), and based on the water quality test results, the water is suitable to be discharged into the Sanitary Sewer system without using a treatment system. However, the water is not suitable to be discharged into the Storm Sewer system without using an appropriate pre-treatment system, as required.
- Pressure relief wells may be required to depressurize the sand seams to mitigate basal heave, subject to the geotechnical engineer's recommendations.
- The wells installed as part of this investigation assessed a deep groundwater level (piezometric level) and not the first groundwater table. For the design of water foundations without perimeter and foundation drainage systems, shallower wells will be required to evaluate the shallow groundwater table, and the hydrogeologist needs to be consulted during the design process.
- It is recommended that borehole investigation be conducted on the eastern part of the property to assess the presence of an aquifer in that portion of the site.
- It is noted that an agreement to discharge into the sewers owned by the City of Toronto will be required prior to releasing dewatering effluent.
- In conformance with Regulation 903 of the Ontario Water Resources Act, the installation and eventual decommissioning of any dewatering system wells or monitoring wells must be completed by a licensed well contractor. This will be required for all wells that are no longer in use.

The conclusions and recommendations provided above should be reviewed in conjunction with the entirety of the report. They assume that the present design concept described throughout the report will proceed to construction. This report is solely intended for the construction and long-term dewatering assessments. Any changes to the design concept may result in a modification to the recommendations provided in this report.

7 Limitations

This report is based on a limited investigation designed to provide information to support an assessment of the current hydrogeological conditions within the study area. The conclusions and recommendations presented within this report reflect Site conditions existing at the time of the assessment. EXP must be contacted immediately if any unforeseen Site conditions are experienced during construction activities. This will allow EXP to review the new findings and provide appropriate recommendations to allow the construction to proceed in a timely and cost-effective manner.

Our undertaking at EXP, therefore, is to perform our work within limits prescribed by our clients, with the usual thoroughness and competence of the geoscience/engineering profession. No other warranty or representation, either expressed or implied, is included or intended in this report.

This report was prepared for the exclusive use of 1140 Yonge Inc. This report may not be reproduced in whole or in part, without the prior written consent of EXP, or used or relied upon in whole or in part by other parties for any purposes whatsoever. Any use which a third party makes of this report, or any part thereof, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. EXP Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We trust that this information is satisfactory for your purposes. Should you have any questions or comments, please do not hesitate to contact this office.

Sincerely,

EXP Services Inc.

Peyman Sayyah, M.Sc., P.Geo.
Senior Hydrogeologist
Environmental Services

Reinhard Zapata Blosa, P.Geo, Ph.D.
Senior Hydrogeologist
Environmental Services

Francois Chartier, M.Sc., P.Geo.
Head of Hydrogeology Group
Environmental Services

8 References

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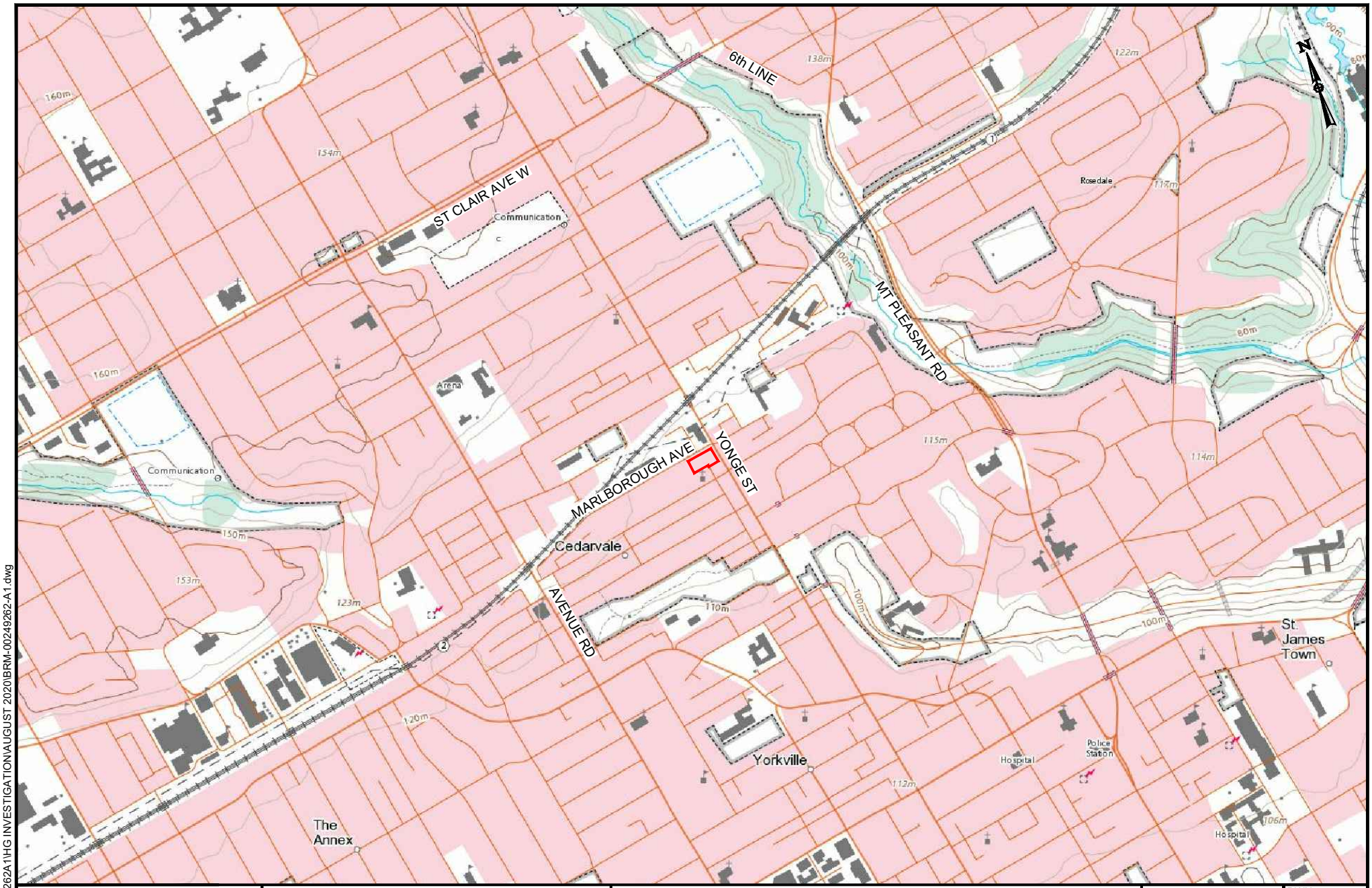
Figures



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EXP Services Inc.
t: +1.905.793.9800 | f: +1.905.793.0641
1595 Clark Boulevard
Brampton, ON L6T 4V1
Canada
www.exp.com

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LEGEND:

APPROXIMATE SITE BOUNDARY

SCALE

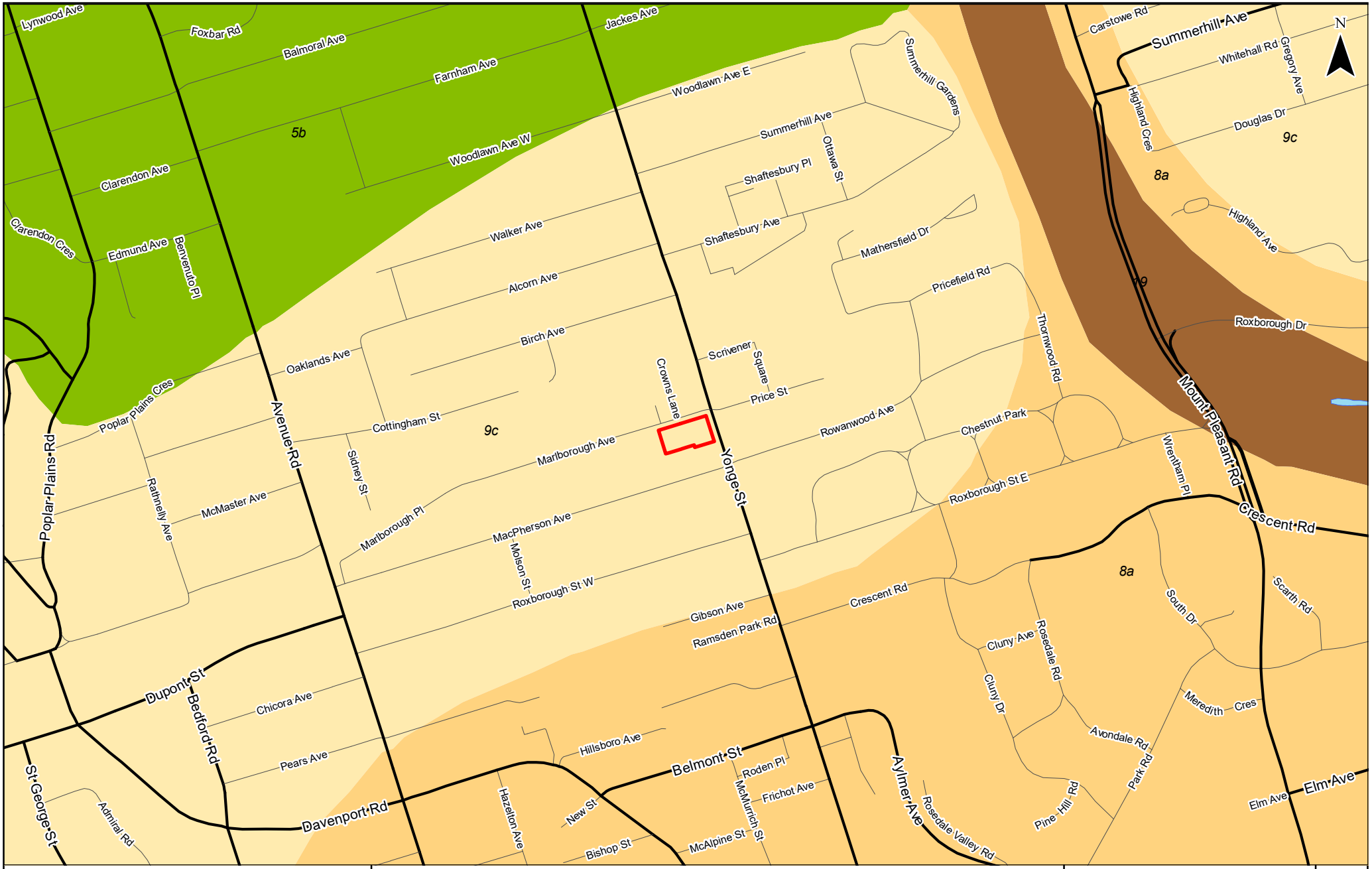
150 0 150 300 450 600 750m

TITLE AND LOCATION:

SITE LOCATION PLAN

HYDROGEOLOGICAL INVESTIGATION
1134 AND 1140 YONGE STREET
TORONTO, ONTARIO

PROJECT NO.:	DWN.:
BRM-00249262-A1	AS
SCALE: AS NOTED	CK: PS
DATE: JULY 2019	FIG. NO.: 1



SCALE:
0 100 200 300 400 500 m

SOURCE:
BASED ON ONTARIO GEOLOGICAL SURVEY DATA PUBLISHED IN 2010

exp.

DRAWN BY:	CHECKED BY:
AC	PS

LEGEND:
- APPROXIMATE SITE BOUNDARY
- 19: MODERN ALLUVIAL DEPOSITS
- 9C: COARSE-TEXTURED (FORESHORE-BASINAL) GLACIOLACUSTRINE DEPOSITS
- 8A: FINE-TEXTURED GLACIOLACUSTRINE DEPOSITS
- 5B: STONE-POOR, CARBONATE-DERIVED SILTY TO SANDY TILL

SURFICIAL GEOLOGY

FIGURE: 2

HYDROGEOLOGICAL INVESTIGATION
1134 AND 1140 YONGE STREET
TORONTO, ONTARIO

PROJECT NUMBER: BRM-00249262-A0 DATE: JULY 2019

SCALE:
0 80 160 240 320 400 m

SOURCE:
BASED ON GOOGLE EARTH IMAGERY DATED 2018,
AVAILABLE WELL RECORD INFORMATION AS OF SEPTEMBER 2017

exp.

DRAWN BY:	CHECKED BY:
AC	PS

LEGEND:

- MONITORING WELL / TEST HOLE
- ABANDONED WELL
- UNCLASSIFIED / UNFINISHED WELL
- APPROXIMATE SITE BOUNDARY
- 500 m ZONE

MECP WATER WELL RECORDS MAP

FIGURE: 3

HYDROGEOLOGICAL INVESTIGATION
1134 AND 1140 YONGE STREET
TORONTO, ONTARIO

PROJECT NUMBER: BRM-00249262-A0

DATE: JULY 2019

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LEGEND:

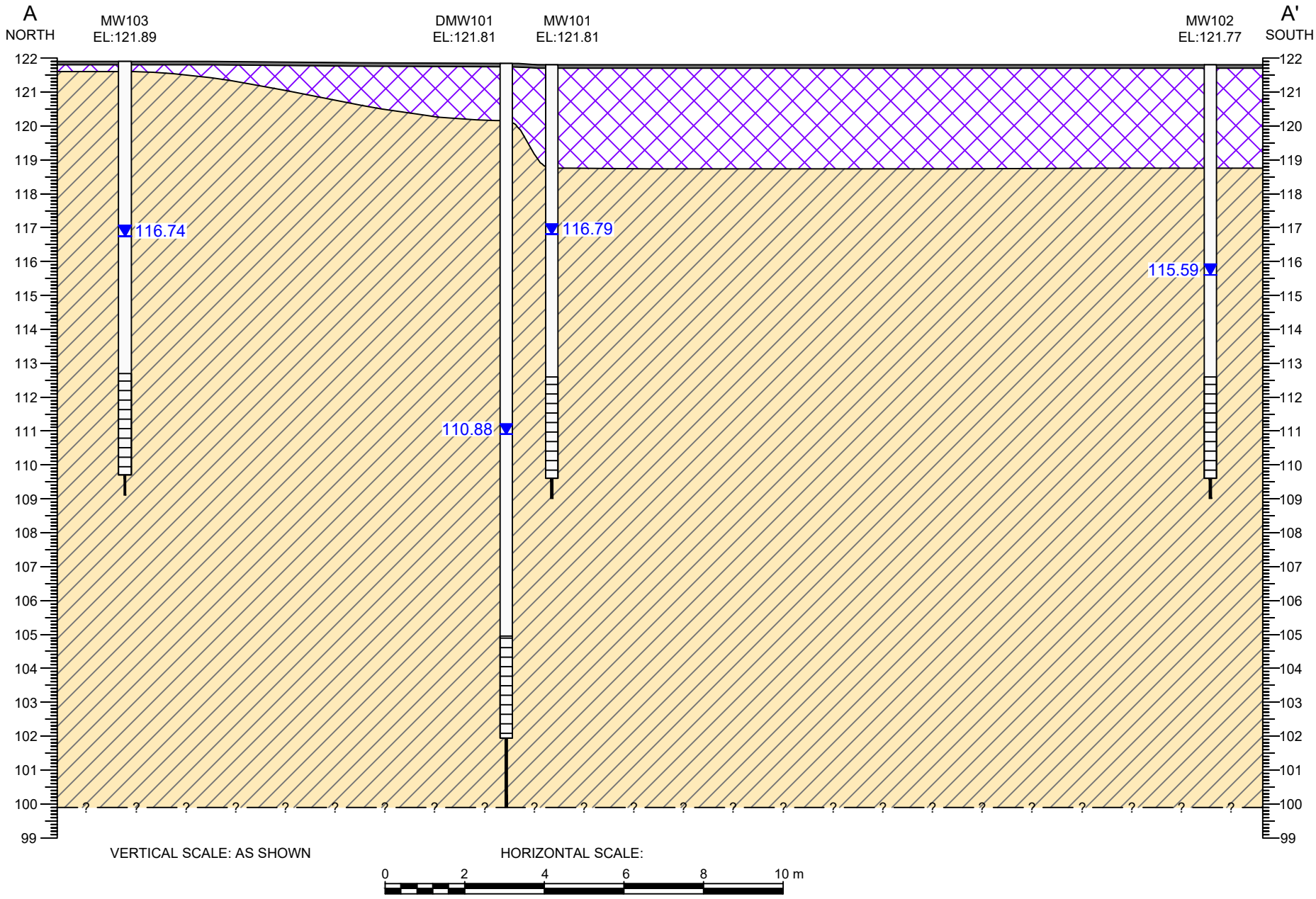
- APPROXIMATE SITE BOUNDARY
- BOREHOLE / MONITORING WELL LOCATION BY WATTERS ENVIRONMENTAL GROUP INC. (MAY, 2019)
- A-A' CROSS SECTION A-A' (SEE FIGURE 5)

TITLE AND LOCATION:

BOREHOLE / MONITORING WELL LOCATION PLAN

HYDROGEOLOGICAL INVESTIGATION
1134 AND 1140 YONGE STREET
TORONTO, ONTARIO

PROJECT NO.: BRM-00249262-A1	DWN.: AS
SCALE: AS NOTED	CK: PS
DATE: JULY 2019	FIG. NO.: 4



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1595 Clark Boulevard
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Canada
www.exp.com

LEGEND:

- ASPHALT
- FILL
- SILTY CLAY
- GROUNDWATER ELEVATION AS MEASURED ON JULY 31, 2019

TITLE AND LOCATION:

CROSS SECTION A-A'

HYDROGEOLOGICAL INVESTIGATION
1134 AND 1140 YONGE STREET
TORONTO, ONTARIO

PROJECT NO.: BRM-00249262-A1	DWN.: AS
SCALE: AS NOTED	CK: PS
DATE: JULY 2019	FIG. NO.: 5

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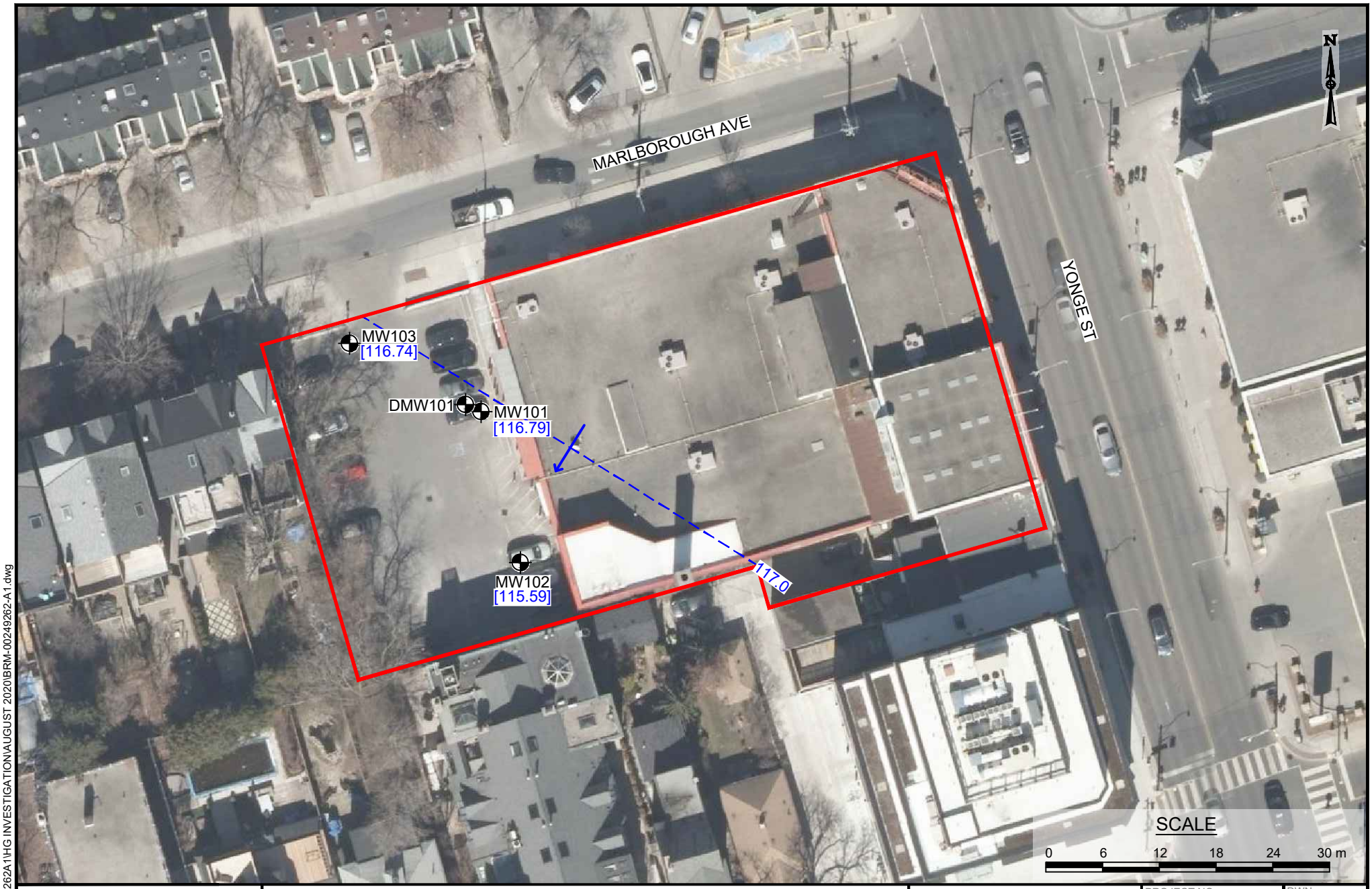

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LEGEND:

- APPROXIMATE SITE BOUNDARY
- BOREHOLE / MONITORING WELL LOCATION BY WATTERS ENVIRONMENTAL GROUP INC. (MAY, 2019)
- INFERRED GROUNDWATER CONTOURS
- [XX.XX] GROUNDWATER ELEVATION AS MEASURED ON JULY 31, 2019
- GROUNDWATER FLOW DIRECTION

TITLE AND LOCATION:

GROUNDWATER CONTOURS

HYDROGEOLOGICAL INVESTIGATION
1134 AND 1140 YONGE STREET
TORONTO, ONTARIO

PROJECT NO.:	DWN.:
BRM-00249262-A1	AS
SCALE: AS NOTED	CK: PS
DATE: JULY 2019	FIG. NO.: 6

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Appendix A – MECP WWR Summary Table

Off-Site												
BORE_HOLE_ID	WELL_ID	DATE	EAST83	NORTH83	ELEVATION (m ASL)	STREET	CITY	DISTANCE TO SITE CENTROID (m)	WATER FOUND (m BGS)	1st USE	2nd USE	FINAL STATUS
10499904	6909224	4/24/1969	630015	4837623	121.3			348	6.1	Not Used		Test Hole
23052033	7052033	8/14/2007	629718	4837406	118.0	1098 YOUNGE STREET		140		Monitoring		Observation Wells
1002030796	7120228	7/15/2008	629718	4837406	118.0	195 WICKSTEED AVE	Toronto	140		Monitoring		Observation Wells
1002960817	7143612	1/15/2010	629629	4837715	124.8	7 BIRCH AVE	Toronto	182	11.6	Monitoring		Observation Wells
1003610325	7172077	10/20/2011	629599	4837803	124.6	1212 WAGE ST	Toronto	275		Monitoring		
1003610327	7172078	10/20/2011	629604	4837790	124.4	1212 YONGE ST	Toronto	261		Monitoring		
1004546324	7206969	7/14/2013	629813	4837595	121.7	23 PRINCE ST	Toronto	147		Monitoring		Observation Wells
1004589336	7208710	8/28/2013	629807	4837853	124.6	1027 YONGE STREET	Toronto	339		Monitoring and Test Hole		Monitoring and Test Hole
1004589339	7208711	8/28/2013	629792	4837105	113.1	1027 YONGE STREET	Toronto	450		Monitoring and Test Hole		Monitoring and Test Hole
1004640889	7211366	7/18/2013	629707	4837505	119.9	1128 YONGE ST	TORONTO	46		Monitoring and Test Hole		Test Hole
1005278323	7235312	12/9/2014	629677	4837121	108.7	1008 YONGE STREET	Toronto	419		Monitoring and Test Hole		Monitoring and Test Hole
1005278326	7235313	12/9/2014	629690	4837112	109.7	1008 YONGE STREET	Toronto	428		Monitoring and Test Hole		Monitoring and Test Hole
1005278329	7235314	12/9/2014	629701	4837121	108.7	1008 YONGE STREET	Toronto	419		Monitoring and Test Hole		Monitoring and Test Hole
1005278332	7235315	12/9/2014	629711	4837129	108.3	1008 YONGE STREET	Toronto	412		Monitoring and Test Hole		Monitoring and Test Hole
1005312442	7238239	1/9/2015	629700	4837485	119.6	1128 YONGE ST	TORONTO	59		Test Hole		
1005323105	7239711	3/18/2015	629667	4837119	109.5	1008 YONGE ST	Toronto	421		Monitoring and Test Hole		Monitoring and Test Hole
1005323108	7239712	3/18/2015	629691	4837157	107.4	1008 YONGE ST	Toronto	383		Monitoring and Test Hole		Monitoring and Test Hole
1005869831	7256183	11/3/2015	629786	4837642	122.7	8 PRICE ST	Toronto	150		Monitoring		Observation Wells
1006013925	7263563	4/8/2016	629695	4837498	119.8	1128 YONGE STREET	Toronto	45		Monitoring and Test Hole		Test Hole
1006013928	7263564	4/5/2016	629695	4837496	119.7	1128 YONGE STREET	Toronto	47		Commerical	Monitoring	Observation Wells
1006060719	7265161	5/17/2016	629815	4837338	115.6	1027 YOUNGE STREET	TORONTO	244		Monitoring and Test Hole		Monitoring and Test Hole
1006060731	7265162	5/17/2016	629813	4837344	115.9	1027 YONGE STREET	TORONTO	238		Monitoring and Test Hole		Monitoring and Test Hole
1006060739	7265163	5/17/2016	629817	4837344	115.8	1027 YONGE STREET	TORONTO	241		Monitoring and Test Hole		Monitoring and Test Hole
1006060742	7265164	5/17/2016	629830	4837347	114.9	1027 YONGE STREET	TORONTO	246		Monitoring and Test Hole		Monitoring and Test Hole
1006060745	7265165	5/17/2016	629830	4837337	114.5	1027 YONGE STREET	TORONTO	254		Monitoring and Test Hole		Monitoring and Test Hole
1006060748	7265166	5/17/2016	629819	4837385	114.9	1027 YONGE STREET	TORONTO	210		Monitoring and Test Hole		Monitoring and Test Hole
1006060754	7265167	5/18/2016	629820	4837323	114.6	1027 YONGE STREET	TORONTO	260		Monitoring and Test Hole		Monitoring and Test Hole
1006060757	7265168	5/18/2016	629821	4837322	114.6	1027 YONGE STREET	TORONTO	261		Monitoring and Test Hole		Monitoring and Test Hole
1006064645	7265169	5/18/2016	629829	4837316	114.0	1027 YONGE STREET	TORONTO	270		Monitoring and Test Hole		Monitoring and Test Hole
1006064648	7265170	5/18/2016	629843	4837326	112.7	1027 YONGE STREET	TORONTO	271		Monitoring and Test Hole		Monitoring and Test Hole
1006375872	7284443	12/7/2016	629715	4837625	122.2	5 SCRIVENER SQUARE	Toronto	94	4.6	Test Hole	Monitoring	Monitoring and Test Hole
1006375875	7284444	12/9/2016	629725	4837647	122.5	SCRIVENER SQUARE	Toronto	118	10.4	Test Hole	Monitoring	Monitoring and Test Hole
1006375878	7284445	12/19/2016	629718	4837687	124.6	SCRIVENER SQUARE	Toronto	153	11.0	Test Hole	Monitoring	Monitoring and Test Hole
1006563709	7288943	1/17/2017	629838	4837323	113.4	1027 YONGE STREET	Toronto	270		Test Hole		Test Hole
1006746948	7295830	8/24/2017	629554	4837728	123.3	26 BIRCH AVENUE	Toronto	225		Test Hole	Monitoring	Monitoring and Test Hole
11558686	6929886	2/15/2006	629627	4837766	123.1	1210 YONGE ST	TORONTO	232		Not Used		Observation Wells
11180078	6928231	10/4/2004	629791	4837511	119.0	5 ROWANWOOD AVE	TORONTO	118	1.0			Observation Wells
11328637	6929668	9/29/2005	629556	4837740	123.4	24 BIRCH AVE	TORONTO	234	7.6			Observation Wells
1002960815	7143611	1/16/2010	629629	4837712	125.1	7 BIRCH AV	Toronto	179	11.6			Observation Wells
1006013931	7263565	4/5/2016	629697	4837491	119.7	1128 YONGE STREET	Toronto	53				Observation Wells
1006032858	7264174	4/21/2016	629154	4837470	122.5	281-289 AVENUE RD	TORONTO	528	1.0			
1006032861	7264175	4/21/2016	629147	4837462	122.4	281-289 AVENUE ROAD	TORONTO	536	3.3			
11766009	7043604	4/16/2007	629733	4837411	118.0	1098 YOUNGE ST	TORONTO	140				Observation Wells
1004230648	7194696	2/15/2012	629587	4837835	125.3			309				
1004727791	7218676	7/17/2013	629699	4837500	119.8			45				
1006038672	7264373	5/25/2016	629787	4837341	115.5			227				
1006376113	7284464	7/11/2016	629792	4837877	125.0			357				
1006713405	7293392	5/26/2017	630105	4837400	118.5			450				

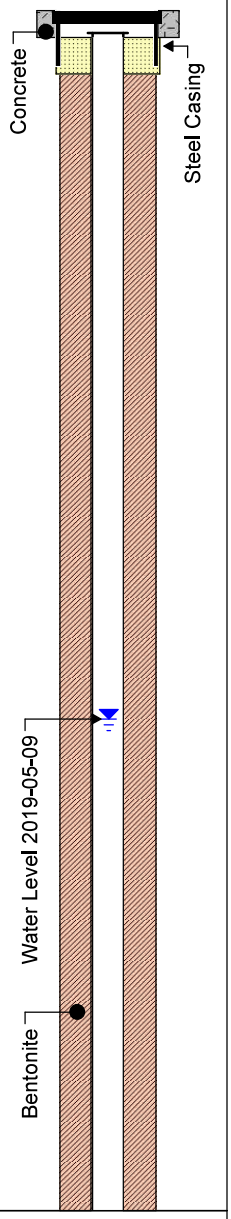
Appendix B – Borehole Logs

WATTERS ENVIRONMENTAL GROUP INC.®
9135 Keele Street, Unit A1
Concord, Ontario L4K 0J4
www.wattersenvironmental.com
416-361-2407

Borehole No: MW101

Project No.: 19-0016.04
Client: 1140 Yonge Inc.
Location: 1140 Yonge Street, Toronto, Ontario
Project Manager: R.O.
Logged By: T.A.
Ground Elevation: 100.33
Total Depth: 12.19 m
Water Level: 4.95 m

SUBSURFACE PROFILE				SAMPLE							Well Completion Data
Depth (ft / m)	Symbol	Description	Depth/Elev. (m)	Number	Type	N-Value	Recovery %	T.O.V. CGD/PID	Lab Submitted	Moisture (%)	
0 / 0		Ground Surface	100.31								
		95 mm Asphalt									
2		compact sand and gravel, brick fragments, concrete fragments FILL		1	SS	17	92			10.3	
4				2	SS	28	43			17.2	
			98.64	3A	SS					13.4	
6 / 2				3B	SS	27	100			16.1	
8		brown		4	SS	25	100			18.2	
		grey									
10		layered SILTY CLAY and weakly plastic SILT occasional sand lens occasional wet sand seam up to 80 mm thick		5	SS	20	100			19.4	
12 / 4											
14				6	SS	16	100		X	19.1	
16		stiff to very stiff		7	SS	14	100			20.4	
18		very stiff to hard		8	SS	32	100			19.8	
20 / 6				9	SS	28	100			20.3	
22											
24				10A	SS					17.5	
26 / 8		400 mm thick wet grey SILT and fine SAND seam		10B	SS	27	100			17.6	
				10C	SS					18.8	



Drilled By: Pontil Drilling, CME 75
Drill Method: Split Spoon Sampling and Hollow Stem Augers
Drill Date: 2019-04-25
Hole Size: 200 mm
Screening Tool: Eagle II
Sheet: 1 of 2

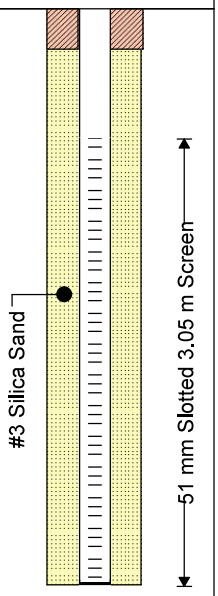
WATTERS ENVIRONMENTAL GROUP INC.®
9135 Keele Street, Unit A1
Concord, Ontario L4K 0J4
www.wattersenvironmental.com
416-361-2407

Borehole No: MW101

Project No.: 19-0016.04
Client: 1140 Yonge Inc.
Location: 1140 Yonge Street, Toronto, Ontario
Project Manager: R.O.
Logged By: T.A.

Ground Elevation: 100.33
Total Depth: 12.19 m
Water Level: 4.95 m

SUBSURFACE PROFILE				SAMPLE							Well Completion Data
Depth	Symbol	Description	Depth/Elev. (m)	Number	Type	N-Value	Recovery %	T.O.V. CGD/PID	Lab Submitted	Moisture (%)	
28											
30		layered SILTY CLAY and weakly plastic SILT occasional sand lens occasiional wet sand seam up to 80 mm thick		11	SS	28	100			19.5	
32											
10											
34		very stiff									
36				12	SS	26	100			20.2	
38											
12			88.12								
40		End of Borehole									
42											
44											
46											
14											
48											
50											
52											
16											
54											



Drilled By: Pontil Drilling, CME 75
Drill Method: Split Spoon Sampling and Hollow Stem Augers
Drill Date: 2019-04-25

Hole Size: 200 mm
Screening Tool: Eagle II
Sheet: 2 of 2

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Concord, Ontario L4K 0J4
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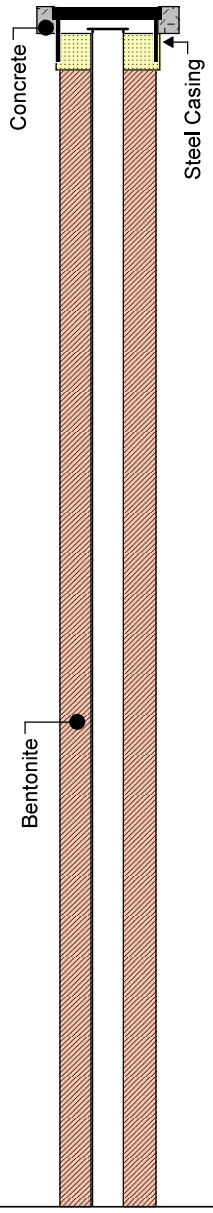
416-361-2407

Borehole No: DMW101

Project No.: 19-0016.04
Client: 1140 Yonge Inc.
Location: 1140 Yonge Street, Toronto, Ontario
Project Manager: R.O.
Logged By: T.A.

Ground Elevation: 100.33
Total Depth: 21.94 m
Water Level: 18.235 m

SUBSURFACE PROFILE				SAMPLE							Well Completion Data
Depth (ft / m)	Symbol	Description	Depth/Elev. (m)	Number	Type	N-Value	Recovery %	T.O.V. CGD/PID	Lab Submitted	Moisture (%)	
0 / 0		Ground Surface	100.33								
		95 mm Asphalt									
		compact sand and gravel, brick fragments, concrete fragments FILL		1	SS	17	92			10.3	
4				2	SS	28	43			17.2	
			98.66	3A	SS					13.4	
6 / 2				3B	SS	27	100			16.1	
8		brown		4	SS	25	100			18.2	
		grey									
10		layered SILTY CLAY and weakly plastic SILT occasional sand lens occasional wet sand seam up to 80 mm thick		5	SS	20	100			19.4	
12 / 4				6	SS	16	100		X	19.1	
14											
16		stiff to very stiff		7	SS	14	100			20.4	
18		very stiff to hard		8	SS	32	100			19.8	
20 / 6				9	SS	28	100			20.3	
22											
24				10A	SS					17.5	
26 / 8		400 mm thick wet grey SILT and fine SAND seam		10B	SS	27	100			17.6	
				10C	SS					18.8	



Drilled By: Pontil Drilling, CME 75
Drill Method: Split Spoon Sampling and Hollow Stem Augers
Drill Date: 2019-04-24

Hole Size: 200 mm
Screening Tool: Eagle II
Sheet: 1 of 3

WATTERS ENVIRONMENTAL GROUP INC.®
9135 Keele Street, Unit A1
Concord, Ontario L4K 0J4
www.wattersenvironmental.com
416-361-2407

Borehole No: DMW101

Project No.: 19-0016.04
Client: 1140 Yonge Inc.
Location: 1140 Yonge Street, Toronto, Ontario
Project Manager: R.O.
Logged By: T.A.

Ground Elevation: 100.33
Total Depth: 21.94 m
Water Level: 18.235 m

SUBSURFACE PROFILE				SAMPLE							Well Completion Data
Depth	Symbol	Description	Depth/Elev. (m)	Number	Type	N-Value	Recovery %	T.O.V. CGD/PID	Lab Submitted	Moisture (%)	
28											
30				11	SS	28	100			19.5	
32											
34		very stiff									
36				12	SS	26	100			20.2	
38											
40		layered SILTY CLAY and weakly plastic SILT occasional sand lens occasiional wet sand seam up to 80 mm thick		13	SS	23	100			18.5	
42											
44											
46				14	SS	27	100			18.6	
48											
50				15	SS	23	100			21.1	
52											
54											

Drilled By: Pontil Drilling, CME 75
Drill Method: Split Spoon Sampling and Hollow Stem Augers
Drill Date: 2019-04-24

Hole Size: 200 mm
Screening Tool: Eagle II
Sheet: 2 of 3

WATTERS ENVIRONMENTAL GROUP INC.®
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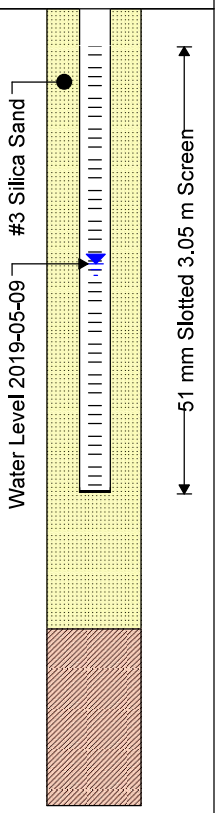
416-361-2407

Borehole No: DMW101

Project No.: 19-0016.04
Client: 1140 Yonge Inc.
Location: 1140 Yonge Street, Toronto, Ontario
Project Manager: R.O.
Logged By: T.A.

Ground Elevation: 100.33
Total Depth: 21.94 m
Water Level: 18.235 m

SUBSURFACE PROFILE				SAMPLE							Well Completion Data
Depth	Symbol	Description	Depth/Elev. (m)	Number	Type	N-Value	Recovery %	T.O.V. CGD/PID	Lab Submitted	Moisture (%)	
18		layered SILTY CLAY and weakly plastic SILT occasioanl sand lens occasional wet sand seams up to 80 mm thick		16	SS	20	100			22.1	
				17	SS	17	100			24.9	
20				18	SS	19	100			18.7	
				19	SS	23	100			13.5	
22		End of Borehole	78.39								
24											



Drilled By: Pontil Drilling, CME 75
Drill Method: Split Spoon Sampling and Hollow Stem Augers
Drill Date: 2019-04-24

Hole Size: 200 mm
Screening Tool: Eagle II
Sheet: 3 of 3

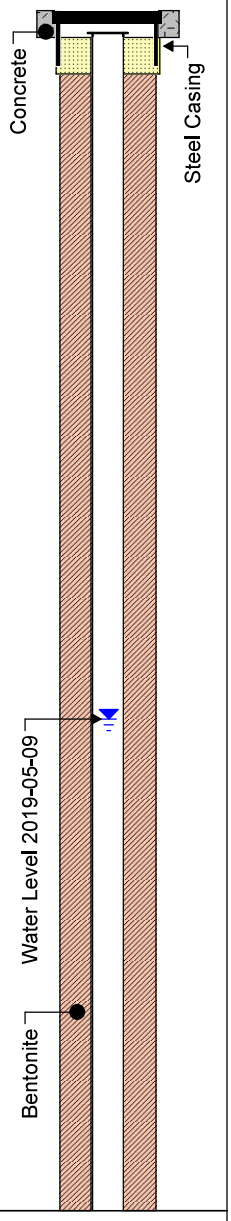
WATTERS ENVIRONMENTAL GROUP INC.®
9135 Keele Street, Unit A1
Concord, Ontario L4K 0J4
www.wattersenvironmental.com
416-361-2407

Borehole No: MW102

Project No.: 19-0016.04
Client: 1140 Yonge Inc.
Location: 1140 Yonge Street, Toronto, Ontario
Project Manager: R.O.
Logged By: T.A.

Ground Elevation: 100.28
Total Depth: 12.80 m
Water Level: 6.07 m

SUBSURFACE PROFILE				SAMPLE							Well Completion Data
Depth (ft / m)	Symbol	Description	Depth/Elev. (m)	Number	Type	N-Value	Recovery %	T.O.V. CGD/PID	Lab Submitted	Moisture (%)	
0 / 0		Ground Surface	100.28								
		130 mm Asphalt									
2		sand and angular gravel FILL		1	SS	17	58				
4				2	SS	20	67				
6 / 2		compact moist		3	SS	11	50				
8		loose wet		4	SS	3	38				
10			97.23								
12				5	SS	21	100				
14 / 4		400 mm seam wet brown SILTY fine SAND		6A	SS	28	100				
				6B	SS						
16				7	SS	23	100				
18		200 mm seam wet SILT and fine SAND		8A	SS						
				8B	SS	23	100				
20 / 6		very stiff grey layered SILTY CLAY frequent silt seam and parting occasional silt and sand lens up to 80 mm thick		9	SS	29	100				
22											
24											
26 / 8				10	SS	24	100				



Drilled By: Pontil Drilling, CME 75
Drill Method: Split Spoon Sampling and Hollow Stem Augers
Drill Date: 2019-04-25

Hole Size: 200 mm
Screening Tool: Eagle II
Sheet: 1 of 2

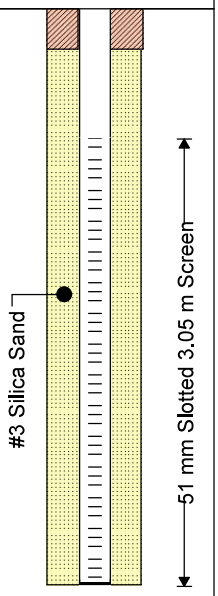
WATTERS ENVIRONMENTAL GROUP INC.®
9135 Keele Street, Unit A1
Concord, Ontario L4K 0J4
www.wattersenvironmental.com
416-361-2407

Borehole No: MW102

Project No.: 19-0016.04
Client: 1140 Yonge Inc.
Location: 1140 Yonge Street, Toronto, Ontario
Project Manager: R.O.
Logged By: T.A.
Ground Elevation: 100.28
Total Depth: 12.80 m
Water Level: 6.07 m

SUBSURFACE PROFILE				SAMPLE							Well Completion Data
Depth	Symbol	Description	Depth/Elev. (m)	Number	Type	N-Value	Recovery %	T.O.V. CGD/PID	Lab Submitted	Moisture (%)	
28		very stiff grey layered SILTY CLAY frequent silt seam and parting occasional silt and sand lens up to 80 mm thick									
30				11	SS	22	100				
32											
34											
36				12	SS	21	100				
38											
40				13	SS	24	100				
42			87.48								
44		End of Borehole									
46											
48											
50											
52											
54											

10
12
14
16



Drilled By: Pontil Drilling, CME 75
Drill Method: Split Spoon Sampling and Hollow Stem Augers
Drill Date: 2019-04-25
Hole Size: 200 mm
Screening Tool: Eagle II
Sheet: 2 of 2

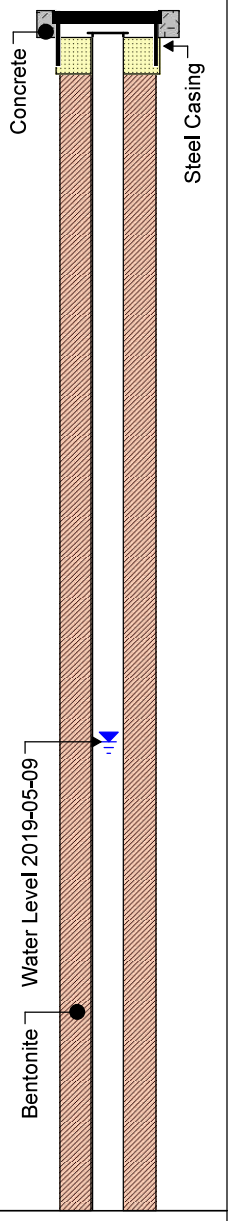
WATTERS ENVIRONMENTAL GROUP INC.®
9135 Keele Street, Unit A1
Concord, Ontario L4K 0J4
www.wattersenvironmental.com
416-361-2407

Borehole No: MW103

Project No.: 19-0016.04
Client: 1140 Yonge Inc.
Location: 1140 Yonge Street, Toronto, Ontario
Project Manager: R.O.
Logged By: T.A.

Ground Elevation: 100.40
Total Depth: 12.80 m
Water Level: 5.105 m

SUBSURFACE PROFILE				SAMPLE							Well Completion Data
Depth (ft / m)	Symbol	Description	Depth/Elev. (m)	Number	Type	N-Value	Recovery %	T.O.V. CGD/PID	Lab Submitted	Moisture (%)	
0 / 0		Ground Surface	100.40								
		50 mm Asphalt 80 mm sand and angular gravel brick some sand, some silt FILL	100.00								
2				1	SS	6	75				
4				2	SS	3	75				
6 / 2		brown with grey patches stiff		3	SS	11	100				
		very stiff									
8				4	SS	23	100				
10				5	SS	21	100				
12 / 4		grey layered SILTY CLAY with silt silt seams and parting occasional thin silt and sand seams		6A	SS	21	100				
14											
16				7	SS	23	100				
18				8	SS	26	100				
20 / 6				9	SS	26	100				
22											
24											
26 / 8				10	SS	26	100				



Drilled By: Pontil Drilling, CME 75
Drill Method: Split Spoon Sampling and Hollow Stem Augers
Drill Date: 2019-04-26

Hole Size: 200 mm
Screening Tool: Eagle II
Sheet: 1 of 2

WATTERS ENVIRONMENTAL GROUP INC.®
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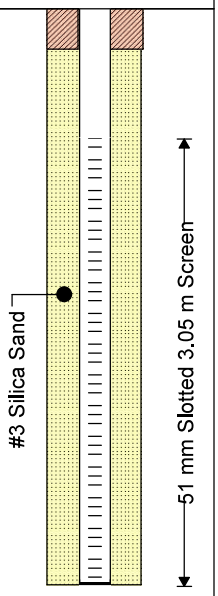
Concord, Ontario L4K 0J4
www.wattersenvironmental.com
416-361-2407

Borehole No: MW103

Project No.: 19-0016.04
Client: 1140 Yonge Inc.
Location: 1140 Yonge Street, Toronto, Ontario
Project Manager: R.O.
Logged By: T.A.

Ground Elevation: 100.40
Total Depth: 12.80 m
Water Level: 5.105 m

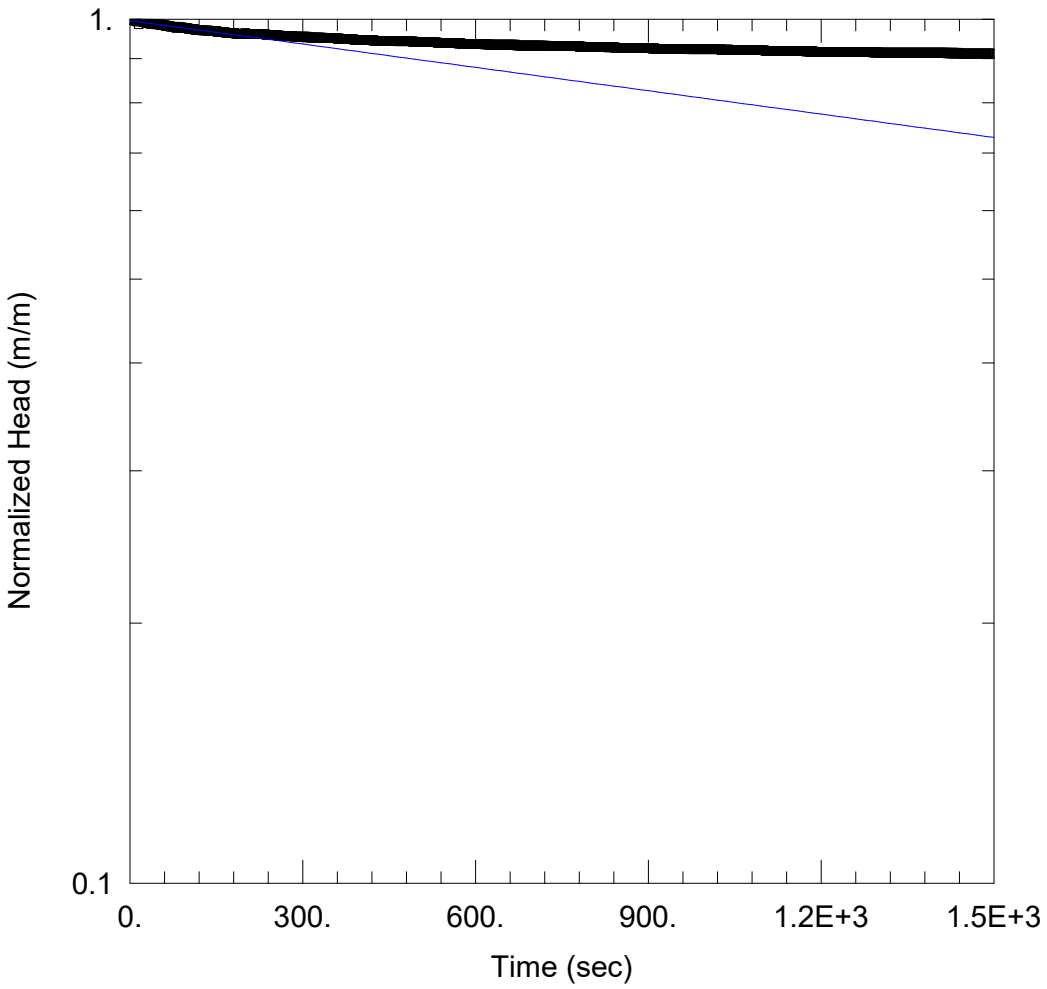
SUBSURFACE PROFILE				SAMPLE							Well Completion Data
Depth	Symbol	Description	Depth/Elev. (m)	Number	Type	N-Value	Recovery %	T.O.V. CGD/PID	Lab Submitted	Moisture (%)	
28		grey layered SILTY CLAY with silt seam and parting occasional thin silt and sand seam									
30				11	SS	17	100				
32											
34											
36				12	SS	28	100				
38											
40											
42			87.60	13	SS	29	100				
44		End of Borehole									
46											
48											
50											
52											
54											



Drilled By: Pontil Drilling, CME 75
Drill Method: Split Spoon Sampling and Hollow Stem Augers
Drill Date: 2019-04-26

Hole Size: 200 mm
Screening Tool: Eagle II
Sheet: 2 of 2

Appendix C – SWRT Procedures and Results



SWRT - RISING HEAD

Data Set: I:\...\MW101-D.aqt
Date: 07/11/19 Time: 15:47:36

PROJECT INFORMATION

Company: EXP Service Inc.
Client: Devron Developments
Project: BRM-00249262-A1
Location: 1140 Yonge Street
Test Well: DMW101
Test Date: May 13, 2019

AQUIFER DATA

Saturated Thickness: 1.6 m Anisotropy Ratio (Kz/Kr): 1.

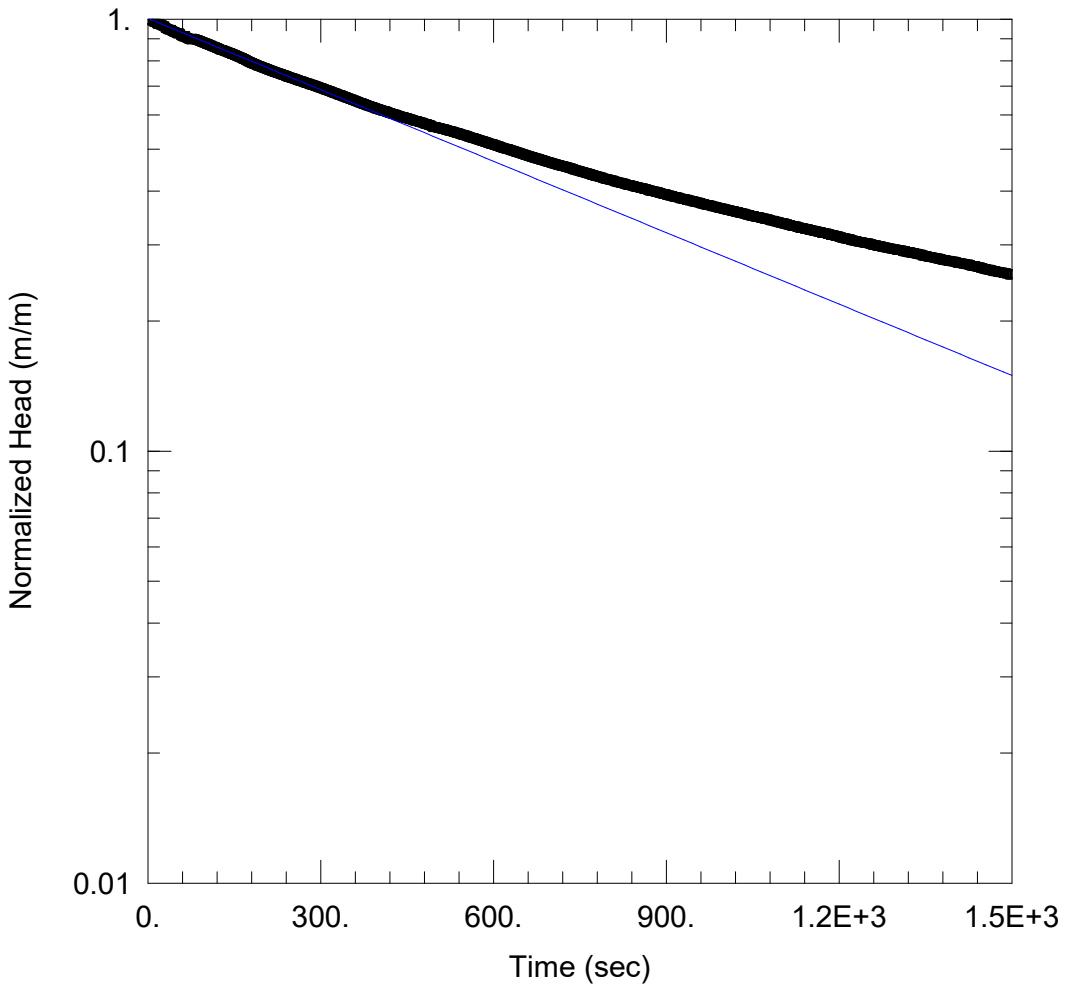
WELL DATA (DMW101)

Initial Displacement: 1.509 m
Total Well Penetration Depth: 3. m
Casing Radius: 0.025 m
Static Water Column Height: 1.6 m
Screen Length: 3. m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 2.147E-7 m/sec y0 = 1.503 m



SWRT - RISING HEAD

Data Set: I:\...\MW101-S.aqt
Date: 07/11/19 Time: 15:48:46

PROJECT INFORMATION

Company: EXP Service Inc.
Client: Devron Developments
Project: BRM-00249262-A1
Location: 1140 Yonge Street
Test Well: MW101
Test Date: May 13, 2019

AQUIFER DATA

Saturated Thickness: 7.465 m Anisotropy Ratio (Kz/Kr): 1.

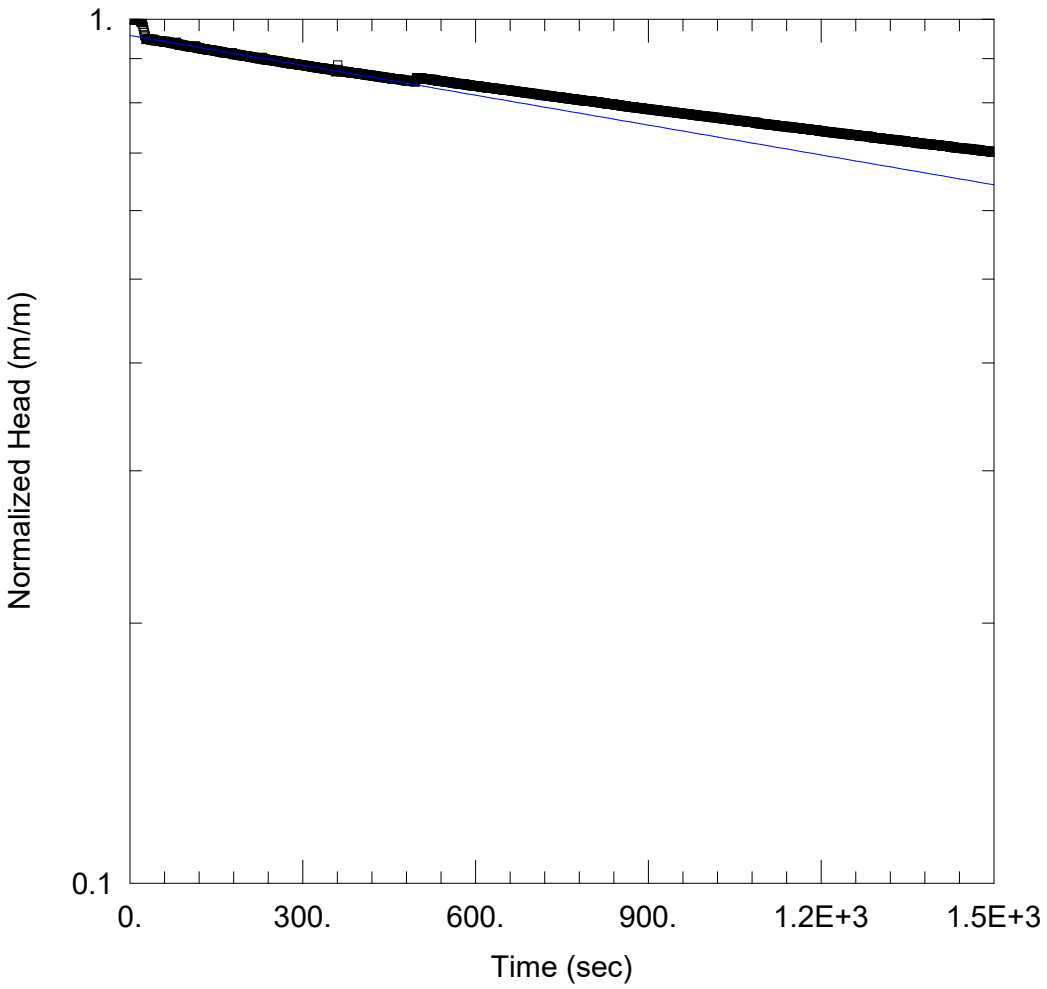
WELL DATA (MW101)

Initial Displacement: 1.235 m
Total Well Penetration Depth: 7.465 m
Casing Radius: 0.025 m
Static Water Column Height: 7.465 m
Screen Length: 3. m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 7.246E-7 m/sec y0 = 1.24 m



SWRT - FALLING HEAD

Data Set: I:\...\MW102.aqt
Date: 07/11/19 Time: 15:49:29

PROJECT INFORMATION

Company: EXP Service Inc.
Client: Devron Developments
Project: BRM-00249262-A1
Location: 1140 Yonge Street
Test Well: MW102
Test Date: May 13, 2019

AQUIFER DATA

Saturated Thickness: 6.125 m Anisotropy Ratio (Kz/Kr): 1.

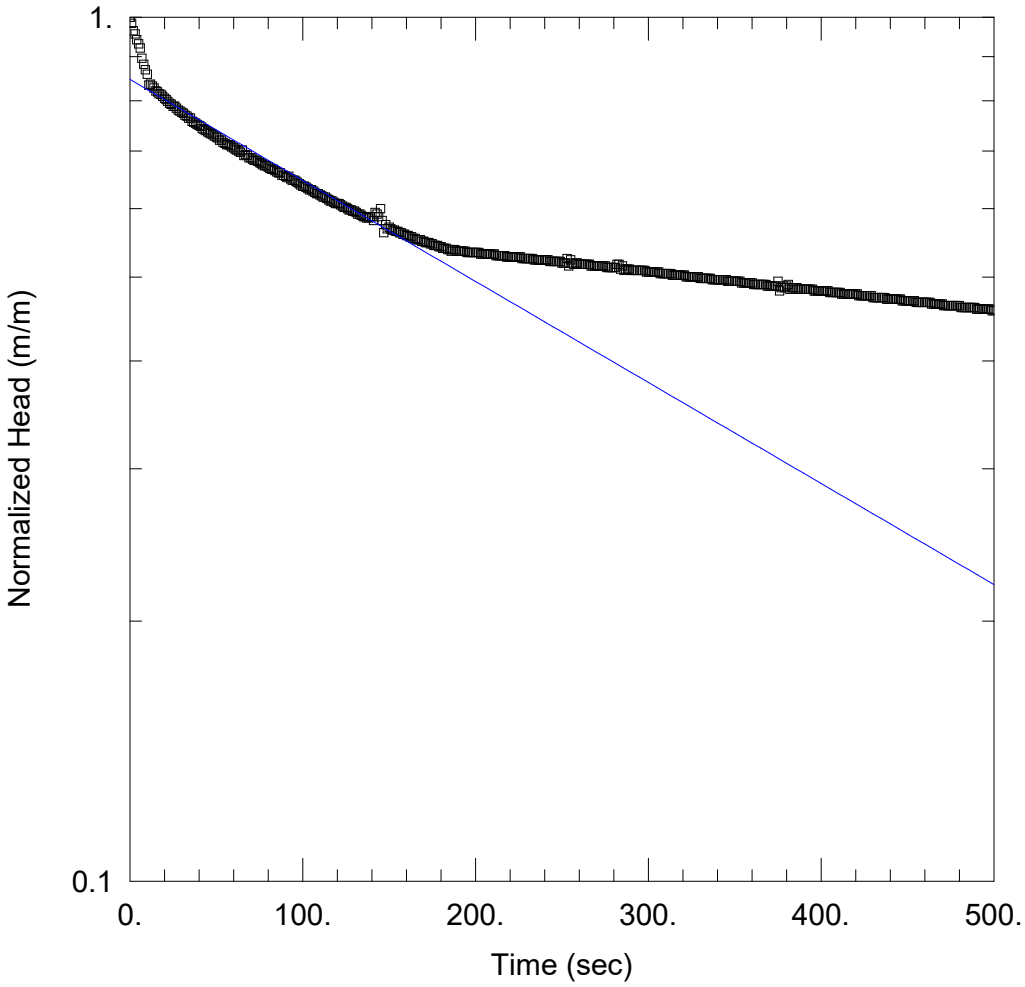
WELL DATA (MW102)

Initial Displacement: 1.001 m
Total Well Penetration Depth: 6.125 m
Casing Radius: 0.025 m
Static Water Column Height: 6.125 m
Screen Length: 3. m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 1.514E-7 m/sec y0 = 0.9582 m



SWRT - FALLING HEAD

Data Set: I:\...\MW103.aqt
Date: 07/11/19 Time: 15:50:06

PROJECT INFORMATION

Company: EXP Service Inc.
Client: Devron Developments
Project: BRM-00249262-A1
Location: 1140 Yonge Street
Test Well: MW103
Test Date: May 13, 2019

AQUIFER DATA

Saturated Thickness: 7.125 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW103)

Initial Displacement: 1.448 m
Total Well Penetration Depth: 7.125 m
Casing Radius: 0.025 m
Static Water Column Height: 7.125 m
Screen Length: 3. m
Well Radius: 0.025 m

SOLUTION

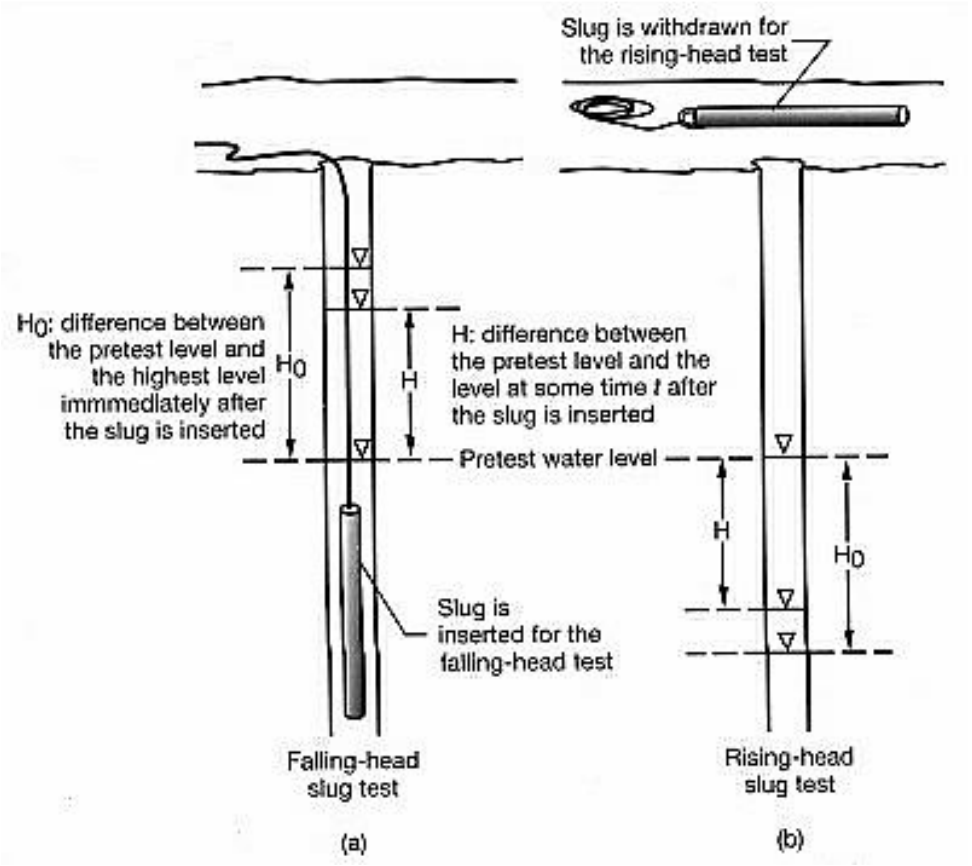
Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 1.537E-6 m/sec
y0 = 1.227 m

Single Well Response Test Procedure

A Single Well Response Test (SWRT), also known as a bail test or a slug test, is conducted in order to determine the saturated hydraulic conductivity (K) of an aquifer. The method of the SWRT is to characterize the change of groundwater level in a well or borehole over time.

In order to ensure consistency and repeatability, all **exp** employees are to follow the procedure outlined in this document when conducting SWRTs.

The figure below depicts a schematic of a slug and bail test and the respective water level changes.



Initials ___

Slug Test Procedure

Equipment Required

- Copy of a signed health and safety plan
- Copy of the work program
- PPE as required by Site-Specific HASP
- Copy of the monitoring well location plan/site plan
- Waterproof pen and bound field note book
- SWRT field data Entry form
- Disposable gloves
- Duct tape
- Deionized water
- Alconox (phosphate free detergent)
- Spray bottles
- Electronic water level meter and spare batteries
- Solid PVC or stainless steel slug of known volume or clean water
- String (nylon)
- Water pressure transducer (data logger) and baro-logger
- Watch or stop watch with second hand
- Plastic sheeting

Testing Procedure

1. Remove cap from well and collect static water level
2. Remove waterra tubing/bailer and place in garbage bag. Record static water level measurement again.
3. Lower the slug into the well and record the dynamic water level.
4. Record the drawdown (for the slug test) at set five (5) second intervals for the first five (5) minutes, then reduce to every one (1) minute.
5. Continue recording the drawdown until 95% recovery is reached. To calculate this value: Find the difference between the dynamic water level and the static water level, then multiply by 95% (.95). Add the resulting value to the dynamic water level.

   (Static Water Level – Dynamic Water Level).95 + Static Water Level = 95% Recovery Value
6. Once complete, replace the waterra tubing/bailer and re-secure the well cap.

Note: If the well is deep, more than one slug may be inserted by attaching the slugs to a series.

Slugs must be washed with methanol, then lab grade soap, and then rinsed with de-ionized water after each use.

Based on the recorded observations, the hydraulic conductivity (in m/s) of the aquifer will be determined. In order to determine the hydraulic conductivity; the well diameter, radius of the borehole and length of the screen will also be required.

Bail Test Procedure

Equipment Required

- 20 L (5 gal) Graduated pail
- Stop watch or watch with seconds
- Garbage bags
- Water level meter
- Field sheets/log book
- Latex Gloves
- Bailer and Rope

Procedure

1. Remove cap from well and collect static water level.
2. If using a **bailer**:
    a. Affix the rope to the bailer.
    b. Remove the waterra tubing and place in garbage bag
    c. Record static water level measurement again.
    d. Record how much water was removed by either counting the number of full bailers or emptying removed water into a container.
    e. Quickly lower the bailer into the well and remove.
    f. Continue this process until the water level will reduce no further.
    g. Record the dynamic water level.
3. If using **waterra** to bail the water:
    a. Pump the water into graduated bucket until the water level will reduce no further.
    b. Record how much water has been removed.
    c. Record the dynamic water level.
4. Record the recovery at set five (5) second intervals for the first (5) minutes, then reduce to every one (1) minute.
5. Continue recording the drawdown/recovery until 95% recovery is reached.
6. Once complete, replace any waterra tubing that may have been removed from the well and re-secure the well cap.

Appendix D – Laboratory Certificates of Analysis

Maxxam
A Bureau Veritas Group Company

Your Project #: BRM-00249262-A1
Site Location: 1140 YONGE
Your C.O.C. #: 677038-19-01

Attention: Francois Chartier

exp Services Inc
1595 Clark Blvd
Brampton, ON
CANADA L6T 4V1

Report Date: 2019/05/22
Report #: R5720582
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9C7702
Received: 2019/05/13, 19:43

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Sewer Use By-Law Semivolatile Organics	1	2019/05/14	2019/05/15	CAM SOP 00301	EPA 8270 m
Biochemical Oxygen Demand (BOD)	1	2019/05/14	2019/05/19	CAM SOP-00427	SM 23 5210B m
Chromium (VI) in Water	1	N/A	2019/05/16	CAM SOP-00436	EPA 7199 m
Total Cyanide	1	2019/05/15	2019/05/15	CAM SOP-00457	OMOE E3015 5 m
Fluoride	1	2019/05/14	2019/05/15	CAM SOP-00449	SM 23 4500-F C m
Mercury in Water by CVAA	1	2019/05/16	2019/05/16	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by ICPMS	1	N/A	2019/05/16	CAM SOP-00447	EPA 6020B m
E.coli, (CFU/100mL)	1	N/A	2019/05/13	CAM SOP-00552	MOE LSB E3371
Total Nonylphenol in Liquids by HPLC	1	2019/05/14	2019/05/15	CAM SOP-00313	In-house Method
Nonylphenol Ethoxylates in Liquids: HPLC	1	2019/05/14	2019/05/15	CAM SOP-00313	In-house Method
Animal and Vegetable Oil and Grease	1	N/A	2019/05/17	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/05/17	2019/05/17	CAM SOP-00326	EPA1664B m,SM5520A m
Polychlorinated Biphenyl in Water	1	2019/05/16	2019/05/17	CAM SOP-00309	EPA 8082A m
pH	1	2019/05/14	2019/05/15	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/05/14	CAM SOP-00444	OMOE E3179 m
Total Kjeldahl Nitrogen in Water	1	2019/05/14	2019/05/16	CAM SOP-00938	OMOE E3516 m
Total PAHs (1)	1	N/A	2019/05/16	CAM SOP - 00301	EPA 8270 m
Mineral/Synthetic O & G (TPH Heavy Oil) (2)	1	2019/05/17	2019/05/17	CAM SOP-00326	EPA1664B m,SM5520F m
Total Suspended Solids	1	2019/05/15	2019/05/16	CAM SOP-00428	SM 23 2540D m
Volatile Organic Compounds in Water	1	N/A	2019/05/16	CAM SOP-00228	EPA 8260C m

Remarks:

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

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

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report.

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

Your Project #: BRM-00249262-A1
Site Location: 1140 YONGE
Your C.O.C. #: 677038-19-01

Attention: Francois Chartier

exp Services Inc
1595 Clark Blvd
Brampton, ON
CANADA L6T 4V1

Report Date: 2019/05/22
Report #: R5720582
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9C7702
Received: 2019/05/13, 19:43

Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Total PAHs include only those PAHs specified in the sewer use by-by-law.
(2) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Christine Gripton, Senior Project Manager
Email: CGripton@maxxam.ca
Phone# (519)652-9444
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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

Maxxam Job #: B9C7702
Report Date: 2019/05/22

exp Services Inc
Client Project #: BRM-00249262-A1
Site Location: 1140 YONGE
Sampler Initials: JL

TORONTO SANITARY & STORM SEWER PACKAGE (WATER)

Maxxam ID				JRX449			JRX449		
Sampling Date				2019/05/13 15:00			2019/05/13 15:00		
COC Number				677038-19-01			677038-19-01		
	UNITS	Criteria	Criteria-2	MW101-S	RDL	QC Batch	MW101-S Lab-Dup	RDL	QC Batch
Calculated Parameters									
Total Animal/Vegetable Oil and Grease	mg/L	150	-	3.3	0.50	6118056			
Inorganics									
Total BOD	mg/L	300	15	6	2	6120115			
Fluoride (F-)	mg/L	10	-	0.16	0.10	6121526	0.14	0.10	6121526
Total Kjeldahl Nitrogen (TKN)	mg/L	100	-	1.3	0.10	6120917			
pH	pH	6.0:11.5	6.0:9.5	7.77		6121514			
Phenols-4AAP	mg/L	1.0	0.008	0.0023	0.0010	6120504			
Total Suspended Solids	mg/L	350	15	**32**	10	6122533			
Total Cyanide (CN)	mg/L	2	0.02	ND	0.0050	6122665			
Petroleum Hydrocarbons									
Total Oil & Grease	mg/L	-	-	3.3	0.50	6127073			
Total Oil & Grease Mineral/Synthetic	mg/L	15	-	ND	0.50	6127077			
Miscellaneous Parameters									
Nonylphenol Ethoxylate (Total)	mg/L	0.2	0.01	ND	0.005	6120116			
Nonylphenol (Total)	mg/L	0.02	0.001	ND	0.001	6120082			
Metals									
Chromium (VI)	ug/L	2000	40	1.1	0.50	6119420			
Mercury (Hg)	mg/L	0.01	0.0004	ND	0.0001	6125130			
Total Aluminum (Al)	ug/L	50000	-	400	5.0	6124626			
Total Antimony (Sb)	ug/L	5000	-	1.0	0.50	6124626			
Total Arsenic (As)	ug/L	1000	20	1.4	1.0	6124626			
Total Cadmium (Cd)	ug/L	700	8	ND	0.10	6124626			
Total Chromium (Cr)	ug/L	4000	80	ND	5.0	6124626			
Total Cobalt (Co)	ug/L	5000	-	0.67	0.50	6124626			
Total Copper (Cu)	ug/L	2000	40	5.5	1.0	6124626			
Total Iron (Fe)	ug/L	-	-	570	100	6124626			
Total Lead (Pb)	ug/L	1000	120	0.54	0.50	6124626			

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Toronto Sanitary and Combined Sewers Discharge Guidelines. Referenced to the Chapter 681.
Criteria-2: Toronto Storm Sewer Discharge Use By-Law
ND = Not detected

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Maxxam Job #: B9C7702
Report Date: 2019/05/22

exp Services Inc
Client Project #: BRM-00249262-A1
Site Location: 1140 YONGE
Sampler Initials: JL

TORONTO SANITARY & STORM SEWER PACKAGE (WATER)

Maxxam ID				JRX449			JRX449		
Sampling Date				2019/05/13 15:00			2019/05/13 15:00		
COC Number				677038-19-01			677038-19-01		
	UNITS	Criteria	Criteria-2	MW101-S	RDL	QC Batch	MW101-S Lab-Dup	RDL	QC Batch
Total Manganese (Mn)	ug/L	5000	50	**92**	2.0	6124626			
Total Molybdenum (Mo)	ug/L	5000	-	6.2	0.50	6124626			
Total Nickel (Ni)	ug/L	2000	80	2.1	1.0	6124626			
Total Phosphorus (P)	ug/L	10000	400	ND	100	6124626			
Total Selenium (Se)	ug/L	1000	20	ND	2.0	6124626			
Total Silver (Ag)	ug/L	5000	120	ND	0.10	6124626			
Total Tin (Sn)	ug/L	5000	-	ND	1.0	6124626			
Total Titanium (Ti)	ug/L	5000	-	22	5.0	6124626			
Total Zinc (Zn)	ug/L	2000	40	**140**	5.0	6124626			
Semivolatile Organics									
Di-N-butyl phthalate	ug/L	80	15	ND	2	6120007			
Bis(2-ethylhexyl)phthalate	ug/L	12	8.8	ND	2	6120007			
3,3'-Dichlorobenzidine	ug/L	2	0.8	ND	0.8	6120007			
Pentachlorophenol	ug/L	5	2	ND	1	6120007			
Phenanthrene	ug/L	-	-	ND	0.2	6120007			
Anthracene	ug/L	-	-	ND	0.2	6120007			
Fluoranthene	ug/L	-	-	ND	0.2	6120007			
Pyrene	ug/L	-	-	ND	0.2	6120007			
Benzo(a)anthracene	ug/L	-	-	ND	0.2	6120007			
Chrysene	ug/L	-	-	ND	0.2	6120007			
Benzo(b/j)fluoranthene	ug/L	-	-	ND	0.2	6120007			
Benzo(k)fluoranthene	ug/L	-	-	ND	0.2	6120007			
Benzo(a)pyrene	ug/L	-	-	ND	0.2	6120007			
Indeno(1,2,3-cd)pyrene	ug/L	-	-	ND	0.2	6120007			
Dibenz(a,h)anthracene	ug/L	-	-	ND	0.2	6120007			
Benzo(g,h,i)perylene	ug/L	-	-	ND	0.2	6120007			
Dibenzo(a,i)pyrene	ug/L	-	-	ND	0.2	6120007			
Benzo(e)pyrene	ug/L	-	-	ND	0.2	6120007			

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
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RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Toronto Sanitary and Combined Sewers Discharge Guidelines. Referenced to the Chapter 681.
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Maxxam Job #: B9C7702
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exp Services Inc
Client Project #: BRM-00249262-A1
Site Location: 1140 YONGE
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TORONTO SANITARY & STORM SEWER PACKAGE (WATER)

Maxxam ID				JRX449			JRX449		
Sampling Date				2019/05/13 15:00			2019/05/13 15:00		
COC Number				677038-19-01			677038-19-01		
	UNITS	Criteria	Criteria-2	MW101-S	RDL	QC Batch	MW101-S Lab-Dup	RDL	QC Batch
Perylene	ug/L	-	-	ND	0.2	6120007			
Dibenzo(a,j) acridine	ug/L	-	-	ND	0.4	6120007			
7H-Dibenzo(c,g) Carbazole	ug/L	-	-	ND	0.4	6120007			
1,6-Dinitropyrene	ug/L	-	-	ND	0.4	6120007			
1,3-Dinitropyrene	ug/L	-	-	ND	0.4	6120007			
1,8-Dinitropyrene	ug/L	-	-	ND	0.4	6120007			
Calculated Parameters									
Total PAHs (18 PAHs)	ug/L	5	2	ND	1	6118353			
Volatile Organics									
Benzene	ug/L	10	2	ND	0.40	6122357			
Chloroform	ug/L	40	2	ND	0.40	6122357			
1,2-Dichlorobenzene	ug/L	50	5.6	ND	1.0	6122357			
1,4-Dichlorobenzene	ug/L	80	6.8	ND	1.0	6122357			
cis-1,2-Dichloroethylene	ug/L	4000	5.6	ND	1.0	6122357			
trans-1,3-Dichloropropene	ug/L	140	5.6	ND	0.80	6122357			
Ethylbenzene	ug/L	160	2	ND	0.40	6122357			
Methylene Chloride(Dichloromethane)	ug/L	2000	5.2	ND	4.0	6122357			
1,1,2,2-Tetrachloroethane	ug/L	1400	17	ND	1.0	6122357			
Tetrachloroethylene	ug/L	1000	4.4	ND	0.40	6122357			
Toluene	ug/L	16	2	ND	0.40	6122357			
Trichloroethylene	ug/L	400	7.6	ND	0.40	6122357			
p+m-Xylene	ug/L	-	-	ND	0.40	6122357			
o-Xylene	ug/L	-	-	ND	0.40	6122357			
Total Xylenes	ug/L	1400	4.4	ND	0.40	6122357			
PCBs									
Total PCB	ug/L	1	0.4	ND	0.05	6125563			
Microbiological									
Escherichia coli	CFU/100mL	-	200	70	10	6119651			

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
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Criteria: Toronto Sanitary and Combined Sewers Discharge Guidelines. Referenced to the Chapter 681.
Criteria-2: Toronto Storm Sewer Discharge Use By-Law
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Maxxam Job #: B9C7702
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exp Services Inc
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TORONTO SANITARY & STORM SEWER PACKAGE (WATER)

Maxxam ID				JRX449			JRX449		
Sampling Date				2019/05/13 15:00			2019/05/13 15:00		
COC Number				677038-19-01			677038-19-01		
	UNITS	Criteria	Criteria-2	MW101-S	RDL	QC Batch	MW101-S Lab-Dup	RDL	QC Batch
Surrogate Recovery (%)									
2,4,6-Tribromophenol	%	-	-	109		6120007			
2-Fluorobiphenyl	%	-	-	54		6120007			
D14-Terphenyl (FS)	%	-	-	94		6120007			
D5-Nitrobenzene	%	-	-	54		6120007			
D8-Acenaphthylene	%	-	-	67		6120007			
Decachlorobiphenyl	%	-	-	78		6125563			
4-Bromofluorobenzene	%	-	-	100		6122357			
D4-1,2-Dichloroethane	%	-	-	98		6122357			
D8-Toluene	%	-	-	95		6122357			

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Toronto Sanitary and Combined Sewers Discharge Guidelines. Referenced to the Chapter 681.
Criteria-2: Toronto Storm Sewer Discharge Use By-Law

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Client Project #: BRM-00249262-A1
Site Location: 1140 YONGE
Sampler Initials: JL

TEST SUMMARY

Maxxam ID: JRX449
Sample ID: MW101-S
Matrix: Water

Collected: 2019/05/13
Shipped:
Received: 2019/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sewer Use By-Law Semivolatile Organics	GC/MS	6120007	2019/05/14	2019/05/15	Kathy Horvat
Biochemical Oxygen Demand (BOD)	DO	6120115	2019/05/14	2019/05/19	Nusrat Naz
Chromium (VI) in Water	IC	6119420	N/A	2019/05/16	Lang Le
Total Cyanide	SKAL/CN	6122665	2019/05/15	2019/05/15	Barbara Kalbasi Esfahani
Fluoride	ISE	6121526	2019/05/14	2019/05/15	Surinder Rai
Mercury in Water by CVAA	CV/AA	6125130	2019/05/16	2019/05/16	Ron Morrison
Total Metals Analysis by ICPMS	ICP/MS	6124626	N/A	2019/05/16	Prempal Bhatti
E.coli, (CFU/100mL)	PL	6119651	N/A	2019/05/13	Sonja Elavinamannil
Total Nonylphenol in Liquids by HPLC	LC/FLU	6120082	2019/05/14	2019/05/15	Tonghui (Jenny) Chen
Nonylphenol Ethoxylates in Liquids: HPLC	LC/FLU	6120116	2019/05/14	2019/05/15	Tonghui (Jenny) Chen
Animal and Vegetable Oil and Grease	BAL	6118056	N/A	2019/05/17	Automated Statchk
Total Oil and Grease	BAL	6127073	2019/05/17	2019/05/17	Francis Afonso
Polychlorinated Biphenyl in Water	GC/ECD	6125563	2019/05/16	2019/05/17	Sarah Huang
pH	AT	6121514	2019/05/14	2019/05/15	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6120504	N/A	2019/05/14	Bramdeo Motiram
Total Kjeldahl Nitrogen in Water	SKAL	6120917	2019/05/14	2019/05/16	Shivani Shivani
Total PAHs	CALC	6118353	N/A	2019/05/16	Automated Statchk
Mineral/Synthetic O & G (TPH Heavy Oil)	BAL	6127077	2019/05/17	2019/05/17	Francis Afonso
Total Suspended Solids	BAL	6122533	2019/05/15	2019/05/16	Mandeep Kaur
Volatile Organic Compounds in Water	GC/MS	6122357	N/A	2019/05/16	Karen Hughes

Maxxam ID: JRX449 Dup
Sample ID: MW101-S
Matrix: Water

Collected: 2019/05/13
Shipped:
Received: 2019/05/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Fluoride	ISE	6121526	2019/05/14	2019/05/15	Surinder Rai

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GENERAL COMMENTS

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

Package 1	7.7°C

Sample JRX449 [MW101-S] : VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

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Maxxam Job #: B9C7702
Report Date: 2019/05/22

QUALITY ASSURANCE REPORT

exp Services Inc
Client Project #: BRM-00249262-A1
Site Location: 1140 YONGE
Sampler Initials: JL

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
6120007	2,4,6-Tribromophenol	2019/05/14	103	10 - 130	98	10 - 130	67	%				
6120007	2-Fluorobiphenyl	2019/05/14	85	30 - 130	82	30 - 130	72	%				
6120007	D14-Terphenyl (FS)	2019/05/14	96	30 - 130	95	30 - 130	95	%				
6120007	D5-Nitrobenzene	2019/05/14	88	30 - 130	83	30 - 130	74	%				
6120007	D8-Acenaphthylene	2019/05/14	89	30 - 130	80	30 - 130	73	%				
6122357	4-Bromofluorobenzene	2019/05/15	102	70 - 130	100	70 - 130	101	%				
6122357	D4-1,2-Dichloroethane	2019/05/15	102	70 - 130	101	70 - 130	99	%				
6122357	D8-Toluene	2019/05/15	95	70 - 130	98	70 - 130	93	%				
6125563	Decachlorobiphenyl	2019/05/17	96	60 - 130	77	60 - 130	83	%				
6119420	Chromium (VI)	2019/05/16	102	80 - 120	101	80 - 120	ND, RDL=0.50	ug/L	3.6	20		
6120007	1,3-Dinitropyrene	2019/05/14	108	30 - 130	111	30 - 130	ND, RDL=0.4	ug/L				
6120007	1,6-Dinitropyrene	2019/05/14	96	30 - 130	95	30 - 130	ND, RDL=0.4	ug/L				
6120007	1,8-Dinitropyrene	2019/05/14	85	30 - 130	99	30 - 130	ND, RDL=0.4	ug/L				
6120007	3,3'-Dichlorobenzidine	2019/05/14	60	30 - 130	98	30 - 130	ND, RDL=0.8	ug/L	NC	40		
6120007	7H-Dibenzo(c,g) Carbazole	2019/05/14	80	30 - 130	74	30 - 130	ND, RDL=0.4	ug/L	NC	40		
6120007	Anthracene	2019/05/14	94	30 - 130	93	30 - 130	ND, RDL=0.2	ug/L	NC	40		
6120007	Benzo(a)anthracene	2019/05/14	103	30 - 130	103	30 - 130	ND, RDL=0.2	ug/L	NC	40		
6120007	Benzo(a)pyrene	2019/05/14	103	30 - 130	105	30 - 130	ND, RDL=0.2	ug/L	NC	40		
6120007	Benzo(b/j)fluoranthene	2019/05/14	101	30 - 130	104	30 - 130	ND, RDL=0.2	ug/L	NC	40		
6120007	Benzo(e)pyrene	2019/05/14	108	30 - 130	110	30 - 130	ND, RDL=0.2	ug/L	NC	40		
6120007	Benzo(g,h,i)perylene	2019/05/14	109	30 - 130	87	30 - 130	ND, RDL=0.2	ug/L	NC	40		
6120007	Benzo(k)fluoranthene	2019/05/14	105	30 - 130	105	30 - 130	ND, RDL=0.2	ug/L	NC	40		
6120007	Bis(2-ethylhexyl)phthalate	2019/05/14	98	30 - 130	100	30 - 130	ND,RDL=2	ug/L	NC	40		
6120007	Chrysene	2019/05/14	90	30 - 130	90	30 - 130	ND, RDL=0.2	ug/L	NC	40		
6120007	Dibenz(a,h)anthracene	2019/05/14	111	30 - 130	86	30 - 130	ND, RDL=0.2	ug/L	NC	40		
6120007	Dibenzo(a,i)pyrene	2019/05/14	105	30 - 130	107	30 - 130	ND, RDL=0.2	ug/L	NC	40		
6120007	Dibenzo(a,j) acridine	2019/05/14	110	30 - 130	85	30 - 130	ND, RDL=0.4	ug/L	NC	40		
6120007	Di-N-butyl phthalate	2019/05/14	100	30 - 130	97	30 - 130	ND,RDL=2	ug/L	NC	40		
6120007	Fluoranthene	2019/05/14	108	30 - 130	107	30 - 130	ND, RDL=0.2	ug/L	NC	40		
6120007	Indeno(1,2,3-cd)pyrene	2019/05/14	112	30 - 130	87	30 - 130	ND, RDL=0.2	ug/L	NC	40		
6120007	Pentachlorophenol	2019/05/14	91	30 - 130	58	30 - 130	ND,RDL=1	ug/L	NC	40		
6120007	Perylene	2019/05/14	95	30 - 130	91	30 - 130	ND, RDL=0.2	ug/L	NC	40		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
6120007	Phenanthrene	2019/05/14	99	30 - 130	96	30 - 130	ND, RDL=0.2	ug/L	NC	40		
6120007	Pyrene	2019/05/14	109	30 - 130	108	30 - 130	ND, RDL=0.2	ug/L	NC	40		
6120082	Nonylphenol (Total)	2019/05/15	113	50 - 130	112	50 - 130	ND, RDL=0.001	mg/L	0.39	40		
6120115	Total BOD	2019/05/19					ND,RDL=2	mg/L	NC	30	103	80 - 120
6120116	Nonylphenol Ethoxylate (Total)	2019/05/15	99	50 - 130	99	50 - 130	ND, RDL=0.005	mg/L	NC	40		
6120504	Phenols-4AAP	2019/05/14	94	80 - 120	96	80 - 120	ND, RDL=0.0010	mg/L	NC	20		
6120917	Total Kjeldahl Nitrogen (TKN)	2019/05/15	NC	80 - 120	96	80 - 120	ND, RDL=0.10	mg/L	5.1	20	98	80 - 120
6121514	pH	2019/05/15			102	98 - 103			0.11	N/A		
6121526	Fluoride (F-)	2019/05/15	101	80 - 120	101	80 - 120	ND, RDL=0.10	mg/L	9.8	20		
6122357	1,1,2,2-Tetrachloroethane	2019/05/15	90	70 - 130	96	70 - 130	ND, RDL=0.50	ug/L				
6122357	1,2-Dichlorobenzene	2019/05/15	87	70 - 130	96	70 - 130	ND, RDL=0.50	ug/L				
6122357	1,4-Dichlorobenzene	2019/05/15	88	70 - 130	98	70 - 130	ND, RDL=0.50	ug/L				
6122357	Benzene	2019/05/15	91	70 - 130	95	70 - 130	ND, RDL=0.20	ug/L				
6122357	Chloroform	2019/05/15	93	70 - 130	96	70 - 130	ND, RDL=0.20	ug/L				
6122357	cis-1,2-Dichloroethylene	2019/05/15	93	70 - 130	96	70 - 130	ND, RDL=0.50	ug/L				
6122357	Ethylbenzene	2019/05/15	84	70 - 130	92	70 - 130	ND, RDL=0.20	ug/L				
6122357	Methylene Chloride(Dichloromethane)	2019/05/15	94	70 - 130	97	70 - 130	ND, RDL=2.0	ug/L				
6122357	o-Xylene	2019/05/15	83	70 - 130	91	70 - 130	ND, RDL=0.20	ug/L				
6122357	p+m-Xylene	2019/05/15	84	70 - 130	91	70 - 130	ND, RDL=0.20	ug/L				
6122357	Tetrachloroethylene	2019/05/15	89	70 - 130	97	70 - 130	ND, RDL=0.20	ug/L				
6122357	Toluene	2019/05/15	85	70 - 130	93	70 - 130	ND, RDL=0.20	ug/L				
6122357	Total Xylenes	2019/05/15					ND, RDL=0.20	ug/L				
6122357	trans-1,3-Dichloropropene	2019/05/15	82	70 - 130	83	70 - 130	ND, RDL=0.40	ug/L				
6122357	Trichloroethylene	2019/05/15	92	70 - 130	96	70 - 130	ND, RDL=0.20	ug/L				
6122533	Total Suspended Solids	2019/05/16					ND, RDL=10	mg/L	8.3	25	100	85 - 115
6122665	Total Cyanide (CN)	2019/05/15	89	80 - 120	102	80 - 120	ND, RDL=0.0050	mg/L	NC	20		
6124626	Total Aluminum (Al)	2019/05/16	94	80 - 120	98	80 - 120	ND, RDL=5.0	ug/L	NC	20		
6124626	Total Antimony (Sb)	2019/05/16	101	80 - 120	102	80 - 120	ND, RDL=0.50	ug/L	NC	20		
6124626	Total Arsenic (As)	2019/05/16	96	80 - 120	99	80 - 120	ND, RDL=1.0	ug/L	0	20		

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Maxxam Job #: B9C7702
Report Date: 2019/05/22

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: BRM-00249262-A1
Site Location: 1140 YONGE
Sampler Initials: JL

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
6124626	Total Cadmium (Cd)	2019/05/16	98	80 - 120	98	80 - 120	ND, RDL=0.10	ug/L	NC	20		
6124626	Total Chromium (Cr)	2019/05/16	91	80 - 120	95	80 - 120	ND, RDL=5.0	ug/L	NC	20		
6124626	Total Cobalt (Co)	2019/05/16	95	80 - 120	100	80 - 120	ND, RDL=0.50	ug/L	NC	20		
6124626	Total Copper (Cu)	2019/05/16	95	80 - 120	94	80 - 120	ND, RDL=1.0	ug/L	NC	20		
6124626	Total Iron (Fe)	2019/05/16	93	80 - 120	97	80 - 120	ND, RDL=100	ug/L	NC	20		
6124626	Total Lead (Pb)	2019/05/16	93	80 - 120	95	80 - 120	ND, RDL=0.50	ug/L	NC	20		
6124626	Total Manganese (Mn)	2019/05/16	94	80 - 120	97	80 - 120	ND, RDL=2.0	ug/L	NC	20		
6124626	Total Molybdenum (Mo)	2019/05/16	94	80 - 120	94	80 - 120	ND, RDL=0.50	ug/L	1.8	20		
6124626	Total Nickel (Ni)	2019/05/16	93	80 - 120	97	80 - 120	ND, RDL=1.0	ug/L	1.5	20		
6124626	Total Phosphorus (P)	2019/05/16	92	80 - 120	98	80 - 120	ND, RDL=100	ug/L				
6124626	Total Selenium (Se)	2019/05/16	101	80 - 120	102	80 - 120	ND, RDL=2.0	ug/L	NC	20		
6124626	Total Silver (Ag)	2019/05/16	95	80 - 120	97	80 - 120	ND, RDL=0.10	ug/L	NC	20		
6124626	Total Tin (Sn)	2019/05/16	97	80 - 120	98	80 - 120	ND, RDL=1.0	ug/L	NC	20		
6124626	Total Titanium (Ti)	2019/05/16	98	80 - 120	96	80 - 120	ND, RDL=5.0	ug/L	NC	20		
6124626	Total Zinc (Zn)	2019/05/16	97	80 - 120	103	80 - 120	ND, RDL=5.0	ug/L	NC	20		
6125130	Mercury (Hg)	2019/05/16	103	75 - 125	101	80 - 120	ND, RDL=0.0001	mg/L	NC	20		
6125563	Total PCB	2019/05/17	88	60 - 130	80	60 - 130	ND, RDL=0.05	ug/L	NC	40		
6127073	Total Oil & Grease	2019/05/17			95	85 - 115	ND, RDL=0.50	mg/L	3.4	25		
6127077	Total Oil & Grease Mineral/Synthetic	2019/05/17			93	85 - 115	ND, RDL=0.50	mg/L	2.7	25		

N/A = Not Applicable

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

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

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

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

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

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

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

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

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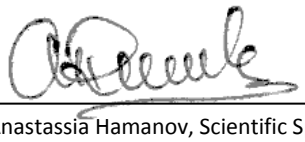
Maxxam Job #: B9C7702
Report Date: 2019/05/22

exp Services Inc
Client Project #: BRM-00249262-A1
Site Location: 1140 YONGE
Sampler Initials: JL

VALIDATION SIGNATURE PAGE

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



Anastassia Hamanov, Scientific Specialist

Sonja Elavinamannil, Analyst I

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MICRO

CHAIN OF CUSTODY RECORD

Page of

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#30554 exp Services Inc	Company Name:	Exp Services Inc.	Quotation #:	B45997	Maxxam Job #:	Bottle Order #:
Attention:	Central Services	Attention:	Francois Chartier	P.O. #:	Stream 2		677038
Address:	1595 Clark Blvd Brampton ON L6T 4V1	Address:	Tomson.Healy@exp.com Jeffrey.Leon@exp.com	Project:	BRM-00249262-A1	COC #:	Project Manager:
Tel:	(905) 793-9800 Fax: (905) 793-0641	Tel:	(905) 793-9800 Ext: 2523 Fax:	Project Name:	1140 YONGE	C#677038-19-01	Tanya Fidlin
Email:	Karen.Burke@exp.com; Luizza.Jose@exp.com; AP@e	Email:	Francois.Chartier@exp.com	Site #:			
				Sampled By:	J.L.		

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

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___	☐ CCME ☑ Sanitary Sewer Bylaw ☐ Reg 558 ☑ Storm Sewer Bylaw ☐ MISA Municipality TORONTO ☐ PWQO ☐ Other	

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

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Toronto Sanitary & Storm Sewer Pkg									# of Bottles	Comments
1		MW 101-S	19/05/13	3 PM	GW	No	✓									19	Please aim for 5-day T.A.T.
2																	Include COC in final report.
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

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

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

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

13-May-19 19:43
Tanya Fidlin
B9C7702
KVG ENV-1151

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only				
Jeffrey Leon	19/05/13	7:41 PM	K. Vancouver	2019/05/13	19:43		Time Sensitive	Temperature (°C) on Recei 6/9/8	Custody Seal	Yes	No
									Present	✓	
									Intact	✓	

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

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

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

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

White: Maxxa Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam Job #: B9C7702
Report Date: 2019/05/22

exp Services Inc
Client Project #: BRM-00249262-A1
Site Location: 1140 YONGE
Sampler Initials: JL

Exceedence Summary Table – Toronto Sanitary Sewer

Result Exceedences

Sample ID	Maxxam ID	Parameter	Criteria	Result	DL	Units
No Exceedences						

The exceedence summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

Exceedence Summary Table – Toronto Storm Sewer

Result Exceedences

Sample ID	Maxxam ID	Parameter	Criteria	Result	DL	Units
MW101-S	JRX449-10	Total Manganese (Mn)	50	92	2.0	ug/L
MW101-S	JRX449-06	Total Suspended Solids	15	32	10	mg/L
MW101-S	JRX449-10	Total Zinc (Zn)	40	140	5.0	ug/L

The exceedence summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

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Appendix E – Short-Term and Long-Term Flow Rate Calculations

APPENDIX E: Construction and Post-Constrcution Dewatering Calculations

1134 and 1140 Yonge Street, Toronto, ON
BRM-00249262-A1

Table E-1: Dewatering Flow Rate Estimates for Proposed Building during Short-Term (ST) and Long-Term (LT) Phases

Parameters	Symbols	Unit	Short-Term	Long-Term
Geological Formation	-	-	Glacial Deposit	Glacial Deposit
Ground Elevation	-	mASL	121.89	121.89
Highest Groundwater Elevation	-	mASL	117.13	117.13
Top of the Water-Bearing Zone	-	mASL	117.13	117.13
Assumed Base of the Water-Bearing Zone	-	mASL	105.00	105.00
Height of Static Water Table Above the Base of the Water-Bearing Zone	**H**	m	12.13	12.13
Dewatered Elevation Target	-	mASL	107.61	109.61
Height of Target Water Level Above the Base of Water-Bearing Zone	**h_w**	m	2.61	4.61
Hydraulic Conductivity	**K**	m/s	1.50E-06	1.50E-06
Length of Excavation	**a**	m	77	77
Width of Excavation	**b**	m	41	41
Equivalent Radius (equivalent perimeter)	**r_e**	m	38	38
Method to Calculate Radius of Influence	-	-	**Sichardt**	**Sichardt**
Sichardt Radius of Influence from Sides of Excavation	**Rs**	m	35	28
Radius of Influence	**Ro**	m	73	65
Dewatering Flow Rate (unconfined radial flow component)	**Q**	m^3/day	87	93
Factor of Safety	**fs**	-	2.0	1.5
Dewatering Flow Rate with Safety Factor	**Q.fs**	m^3/day	174	139
Assumed Precipitation Event	**Pr**	mm	15	0
Rain Collection Volume	**Q_r**	m^3	47	0
Dewatering Flow Rate with Rain Collection Volume but without Saftey Factor	**$Q + Q_r$**	m^3/day	134	-
Dewatering Flow Rate with Safety Factor and Rain Collection Volume	**$Q.fs + Q_r$**	m^3/day	221	139

Notes:
mASL - meters above sea level

Analytical Solution for Estimating Radial Flow from an Unconfined Aquifer to a Fully-Penetrating Excavation

$$Q_w = \frac{\pi K(H^2 - h^2)}{Ln\,[\frac{R_o}{r_e}]}$$

(Based on the Dupuit-Forcheimer Equation)

$$r_e = \frac{a+b}{\pi} \qquad R_o = R_s + r_e$$

Where:

Q_w = Flow rate per unit length of excavation (m^3/s)

K = Hydraulic conductivity (m/s)

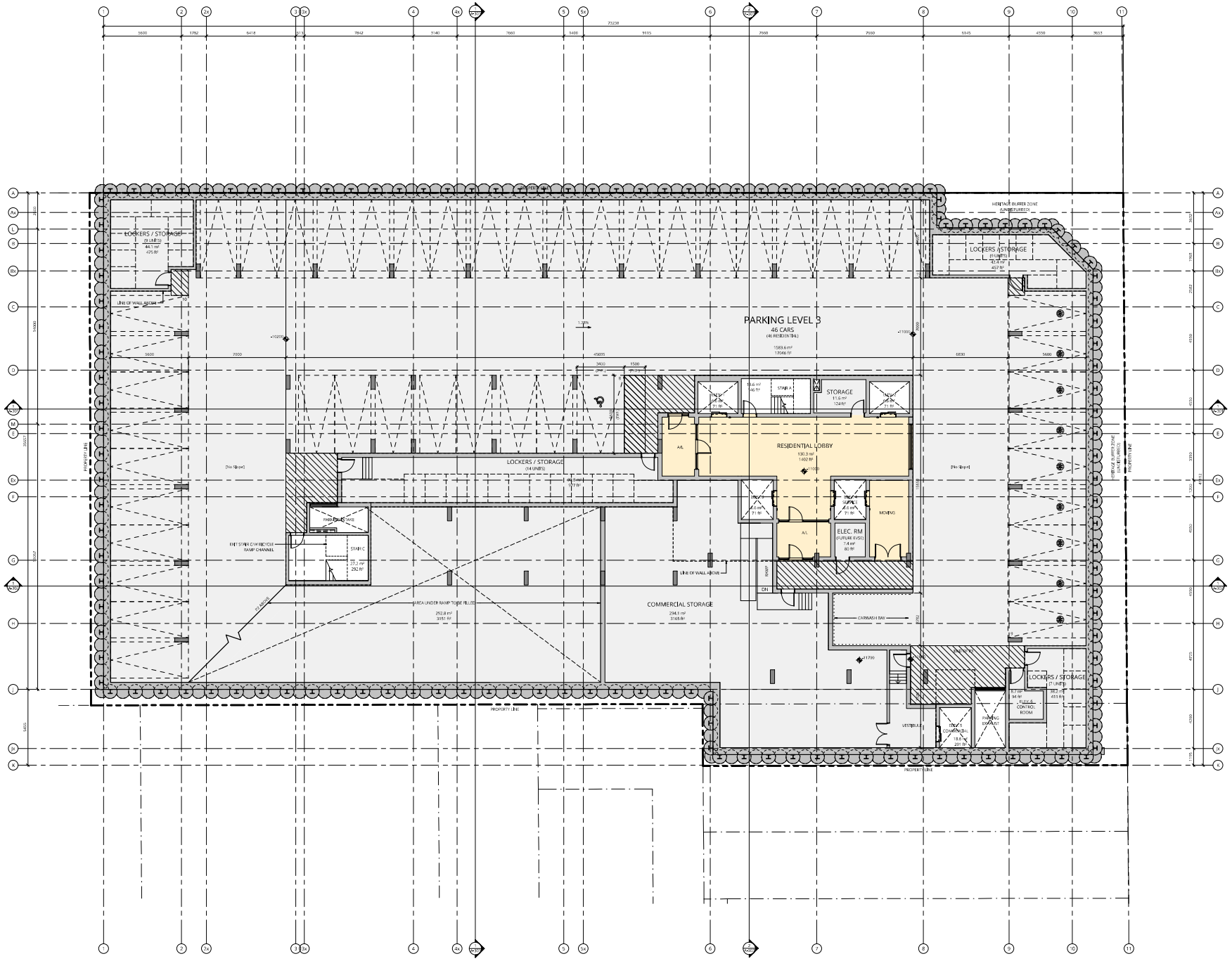
H = Height of static water table above base of water-bearing zone (m)

h_w = Height of target water level above the base of water-bearing zone (m)

R_o=Radius of influence (m)

re=Equivalent perimeter (m)

Appendix F – Architectural Drawings



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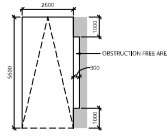
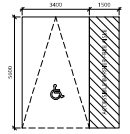
PARKING LEGEND:

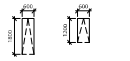
TYPICAL PARKING SPACE:
MIN. 2.6m (W) x 5.6m (L) x 2.0m (H)



ACCESSIBLE PARKING SPACE:
MIN. 3.4m (W) x 5.6m (L) x 2.0m (H)
WITH ADJACENT 1.5m (W) ACCESSIBLE BARRIER FREE AISLE



BICYCLE PARKING SPACE:
HORIZONTAL: MIN. 0.6m (W) x 1.8m (L) x 1.9m (H)
VERTICAL: MIN. 0.6m (W) x 1.2m (L) x 1.9m (H)



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TORONTO, ONTARIO

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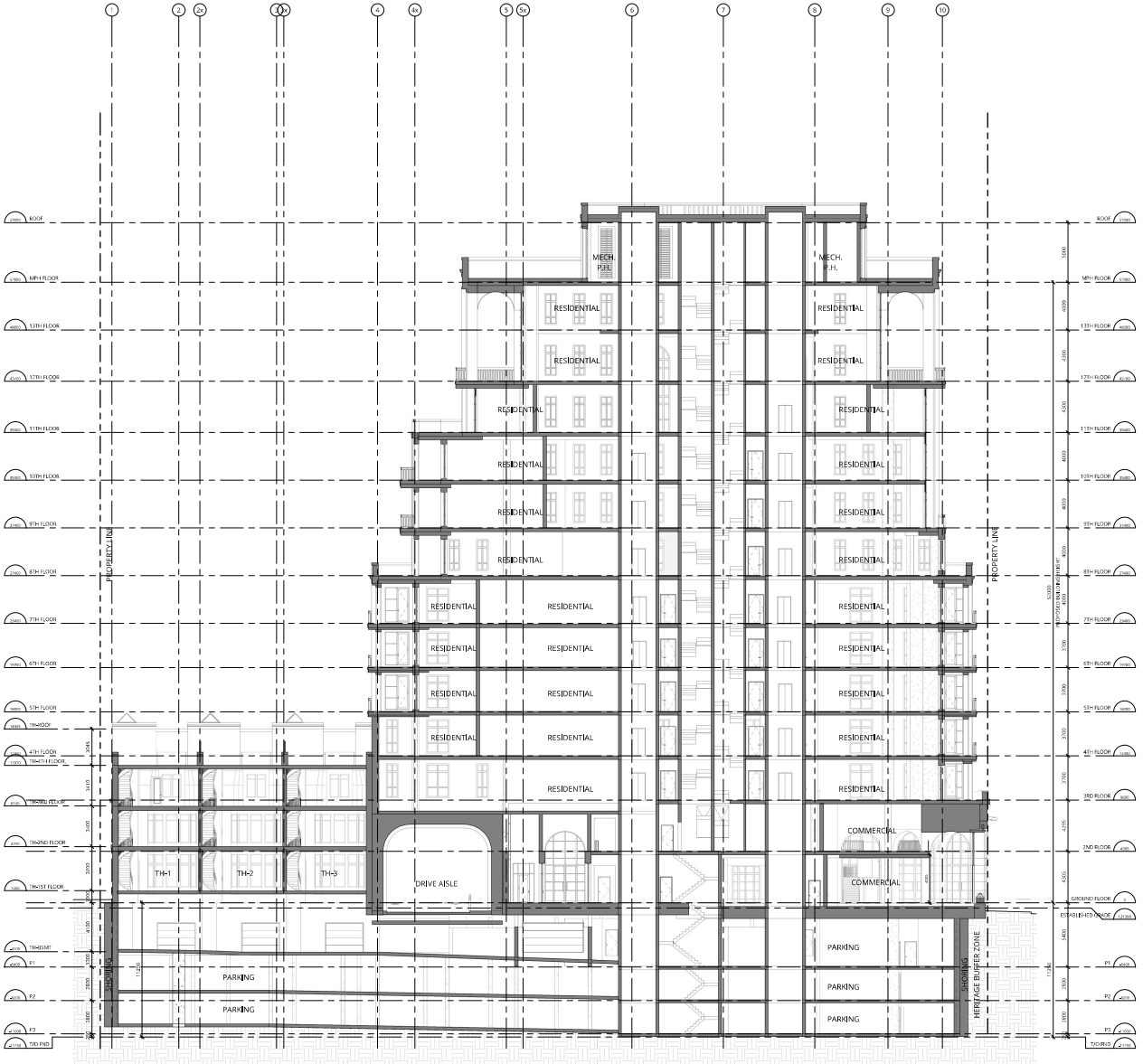

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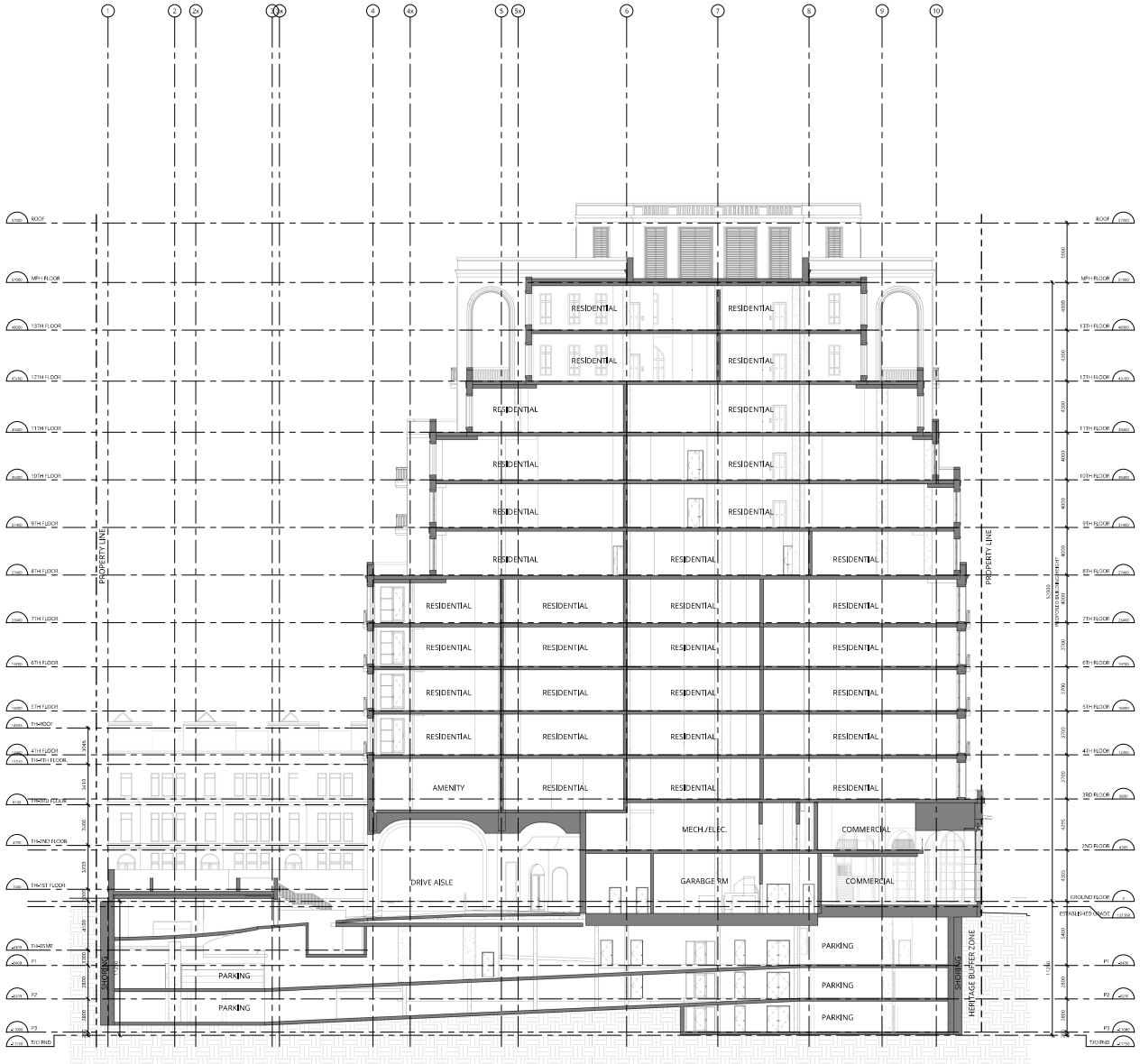

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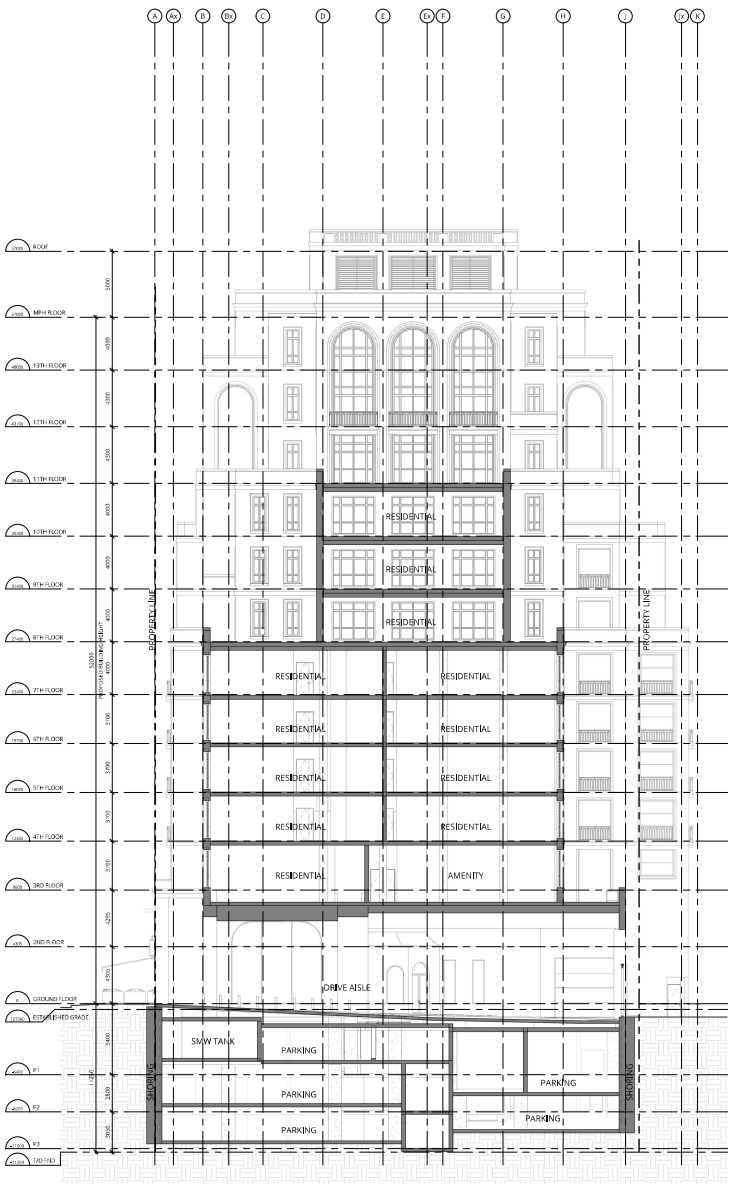
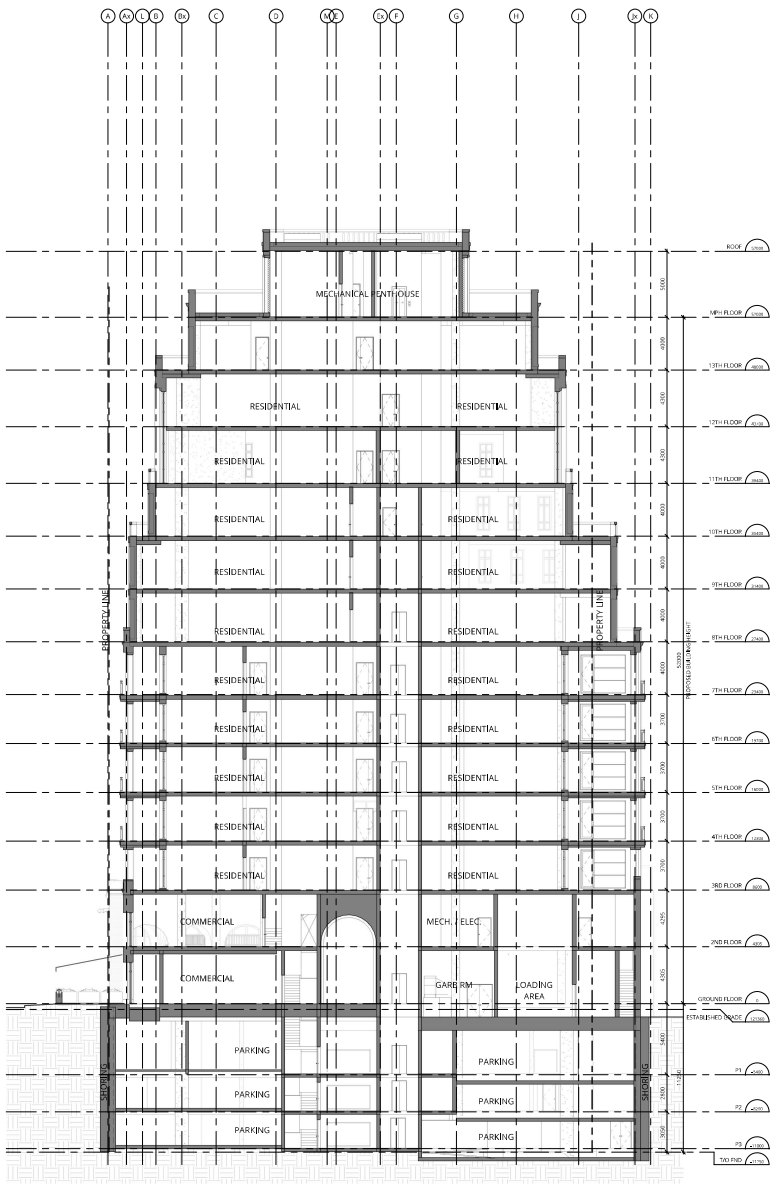


1 BUILDING SECTION - NORTH SOUTH #1
1 : 150



2 BUILDING SECTION - NORTH SOUTH #2
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