Mixed Use Development

Hydrogeological Investigation
11 to 25 Yorkville Avenue and 16 to 18 Cumberland Street,
Toronto, Ontario

Client:
11 Yorkville Partners Inc.

Type of Document:
Update

Project Name:
Hydrogeological Investigation
11 to 25 Yorkville Avenue and 16 to 18 Cumberland Street,
Toronto, Ontario

Project Number:
MRK-00242474-A0

EXP Services Inc.
200 Commerce Valley Drive West, Unit 110
Markham, ON, L3T 0A8
t: 905.695.3217
f: 905.695.0169

Date Submitted:
March 13, 2018
Updated July 15, 2019

Table of Contents

List of Appendices

1. Introduction

1.1 Project Description

EXP Services Inc. (EXP) was retained by 11 Yorkville Partners Inc. to prepare a Hydrogeological Investigation Report associated with the proposed development located at 11 to 25 Yorkville Avenue and 16 to 18 Cumberland Street, Toronto, Ontario (hereinafter referred to as the 'Site'). This report was originally submitted on May 7, 2019 and recently updated to include revision to the building foundation design to accommodate an unencumbered on-site public parkland dedication to the City of Toronto as part of the development.

The Site is currently occupied by four multilevel buildings (ranging from 2 to 9 stories) with one level basement or underground parking (P1) at 11 to 21 Yorkville Avenue and two (2) 2-storey commercial buildings at 16 to 18 Cumberland Street. It is our understanding that the proposed development plan is to demolish the existing buildings along Yorkville Avenue and construct a sixty-two (62) storey high-rise building structure with one (1) above grade mezzanine level and four (4) levels of underground parking (P4). The proposed development also includes two (2) commercial buildings along Cumberland that will be developed in the future. The Site location plan is shown on Figure 1.

EXP conducted a Preliminary Geotechnical Investigation and Environmental Site Assessment in conjunction with this investigation onsite and reported under separate covers. The pertinent information gathered from the noted Investigations 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;
- Provide Preliminary recommendations on construction and long-term dewatering;
- 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) monitoring wells to an approximate depth of 22 meter below ground surface (mbgs);
- Develop four (4) existing monitoring wells and two (2) existing monitoring wells on the Site;
- Conduct Single Well Response Tests (SWRT) on all available monitoring wells to assess hydraulic conductivities of the saturated soils at the Site;
- Complete three (3) months of groundwater monitoring for the highrise building as per City's requirements. Complete a minimum of six rounds (6) rounds of groundwater level measurements at all monitoring wells over a three-month period;
- Collect one (1) groundwater sample from a selected monitoring well at the foundation level of the proposed highrise building for the City of Toronto Chapter 681, Sewer, By-Law Sanitary and Storm Sewer parameters;
- 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;

- Provide preliminary recommendations on the requirements for construction and long-term dewatering;
- Provide recommendations on the Ministry of Environment, Conservation and Parks (MECP) Water Taking Permits and City of Toronto Sewer Discharge Agreements (SDA) for the construction and post construction phases; and,
- Prepare a 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 (ESA).

1.4 Review of Previous Reports

The following reports were reviewed as part of this Hydrogeological Investigation:

- EXP Services Inc. (March 13, 2018) Preliminary Hydrogeological Investigation, 11 Yorkville Avenue, 11 to 21 Yorkville Avenue and 16 to 18 Cumberland Street, Toronto, ON, prepared for 11 Yorkville Partners Inc.
- EXP Services Inc. (March 8, 2018) Preliminary Geotechnical Assessment, 11 Yorkville Avenue, 11 to 21 Yorkville Avenue and 16 to 18 Cumberland Street, Toronto, ON, prepared for 11 Yorkville Partners Inc.
- EXP Services Inc. (February 28, 2019) Phase Two Environmental Site Assessment (ESA) Update, 11 Yorkville Avenue, Toronto, ON, prepared for 11 Yorkville Partners Inc.

The Preliminary Hydrogeological Investigation was completed based on the existing borehole information available at the time of the report preparation for the preliminary design of the proposed development.

The Preliminary Geotechnical Assessment was completed based on the existing borehole information available at the time of the report preparation.

Thirteen (13) boreholes, including the four (4) 50 mm diameter monitoring wells installed for the Hydrogeological investigation, were completed between November and December 2018 as part of EXP's Phase Two ESA drilling program.

Information obtained from the Preliminary Hydrogeological Investigation, Preliminary Geotechnical Assessment and the Phase Two ESA Update were used to develop the subsurface profile provided in the cross-section diagrams in the Hydrogeological Investigation.

2 Hydrogeological Setting

2.1 Regional Setting

2.1.1 Regional Physiography

The Site is located within a physiographic region known as the Iroquois Plain and the Physiographic landform known as Sand Plain (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.

2.1.2 Regional Geology and Hydrogeology

The surficial geology can be described as coarse textured (foreshore-basinal) glaciolacustrine deposits consisting 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.

Based on the available regional geology maps, the thickness of overburden within the Site boundary and its proximity approximately ranges from 20 to 80 meters (Oak Ridge Moraine Groundwater Program, 2018) and the subsurface stratigraphy of the Site from the highest to the lowest elevations can be described in the following sequence (TRCA, 2008 and Oak Ridge Moraine Groundwater Program, 2018):

- Halton Till: This lithologic unit typically consists of sandy silt to clayey silt till interbedded with silt, clay, sand and gravel (TRCA, 2008). Top elevation of this unit within the proposed development area approximately ranges from 122 to 123 masl.
- Oak Ridges Moraine: This geology unit mainly consists of interbedded fine-grained sand and silt deposits where coarse-grained sand and gravel along with clay laminae are locally reported. A distinctive lithologic unit, consisting of fine-grained sediments and silts within the main Oak Ridges Moraine has been identified in some of the areas of the Humber River Watershed (TRCA, 2008). Top elevation of this unit within the proposed development area is approximately at 122 masl.
- Newmarket Till: This lithologic unit mainly consist of a massive and dense silty sand unit (TRCA, 2008). This geologic unit is not mapped within the Site area.
- Thorncliffe: This geology formation generally consists of glaciofluvial (sand, silty sand) or glaciolacustrine deposits (silt, sand, pebbly silt and clay) (TRCA, 2008). Top elevation of this geology unit is approximately at 121 masl.
- Sunnybrook: This lithologic unit predominately consists of silt and clay (TRCA, 2008). Top elevation of this geology unit is mapped within the proposed development area is approximate at 118 masl.
- Scarborough: This geology unit consists of peat sand overlaying silt and clay deposits (TRCA, 2008). Top elevation of this unit is within the proposed development area is approximately at 112 masl. (Oak Ridge Moraine Groundwater Program, 2018).
- Bedrock: Bedrock of the region corresponds to the Upper Ordovician age Georgian Bay Formation, primarily consisting of interbedded shale, limestone, dolostone, and siltstone (Ministry of Northern Development and Mines, 2012). Top of this unit within the proposed development is approximately at 110 masl.

Regional groundwater flow across the area is expected to be directed southeast, towards Lake Ontario (Oak Ridge Moraine Groundwater Program, 2018), located approximately 3.6 km south of the Site. 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 boundaries.

The MECP WWR database indicates that two hundred and eighty-two (282) well records were located within a 500 m radius from the Site centroid. Eight (8) of the well records were identified onsite (Figure 3 and Appendix A). The onsite wells were listed as monitoring or test holes.

The database indicates that the offsite wells final statuses were observation wells, test holes, dewatering, monitoring wells or abandoned-other. Eighteen (18) of the offsite well records were reportedly located at distance less than 100m from the centroid of the Site.

One (1) offsite well (well ID 7119992) was identified in the WWR database as a domestic well as its first use and as a set of dewatering wells in its final well use status in March 2009. The well was decommissioned in May 2009 (well ID 7122932). Well ID 7119992 was reportedly located 235 m from the Site centroid.

Based on the decommissioning date of water supply/dewatering wells and since the area is municipally serviced, it is unlikely that the noted water well is still active.

Sixty-three (63) offsite well records reportedly have water levels ranged from depths of 0.8 m to 100.0 meters below ground surface (mbgs). The onsite well records reportedly did not contain any data on the water levels encountered.

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.

2.2 Site Setting

2.2.1 Site Topography

The Site is located in an urbanized land use setting.

The topography is considered relatively flat, with an overall gradual downwards slope to the south towards Lake Ontario (Ontario Ministry of Natural Resources Base Map Sheet 10 17 6250 48350 and Sheet 10 17 6300 48350).

As indicated on the borehole logs included in Appendix B and Topographic Plan, Drawing Number 17M-01494-000, prepared by WSP Geomatics Ontario Limited, dated August 21, 2017, the surface elevation of the Site ranges between approximately 116.0 and 116.3 meters above sea level (masl).

2.2.2 Local Surface Water Features

The Site is located within the Don River watershed.

No surface water features are located onsite. The nearest surface water features are the Don River and its tributary, located approximately 1 to 2 km north east to east of the Site. Lake Ontario is approximately 3.6 km south of the Site.

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 (EXP, 2018) and the Phase Two ESA and they are summarized for the hydrogeological interpretations. As such, the information provided in this section shall not be used for the 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). 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 form an integral part of and should be read in conjunction with this report. The following is a brief description of the soil conditions encountered during the investigation.

Based on the results of the preliminary geotechnical assessment and Phase Two ESA, the general subsurface soil stratigraphy consist of the following units from top to maximum depth of investigation onsite as follows:

Pavement Structure

Pavement structure, comprising 50 mm asphaltic concrete, was encountered in Boreholes TH1 to TH4 and BH1.

Fill

Fill was encountered in all boreholes, extending to depths of 2.3 m below the existing grade (BH15-3). The fill material generally comprised silty sand to sand with variable amounts of gravel. Brick, coal, asphalt and concrete fragments were noted within the fill. The fill was generally moist to very moist.

Sand/Silty Sand

A shallow Sand/Silty Sand deposit was encountered below the fill in the boreholes and extended to depths of about 3.5 to 4.6 m below the existing grade. The Sand/Silty Sand existed in a loose to compact state of compactness. The Sand/Silty Sand deposit was found to be moist becoming wet at about 3 m below then existing grade with black laminations and staining evident.

Lower levels of Sand/Silty Sand layers were encountered at depths of about 12.2 to 25.9 m below the existing grade in Borehole BH-1. Based on the Standard Penetration Test (SPT) values, the lower Sand/Silty Sand existed in a dense to very dense state of compactness. The lower portion of the Sand/Silty Sand unit exist in a moist to wet condition.

Silty Clay / Silty Clay Till

Silty Clay or Silty Clay Till was encountered below the Fill and shallow Sand/Silty Sand deposit. The Silty Clay/Silty Clay till deposits were grey in colour, contained trace Sand and Gravel, and were stiff to very stiff in consistency. The Silty Clay/Silty Clay Till were in a moist condition. The Silty Clay/Silty Clay Till deposits extended to depths of about 4.55 to 12.2 m below then existing grade.

Silt, Sandy silt, and Sandy Silt to Silty Sand

Alternating deposits of Silt, Sandy Silt, and Sandy Silt to Silty Sand was encountered below the Silty Clay or Sand/Silty Sand in the boreholes. The deposits contained variable amounts of Clay. Frequent Clayey Silt seams/layers were noted in the Sandy Silt to Silty Sand deposit. The compactness of the deposits ranged from compact to very dense but was typically dense to very dense. The deposits were generally in a wet condition.

A lower Sandy Silt layer was encountered at a depth of 21.7 m below then existing grade in Borehole BH15-3 and extended to the termination depth of borehole at 21.9 m below the existing grade. The lower Sandy Silt layer contained trace Clay and existed in a dense state of compactness. The lower Sandy Silt layer existed in a wet condition.

Clayey Silt Till

Clayey Silt Till was encountered at depths ranging from approximately 19.3 to 33.5 m below existing grade in Borehole BH-1. The Clayey Silt Till contained variable amounts of Sand, trace Gravel, and was hard in consistency. Shale fragments were noted in the clayey silt till with depth. The Clayey Silt Till was in a moist condition.

Shale Bedrock

Weathered Shale bedrock was encountered below the Clayey Silt Till deposit in Borehole BH-1. The contact surface of the bedrock was at approximately 38.1 m below existing grade, corresponding to approximately Elevation 78.5 m. No coring was carried out to confirm and to determine the quality of the bedrock for this preliminary investigation. As such, the contact elevations should not be interpreted as exact planes of bedrock since the auger will frequently penetrate some distance into the weathered Shale bedrock before noticeable resistance is encountered.

Based on EXP's past experience in the area, the bedrock encountered in the borehole belongs to the Georgian Bay Formation (Ordovician period) and underlies this Site at a significant depth. The upper zone of the bedrock is generally highly weathered to weathered. The distinction between highly weathered shale and the overlying strata, particularly if the latter contains abundant shale fragments, is not always clear and consequently, some of the soils resting on the surface of the bedrock might be very weak or highly weathered rock.

The borehole and monitoring well locations are shown on Figure 4. Geological cross-sections were generated based on the available borehole logs completed as part of the previous and current investigations and shown on Figure 5A (Cross section A-A') and on Figure 5B (Cross section B-B'). Borehole logs used to generate both cross-sections are provided in Appendix B.

3 Results

3.1 Monitoring Well Details

The monitoring well network installed as part of the Geotechnical and Environmental Investigations and previous investigations at the Site utilized for this Hydrogeological Investigation consists of the following:

- Four (4) overburden monitoring wells (TH101D, TH105D, TH106D, and TH109D) were installed by EXP in November/December 2018 to at least 2m below the proposed depth of the highrise structure foundation;
- One nested location including one (1) deep overburden monitoring well (BH15-3) and a one (1) shallow monitoring well (BH15-S) was installed on January 24, 2015 by others (SPL Consultants Limited);
- One (1) deep monitoring well (BH1) was installed to bedrock February 24, 2016 by others (McClymont & Rak Engineers Inc);
- Sixteen (16) shallow monitoring wells were installed by EXP for the Phase Two Environmental Site Assessment;
- Diameter of all the monitoring wells is 50 mm;
- All wells installed with a flush mount well protective casing.

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

3.2 Water Level Monitoring

As part of this Hydrogeological Investigation, static water levels in the monitoring wells installed to the foundation depth of the highrise building were recorded in bi-weekly (every two weeks) monitoring events over a three (3) month period, between December 2018 and April 2019. Water levels were also recorded in all available shallow monitoring wells, previously installed on site. A summary of static water level data measured by EXP as it relates to the elevation survey for deep and shallow water bearing zones is summarized in Tables 3-1 and 3-2 below, respectively.

According, the groundwater elevation recorded at the approximate foundation levels of the highrise building (BH15-3, TH101D, TH105D, TH106D, and TH109D) ranged from 99.00 masl (17.3 mbgs at BH15-3 on April 12, 2019) to 96.24 masl (17.61 mbgs at TH101D on January 14, 2019). Furthermore, the groundwater elevation recorded for the deep well (BH-1) ranged from 96.28 masl (20.36 mbgs on March 4, 2019) to 96.16 masl (20.48 mbgs on January 14, 2019). Figure 6A presents the deep groundwater contour map as measured on January 14, 2019. Accordingly, the groundwater flow directions in the deep zone is interpreted to be northwest to the Site.

Table 3-1: Summary of Measured Deep Groundwater Elevations

Monitoring Well ID	Ground Surface Elevation (masl)	Approximate Full Well Depth (mbgs)*	Depth	11-Dec-18	14-Jan-19	8-Feb-19	22-Feb-19	4-Mar-19	28-Mar-19	12-Apr-19
BH1	116.64	27.4/36.9**	mbgs	na	20.48	20.38	20.37	20.36	20.40	20.38
			masl	na	96.16	96.26	96.27	96.28	96.24	96.26
BH15-3	116.30	21.8	mbgs	na	17.59	17.32	na	na	17.33	17.3

Monitoring Well ID	Ground Surface Elevation (masl)	Approximate Full Well Depth (mbgs)*	Depth	11-Dec-18	14-Jan-19	8-Feb-19	22-Feb-19	4-Mar-19	28-Mar-19	12-Apr-19
			masl	na	98.61	98.98	na	na	98.97	99.00
TH101D	113.85	19.8	mbgs	17.41	17.61	17.61	na	na	17.33	17.3
			masl	96.44	96.24	96.24	na	na	96.52	96.55
TH105D	116.67	23.2	mbgs	19.87	20.01	19.98	19.96	na	19.22	19.9
			masl	96.80	96.66	96.69	96.71	na	97.45	96.77
TH106D	113.08	19.2	mbgs	15.45	16.34	16.40	16.36	9.66	16.35	16.31
			masl	97.63	96.74	96.68	96.72	114.18	96.73	96.77
TH109D	113.72	19.8	mbgs	16.30	15.38	15.58	15.58	4.35	15.58	15.51
			masl	97.42	98.34	98.14	98.14	119.17	98.14	98.21

Notes:

mbgs: meters below ground surface

masl: meters above mean sea level

* Based on field measurements

Two (2) monitoring wells TH1 and TH105i were installed to depths of 15.8 and 10.1 mbgs, respectively. These two monitoring wells were installed below the shallow monitoring wells to vertically profile the shallow groundwater condition in the Phase Two Environmental Site Assessment. Both of these wells were found to be dry during subsequent site visits to monitor the water levels.

The shallow groundwater elevation recorded in the shallow monitoring wells BH15-3S, MW01, MW02, MW04, TH2, TH3 TH4, TH101S, TH102, TH103, TH104, TH106S, TH107, TH108 and TH109 between November 28, 2017 and January 14, 2019, ranged from a high of 113.94 masl (0.32 mbgs at MW04 on January 14, 2019) to a low of 112.12 masl (4.19 mbgs at MW01 on November 28, 2017). It should be noted that monitoring well TH106, was found to be dry.

Figure 6B presents the shallow groundwater contour map as measured on January 14, 2019. Accordingly, the groundwater flow directions in the shallow zone is interpreted to be southwest on the Site.

Table 3-2: Summary of Measured Groundwater Elevations – Shallow Groundwater

Monitoring Well ID	Ground Surface Elevation (masl)	Approximate Full Well Depth (mbgs)*		28-Nov-17	5-Feb-18	14-Jan-19
BH15-3S	116.30	5.5	mbgs	3.19		3.02
			masl	113.11		113.28
MW01	116.31	6.1	mbgs	4.19		3.18
			masl	112.12		113.13
MW02	116.31	5.2	mbgs	3.34		3.12
			masl	112.97		113.19
MW04	114.26	3.05	mbgs	0.58		0.32
			masl	113.68		113.94
TH2	116.89	5.5	mbgs		3.44	3.38
			masl		113.46	113.51
TH3	116.23	5.8	mbgs		3.22	3.12
			masl		113.02	113.11
TH4	116.20	5.9	mbgs		3.25	na
			masl		112.96	na
TH101S	113.85	3.7	mbgs			0.41
			masl			113.44
TH102	113.88	3.7	mbgs			0.34
			masl			113.54
TH103	116.78	4.3	mbgs			3.11
			masl			113.67
TH104	116.76	4.3	mbgs			3.86
			masl			112.90
TH106S	113.08	3.7	mbgs			dry
			masl			dry

Monitoring Well ID	Ground Surface Elevation (masl)	Approximate Full Well Depth (mbgs)*		28-Nov-17	5-Feb-18	14-Jan-19
TH107	113.00	4.6	mbgs			4.59
			masl			108.41
TH108	113.71	4.6	mbgs			1.08
			masl			112.63
TH109	113.72	4.6	mbgs			4.46
			masl			109.26

Notes:

Na – not available for measuring

Dry – no groundwater detected

mbgs: meters below ground surface

masl: meters above mean sea level

* Based on field measurements

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. There is a potential that both shallow and deep ground water levels might show localized variations due to ongoing construction activities on adjacent properties (south east, south west and north west of the Site.

3.3 Hydraulic Conductivity Testing

Six (6) Single Well Response Tests (SWRT's) were completed on monitoring wells TH101D, TH105D, TH106D, and TH109D on January 14, 2019 and on monitoring wells BH1 and BH15-3 on February 5, 2018. 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 3-3.

Table 3-3: Summary of Hydraulic Conductivity Testing

Monitoring Well	Well Depth (mbgs)*	Screen Interval (mbgs) from	Screen Interval (mbgs) to	Soil Formation Screened **	Estimated Hydraulic Conductivity (m/s)
BH1	27.4/36.9	24.4	27.4	Sandy Silt/Silty Sand	9.8×10^{-7}
BH15-3	21.3	18.3	21.3	Sandy Silt/Silty Sand/Clayey Silt Till	1.2×10^{-7}
TH101D	19.8	16.8	19.8	Sandy Silt	n/a
TH105D	23.2	19.8	22.8	Sandy Silt/Silty Sand	3.9×10^{-6}
TH106D	19.2	16.2	19.2	Silty Sand	5.9×10^{-6}
TH109D	19.8	16.8	19.8	Clayey Silt Till/Sand	8.8×10^{-7}
BH1	27.4/36.9	24.4	27.4	Sandy Silt/Silty Sand	9.8×10^{-7}
BH15-3	21.3	18.3	21.3	Sandy Silt/Silty Sand/Clayey Silt Till	1.2×10^{-7}
Highest Estimated K Value					5.9×10^{-6}
Geometric Mean of Estimated K Values					3.1×10^{-7}

Notes:

*Well depth is based on the field measurements

** Soil descriptions are based on the borehole logs.

SWRTs provide estimates of K for the geological formation in the immediate media zone surrounding the well screens and may not be representative of bulk formation hydraulic conductivity. As shown in Table 3-3, the highest K for the tested water-bearing zones is estimated to be 5.9 x 10-6 m/s, and the geometric mean of the K values is to be 3.1 x 10-7 m/s. The extension of the sand pack below the base of the deep well in Borehole BH1 did not significantly increase the hydraulic conductivity relative to the other results in the formation. Reliable data could not be obtained from the monitoring well TH101D during the SWRT test, the decline of the water table was too slow and considered not representative of the materials encountered.

3.4 Groundwater Quality

To assess the suitability for discharge of pumped groundwater to City of Toronto Sanitary and Strom Sewer during dewatering activities, a groundwater sample was collected from monitoring well BH15-3 on February 7, 2018 and from monitoring well TH109D on March 4, 2019 using a bladder pump. Prior to the collection of noted water samples, approximately three (3) standing well volumes of groundwater were purged from the noted wells.

Both samples were 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 to a CALA certified independent laboratory, Maxxam Analytics Inc., in Mississauga, Ontario for analysis.

When compared to the City of Toronto Sanitary Sewer By-Law Limits (Table 1), the laboratory Certificate of Analysis (CofA) results showed that all parameters were detected at concentrations below the Sanitary By-Law limits (Table 1) except for TSS in the sample from BH15-3 (Table 1 of the By-law). The results from the sample TH109D, had much lower concentration of TSS and met the Sanitary and Combined Sewer By-Law limits.

When compared to the City of Toronto Storm Sewer By-Law Limits (Table 2), the CofA results for samples BH15-3 and TH109D were reported below the Storm Sewer Use By-Law criteria except for concentrations of Total Suspended Solids (TSS), Total Manganese (Mn) and Total Phosphorous (P).

Analytical results are provided in Appendix D. A summary of the pertinent results is provided in Table 3-4.

Table 3-4: 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 BH15-3 February 7, 2018	Concentration TH109D March 4, 2019
Total Suspended Solids (mg/L)	350	15	12,000	37
Total Manganese (Mn) (µg/L) Total Phosphorous (P)	5,000	50	940	86
Total Phosphorous (P (µg/L)	10,000	400	1,700	490

Notes:

Bold indicates concentration exceeds the City of Toronto Storm Sewer Use By-Law Limit

Red and Underlined concentration exceeds City of Toronto Sanitary Sewer Use By-Law Limit

The results from Samples BH15-3 and TH109D, included in Table 3-4, suggest that the concentrations of total manganese and total phosphorus might be contributable, at least partially, to elevated concentrations of TSS detected in each sample.

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.

Based on the results from Sample TH109D, the long-term dewatering discharge to the Sanitary sewer system (post-development phase) and based on the water quality test results for TH109D, the water is suitable to discharge without a treatment system.

For the long-term dewatering discharge to the Storm sewer system (post-development phase) and based on the water quality results, it is recommended to implement a suitable pre-treatment, as required.

It is noted that the water quality results presented in this report are not representative of the long-term groundwater quality onsite. As such, regular water quality monitoring is recommended for the post-construction phase as required by the City.

It is noted that an agreement to discharge to the City of Toronto will be required prior to discharging dewatering effluent.

Furthermore, the Environmental Site Assessment Report(s) should be reviewed for more information on the groundwater quality conditions at the Site. The analytical results from one (1) water sample from the shallow groundwater encountered in TH101S detected exceedances of tetrachloroethylene, trichloroethylene, cis-1,2–Dichloroethylene, trans-1,2-dichloroethylene and vinyl chloride. It should be noted that the parameters detected in the shallow groundwater sample and reported in the Phase Two Environmental Site Assessment (EXP, Feb 28, 2019) were not detected in the deep groundwater samples analyzed in this Hydrogeological Investigation. However, it should be noted that the groundwater quality for any dewatering discharge to the sewer system from the Site may require treatment for these organic compounds.

4 Construction Dewatering Assessment

4.1 Construction Dewatering Rate Assumptions

It is our understanding that the proposed development plan will be completed in phases. Phase One will include demolition of the existing buildings on the Site and construction of a six-two (62) storey high-rise structure with one (1) above grade mezzanine level and four (4) levels of underground parking. Phase Two of the proposed development will include construction of two (2) commercial buildings along Cumberland Street at some time in the future. The construction dewatering assessment presented herein is for the Phase One development only.

It should be noted that shoring drawings were not available at the time of this report. For this assessment, it was assumed that the proposed construction plans include an excavation with a caisson wall shoring system 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 presents the assumptions used to calculate the dewatering rate for the Site.

Table 4-1 Dewatering Estimate Assumptions

Input Parameter	Assumption	Notes
Ground floor elevation	116.35 masl	Elevation at Residential lobby, from Drawing Ground Floor Plan, A102 by Sweeny & Company Architects, revised date May 11, 2019.
P4 Underground Parking Finished Floor (FFE) Elevation (lowest)	101.50 masl	Elevation from Drawing A201 by Sweeny & Company Architects, date May 11, 2019 revised July 8, 2019.
P4 Perimeter footing Elevation (lowest)	100.30 masl	Elevation estimated from Drawing A101b by Sweeny & Company Architects, revised date May 11 2019 (1.2m below P4 FFE).
P4 Mat Slab elevation below elevator (lowest)	97.04 masl	Elevation from Drawing A201 by Sweeny & Company Architects, date May 11, 2019 revised Jul 8, 2019.
Dewatered elevation target	96.05 masl	Assumed to be approx. 1 m below the lowest footing elevation.
Site Excavation Area	49m by 48m 2352 m^2	Area estimated from Drawing A101 by Sweeny & Company Architects, revised date May 11, 2019 revised July 8, 2019.
Excavation Area for Mat Slab below highest groundwater level	42m by 23m 956 m^2	Area estimated from Drawing A101 by Sweeny & Company Architects, revised date May 11, 2019 revised July 8, 2019.
Highest Groundwater elevation	100 masl	The highest representative groundwater elevation measured across the Site (BH15-3 on April 12, 2019 plus 1 metre).
Hydraulic Conductivity (K)	5.9 x 10^{-6} m/s	Highest K value estimated for overburden (TH106D)

4.1.1 Dewatering Flow Rate Estimate and Zone of Influence

The Dupuit equation for steady linear flow to both sides of an excavation through an unconfined aquifer resting on a horizontal impervious surface was used to obtain a flow rate estimate. Dewatering flow rate is expressed as follows:

$$Q_w = xK(H^2 - h^2)/Lo$$

Where:

Qw = Rate of pumping (m3/sec)
X = Length of excavation (m)
K = Hydraulic conductivity (m/sec)
H = Head beyond the influence of pumping (static groundwater elevation) (m)
h = Head above the base of aquifer in an excavation (m)
Lo = Distance of Influence (m)

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 Radius of Influence

The radius of influence (ROI) for the construction dewatering was calculated based on the Sichardt equation. This 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 described as follows:

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

Where:

Ro = Estimated radius of influence (m)
H = Head in aquifer (static water level or saturated depth) (m)
h = Dynamic water level (m)
K = Hydraulic Conductivity (m/sec)
C = Constant (3,000)

Based on the Sichardt formula and the highest K value, the calculated zone of influence (Lo = Ro/2) would be approximately 29.1 m from the sides of the excavation during construction activity.

The calculations for radius of influence are provided in Appendix E (Table E-1).

4.2 Rainfall

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 direct input of rain water into the excavation.

A 15 mm precipitation event was utilized for the estimate. Given that the total area of the building excavation is approximately 2352 m^2 the estimated volume of direct precipitation to be collected in the excavation is approximately 35 m^3 for a 15 mm precipitation event. The calculations for the rainfall input estimate is included in Appendix E (Table E-2).

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 on site to not exceed the allowable water taking and discharge limits as necessary.

4.3 Results of Construction Dewatering Rate Estimate

Based on the assumptions provided in this report, the results of the dewatering rate estimate can be summarized as follows :

Table 4-2 Summary of Dewatering Flow Rate Estimate

Location	Peak Dewatering Flow Rate Including Safety Factor and Precipitation (m^3/day)
Site Extents	333 (rounded)

Construction dewatering flow rate estimate is provided in Appendix E (Table E-3).

This peak dewatering flow rates accounts 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 the course of this study. This peak dewatering flow rate also provides additional capacity for the dewatering contractor.

It is noted that the maximum flow estimate equation calculated with a high K value, provides a conservative estimate to account for higher than expected flow rates during the construction dewatering.

Please note that it is the responsibility of the contractor to ensure dry conditions are maintained within the excavation at all times and at all costs.

4.4 Construction MECP Water Taking Permit

In accordance with the Ontario Water Resources Act, if the water taking for the construction dewatering will be more than 50 m3/day but less than 400 m^3/day, application for the Environmental Activity and Sector Registry (EASR) with MECP is required. If groundwater dewatering rates on-Site exceed 400 m^3/day, a Category 3 Permit to Take Water (PTTW) would be required from the MECP.

It is recognized that the maximum flow estimate equation calculated with a high K value, provides a conservative estimate to account for higher than expected flow rates during the construction dewatering. Based on the dewatering estimate of approximately 333 m^3/day for this project, an EASR would be required to facilitate the construction dewatering program for the Site.

5 Sub-Drain Discharge Estimate

5.1 Long-Term Dewatering Rate Assessment

The long-term dewatering assessment presented herein is for the Phase One development for the construction of the six-two (62) storey high-rise structure with one (1) above grade mezzanine level and four (4) levels of underground parking.

It is our understanding that the development plan for the highrise structure includes a permanent foundation sub-drain system that will ultimately discharge to the municipal sewer system.

Since the P4 sub-drain system will be installed above water table, no long-term groundwater dewatering is anticipated. However, for the provision of the sub-drain system, it is recommended to accommodate approximately 20 m^3/day of long-term flow rates in the post-construction phase.

The Foundation Mat below the P4 slab will be constructed to a thickness of 2.5m but will be constructed to act as a hydraulic barrier so that groundwater does not enter the elevator pit.

The commercial buildings on the property at 16 and 18 Cumberland Street (Phase Two Development), will remain in place until such time as the owner proposes to redevelop these properties. The shallow groundwater level, encountered in monitoring well TH4, located at the rear of 16 Cumberland Street, is below the existing basement structure. It should be noted, that at that time additional hydrogeological investigation might be required to address the future proposed development.

5.3 Post-Development MECP Water Taking Permit

In accordance with the Ontario Water Resources Act, if the water taking for the construction dewatering will be less than 50 m^3/day, application for a Category 3 Permit to Take Water (PTTW) would not be required from the MECP.

6 Environmental Impact

6.1 Surface Water Features

The Site is located within the Don River watershed.

No surface water features are located onsite. The nearest surface water feature is the Don River and its tributary. The Don River is located approximately 2 km east of the Site and its western tributary flows eastward approximately 1 km north east of the Site. Lake Ontario is approximately 3.6 km south of the Site.

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.

6.2 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. Given that no groundwater supply wells were identified within 500m of the Site, no dewatering zone of influence related impact is expected on the water wells in the area.

It is anticipated that the area adjacent to the site is fully provided with municipal water supply and sewer services.

6.3 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.

6.4 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 be in compliance with 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.

Long-term foundation drainage discharge is not anticipated based on the groundwater conditions encountered at the Site and the current building design. If the building design changes, it should be noted that the groundwater quality results indicate that discharge from the foundation drainage system can occur after treatment for TSS to the Sanitary sewer system (post-development phase). Water treatment would also be required for long-term foundation dewatering discharge to the Storm sewer system (post-development phase) based on the groundwater quality results.

It should be noted that the water quality results presented in this report are not 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.

It is noted that an agreement to discharge to the City of Toronto sewer system will be required prior to discharging dewatering effluent.

Furthermore, the Phase Two Environmental Site Assessment Update Report shall be reviewed for more information on the groundwater quality conditions at the Site. A shallow groundwater condition was encountered in the shallow sand deposit overlying a layer of native silty clay encountered approximately 1.0 to 3.5 mbgs. The shallow groundwater results from the Phase Two ESA encountered one sample exceedance of Trichloroethylene (TCE), cis 1,2 Dichloroethylene, trans 1,2 dichloroethylene, and vinyl chloride from TH101S. The rest of the water samples from the monitoring wells met the Ontario Regulation 153/04 Table 3 all property use standards for fine grained soils. The Phase Two ESA Update did not identify any exceedances of the MECP Table 3 Standards in the groundwater at the foundation level. Furthermore, petroleum related compounds included in the Sewer Use chemical analysis package were all non-detect and confirmed the results of the Phase Two ESA. The use of a caisson wall around the property boundary will provide a hydraulic barrier and isolate the site from the shallow groundwater flow from the surrounding properties.

6.5 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.

7 Conclusions and Recommendations

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

- The laboratory CofA showed that all parameters were detected at concentrations below the Sanitary and Combined Sewer By-Law limits except for TSS detected above the standard limits from sample BH15-3 in 2018 (Table 1 of the By-law). All parameters were detected at concentrations below the Sanitary and Combined Sewer By-Law limits for the sample TH109D in 2019;
- The laboratory CofA results for both samples (BH15-3 in 2018 and TH109D in 2019) showed that all parameters were detected at concentrations below the Table 2 Storm Sewer Use By-Law except for Total Suspended Solids (TSS), Total Manganese (Mn) and Total Phosphorous (P);
- Based on the assumptions outlined in this report, the estimated peak dewatering pumping rate for proposed construction activities is approximately 333 m^3/day. As the dewatering flow rate estimate is below the MECP EASR threshold of 400 m^3/day, an EASR would be required to facilitate the construction dewatering program for the Site ;
- Although the current building design foundation levels are anticipated to be above the water table, the preliminary long-term flow rate of the foundation sub-drain system of approximately 20 m^3/day is recommended. 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 should be installed at the sump(s) to record daily discharge volumes to provide more representative rates during the commissioning stage of the system. Regular maintenance/cleaning of the sub-drain system is recommended to ensure its proper operation. A PTTW will not be required for long term discharge, based on the design volume provided ;
- The construction dewatering and long-term estimate of sub-drain discharge volumes is based on the assumptions outlined in this report, and that 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 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 the City of Toronto sewer system (post-development phase) and based on the water quality results, it is recommended to implement a suitable pre-treatment, as required.
- It is noted that an agreement to discharge to the City of Toronto will be required prior to discharging 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 where they are based on the assumptions that the present design concept described throughout the report will proceed to construction. Furthermore, 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.

8 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 11 Yorkville Partners 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.

PROFESSIONAL GEOSCIENTIST
July 25 2019
ROBERT FERRIS
PRACTISING MEMBER
1333
ONTARIO

Robert Ferris, P.Geo.
Hydrogeologist
Earth and Environmental Services

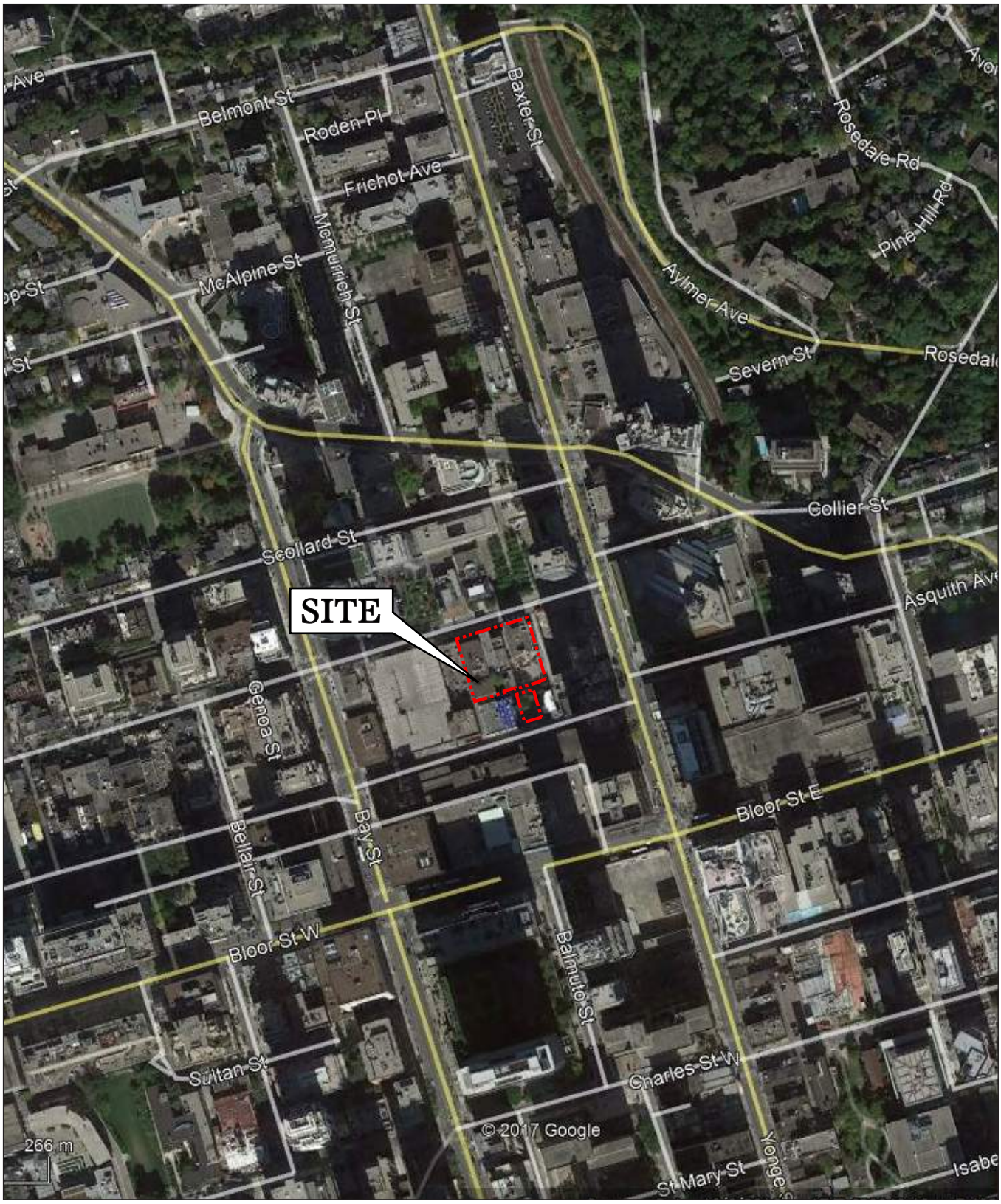
PROFESSIONAL GEOSCIENTIST
July 25, 2019
NATALIYA TKACH
PRACTISING MEMBER
1691
ONTARIO

Nataliya Tkach, P.Geo., PMP, P.Eng.
Senior Hydrogeologist
Environmental Services

9 References

- Ministry of Northern Development and Mines (May, 2012). OGS Earth. Retrieved from http://www.mndm.gov.on.ca/en/mines-and-minerals/applications/ogsearth.
- Well Records from the Ministry of the Environment, Conservation and Parks (MECP) Water Well Record (WWR) Database;
- Ontario Ministry of Natural Resources Base Map Sheet 10 17 6250 48350 and Sheet 10 17 6300 48350;
- Cashman and Preene (2013) Groundwater Lowering in Construction, 2nd Edition.
- Chapman, L.J. and Putnam, D.F. (2007). Physiography of Southern Ontario, 3rd Edition, Ontario Geological Survey.
- J.P. Powers, A.B. Corwin, P.C. Schmall, and W.E. Kaeck (2007). Construction Dewatering and Groundwater Control, Third Edition.
- Oak Ridges Moraine Groundwater Program. Accessed to the website (https://oakridgeswater.ca/) dated October 2018.
- Toronto and Region Conservation (2008/2009), Humber/Don River State of the Watershed Report – Geology and Groundwater Resources.
- EXP Services Inc. (March 13, 2018) Preliminary Hydrogeological Investigation, 11 Yorkville Avenue, 11 to 21 Yorkville Avenue and 16 to 18 Cumberland Street, Toronto, ON, prepared for 11 Yorkville Partners Inc.;
- EXP Services Inc. (March 8, 2018) Preliminary Geotechnical Assessment, 11 Yorkville Avenue, 11 to 21 Yorkville Avenue and 16 to 18 Cumberland Street, Toronto, ON, prepared for 11 Yorkville Partners Inc.;
- EXP Services Inc. (February 28, 2019) Phase Two Environmental Site Assessment Update, 11 Yorkville Avenue, Toronto, ON, prepared for 11 Yorkville Partners Inc.;
- Drawing A101b Mat Slab detail by Sweeny & Company Architects, revised date May 11, 2019;
- Drawing A101 P4 Floor Plan by Sweeny & Company Architects, revised date May 11, 2019;
- Drawing A105 Ground Floor Plan by Sweeny & Company Architects, revised date May 11, 2019
- Drawing A201 Building Sections by Sweeny & Company Architects, revised date May 11, 2019.

Figures



SCALE: 0 50 100m

SOURCE: GOOGLE EARTH IMAGE DATED NOV. 9, 2016

DRAWN BY	CHECKED BY
K.G.	R.F.

LEGEND:

APPROXIMATE PROPERTY BOUNDARY

N

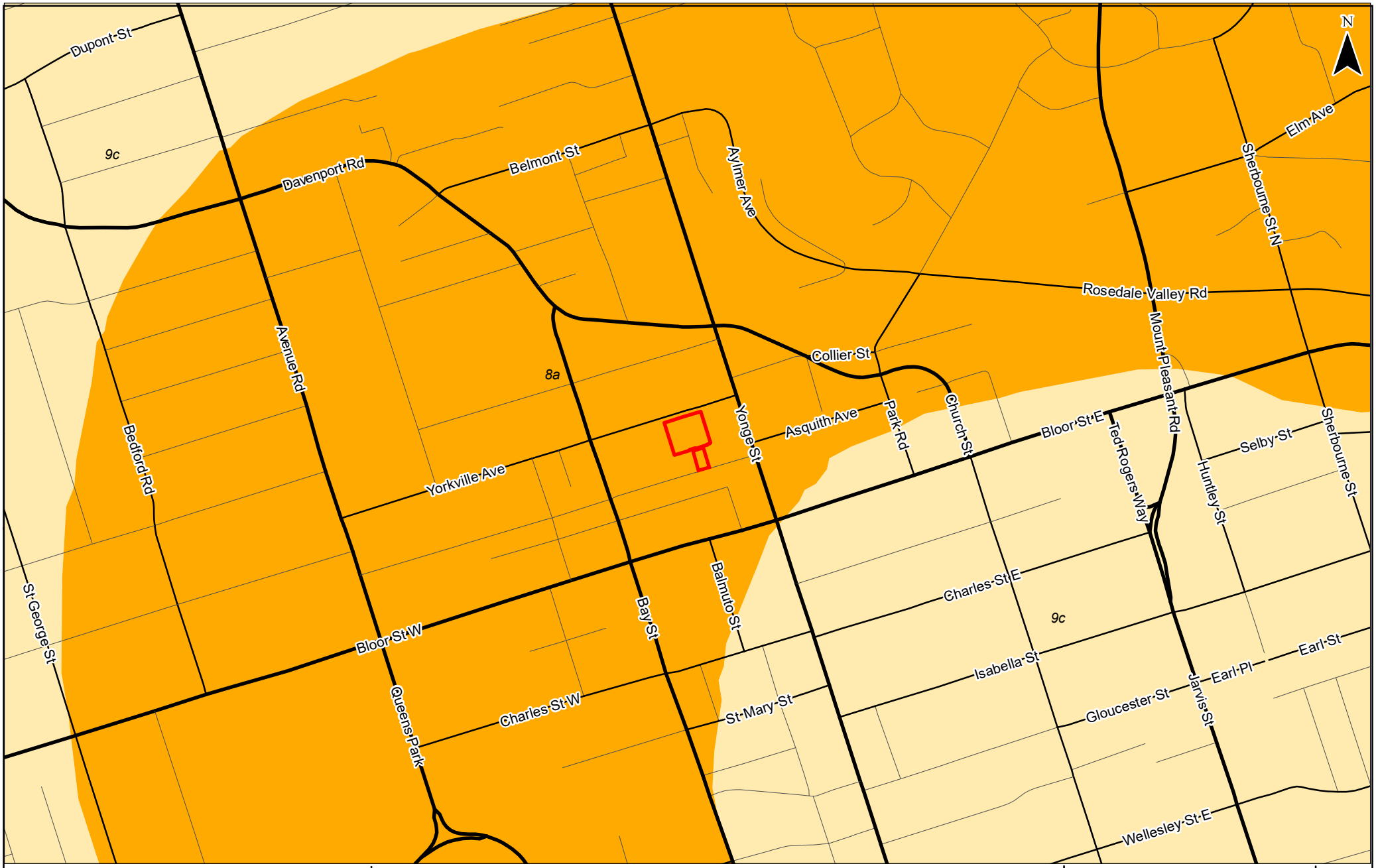
SITE LOCATION PLAN

FIGURE 1

11 TO 21 YORKVILLE AVENUE AND
16 TO 18 CUMBERLAND STREET
TORONTO, ONTARIO

PROJECT NUMBER: 242474 | DATE: APRIL 2019

242474-LOCALITY-APR19



SCALE:
0 50 100 200 300 400 500 m

SOURCE:
BASED ON ONTARIO GEOLOGICAL SURVEY DATA PUBLISHED IN 2010

LEGEND:
- APPROXIMATE SITE BOUNDARY
- 9C: COARSE-TEXTURED (FORESHORE-BASINAL) GLACIOLACUSTRINE DEPOSITS
- 8A: FINE-TEXTURED GLACIOLACUSTRINE DEPOSITS

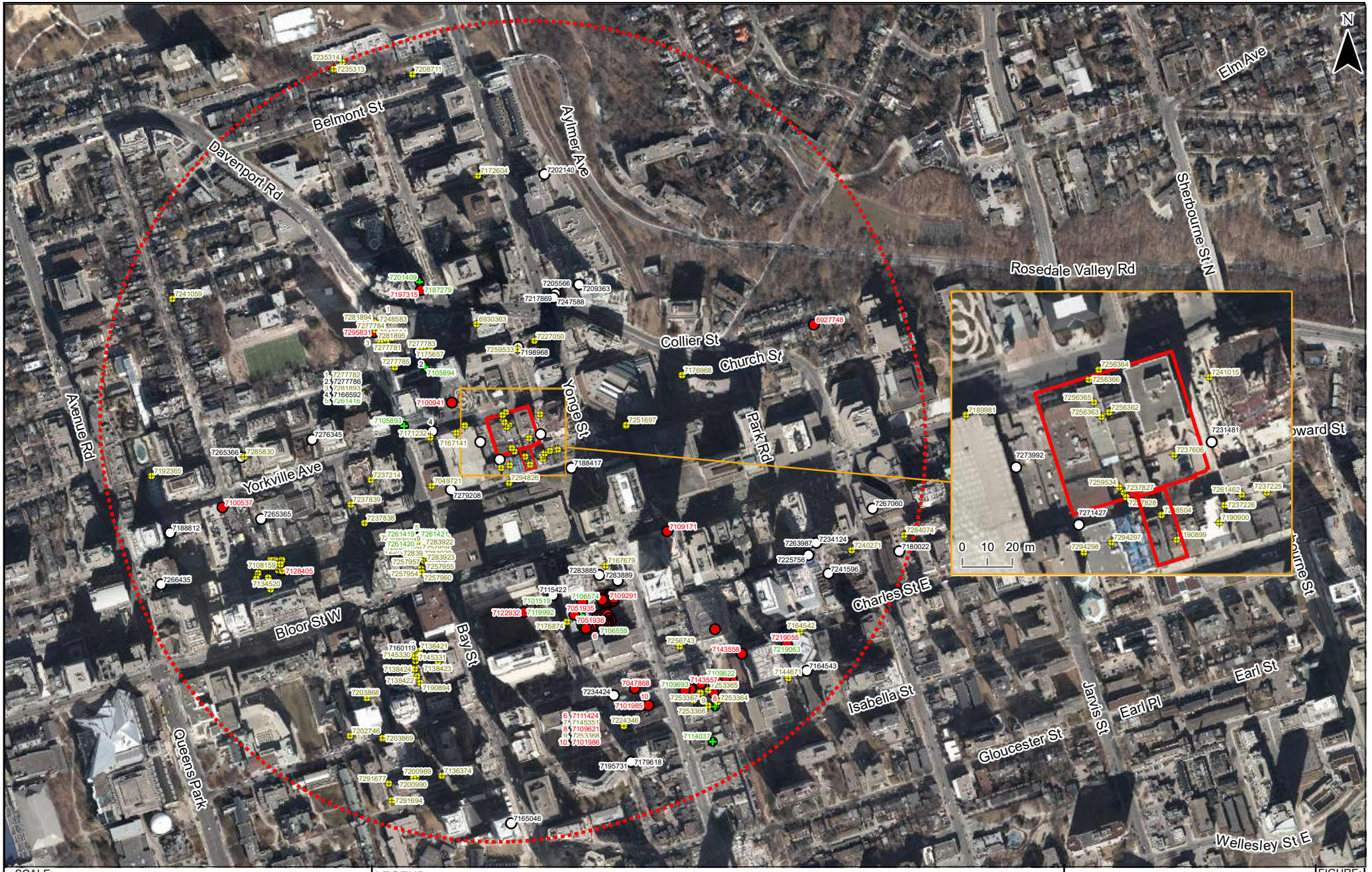
DRAWN BY:	CHECKED BY:
AC	RF

SURFICIAL GEOLOGY

FIGURE: 2

HYDROGEOLOGICAL INVESTIGATION
11 - 21 YORKVILLE AVENUE
16 - 18 CUMBERLAND STREET
TORONTO, ONTARIO

PROJECT NUMBER: MRK-00242474-A0 | DATE: APRIL 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	RF

LEGEND:

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

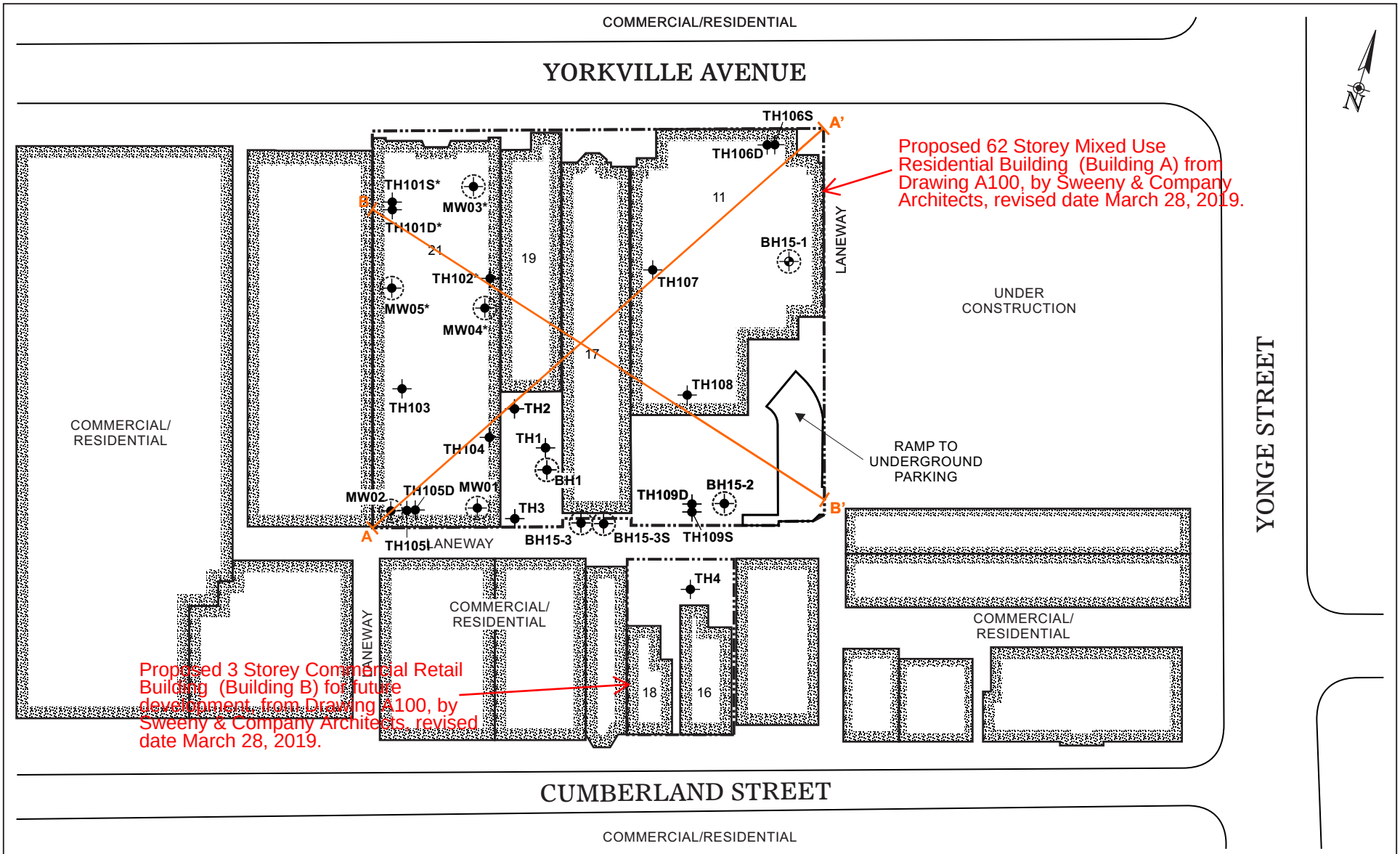
NOTE:
Duplicate labels for Well IDs have been removed.

MECP WATER WELL RECORDS MAP

FIGURE: 3

HYDROGEOLOGICAL INVESTIGATION
11 - 21 YORKVILLE AVENUE
16 - 18 CUMBERLAND STREET
TORONTO, ONTARIO

PROJECT NUMBER: MRK-00242474-A0 DATE: APRIL 2019



SCALE: 0 10 20m

SOURCE: BASED ON CITY OF TORONTO INTERACTIVE MAP, SURVEY PLAN BY WSP GEOMATICS ONTARIO LTD, DATE AUG. 21, 2017 AND FIELD OBSERVATIONS BY EXP STAFF

exp.	DRAWN BY	CHECKED BY
	J.D.H.	R.F.

NOTE:

AT 11 YORKVILLE AVENUE, ALL TEST HOLES WERE ADVANCED WITHIN THE UNDERGROUND PARKING GARAGE.

AT 21 YORKVILLE AVENUE, THE TEST HOLES INDICATED BY AN * WERE ADVANCED WITHIN THE BASEMENT. ALL OTHER TEST HOLES WERE ADVANCED FROM THE GROUND FLOOR.

LEGEND:

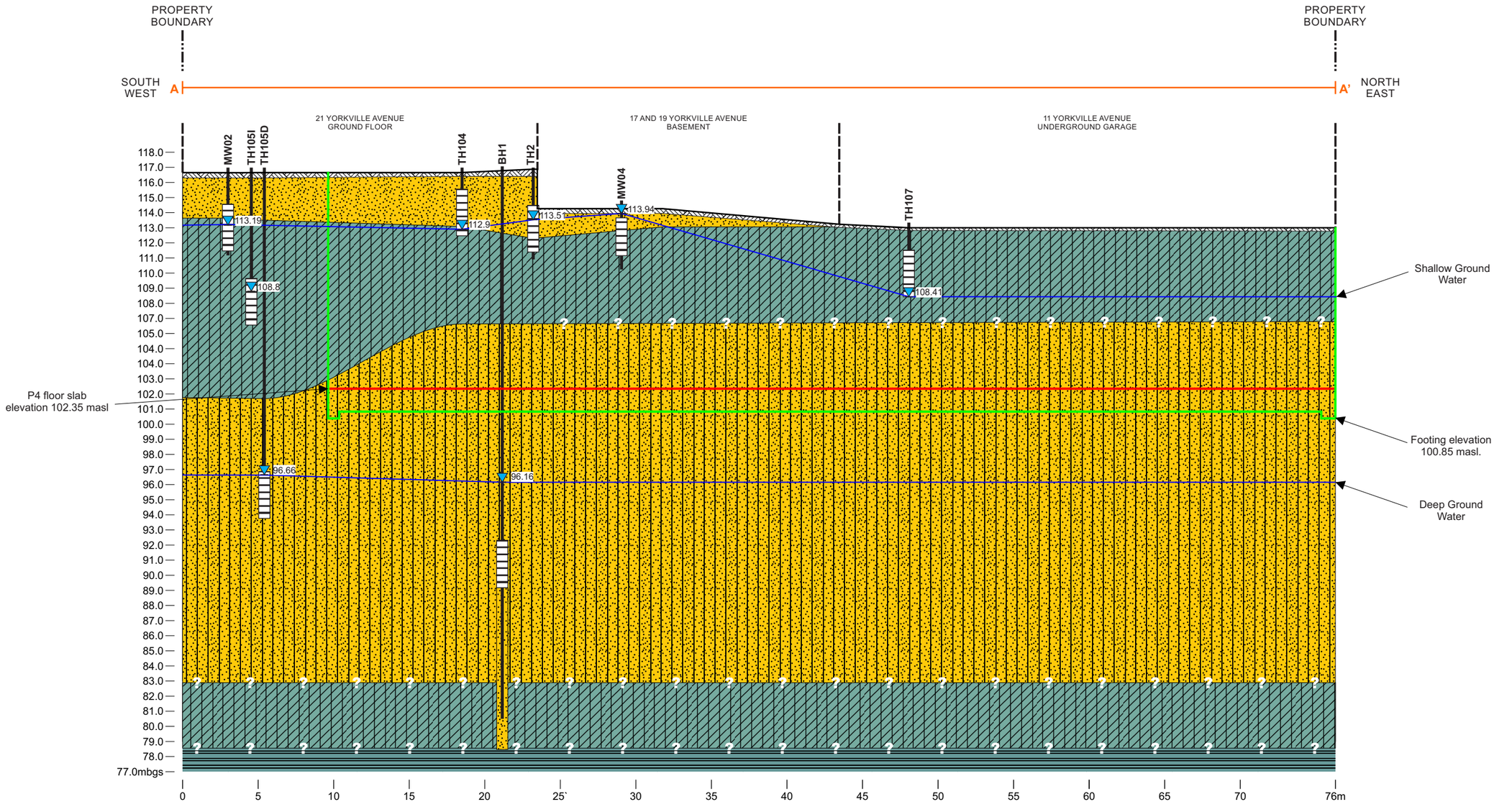
- PROPERTY BOUNDARY
- TEST HOLE WITH MONITOR
  DEEP MONITORS: TH1, TH101D, TH105D, TH106D, TH109D (EXP, 2018)
  INTERMEDIATE MONITOR: TH105I (EXP, 2018)
  SHALLOW MONITORS: TH2, TH3, TH4, TH101S, TH102, TH103, TH104, TH106S, TH107, TH108, TH109S (EXP, 2018)
- TEST HOLE WITH MONITORS BH15-2, BH15-3, BH15-3S (SPL, 2015) BH1 (MCCLYMONT & RAK, 2016) MW SERIES (PINCHIN, 2016)
- TEST HOLE BH15-1 (SPL, 2015)
- CROSS SECTION LOCATION

BOREHOLE LOCATION PLAN

FIGURE 4

11 TO 21 YORKVILLE AVENUE AND 16 TO 18 CUMBERLAND STREET TORONTO, ONTARIO

PROJECT NUMBER: 242474 | DATE: APRIL 2019



SCALE:

VERTICAL & HORIZONTAL SCALE 1:1

SOURCE:

BASED ON FIELD OBSERVATIONS BY EXP STAFF

DRAWN BY	CHECKED BY
J.D.H.	R.F.

LEGEND:

- TEST HOLE
- SCREEN INTERVAL
- SOIL SAMPLE
- GROUND WATER ELEVATION (GW ELEV (masl, JANUARY 14, 2019)
- 113.44 GROUND WATER ELEVATION (masl)
- CONCRETE
- SAND
- SILTY CLAY/SILTY CLAY TILL
- SANDY SILT/SILTY SAND
- SHALE
- PROPOSED FFE
- BASE OF FOOTING ELEVATION (APPROXIMATE)

CROSS SECTION VIEW A-A'

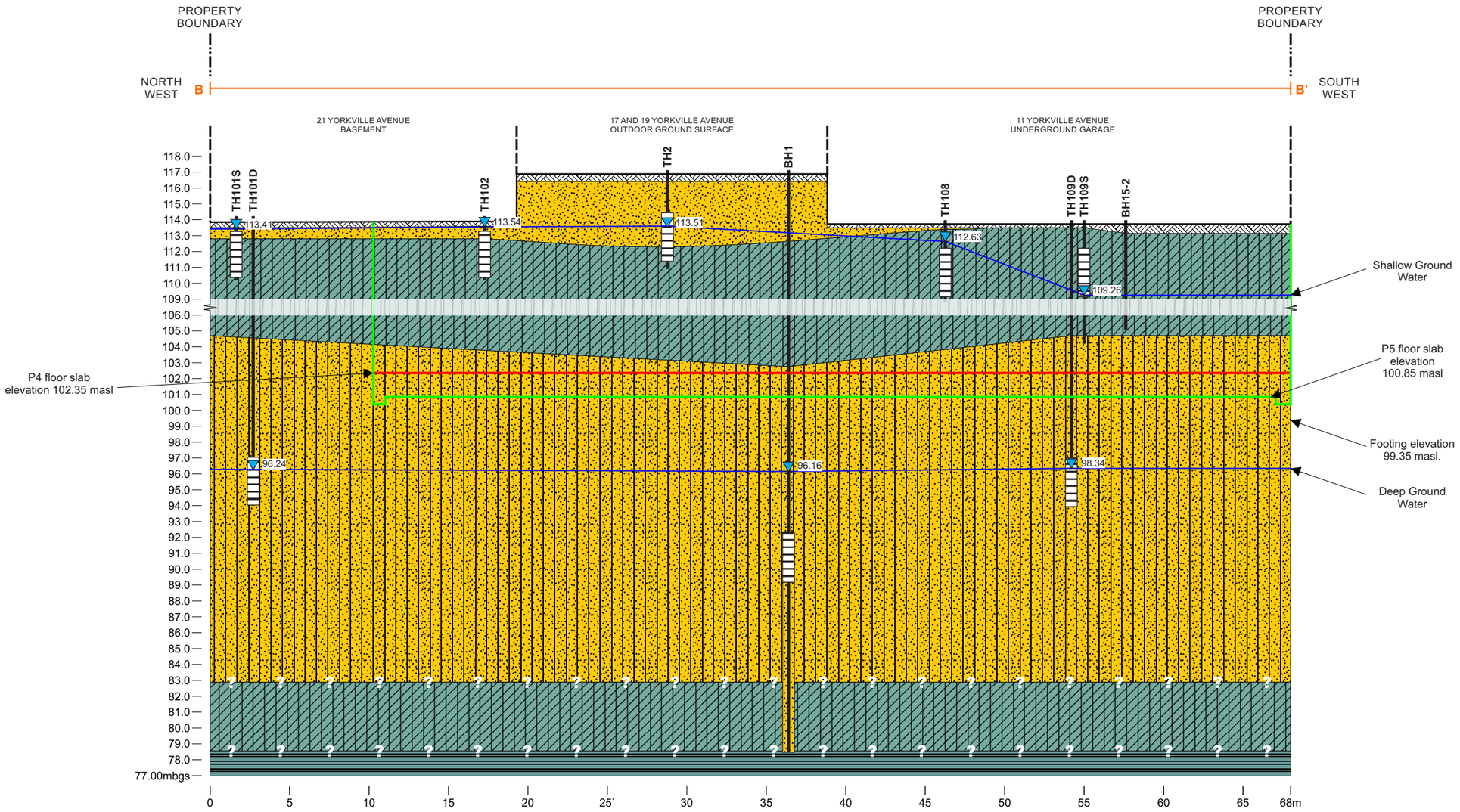
FIGURE 5A

11 TO 21 YORKVILLE AVENUE AND
16 TO 18 CUMBERLAND STREET
TORONTO, ONTARIO

PROJECT NUMBER: 242474

DATE: APRIL 2019

242474-XSEC A-A'-APR19



SCALE:

VERTICAL & HORIZONTAL SCALE 1:1

SOURCE:

BASED ON FIELD OBSERVATIONS BY EXP STAFF

DRAWN BY	CHECKED BY
J.D.H.	R.F.

LEGEND:

- TEST HOLE
- SCREEN INTERVAL
- SOIL SAMPLE
- GROUND WATER ELEVATION (GW ELEV (masl, JANUARY 14, 2019)
- 113.44 GROUND WATER ELEVATION (masl)
- CONCRETE
- SAND
- SILTY CLAY/SILTY CLAY TILL
- SANDY SILT/SILTY SAND
- SHALE
- PROPOSED FFE
- BASE OF FOOTING ELEVATION (APPROXIMATE)

CROSS SECTION VIEW B-B'

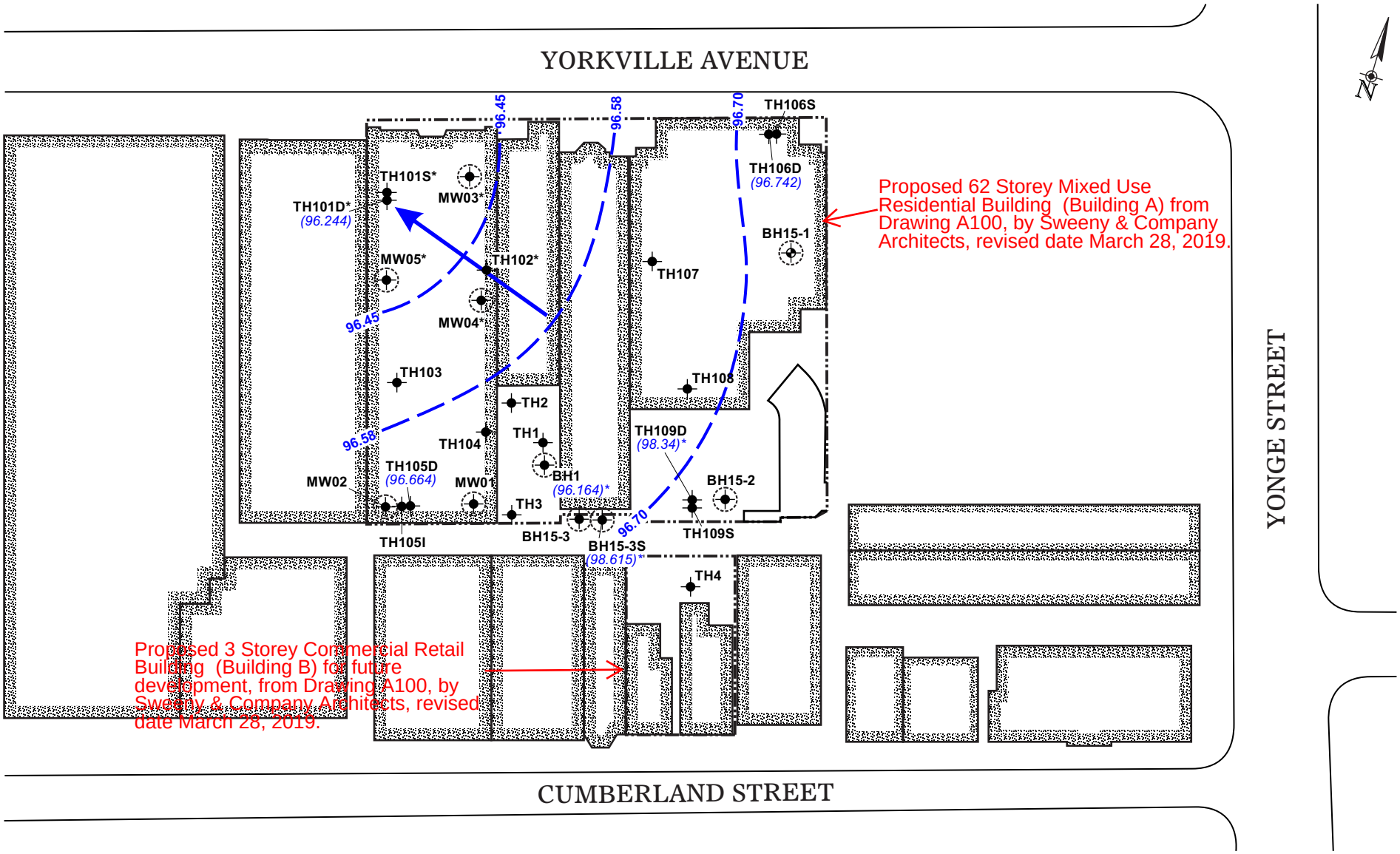
FIGURE 5B

11 TO 21 YORKVILLE AVENUE AND
16 TO 18 CUMBERLAND STREET
TORONTO, ONTARIO

PROJECT NUMBER: 242474

DATE: APRIL 2019

242474-XSEC B-B'-APR19



SCALE: 0 10 20m

SOURCE:
BASED ON CITY OF TORONTO INTERACTIVE MAP, SURVEY PLAN BY WSP GEOMATICS ONTARIO LTD, DATE AUG. 21, 2017 AND FIELD OBSERVATIONS BY EXP STAFF

DRAWN BY	CHECKED BY
J.D.H.	R.F.

LEGEND:

- PROPERTY BOUNDARY
- TEST HOLE WITH MONITOR
  DEEP MONITORS: TH1, TH101D, TH105D, TH106D, TH109D (EXP, 2018)
  INTERMEDIATE MONITOR: TH105I (EXP, 2018)
  SHALLOW MONITORS: TH2, TH3, TH4, TH101S, TH102, TH103, TH104, TH106S, TH107, TH108, TH109S (EXP, 2018)
- TEST HOLE WITH MONITORS BH15-2, BH15-3, BH15-3S (SPL, 2015) BH1 (MCCLYMONT & RAK, 2016) MW SERIES (PINCHIN, 2016)
- TEST HOLE BH15-1 (SPL, 2015)
- (100.00) GROUND WATER ELEVATION (masl)
- (100.00)* GROUND WATER ELEVATION NOT USED IN CONTOURING (masl)
- 100.00 GROUND WATER ELEVATION CONTOUR (masl)
- GROUND WATER FLOW DIRECTION
- (NM) NOT MONITORED
- (NA) NOT ACCESSIBLE

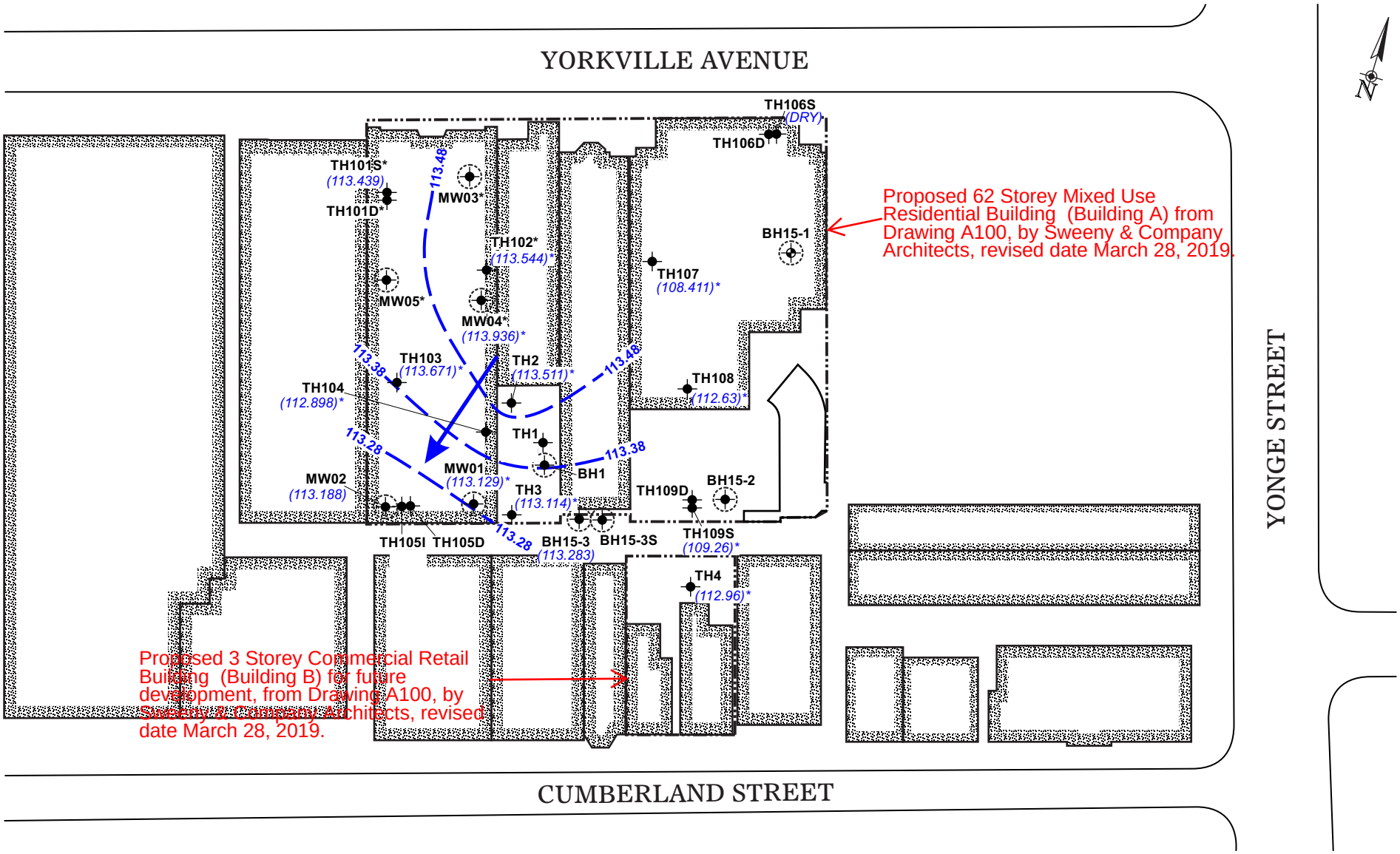
GROUND WATER CONTOUR PLAN BUILDING FOUNDATION LEVEL (JANUARY 14, 2019)

FIGURE 6A

11 TO 21 YORKVILLE AVENUE AND 16 TO 18 CUMBERLAND STREET TORONTO, ONTARIO

PROJECT NUMBER: 242474 | DATE: APRIL 2019

242474-GWC BUILDING FOUNDATION LEVEL-APR19



SCALE: 0 10 20m

SOURCE:
BASED ON CITY OF TORONTO INTERACTIVE MAP, SURVEY PLAN BY WSP GEOMATICS ONTARIO LTD, DATE AUG. 21, 2017 AND FIELD OBSERVATIONS BY EXP STAFF

exp.

DRAWN BY	CHECKED BY
J.D.H.	R.F.

LEGEND:

- PROPERTY BOUNDARY
- TEST HOLE WITH MONITOR
  DEEP MONITORS: TH1, TH101D, TH105D, TH106D, TH109D (EXP, 2018)
  INTERMEDIATE MONITOR: TH105I (EXP, 2018)
  SHALLOW MONITORS: TH2, TH3, TH4, TH101S, TH102, TH103, TH104, TH106S, TH107, TH108, TH109S (EXP, 2018)
- TEST HOLE WITH MONITORS BH15-2, BH15-3, BH15-3S (SPL, 2015) BH1 (MCCLYMONT & RAK, 2016) MW SERIES (PINCHIN, 2016)
- TEST HOLE BH15-1 (SPL, 2015)
- (100.00) GROUND WATER ELEVATION (masl)
- (100.00)* GROUND WATER ELEVATION NOT USED IN CONTOURING (masl)
- 100.00 GROUND WATER ELEVATION CONTOUR (masl)
- GROUND WATER FLOW DIRECTION

GROUND WATER CONTOUR PLAN SHALLOW UNIT (JANUARY 14, 2019)

FIGURE 6B

11 TO 21 YORKVILLE AVENUE AND 16 TO 18 CUMBERLAND STREET TORONTO, ONTARIO

PROJECT NUMBER: 242474 | DATE: APRIL 2019

242474-GWC BUILDING FOUNDATION LEVEL-SHALLOW-APR19

Appendix A – MECP WWR Summary Table

Appendix -A
MECP Water Well Record Summary - 500m
11 Yorkville, Toronto, ON

On-Site

BORE_HOLE_	WELL_ID	DATE	EAST83	NORTH83	ELEVATION (m ASL)	LOCATION ACCURACY	STREET	CITY	DISTANCE TO SITE CENTROID (m)	WATER FOUND (m BGS)	1st USE	2nd USE	FINAL STATUS
1005307863	7237606	1/23/2015	629943	4836633	115.6	margin of error : 30 m - 100 m	11 YORKVILLE AVE	TORONTO	23		Monitoring and Test Hole		Monitoring and Test Hole
1005309323	7237827	1/24/2015	629923	4836618	115.2	margin of error : 30 m - 100 m	17 YORKVILLE AVE.	TORONTO	24		Monitoring		Observation Wells
1005309326	7237828	1/24/2015	629924	4836616	115.2	margin of error : 30 m - 100 m	11-17 YORKVILLE AVE	TORONTO	26		Monitoring		Observation Wells
1005871275	7256362	12/17/2015	629917	4836650	115.5	margin of error : 30 m - 100 m	21 YORKVILLE RD	Toronto	10		Monitoring and Test Hole		Monitoring and Test Hole
1005871278	7256363	12/17/2015	629914	4836648	115.4	margin of error : 30 m - 100 m	21 YORKVILLE RD	Toronto	10		Monitoring and Test Hole		Monitoring and Test Hole
1005871284	7256365	12/17/2015	629911	4836654	115.5	margin of error : 30 m - 100 m	21 YORKVILLE RD	Toronto	17		Monitoring and Test Hole		Monitoring and Test Hole
1005871287	7256366	12/18/2015	629909	4836663	115.6	margin of error : 30 m - 100 m	21 YORKVILLE RD	Toronto	25		Monitoring and Test Hole		Monitoring and Test Hole
1005909890	7259534	2/24/2016	629921	4836620	115.3	margin of error : 30 m - 100 m	19 YORKVILLE AVENUE	Toronto	22		Monitoring		Observation Wells

Off-Site

BORE_HOLE_	WELL_ID	DATE	EAST83	NORTH83	ELEVATION (m ASL)	LOCATION ACCURACY	STREET	CITY	DISTANCE TO SITE CENTROID (m)	WATER FOUND (m BGS)	1st USE	2nd USE	FINAL STATUS
23051935	7051935	4/13/2007	630012	4836420	113.8	margin of error : 10 - 30 m			239	24.3	Not Used		Observation Wells
23051936	7051936	4/13/2007	630002	4836404	113.9	margin of error : 10 - 30 m			251	22.0	Not Used		Observation Wells
1000055238	7100537	12/1/2007	629546	4836543	115.7	margin of error : 10 - 30 m	130 BLOOR ST. WEST	TORONTO	389		Not Used		Observation Wells
1000067387	7100941	10/31/2007	629843	4836679	115.7	margin of error : 10 - 30 m	YORKVILLE AVENUE	Toronto	88	15.2	Not Used		Test Hole
1001485054	7101519	12/20/2007	629974	4836429	114.2	margin of error : 10 - 30 m	35 BALMUTO STREET		219	18.0	Dewatering		Dewatering
1001505223	7101985	12/19/2007	630095	4836286	113.5	margin of error : 10 - 30 m			396	17.5	Not Used		Test Hole
1001505226	7101986	12/20/2007	630098	4836286	113.5	margin of error : 10 - 30 m			397	17.1	Not Used		Monitoring and Test Hole
1001605468	7105893	4/10/2008	629781	4836649	116.1	margin of error : 10 - 30 m	BAY AND SCOLLARD	Toronto	141	22.9	Dewatering		Dewatering
1001605471	7105894	4/10/2008	629808	4836725	116.0	margin of error : 10 - 30 m	BAY AND SCOLLARD	Toronto	141	100.0	Dewatering		Dewatering
1001616095	7106574	5/9/2008	630039	4836420	113.6	margin of error : 10 - 30 m	35 BALMUTO STREET		251	3.0	Dewatering		Dewatering
1001658146	7108159	6/19/2008	629618	4836462	116.0	margin of error : 10 - 30 m	130 BLOOR STREET WEST	Toronto	353		Monitoring		Test Hole
1001710611	7109171	8/1/2007	630122	4836512	114.3	margin of error : 10 - 30 m	1 BLOOR STREET EAST	Toronto	238		Not Used		Observation Wells
1001726498	7109693	7/15/2008	630219	4836353	114.0	margin of error : 10 - 30 m	21 BALMUTO ST.	Toronto	414	1.0	Dewatering		Dewatering
1002026092	7119992		629936	4836407	114.7	margin of error : 30 m - 100 m	NORTH EAST CORNER OF BAY AND YORKVILLE	Toronto	235	1.0	**Domestic**		Dewatering
1002687176	7109693	4/29/2008	630219	4836353	114.0	margin of error : 10 - 30 m	21 BALMUTO ST.	Toronto	414	1.0	Dewatering		Dewatering
1002687185	7109693	4/30/2008	630200	4836320	114.0	margin of error : 10 - 30 m	21 BALMUTO ST.	Toronto	425	1.0	Dewatering		Dewatering
1002687194	7109693	5/1/2008	630166	4836314	113.9	margin of error : 10 - 30 m	21 BALMUTO ST.	Toronto	409	1.0	Dewatering		Dewatering
1002687203	7109693	5/22/2008	630182	4836302	114.0	margin of error : 10 - 30 m	21 BALMUTO ST.	Toronto	428	1.0	Dewatering		Dewatering
1002687212	7109693	5/23/2008	630184	4836285	113.6	margin of error : 10 - 30 m	21 BALMUTO ST.	Toronto	443	1.0	Dewatering		Dewatering
1002687221	7109693	5/24/2008	630153	4836307	113.6	margin of error : 10 - 30 m	21 BALMUTO ST.	Toronto	407	1.0	Dewatering		Dewatering
1002687230	7109693	5/20/2008	630198	4836323	114.0	margin of error : 10 - 30 m	21 BALMUTO ST.	Toronto	422	1.0	Dewatering		Dewatering
1002687239	7109693	5/20/2008	630145	4836306	113.6	margin of error : 10 - 30 m	21 BALMUTO ST.	Toronto	403	1.0	Dewatering		Dewatering
1002694433	7128405	1/29/2008	629623	4836461	116.0	margin of error : 30 m - 100 m	130 BLOOR STREET WEST	TORONTO	350	4.0	Not Used		Observation Wells
1002774481	7106574	5/9/2008	630038	4836423	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		248	3.0	Dewatering		Dewatering
1002774490	7106574	5/9/2008	630051	4836421	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		256	3.0	Dewatering		Dewatering
1002774499	7106574	5/9/2008	630053	4836422	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		256	3.0	Dewatering		Dewatering
1002774508	7106574	5/9/2008	630053	4836425	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		253	3.0	Dewatering		Dewatering
1002774521	7106574	5/9/2008	630046	4836430	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		245	3.0	Dewatering		Dewatering
1002774530	7106574	5/9/2008	630052	4836428	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		250	3.0	Dewatering		Dewatering
1002774539	7106574	5/9/2008	630043	4836429	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		245	3.0	Dewatering		Dewatering
1002774548	7106574	5/9/2008	630046	4836428	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		247	3.0	Dewatering		Dewatering
1002774557	7106574	5/9/2008	630037	4836428	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		243	3.0	Dewatering		Dewatering
1002774566	7106574	5/9/2008	630038	4836425	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		246	3.0	Dewatering		Dewatering
1002774575	7106574	5/9/2008	630040	4836418	113.6	margin of error : 10 - 30 m	35 BALMUTO STREET		253	3.0	Dewatering		Dewatering
1002774584	7106574	5/9/2008	630043	4836418	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		254	3.0	Dewatering		Dewatering
1002774593	7106574	5/9/2008	630045	4836419	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		254	3.0	Dewatering		Dewatering
1002774602	7106574	5/9/2008	630048	4836420	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		255	3.0	Dewatering		Dewatering
1002776549	7108159	6/9/2008	629618	4836462	116.0	margin of error : 10 - 30 m	130 BLOOR STREET WEST	Toronto	353		Monitoring		Test Hole
1002776558	7108159	6/10/2008	629620	4836466	116.0	margin of error : 10 - 30 m	130 BLOOR STREET WEST	Toronto	350		Monitoring		Test Hole
1002776567	7108159	6/10/2008	629618	4836466	116.0	margin of error : 10 - 30 m	130 BLOOR STREET WEST	Toronto	351		Monitoring		Test Hole
1002776576	7108159	6/10/2008	629613	4836466	116.0	margin of error : 10 - 30 m	130 BLOOR STREET WEST	Toronto	356		Monitoring		Test Hole
1002776585	7108159	6/11/2008	629610	4836466	116.0	margin of error : 10 - 30 m	130 BLOOR STREET WEST	Toronto	358		Monitoring		Test Hole
1002776594	7108159	6/11/2008	629605	4836466	116.0	margin of error : 10 - 30 m	130 BLOOR STREET WEST	Toronto	363		Monitoring		Test Hole
1002776603	7108159	6/13/2008	629602	4836466	116.0	margin of error : 10 - 30 m	130 BLOOR STREET WEST	Toronto	365		Monitoring		Test Hole
1002776612	7108159	6/13/2008	629598	4836466	115.9	margin of error : 10 - 30 m	130 BLOOR STREET WEST	Toronto	369		Monitoring		Test Hole
1002776621	7108159	6/13/2008	629610	4836471	116.0	margin of error : 10 - 30 m	130 BLOOR STREET WEST	Toronto	356		Monitoring		Test Hole
1002776630	7108159	6/16/2008	629607	4836471	116.0	margin of error : 10 - 30 m	130 BLOOR STREET WEST	Toronto	359		Monitoring		Test Hole
1002776663	7108159	6/16/2008	629615	4836471	116.0	margin of error : 10 - 30 m	130 BLOOR STREET WEST	Toronto	352		Monitoring		Test Hole
1002776672	7108159	6/16/2008	629608	4836475	116.0	margin of error : 10 - 30 m	130 BLOOR STREET WEST	Toronto	356		Monitoring		Test Hole
1002776681	7108159	6/17/2008	629611	4836475	116.0	margin of error : 10 - 30 m	130 BLOOR STREET WEST	Toronto	353		Monitoring		Test Hole
1002776690	7108159	6/17/2008	629616	4836475	116.0	margin of error : 10 - 30 m	130 BLOOR STREET WEST	Toronto	349		Monitoring		Test Hole
1002776699	7108159	6/19/2008	629618	4836474	116.0	margin of error : 10 - 30 m	130 BLOOR STREET WEST	Toronto	347		Monitoring		Test Hole
1002776708	7108159	6/19/2008	629623	4836475	116.0	margin of error : 10 - 30 m	130 BLOOR STREET WEST	Toronto	343		Monitoring		Test Hole
1002839322	7134520	11/12/2009	629623	4836461	116.0	margin of error : 30 m - 100 m	130 BLOOR ST W	Toronto	350	3.0	Monitoring		Test Hole
1002896339	7136374	11/18/2009	629830	4836195	112.7	margin of error : 10 - 30 m	70 SAINT MARY STREET	Toronto	456		Test Hole		Test Hole
1002925505	7138421	11/19/2009	629799	4836357	114.6	margin of error : 30 m - 100 m	77 BAY ST	TORONTO	310		Monitoring and Test Hole		Monitoring and Test Hole
1002925508	7138422	12/2/2009	629798	4836324	114.4	margin of error : 30 m - 100 m	77 BLOOR ST	TORONTO	341		Monitoring		
1002925511	7138423	12/3/2009	629825	4836343	114.3	margin of error : 30 m - 100 m	77 BLOOR ST W	TORONTO	314		Test Hole		Monitoring and Test Hole
1002925514	7138424	11/18/2009	629795	4836334	114.5	margin of error : 30 m - 100 m	77 BLOOR ST W	TORONTO	333		Monitoring		
1002978675	7144671	3/17/2010	630279	4836322	113.4	margin of error : 30 m - 100 m	38 ISABELLA ST	Toronto	479		Test Hole		Test Hole
1002984810	7145330	4/24/2010	629794	4836352	114.6	margin of error : 30 m - 100 m	77 BLOOR STREET WEST	Toronto	317		Monitoring and Test Hole		Monitoring and Test Hole
1002984812	7145331	4/24/2010	629796	4836344	114.5	margin of error : 30 m - 100 m	77 BLOOR STREET WEST	Toronto	323		Monitoring and Test Hole		Monitoring and Test Hole
1002984858	7145351	4/24/2010	629795	4836349	114.6	margin of error : 30 m - 100 m	77 BLOOR STREET WEST	Toronto	319		Monitoring and Test Hole		Monitoring and Test Hole
1003265179	7134520	11/12/2009	629621	4836470	116.0	margin of error : 10 - 30 m	130 BLOOR ST W	Toronto	347	3.0	Monitoring		Test Hole
1003265188	7134520	11/12/2009	629605	4836452	116.0	margin of error : 10 - 30 m	130 BLOOR ST W	Toronto	370	3.0	Monitoring		Test Hole
1003265197	7134520	11/12/2009	629592	4836458	115.9	margin of error : 10 - 30 m	130 BLOOR ST W	Toronto	378	3.0	Monitoring		Test Hole
1003265206	7134520	11/12/2009	629590	4836451	115.8	margin of error : 10 - 30 m	130 BLOOR ST W	Toronto	383	3.0	Monitoring		Test Hole
1003265215	7134520	11/12/2009	629593	4836443	115.8	margin of error : 10 - 30 m	130 BLOOR ST W	Toronto	385	3.0	Monitoring		Test Hole
1003265224	7134520	11/12/2009	629608	4836437	115.9	margin of error : 10 - 30 m	130 BLOOR ST W	Toronto	375	3.0	Monitoring		Test Hole
11108588	6927748	3/24/2004	630312	4836780	114.7	margin of error : 100 m - 300 m		TORONTO	414		Not Used		Test Hole
23047868	7047868	3/13/2007	630080	4836308	114.0	margin of error : 10 - 30 m	9 BLOOR STREET EAST	TORONTO	369		Not Used		Observation Wells
1001616050	7106559	6/2/2008	630047	4836401	113.6	margin of error : 10 - 30 m	21 BALMUTO STREET		271		Dewatering		Dewatering
1001799226	7111424	7/24/2008	630047	4836401	113.6	margin of error : 10 - 30 m	21 BALMUTO ST.		271		Dewatering		Abandoned-Other
1002774211	7106559	6/2/2008	630042	4836393	113.7	margin of error : 10 - 30 m	21 BALMUTO STREET		276		Dewatering		Dewatering
1002774219	7106559	6/2/2008	630039	4836393	113.7	margin of error : 10 - 30 m	21 BALMUTO STREET		275		Dewatering		Dewatering
1002774227	7106559	6/2/2008	630036	4836392	113.7	margin of error : 10 - 30 m	21 BALMUTO STREET		275		Dewatering		Dewatering
1002774235	7106559	6/2/2008	630034	4836391	113.7	margin of error : 10 - 30 m	21 BALMUTO STREET		275		Dewatering		Dewatering
1002774243	7106559	6/2/2008	630032	4836390	113.7	margin of error : 10 - 30 m	21 BALMUTO STREET		275		Dewatering		Dewatering
1002774251	7106559	6/2/2008	630029	4836389	113.7	margin of error : 10 - 30 m	21 BALMUTO STREET		274		Dewatering		Dewatering
1002774259	7106559	6/2/2008	630026	4836388	113.7	margin of error : 10 - 30 m	21 BALMUTO STREET		274		Dewatering		Dewatering
1002774267	7106559	6/2/2008	630024	4836388	113.8	margin of error : 10 - 30 m	21 BALMUTO STREET		273		Dewatering		Dewatering
1002774275	7106559	6/2/2008	630020	4836386	113.8	margin of error : 10 - 30 m	21 BALMUTO STREET		274		Dewatering		Dewatering
1002774283	7106559	6/2/2008	630017	4836386	113.8	margin of error : 10 - 30 m	21 BALMUTO STREET		273		Dewatering		Dewatering
1002774298	7106559	6/2/2008	630032	4836402	113.7	margin of error : 10 - 30 m	21 BALMUTO STREET		264		Dewatering		Dewatering
1002774307	7106559	6/2/2008	630035	4836403	113.6	margin of error : 10 - 30 m	21 BALMUTO STREET		264		Dewatering		Dewatering
1002774316	7106559	6/2/2008	630038	4836404	113.6	margin of error : 10 - 30 m	21 BALMUTO STREET		264		Dewatering		Dewatering
1002774325	7106559	6/2/2008	630041	4836404	113.6	margin of error : 10 - 30 m	21 BALMUTO STREET		266		Dewatering		Dewatering
1002774334	7106559	6/2/2008	630043	4836406	113.6	margin of error : 10 - 30 m	21 BALMUTO STREET		265		Dewatering		Dewatering
1002774343	7106559	6/2/2008	630045	4836404	113.6	margin of error : 10 - 30 m	21 BALMUTO STREET		268		Dewatering		Dewatering
1002774352	7106559	6/2/2008	630047	4836399	113.7	margin of error : 10 - 30 m	21 BALMUTO STREET		273		Dewatering		Dewatering
1002774361	7106559	6/2/2008	630049	4836396	113.7	margin of error : 10 - 30 m	21 BALMUTO STREET		277		Dewatering		Dewatering
1002774370	7106559	6/2/2008	630046	4836395	113.7	margin of error : 10 - 30 m	21 BALMUTO STREET		276		Dewatering		Dewatering
1002774379	7106559	6/2/2008	630044	4836394	113.7	margin of error : 10 - 30 m	21 BALMUTO STREET		276		Dewatering		Dewatering
1002774395	7106559	6/2/2008	630014	4836385	113.8	margin of error : 10 - 30 m	21 BALMUTO STREET		273		Dewatering		Dewatering
1002774404	7106559	6/2/2008	630013	4836387	113.8	margin of error : 10 - 30 m	21 BALMUTO STREET		270		Dewatering		Dewatering
1002774413	7106559	6/2/2008	630011	4836390	113.8	margin of error : 10 - 30 m	21 BALMUTO STREET		267		Dewatering		Dewatering
1002774422	7106559	6/2/2008	630010	4836394	113.8	margin of error : 10 - 30 m	21 BALMUTO STREET		263		Dewatering		Dewatering
1002774431	7106559	6/2/2008	630010	4836397	113.8	margin of error : 10 - 30 m	21 BALMUTO STREET		260		Dewatering		Dewatering
1002774440	7106559	6/2/2008	630010	4836401	113.8	margin of error : 10 - 30 m	21 BALMUTO STREET		256		Dewatering		Dewatering
1002774449	7106559	6/2/2008	630010	4836404	113.8	margin of error : 10 - 30 m	21 BALMUTO STREET		253		Dewatering		Dewatering
1002779166	7111424	7/24/2008	630032	4836402	113.7	margin of error : 10 - 30 m	21 BALMUTO ST.		264		Dewatering		Abandoned-Other
1002779175	7111424	7/24/2008	630035	4836403	113.6	margin of error : 10 - 30 m	21 BALMUTO ST.		264		Dewatering		Abandoned-Other
1002779183	7111424	7/24/2008	630038	4836404	113.6	margin of error : 10 - 30 m	21 BALMUTO ST.		264		Dewatering		Abandoned-Other
1002779191	7111424	7/24/2008	630041	4836404	113.6	margin of error : 10 - 30 m	21 BALMUTO ST.		266		Dewatering		Abandoned-Other
1002779199	7111424	7/24/2008	630043	4836406	113.6	margin of error : 10 - 30 m	21 BALMUTO ST.		265		Dewatering		Abandoned-Other
1002779207	7111424	7/24/2008	630045	4836404	113.6	margin of error : 10 - 30 m	21 BALMUTO ST.		268		Dewatering		Abandoned-Other

Off-Site												
BORE_HOLE_	WELL_ID	DATE	EAST83	NORTH83	ELEVATION (m ASL)	LOCATION ACCURACY	STREET	CITY	DISTANCE TO SITE CENTROID (m)	WATER FOUND (m BGS)	1st USE	2nd USE	FINAL STATUS
1002779215	7111424	7/24/2008	630047	4836399	113.7	margin of error : 10 - 30 m	21 BALMUTO ST.		273		Dewatering		Abandoned-Other
1002779223	7111424	7/24/2008	630049	4836396	113.7	margin of error : 10 - 30 m	21 BALMUTO ST.		277		Dewatering		Abandoned-Other
1002779231	7111424	7/24/2008	630046	4836395	113.7	margin of error : 10 - 30 m	21 BALMUTO ST.		276		Dewatering		Abandoned-Other
1002779239	7111424	7/24/2008	630044	4836394	113.7	margin of error : 10 - 30 m	21 BALMUTO ST.		276		Dewatering		Abandoned-Other
1002779248	7111424	7/24/2008	630042	4836393	113.7	margin of error : 10 - 30 m	21 BALMUTO ST.		276		Dewatering		Abandoned-Other
1002779257	7111424	7/24/2008	630039	4836393	113.7	margin of error : 10 - 30 m	21 BALMUTO ST.		275		Dewatering		Abandoned-Other
1002779266	7111424	7/25/2008	630036	4836392	113.7	margin of error : 10 - 30 m	21 BALMUTO ST.		275		Dewatering		Abandoned-Other
1002779275	7111424	7/25/2008	630034	4836391	113.7	margin of error : 10 - 30 m	21 BALMUTO ST.		275		Dewatering		Abandoned-Other
1002779284	7111424	7/25/2008	630032	4836390	113.7	margin of error : 10 - 30 m	21 BALMUTO ST.		275		Dewatering		Abandoned-Other
1002779293	7111424	7/25/2008	630029	4836389	113.7	margin of error : 10 - 30 m	21 BALMUTO ST.		274		Dewatering		Abandoned-Other
1002779302	7111424	7/25/2008	630026	4836388	113.7	margin of error : 10 - 30 m	21 BALMUTO ST.		274		Dewatering		Abandoned-Other
1002779311	7111424	7/25/2008	630024	4836388	113.8	margin of error : 10 - 30 m	21 BALMUTO ST.		273		Dewatering		Abandoned-Other
1002779320	7111424	7/25/2008	630020	4836386	113.8	margin of error : 10 - 30 m	21 BALMUTO ST.		274		Dewatering		Abandoned-Other
1002779329	7111424	7/25/2008	630017	4836386	113.8	margin of error : 10 - 30 m	21 BALMUTO ST.		273		Dewatering		Abandoned-Other
11559163	6930363	6/16/2006	629875	4836781	116.0	margin of error : 10 - 30 m	INTERSECTION OF CHURCH AND YONGE	TORONTO	147	2.0			Observation Wells
1001726040	7109621	6/8/2008	630186	4836308	114.1	margin of error : 10 - 30 m	21 BALMATO ST.		425				Abandoned-Other
1001726043	7109622	7/5/2007	630192	4836320	114.1	margin of error : 10 - 30 m	21 BALMATO ST.	Toronto	420				Dewatering
1001886778	7115422	10/7/2008	629974	4836429	114.2	margin of error : 10 - 30 m	35 BALMUNTO ST		219				
1002424189	7122932	5/8/2009	629936	4836407	114.7	margin of error : 30 m - 100 m	N.E. CORNER OF BAY & YORKVILLE	Toronto	235				Abandoned-Other
1002959667	7143557	7/5/2007	630192	4836320	114.1	margin of error : 30 m - 100 m	21 BAWUTO ST.	TORONTO	420				Abandoned-Other
1002959669	7143558	1/20/2010	630219	4836353	114.0	margin of error : 30 m - 100 m	21 BALMUTO ST	Toronto	414	10.0			Abandoned-Other
1003294024	7143558	1/28/2010	630219	4836353	114.0	margin of error : 30 m - 100 m	21 BALMUTO ST	Toronto	414	10.0			Abandoned-Other
1003294033	7143558	1/28/2010	630206	4836320	114.0	margin of error : 30 m - 100 m	21 BALMUTO ST	Toronto	429	10.0			Abandoned-Other
1003294042	7143558	1/28/2010	630166	4836314	113.9	margin of error : 30 m - 100 m	21 BALMUTO ST	Toronto	409	10.0			Abandoned-Other
1003294051	7143558	1/28/2010	630182	4836302	114.0	margin of error : 30 m - 100 m	21 BALMUTO ST	Toronto	428	10.0			Abandoned-Other
1003294060	7143558	1/28/2010	630184	4836385	112.8	margin of error : 30 m - 100 m	21 BALMUTO ST	Toronto	367	10.0			Abandoned-Other
1003294069	7143558	1/28/2010	630153	4836307	113.6	margin of error : 30 m - 100 m	21 BALMUTO ST	Toronto	407	10.0			Abandoned-Other
1003294078	7143558	1/28/2010	630198	4836323	114.0	margin of error : 30 m - 100 m	21 BALMUTO ST	Toronto	422	10.0			Abandoned-Other
1003294087	7143558	1/28/2010	630145	4836306	113.6	margin of error : 30 m - 100 m	21 BALMUTO ST	Toronto	403	10.0			Abandoned-Other
23049721	7049721	8/2/2007	629817	4836571	116.0	margin of error : 10 - 30 m			127				Observation Wells
1001719338	7109291	7/11/2008	630039	4836420	113.6	margin of error : 10 - 30 m	35 BALMUTO STREET		251				Abandoned-Other
1002777696	7109291	6/17/2008	630046	4836430	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		245				Abandoned-Other
1002777705	7109291	6/17/2008	630052	4836428	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		250				Abandoned-Other
1002777714	7109291	6/17/2008	630043	4836429	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		245				Abandoned-Other
1002777723	7109291	6/17/2008	630040	4836428	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		244				Abandoned-Other
1002777732	7109291	6/17/2008	630037	4836428	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		243				Abandoned-Other
1002777741	7109291	6/17/2008	630038	4836425	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		246				Abandoned-Other
1002777750	7109291	6/17/2008	630040	4836418	113.6	margin of error : 10 - 30 m	35 BALMUTO STREET		253				Abandoned-Other
1002777759	7109291	6/17/2008	630043	4836418	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		254				Abandoned-Other
1002777768	7109291	6/17/2008	630045	4836419	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		254				Abandoned-Other
1002777777	7109291	6/17/2008	630048	4836420	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		255				Abandoned-Other
1002777801	7109291	6/17/2008	630038	4836423	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		248				Abandoned-Other
1002777810	7109291	6/17/2008	630051	4836421	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		256				Abandoned-Other
1002777819	7109291	6/17/2008	630053	4836422	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		256				Abandoned-Other
1002777828	7109291	6/17/2008	630053	4836425	113.5	margin of error : 10 - 30 m	35 BALMUTO STREET		253				Abandoned-Other
1003524862	7164542	1/29/2011	630294	4836383	114.2	margin of error : 10 - 30 m	45 CHARLES STREET	Toronto	453		Monitoring and Test Hole		Monitoring and Test Hole
1003548498	7167141	4/8/2011	629849	4836640	115.5	margin of error : 10 - 30 m	50 CUMBER LAND	Toronto	**73**		Monitoring		Observation Wells
1003554413	7167679	8/11/2011	630042	4836468	113.5	margin of error : 10 - 30 m	774 YONGE ST	Toronto	211		Monitoring and Test Hole		Test Hole
1003597943	7171232	10/5/2011	629815	4836634	115.8	margin of error : 10 - 30 m	50 CUMBERLAND ST.	Toronto	108		Monitoring and Test Hole		Observation Wells
1003614288	7172604	7/29/2011	629877	4836974	115.3	margin of error : 10 - 30 m	901 YONGE ST	Toronto	335		Monitoring		Observation Wells
1003693484	7176874	12/21/2011	629992	4836395	114.0	margin of error : 100 m - 300 m	3 CHARLES ST. WEST	TORONTO	256		Monitoring and Test Hole		Monitoring and Test Hole
1003697230	7176968	1/6/2012	630141	4836715	115.6	margin of error : 30 m - 100 m	820 CHURCH STREET	TORONTO	231		Monitoring and Test Hole		Monitoring and Test Hole
1004157041	7187279	5/25/2012	629803	4836825	116.1	margin of error : 30 m - 100 m	32 DAVENPORT	Toronto	219	16.8	Dewatering		Dewatering
1004186139	7189981	9/12/2012	629860	4836649	115.5	margin of error : 10 - 30 m	27 YORKVILLE RD	TORONTO	**63**		Monitoring and Test Hole		Test Hole
1004198751	7190894	10/13/2012	629802	4836316	114.3	margin of error : 30 m - 100 m	77 BLOOR ST WEST	Toronto	347		Monitoring		Observation Wells
1004198766	7190899	10/16/2012	629944	4836599	115.1	margin of error : 30 m - 100 m	30 CUBERLAND ST	Toronto	**48**		Monitoring and Test Hole		Test Hole
1004198769	7190900	10/16/2012	629961	4836606	115.3	margin of error : 30 m - 100 m	226 CUMBERLAND ST	Toronto	**53**		Monitoring and Test Hole		Test Hole
1004211773	7192365	11/13/2012	629454	4836584	116.1	margin of error : 10 - 30 m	136 YORKVILLE RD	TORONTO	472		Monitoring		
1004254424	7197315	11/15/2012	629803	4836825	116.1	margin of error : 30 m - 100 m	32 DAVENPORT RD.	Toronto	219		Dewatering		Abandoned-Other
1004279185	7200989	4/8/2013	629797	4836193	112.7	margin of error : 30 m - 100 m	2 ST. THOMAS STREET	TORONTO	466		Monitoring and Test Hole		Monitoring and Test Hole
1004279188	7200990	4/8/2012	629793	4836192	112.7	margin of error : 30 m - 100 m	2 ST. THOMAS STREET	TORONTO	468		Monitoring and Test Hole		Monitoring and Test Hole
1004290807	7201409	2/12/2013	629801	4836835	116.0	margin of error : 30 m - 100 m	32 DAVENPORT	Toronto	228	0.8	Dewatering		Dewatering
1004331441	7202746	4/30/2013	629711	4836247	114.0	margin of error : 30 m - 100 m	2 ST THOMAS ST	Toronto	448		Monitoring		Observation Wells
1004377431	7203868	5/1/2013	629733	4836296	114.3	margin of error : 30 m - 100 m	2 ST THOMAS ST	Toronto	394		Monitoring		Observation Wells
1004589339	7208711	8/28/2013	629792	4837105	113.1	margin of error : 30 m - 100 m	1027 YONGE STREET	Toronto	481		Monitoring and Test Hole		Monitoring and Test Hole
1004955919	7224346	7/2/2014	630066	4836260	112.7	margin of error : 30 m - 100 m	10 ST. MARY STREET	Toronto	408	3.0	Monitoring		
1005119592	7227050	7/17/2014	629950	4836759	115.9	margin of error : 30 m - 100 m	830 YONGE ST.	TORONTO	120		Monitoring and Test Hole		Test Hole
1005278326	7235313	12/9/2014	629690	4837112	109.7	margin of error : 30 m - 100 m	1008 YONGE STREET	Toronto	524		Monitoring and Test Hole		Monitoring and Test Hole
1005278329	7235314	12/9/2014	629701	4837121	108.7	margin of error : 30 m - 100 m	1008 YONGE STREET	Toronto	528		Monitoring and Test Hole		Monitoring and Test Hole
1005305177	7237214	11/17/2014	629738	4836579	116.3	margin of error : 30 m - 100 m	GENOA ST	Toronto	195		Monitoring		Observation Wells
1005305293	7237225	12/8/2014	629980	4836618	115.6	margin of error : 30 m - 100 m	826-834 YONGE ST	Toronto	**62**		Monitoring		Observation Wells
1005305296	7237226	12/8/2014	629963	4836613	115.4	margin of error : 30 m - 100 m	826-834 YONGE ST	Toronto	**50**		Monitoring		Observation Wells
1005309356	7237838	1/19/2015	629730	4836523	116.1	margin of error : 30 m - 100 m	CUMBERLAND ST EAST OF BELLAIR AT NORTH EDGE	TORONTO	226		Monitoring		Observation Wells
1005309359	7237839	1/19/2015	629712	4836547	116.2	margin of error : 30 m - 100 m	BELLAIR ST. NORTH OF CUMBERLAND		231		Monitoring		Observation Wells
1005314122	7238504	2/17/2015	629938	4836609	115.2	margin of error : 30 m - 100 m	18 CUMBERLAND ST	TORONTO	**36**	3.7	Monitoring		
1005327050	7240271	3/5/2015	630361	4836488	115.4	margin of error : 30 m - 100 m	640 CHURCHSTREET	TORONTO	465		Monitoring and Test Hole		Observation Wells
1005342062	7241015	2/2/2015	629957	4836664	115.9	margin of error : 30 m - 100 m	848 YONGE ST	Toronto	**41**		Monitoring		Observation Wells
1005342545	7241059	2/9/2015	629481	4836814	116.9	margin of error : 30 m - 100 m	70 HAZELTON AVENUE	Toronto	474		Monitoring and Test Hole		Monitoring and Test Hole
1005694558	7248583	8/24/2015	629745	4836782	116.4	margin of error : 30 m - 100 m	BAY STREET 7 SCOLLARD STREET	Toronto	226		Monitoring		Observation Wells
1005694561	7248584	8/24/2015	629765	4836763	116.2	margin of error : 30 m - 100 m	BAY STREET & SCOLLARD STREET	Toronto	199		Monitoring		Observation Wells
1005791578	7251697	10/1/2015	630069	4836650	116.0	margin of error : 30 m - 100 m	771 YONGE ST	Toronto	147	13.7	Monitoring and Test Hole		Test Hole
1005823261	7253364	10/27/2015	630187	4836291	113.8	margin of error : 30 m - 100 m	651 YONGE STREET	Toronto	440		Monitoring and Test Hole		Monitoring and Test Hole
1005823264	7253365	10/27/2015	630175	4836306	114.0	margin of error : 30 m - 100 m	651 YONGE STREET	Toronto	420		Monitoring and Test Hole		Monitoring and Test Hole
1005823267	7253366	10/27/2015	630175	4836286	113.5	margin of error : 30 m - 100 m	651 YONGE STREET	Toronto	436		Monitoring and Test Hole		Monitoring and Test Hole
1005823270	7253367	10/27/2015	630165	4836303	113.7	margin of error : 30 m - 100 m	651 YONGE STREET	Toronto	417		Monitoring and Test Hole		Monitoring and Test Hole
1005823273	7253368	10/27/2015	630156	4836293	113.4	margin of error : 30 m - 100 m	651 YONGE STREET	Toronto	420		Monitoring and Test Hole		Monitoring and Test Hole
1005871281	7256364	12/18/2015	629913	4836667	115.6	margin of error : 30 m - 100 m	21 YORKVILLE RD	Toronto	**27**		Monitoring and Test Hole		Monitoring and Test Hole
1005873392	7256743	11/20/2015	630138	4836363	114.0	margin of error : 30 m - 100 m	6 CHARLES STREET EAST	Toronto	353		Monitoring and Test Hole		Monitoring and Test Hole
1005888696	7257954	1/11/2016	629803	4836464	115.6	margin of error : 30 m - 100 m	1200 BAY STREET	TORONTO	214		Monitoring and Test Hole		Monitoring and Test Hole
1005888699	7257955	1/11/2016	629807	4836474	115.6	margin of error : 30 m - 100 m	1200 BAY STREET	TORONTO	204		Monitoring and Test Hole		Monitoring and Test Hole
1005888702	7257956	1/11/2016	629796	4836492	115.8	margin of error : 30 m - 100 m	1200 BAY STREET	TORONTO	196		Monitoring and Test Hole		Monitoring and Test Hole
1005888705	7257957	1/12/2011	629806	4836478	115.7	margin of error : 30 m - 100 m	1200 BAY STREET	TORONTO	201		Monitoring and Test Hole		Monitoring and Test Hole
1005888708	7257958	1/14/2016	629809	4836481	115.7	margin of error : 30 m - 100 m	1200 BAY STREET	TORONTO	197		Monitoring and Test Hole		Monitoring and Test Hole
1005888711	7257959	1/14/2016	629800	4836492	115.8	margin of error : 30 m - 100 m	1200 BAY STREET	TORONTO	193		Monitoring and Test Hole		Monitoring and Test Hole
1005888714	7257960	1/14/2016	629804	4836459	115.5	margin of error : 30 m - 100 m	1200 BAY STREET	TORONTO	218		Monitoring and Test Hole		Monitoring and Test Hole
1005909887	7259533	2/25/2016	629928	4836748	116.0	margin of error : 30 m - 100 m	874-878 YONGE ST	Toronto	106		Monitoring		Observation Wells
1005930696	7261462	3/28/2016	629970	4836617	115.5	margin of error : 30 m - 100 m	8 CUMBERLAND ST	TORONTO	**54**		Monitoring		Observation Wells
1006319984	7277782	11/11/2016	629763	4836787	116.3	margin of error : 30 m - 100 m	58 SCOLLARD STREET	Toronto	215		Monitoring and Test Hole		Monitoring and Test Hole
1006319987	7277783	11/11/2016	629806	4836748	116.0	margin of error : 30 m - 100 m	58 SCOLLARD STEET	Toronto	157		Monitoring and Test Hole		Monitoring and Test Hole
1006319990	7277784	11/11/2016	629759	4836786	116.3	margin of error : 30 m - 100 m	58 SCOLLARD STREET	Toronto	218		Monitoring and Test Hole		Monitoring and Test Hole
1003744617	7114037	10/5/2008	630181	4836240	112.1	margin of error : 10 - 30 m	W OF WOODBINE & N OF ELGIN MILLS		478		Dewatering		Dewatering
1003638134	7175657	1/4/2012	629815	4836750	116.0	margin of error : 30 m - 100 m	SCROLLARD STREET	Toronto	152	3.1			Observation Wells
1004377473	7203869	5/3/2013	629753	4836244	113.7	margin of error : 30 m - 100 m	2 ST THOMAS ST	Toronto	432				Observation Wells
1004730440	7219055	3/6/2013	630277	4836367	114.0	margin of error : 30 m - 100 m	45 CHARLES ST. E	TORONTO	449	1.2			Abandoned-Other
1004730464	7219063	12/18/2012	630277	4836367	114.0	margin of error : 30 m - 100 m	45 CHARLES ST. E	TORONTO	449				Dewatering
1005929952	7261416	3/24/2016	629800	4836503	115.9	margin of error : 30 m - 100 m	1200 BAY STREET	TORONTO	185				Dewatering
1005929955	7261417	3/24/2016	629798	4836503	115.9	margin of error : 30 m - 100 m	1200 BAY STREET	TORONTO	186				Dewatering
1005929958	7261418	3/24/2016	629798	4836504	115.9	margin of error : 30 m - 100 m	1200 BAY STREET	TORONTO	186				Dewatering
1005929961	7261419	3/24/2016	629798	4836502	115.9	margin of error : 30 m - 100 m	1200 BAY STREET	TORONTO	187				Dewatering
1005929964	7261420	3/24/2016	629799	4836501	115.9	margin of error : 30 m - 100 m	1200 BAY STREET	TORONTO	187				Dewatering
1005929967	7261421	3/24/2016	629800	4836502	115.9	margin of error : 30 m - 100 m	1200 BAY STREET	TORONTO	186				Dewatering
1003483269	7160119	12/11/2010	629800	4836356	114.6	margin of error : 10 - 30 m			311				
1003524864	7164543	2/12/2011	630303	4836331	113.5	margin of error : 10 - 30 m			492				
1003531856	7165046	7/1/2011	629920	4836133	112.2	margin of error : 10 - 30 m			509				
1003544654	7166592	6/16/2011	629818	4836642	115.8	margin of error : 10 - 30 m			104				
1003714472	7180022	2/21/2012	630423	4836486	114.2	margin of error : 10 - 30 m			524				
1003755200	7179618	12/5/2011	630075	4836213	112.0	margin of error : 30 m - 100 m			455				

Off-Site												
BORE_HOLE_	WELL_ID	DATE	EAST83	NORTH83	ELEVATION (m ASL)	LOCATION ACCURACY	STREET	CITY	DISTANCE TO SITE CENTROID (m)	WATER FOUND (m BGS)	1st USE	2nd USE	FINAL STATUS
1004169555	7188417	7/30/2012	629998	4836594	115.2	margin of error : 30 m - 100 m			**90**				
1004197788	7188812	7/17/2012	629478	4836510	115.4	margin of error : 30 m - 100 m			463				
1004241305	7195731	12/3/2012	630075	4836213	112.0	margin of error : 30 m - 100 m			455				
1004265722	7198968	1/14/2013	629929	4836751	116.0	margin of error : 30 m - 100 m			109				
1004313286	7202140	12/11/2012	629963	4836975	110.9	margin of error : 30 m - 100 m			336				
1004469373	7205566	6/21/2013	629977	4836826	114.6	margin of error : 30 m - 100 m			192				
1004600979	7209363	2/25/2013	630008	4836832	114.4	margin of error : 30 m - 100 m			209				
1004722030	7217869	11/8/2013	629977	4836820	114.7	margin of error : 30 m - 100 m			186				
1005084241	7225756	7/18/2014	630305	4836481	115.5	margin of error : 30 m - 100 m			415				
1005263798	7234124	12/3/2014	630315	4836497	115.9	margin of error : 30 m - 100 m			419				
1005265882	7234424	12/13/2014	630053	4836299	113.6	margin of error : 30 m - 100 m			367				
1005284034	7231481	7/18/2012	629958	4836638	115.8	margin of error : 30 m - 100 m			**36**				
1005367138	7241596	3/6/2015	630331	4836457	115.1	margin of error : 30 m - 100 m			449				
1005661741	7247588	4/22/2015	629975	4836815	114.8	margin of error : 30 m - 100 m			181				
1006028571	7263987	5/10/2016	630315	4836497	115.9	margin of error : 30 m - 100 m			419				
1006068043	7265365		629596	4836528	115.8	margin of error : 30 m - 100 m			346				
1006068046	7265366		629570	4836608	116.1	margin of error : 100 m - 300 m			354				
1006140852	7266435	10/10/2014	629466	4836443	114.5	margin of error : 30 m - 100 m			498				
1006176898	7267060	2/24/2015	630388	4836541	115.6	margin of error : 30 m - 100 m			477				
1006243599	7271427	8/29/2016	629905	4836605	115.1	margin of error : 30 m - 100 m			**41**				
1006278819	7273992		629880	4836628	115.3	margin of error : 30 m - 100 m			**44**				
1006301262	7276345	4/11/2016	629662	4836631	116.4	margin of error : 30 m - 100 m			260				
1006319993	7277785	11/17/2016	629769	4836725	116.1	margin of error : 30 m - 100 m	45 SCOLLARD STREET	Toronto	174		Monitoring and Test Hole		Monitoring and Test Hole
1006322374	7277781	11/10/2016	629758	4836758	116.2	margin of error : 30 m - 100 m	58 SCOLLARD STREET	Toronto	201		Monitoring and Test Hole		Monitoring and Test Hole
1006324933	7278273	11/29/2016	629748	4836541	116.2	margin of error : 30 m - 100 m	94 CUMBERLAND STREET	Toronto	201	12.3	Dewatering		Observation Wells
1006358243	7281893	1/20/2017	629750	4836757	116.3	margin of error : 30 m - 100 m	58 SCOLLARD STREET	Toronto	207	3.6	Test Hole		Monitoring and Test Hole
1006358246	7281894	1/20/2017	629742	4836783	116.4	margin of error : 30 m - 100 m	58 SCOLLARD ST	Toronto	229		Test Hole		Monitoring and Test Hole
1006358249	7281895	1/20/2017	629744	4836773	116.4	margin of error : 30 m - 100 m	58 SCOLLARD ST	Toronto	221		Test Hole		Monitoring and Test Hole
1006375983	7284074	3/1/2016	630429	4836507	114.3	margin of error : 30 m - 100 m	625 CHURCH ST	Toronto	524		Monitoring		Observation Wells
1006395070	7285830	3/13/2017	629574	4836609	116.1	margin of error : 30 m - 100 m	102 YORKVILLE AVE	Toronto	350	11.6	Test Hole		Test Hole
1006673977	7291677	6/29/2017	629761	4836185	112.7	margin of error : 10 - 30 m	70 ST. MARY STREET	Toronto	484		Monitoring		Observation Wells
1006676159	7291694	6/30/2017	629765	4836163	112.5	margin of error : 30 m - 100 m	70 ST. MARY STREET	Toronto	504		Monitoring		Observation Wells
1006728672	7294826	8/13/2017	629917	4836575	114.9	margin of error : 30 m - 100 m	28 CUMBERLAND STREET	Toronto	**67**		Monitoring		Observation Wells
1006319996	7277786	11/17/2016	629801	4836745	116.0	margin of error : 30 m - 100 m	45 SCOLLARD STREET	Toronto	159				
1006372658	7283914	2/27/2017	629791	4836499	115.9	margin of error : 30 m - 100 m	1200 BAY ST	Toronto	194				Observation Wells
1006372661	7283915	2/27/2017	629797	4836498	115.8	margin of error : 30 m - 100 m	1200 BAY ST	Toronto	191				Observation Wells
1006372664	7283916	2/27/2017	629795	4836495	115.8	margin of error : 30 m - 100 m	1200 BAY ST	Toronto	194				Observation Wells
1006372667	7283917	2/27/2017	629798	4836497	115.8	margin of error : 30 m - 100 m	1200 BAY ST	Toronto	191				Observation Wells
1006372670	7283918	2/27/2017	629802	4836498	115.8	margin of error : 30 m - 100 m	1200 BAY ST	Toronto	187				Observation Wells
1006372673	7283919	2/27/2017	629798	4836492	115.8	margin of error : 30 m - 100 m	1200 BAY ST	Toronto	195				Observation Wells
1006372676	7283920	2/27/2017	629804	4836491	115.8	margin of error : 30 m - 100 m	1200 BAY ST	Toronto	192				Observation Wells
1006372679	7283921	2/27/2017	629802	4836495	115.8	margin of error : 30 m - 100 m	1200 BAY ST	Toronto	190				Observation Wells
1006372682	7283922	2/27/2017	629805	4836499	115.9	margin of error : 30 m - 100 m	1200 BAY ST	Toronto	185				Observation Wells
1006372685	7283923	2/27/2017	629807	4836484	115.7	margin of error : 30 m - 100 m	1200 BAY ST	Toronto	195				Observation Wells
1006719679	7294297	8/14/2017	629918	4836598	115.0	margin of error : 30 m - 100 m	30 CUMBERLAND STREET	TORONTO	**44**	1.1			Observation Wells
1006721151	7294298	6/14/2017	629907	4836594	115.0	margin of error : 30 m - 100 m	30 CUMBERLAND STREET	TORONTO	**50**	3.6			Observation Wells
1006746951	7295831	8/22/2017	629743	4836770	116.4	margin of error : 30 m - 100 m	48 SCOLLAND DRIVE	Toronto	220				Abandoned-Other
1006339257	7279208	10/18/2016	629842	4836566	115.9	margin of error : 30 m - 100 m			110				
1006372198	7283885	3/23/2016	630034	4836455	113.5	margin of error : 30 m - 100 m			218				
1006372210	7283889	1/13/2016	630058	4836448	113.4	margin of error : 30 m - 100 m			237				

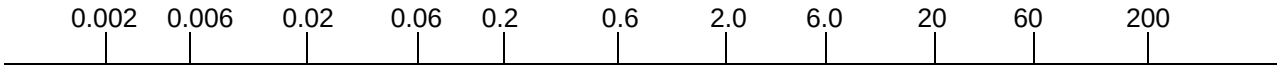
Appendix B – Borehole Logs

Notes On Sample Descriptions

1. All sample descriptions included in this report follow the Canadian Foundations Engineering Manual soil classification system. This system follows the standard proposed by the International Society for Soil Mechanics and Foundation Engineering. Laboratory grain size analyses provided by exp also follow the same system. Different classification systems may be used by others; one such system is the Unified Soil Classification. Please note that, with the exception of those samples where a grain size analysis has been made, all samples are classified visually. Visual classification is not sufficiently accurate to provide exact grain sizing or precise differentiation between size classification systems.

ISSMFE SOIL CLASSIFICATION

CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE		



EQUIVALENT GRAIN DIAMETER IN MILLIMETERS

CLAY (PLASTIC) TO	FINE	MEDIUM	CRS.	FINE	COARSE
SILT (NONPLASTIC	SAND			GRAVEL	

UNIFIED SOIL CLASSIFICATION

2. Fill: Where fill is designated on the borehole log it is defined as indicated by the sample recovered during the boring process. The reader is cautioned that fills are heterogeneous in nature and variable in density or degree of compaction. The borehole description may therefore not be applicable as a general description of site fill materials. All fills should be expected to contain obstruction such as wood, large concrete pieces or subsurface basements, floors, tanks, etc., none of these may have been encountered in the boreholes. Since boreholes cannot accurately define the contents of the fill, test pits are recommended to provide supplementary information. Despite the use of test pits, the heterogeneous nature of fill will leave some ambiguity as to the exact composition of the fill. Most fills contain pockets, seams, or layers of organically contaminated soil. This organic material can result in the generation of methane gas and/or significant ongoing and future settlements. Fill at this site may have been monitored for the presence of methane gas and, if so, the results are given on the borehole logs. The monitoring process does not indicate the volume of gas that can be potentially generated nor does it pinpoint the source of the gas. These readings are to advise of the presence of gas only, and a detailed study is recommended for sites where any explosive gas/methane is detected. Some fill material may be contaminated by toxic/hazardous waste that renders it unacceptable for deposition in any but designated land fill sites; unless specifically stated the fill on this site has not been tested for contaminants that may be considered toxic or hazardous. This testing and a potential hazard study can be undertaken if requested. In most residential/commercial areas undergoing reconstruction, buried oil tanks are common and are generally not detected in a conventional geotechnical site investigation.

3. Till: The term till on the borehole logs indicates that the material originates from a geological process associated with glaciation. Because of this geological process the till must be considered heterogeneous in composition and as such may contain pockets and/or seams of material such as sand, gravel, silt or clay. Till often contains cobbles (60 to 200 mm) or boulders (over 200 mm). Contractors may therefore encounter cobbles and boulders during excavation, even if they are not indicated by the borings. It should be appreciated that normal sampling equipment cannot differentiate the size or type of any obstruction. Because of the horizontal and vertical variability of till, the sample description may be applicable to a very limited zone; caution is therefore essential when dealing with sensitive excavations or dewatering programs in till materials.

Log of Borehole TH1

Project No. MRK-00242474-A0 Drawing No. 1

Project: Phase Two Environmental Site Assessment Sheet No. 1 of 2

Location: Yorkville Avenue and Cumberland Street, Toronto, Ontario

Date Drilled: January 25 & 26, 2018

Drill Type: CME-55 Track, HSA

Datum: Benchmark CT828

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH	N Value	Combustible Vapour Reading (ppm)	SAMPLES	% RECOV	SAMPLE ID	ANALYSIS
			116.84		20 40 60	25 50 75				
		5cm of **ASPHALT** pavement.	~116.8	0	ND			80	SS1	ING PAH
		Brown sand and gravel **FILL**, trace brick, moist, no odour, no staining.		1	ND			40	SS2	pH
		Brown **SAND**, turning grey at 3.05 mbgs, wet at 3.05 mbgs, no odour, no staining.	~115.8	2	ND			60	SS3	ING PAH
					ND			60	SS4	
				3	ND			70	SS5	PHC VOC
		Grey silty **CLAY**, moist to wet, no odour, no staining.	~113.2	4	ND			60	SS6	Grain size
				5	ND			80	SS7	
					ND			80	SS8	
				6	ND			70	SS9	
				7	ND			60	SS10	pH
				8	ND			80	SS11	
					ND			60	SS12	
				9	ND			80	SS13	
		Grey silty **SAND**, moist , no odour, no staining.	~107.1	10						
				11	ND			80	SS14	
				12						

ENVIRONMENTAL-EXP MRK-242474- YORKVILLE.GPJ 4/24/19

Continued Next Page

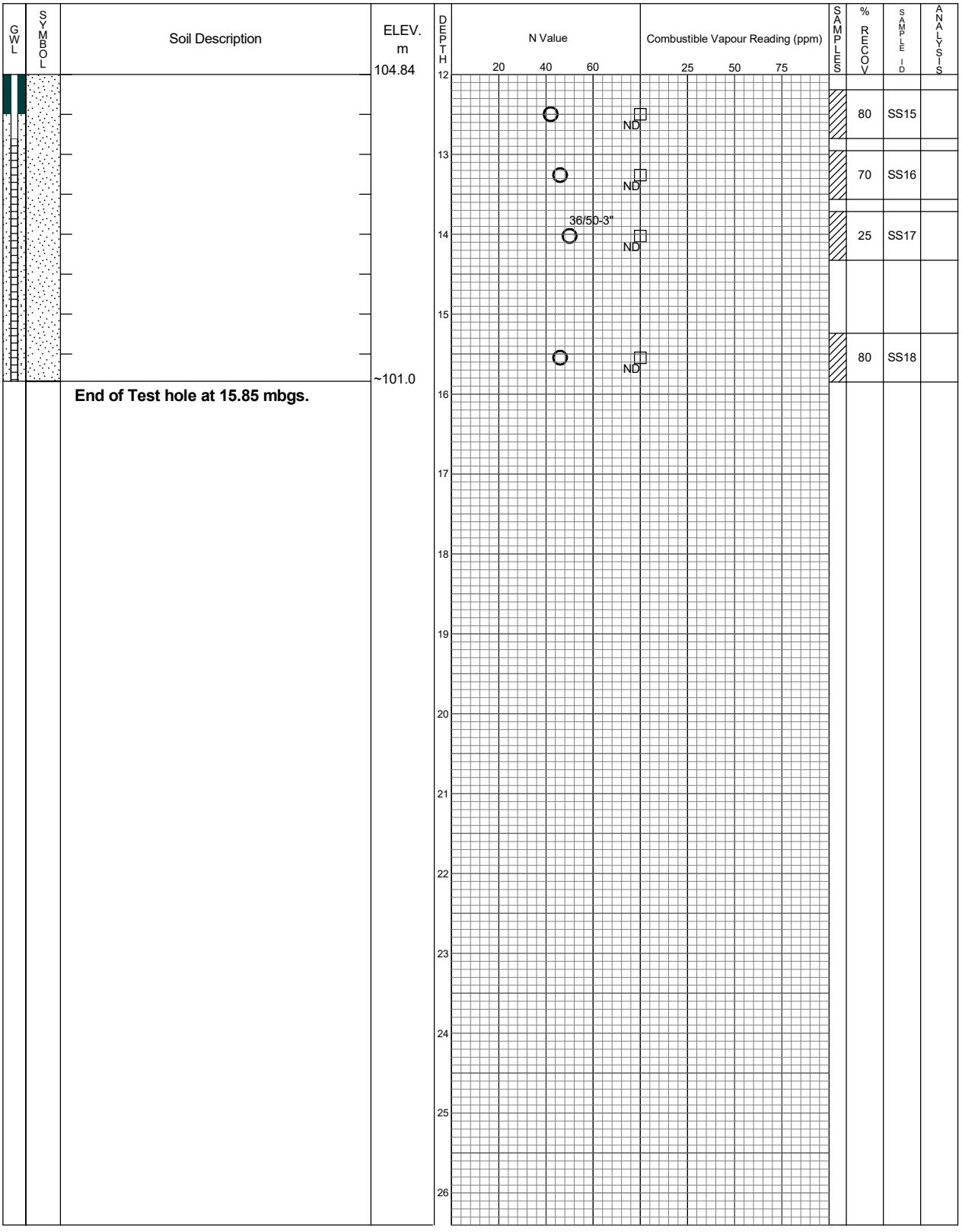
Time	Water Level (m)	Depth to Cave (m)
January 29, 2018	Dry	
January 31, 2018	Dry	
February 5, 2018	Dry	
January 14, 2019	Dry	

exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Log of Borehole TH1

Project No. MRK-00242474-A0 Drawing No. 1

Project: Phase Two Environmental Site Assessment Sheet No. 2 of 2



exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Time	Water Level (m)	Depth to Cave (m)
January 29, 2018	Dry	
January 31, 2018	Dry	
February 5, 2018	Dry	
January 14, 2019	Dry	

Log of Borehole TH2

Project No. MRK-00242474-A0 Drawing No. 2

Project: Phase Two Environmental Site Assessment Sheet No. 1 of 1

Location: Yorkville Avenue and Cumberland Street, Toronto, Ontario

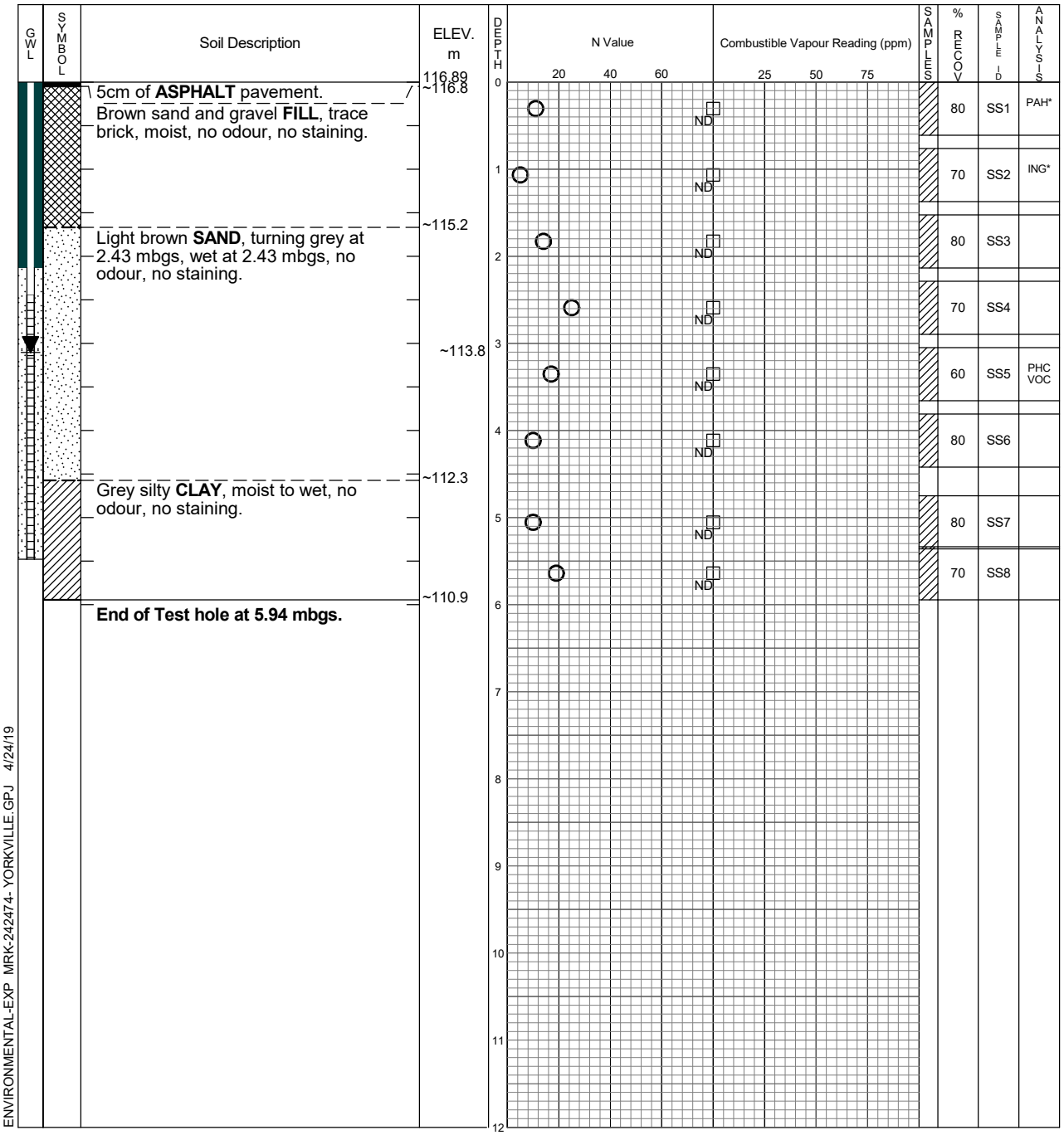
Date Drilled: January 26, 2018

Drill Type: CME-45 Truck, HSA

Datum: Benchmark CT828

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		



ENVIRONMENTAL-EXP MRK-242474- YORKVILLE.GPJ 4/24/19

Time	Water Level (m)	Depth to Cave (m)
January 29, 2018	3.41	
February 5, 2018	3.44	
January 14, 2019	3.14	

exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Log of Borehole TH3

Project No. MRK-00242474-A0 Drawing No. 3

Project: Phase Two Environmental Site Assessment Sheet No. 1 of 1

Location: Yorkville Avenue and Cumberland Street, Toronto, Ontario

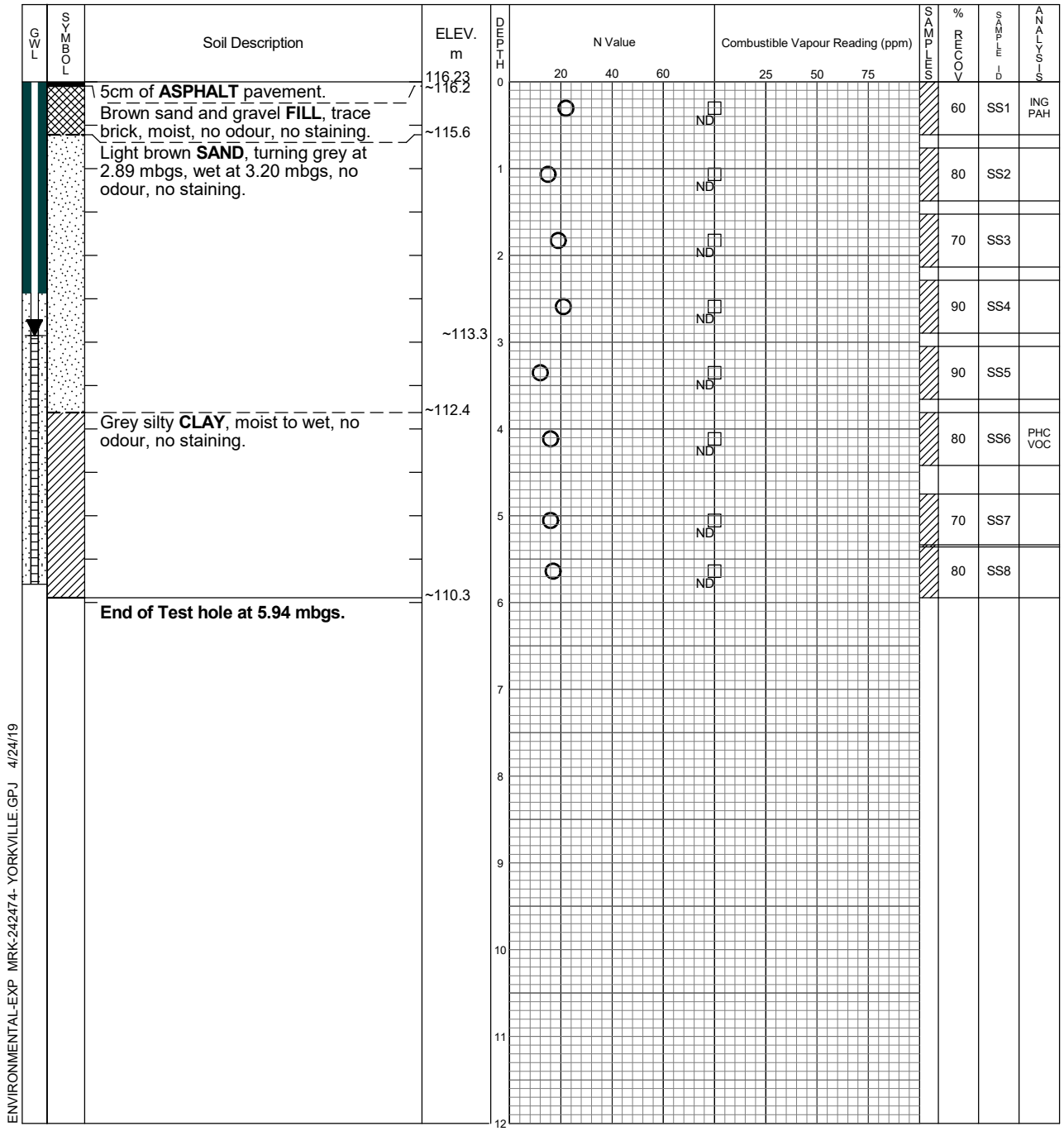
Date Drilled: January 29, 2018

Drill Type: CME-55 Track, HSA

Datum: Benchmark CT828

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		



ENVIRONMENTAL-EXP MRK-242474- YORKVILLE.GPJ 4/24/19

Time	Water Level (m)	Depth to Cave (m)
January 29, 2018	3.19	
January 31, 2018	3.22	
January 14, 2019	2.96	

exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Log of Borehole TH4

Project No. MRK-00242474-A0 Drawing No. 4

Project: Phase Two Environmental Site Assessment Sheet No. 1 of 1

Location: Yorkville Avenue and Cumberland Street, Toronto, Ontario

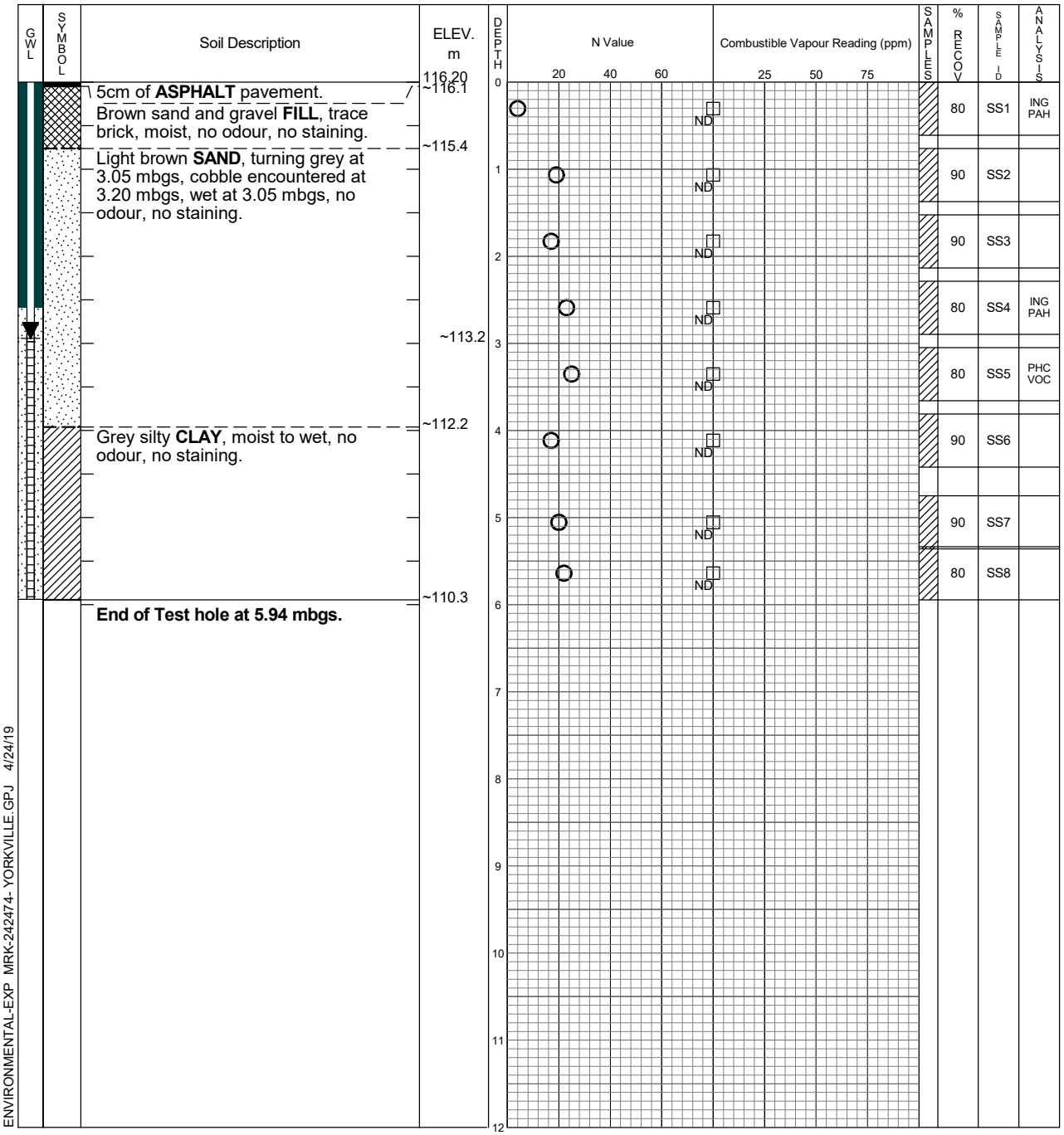
Date Drilled: January 29, 2018

Drill Type: CME-55 Track, HSA

Datum: Benchmark CT828

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		



exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Time	Water Level (m)	Depth to Cave (m)
January 29, 2018	3.23	
January 31, 2018	3.25	
January 14, 2019	2.98	

Log of Borehole TH101D

Project No. MRK-00242474-A0-011 Drawing No. 2

Project: Supplemental Phase II ESA and Hydrogeological Investigation Sheet No. 1 of 2

Location: 11-25 Yorkville Avenue, Toronto, Ontario

21 Yorkville Avenue, NW portion of basement, 1 m S of TH101S

Date Drilled: November 14 to 15, 2018

Drill Type: Hilti

Datum: City of Toronto BM# CT828

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH	N Value (20, 40, 60)	Combustible Vapour Reading (ppm) (25, 50, 75)	SAMPLES	% RECOV	SAMPLE ID	ANALYSIS
		Straight augered to 3.66 mbgs. Strata same as TH101S.	113.85	0						
				1						
				2						
				3						
			~110.2	4				66%	SS1	
		Grey silty **CLAY**, moist, no odour, no staining.		5				72%	SS2	
				6						
			~107.3	7				100%	SS3	
		Grey sandy **SILT** to silty **SAND**, moist turning wet at 13.72 mbgs, no odour, no staining.		8				100%	SS4	
				9				100%	SS5	
				10						
				11					SS6	
				12						

ENVIRONMENTAL-EXP MRK-00242474-A0-011_11, 21-25 YORKVILLE AVENUE, TORONTO.GPJ 3/5/19

Continued Next Page

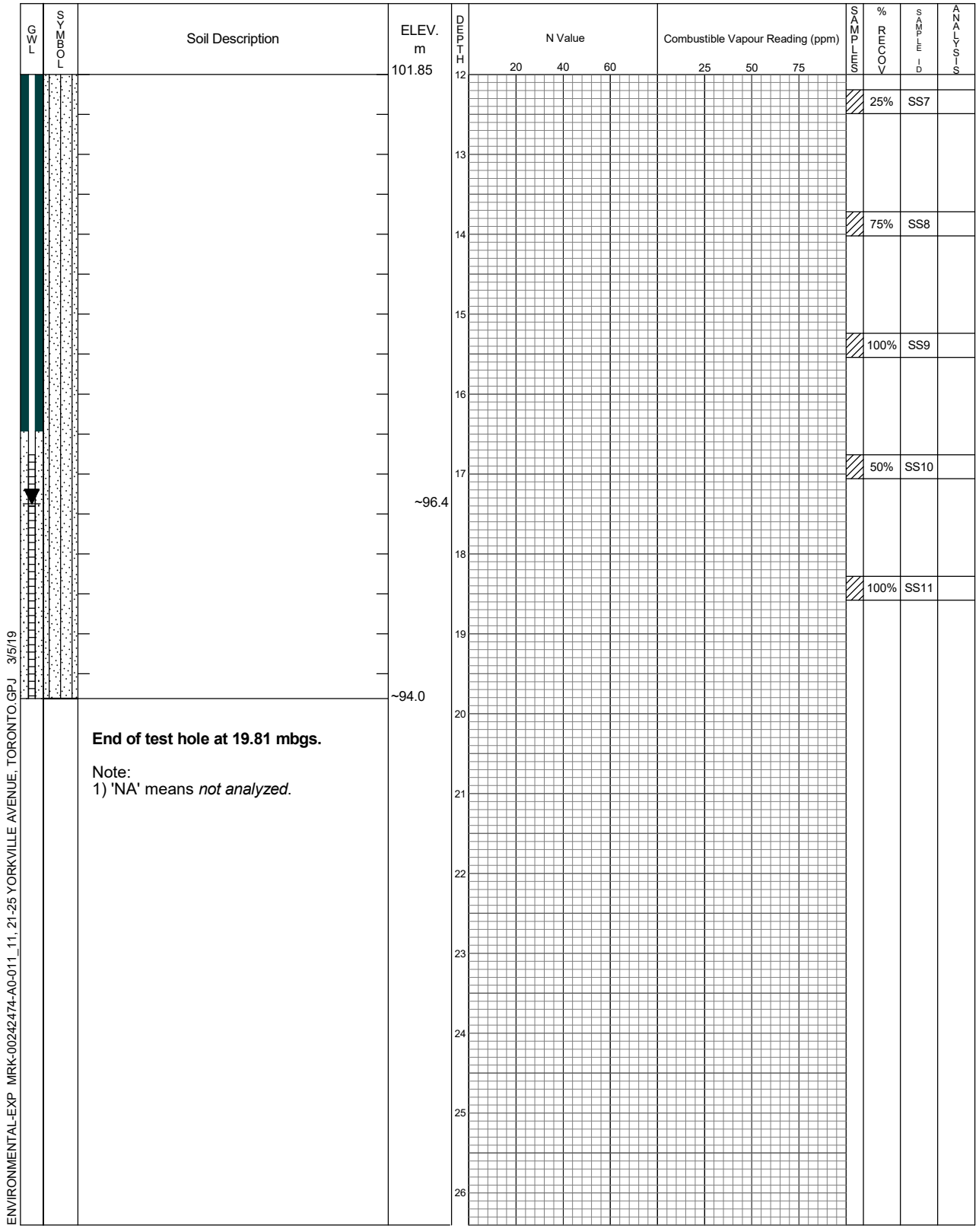
Time	Water Level (m)	Depth to Cave (m)
December 11, 2018	17.408	
January 14, 2019	17.538	

exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Log of Borehole TH101D

Project No. MRK-00242474-A0-011 Drawing No. 2

Project: Supplemental Phase II ESA and Hydrogeological Investigation Sheet No. 2 of 2



Time	Water Level (m)	Depth to Cave (m)
December 11, 2018	17.408	
January 14, 2019	17.538	

exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Log of Borehole TH101S

Project No. MRK-00242474-A0-011 Drawing No. 1

Project: Supplemental Phase II ESA and Hydrogeological Investigation Sheet No. 1 of 1

Location: 11-25 Yorkville Avenue, Toronto, Ontario

21 Yorkville Avenue, NW portion of basement, 1 m N of TH101D

Date Drilled: November 6, 2018

Drill Type: Hilti

Datum: City of Toronto BM# CT828

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH
			113.85	0
		17 cm **CONCRETE** slab.	~113.7	
		8 cm of granular **FILL**.	~113.6	
		Grey **SAND**, wet, no odour, no staining.	~113.5	
		Grey silty **CLAY**, moist, faint petroleum odour from 2.74 to 3.35 mbgs, no staining.	~112.8	1
				2
				3
			~110.2	4
		End of test hole at 3.66 mbgs.		5
		Notes: 1) Vapour readings of PCE by GasTec Pump with 133LL tube and RKI Eagle II Gas Detector. Measurements of PCE are shown. 2) 'ND' means *non-detect* at less than 0.2 ppm. 3) 'NA' means *not analyzed*.		6
				7
				8
				9
				10
				11
				12

N Value: 20, 40, 60

Combustible Vapour Reading (ppm): 25, 50, 75

1.2 PPM

ND

ND

ND

ND

SAMPLES	% RECOV	SAMPLE ID	ANALYSIS
	71%	SS1	ING PAH PHC VOC
	88%	SS2	
	13%	SS3	
	100%	SS4	VOC
	83%	SS5	

ENVIRONMENTAL-EXP MRK-00242474-A0-011_11, 21-25 YORKVILLE AVENUE, TORONTO.GPJ 3/5/19

Time	Water Level (m)	Depth to Cave (m)
November 9, 2018	0.335	
January 14, 2019	0.302	

exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Log of Borehole TH102

Project No. MRK-00242474-A0-011 Drawing No. 3

Project: Supplemental Phase II ESA and Hydrogeological Investigation Sheet No. 1 of 1

Location: 11-25 Yorkville Avenue, Toronto, Ontario

21 Yorkville Avenue, NE portion of basement

Date Drilled: November 6 to 7, 2018

Drill Type: Hilti

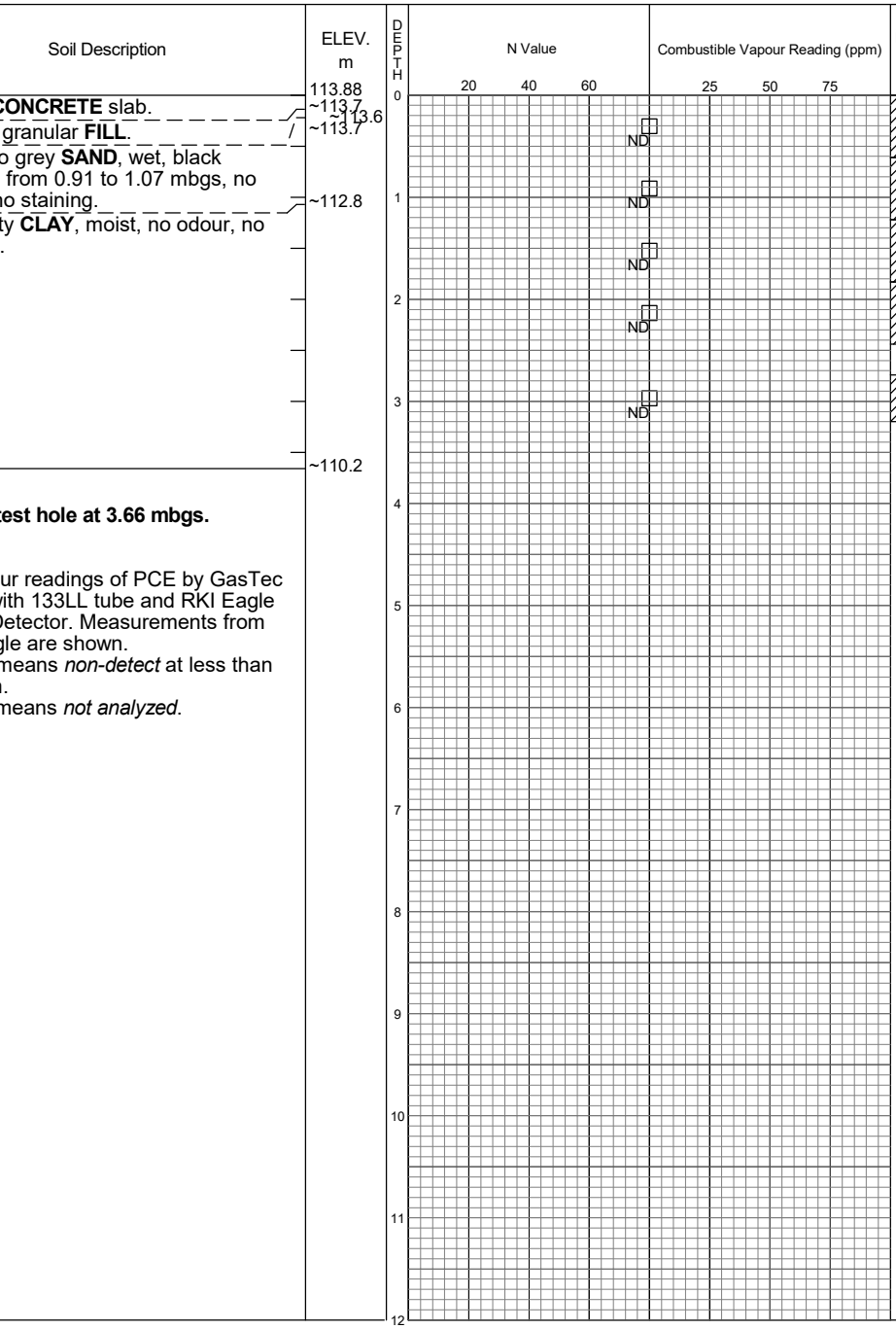
Datum: City of Toronto BM# CT828

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH
			113.88	0
		14 cm **CONCRETE** slab.	~113.7	
		8 cm of granular **FILL**.	~113.7	
		Brown to grey **SAND**, wet, black laminae from 0.91 to 1.07 mbgs, no odour, no staining.	~112.8	1
		Grey silty **CLAY**, moist, no odour, no staining.		2
			~110.2	3
		End of test hole at 3.66 mbgs.		4

Notes:
1) Vapour readings of PCE by GasTec Pump with 133LL tube and RKI Eagle II Gas Detector. Measurements from RKI Eagle are shown.
2) 'ND' means *non-detect* at less than 0.2 ppm.
3) 'NA' means *not analyzed*.



SAMPLES	% RECOV	SAMPLE ID	ANALYSIS
	75%	SS1	ING PAH
	92%	SS2	PHC VOC
	38%	SS3	PHC VOC
	46%	SS4	
	17%	SS5	

ENVIRONMENTAL-EXP MRK-00242474-A0-011_11. 21-25 YORKVILLE AVENUE, TORONTO.GPJ 3/5/19

exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Time	Water Level (m)	Depth to Cave (m)
November 14, 2018	0.267	
January 14, 2019	0.252	

Log of Borehole TH103

Project No. MRK-00242474-A0-011 Drawing No. 4

Project: Supplemental Phase II ESA and Hydrogeological Investigation Sheet No. 1 of 1

Location: 11-25 Yorkville Avenue, Toronto, Ontario

21 Yorkville Avenue, west-central portion of ground floor

Date Drilled: November 5, 2018

Drill Type: Hilti

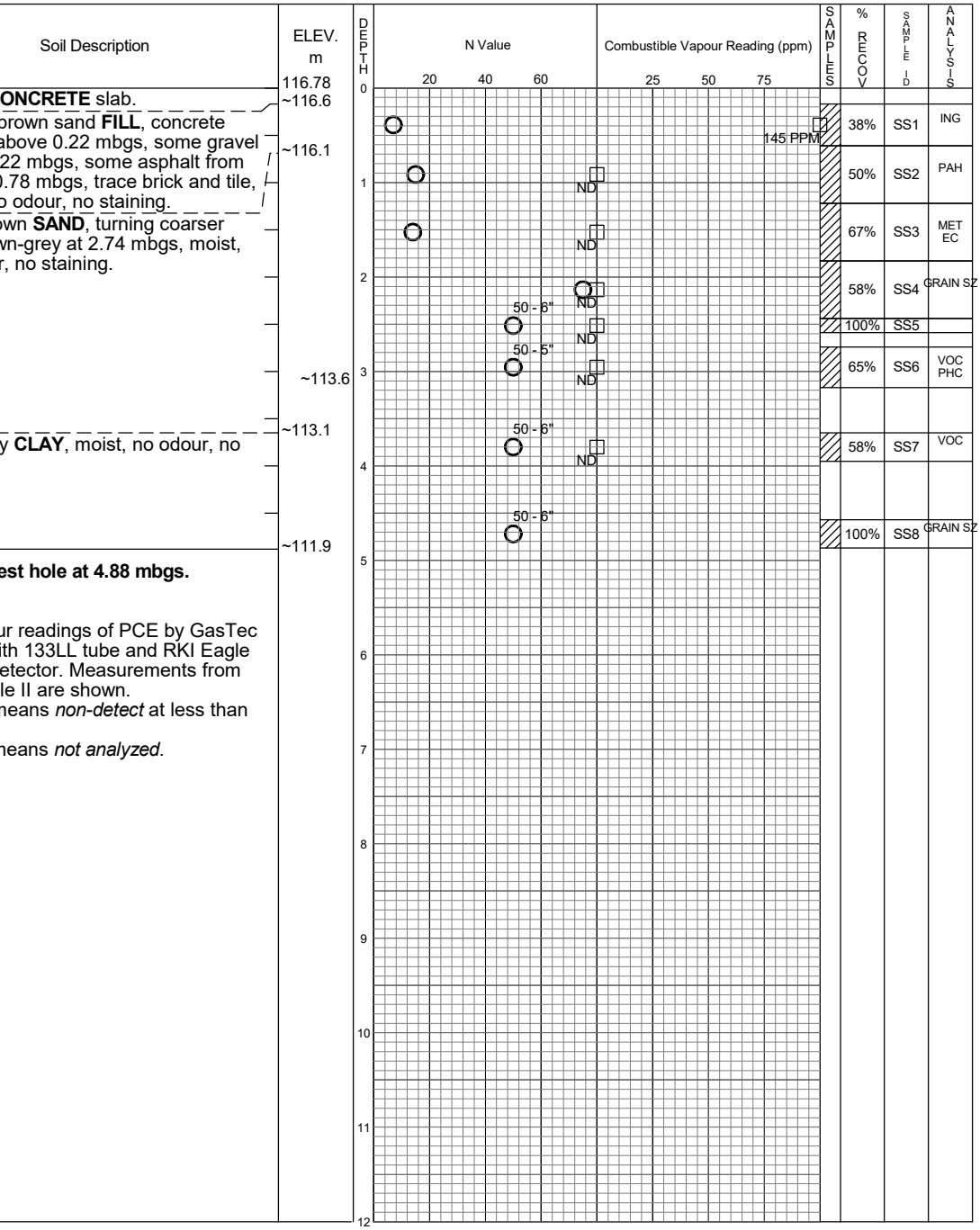
Datum: City of Toronto BM# CT828

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH
		17 cm **CONCRETE** slab.	116.78	0
		Grey to brown sand **FILL**, concrete chunks above 0.22 mbgs, some gravel below 0.22 mbgs, some asphalt from 0.73 to 0.78 mbgs, trace brick and tile, moist, no odour, no staining.	~116.6	
		Light brown **SAND**, turning coarser and brown-grey at 2.74 mbgs, moist, no odour, no staining.	~116.1	1
				2
			~113.6	3
		Grey silty **CLAY**, moist, no odour, no staining.	~113.1	4
		End of test hole at 4.88 mbgs.	~111.9	5
				6
				7
				8
				9
				10
				11
				12

Notes:
1) Vapour readings of PCE by GasTec Pump with 133LL tube and RKI Eagle II Gas Detector. Measurements from RKI Eagle II are shown.
2) 'ND' means *non-detect* at less than 25 ppm.
3) 'NA' means *not analyzed*.



SAMPLES	% RECOV	SAMPLE ID	ANALYSIS
	38%	SS1	ING
	50%	SS2	PAH
	67%	SS3	MET EC
	58%	SS4	GRAIN SZ
	100%	SS5	
	65%	SS6	VOC PHC
	58%	SS7	VOC
	100%	SS8	GRAIN SZ

ENVIRONMENTAL-EXP MRK-00242474-A0-011_11, 21-25 YORKVILLE AVENUE, TORONTO.GPJ 3/5/19

exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Time	Water Level (m)	Depth to Cave (m)
November 7, 2018	3.208	
November 30, 2018	3.179	
December 11, 2018	3.134	
January 14, 2019	2.966	

Log of Borehole TH104

Project No. MRK-00242474-A0-011 Drawing No. 5

Project: Supplemental Phase II ESA and Hydrogeological Investigation Sheet No. 1 of 1

Location: 11-25 Yorkville Avenue, Toronto, Ontario

21 Yorkville Avenue, southeast portion of ground floor

Date Drilled: November 5 to 6, 2018

Drill Type: Hilti

Datum: City of Toronto BM# CT828

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH	N Value (20, 40, 60)	Combustible Vapour Reading (ppm) (25, 50, 75)	SAMPLES	% RECOV	SAMPLE ID	ANALYSIS
		33 cm **CONCRETE** slab.	116.76	0						
		5 cm of gravel **FILL** with concrete chunks.	~116.4 ~116.4							
		Brown **SAND** turning brown-grey and coarse at 2.74 mbgs, thin layer of sandy topsoil from 0.91 to 1.06 mbgs, moist turning moist-wet at 2.74 mbgs, black and grey laminae from 3.27 to 3.35 mbgs, no odour, no staining.		1		ND		25%	SS1	ING PAH
				2		ND		50%	SS2	
				3				50%	SS3	EC
				4		ND		46%	SS4	PHC VOC
			~113.1							
		Grey silty **CLAY**, moist, no odour, no staining.	~112.9			ND		100%	SS5	
			~112.5	5						
		End of test hole at 4.27 mbgs.		6						
				7						
				8						
				9						
				10						
				11						
				12						

Notes:
1) Vapour readings of PCE by GasTec Pump with 133LL tube and RKI Eagle II Gas Detector. Measurements from RKI Eagle II are shown.
2) 'ND' means *non-detect* at less than 25 ppm.
3) 'NA' means *not analyzed*.

ENVIRONMENTAL-EXP MRK-00242474-A0-011_11. 21-25 YORKVILLE AVENUE, TORONTO.GPJ 3/5/19

exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Time	Water Level (m)	Depth to Cave (m)
November 9, 2018	3.821	
January 14, 2019	3.782	

Log of Borehole TH105D

Project No. MRK-00242474-A0-011 Drawing No. 7

Project: Supplemental Phase II ESA and Hydrogeological Investigation Sheet No. 1 of 2

Location: 11-25 Yorkville Avenue, Toronto, Ontario

21 Yorkville Avenue, southwest portion of ground floor, 1 m E of TH105I

Date Drilled: November 21 and 26, 2018

Drill Type: Hilti

Datum: City of Toronto BM# CT828

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH	N Value (20, 40, 60)	Combustible Vapour Reading (ppm) (25, 50, 75)	SAMPLES	% RECOV	SAMPLE ID	ANALYSIS
		15 cm **CONCRETE** slab.	116.67	0						
		Straight augered to 10.67 mbgs. Strata same as TH105I.	~116.5	1						
				2						
				3						
				4						
				5						
				6						
				7						
				8						
				9						
				10						
		Grey silty **CLAY** to clay with trace silt, wet, no odour, no staining.	~106.0	11				100%	SS1	
				12						

ENVIRONMENTAL-EXP MRK-00242474-A0-011_11, 21-25 YORKVILLE AVENUE, TORONTO.GPJ 3/5/19

Continued Next Page

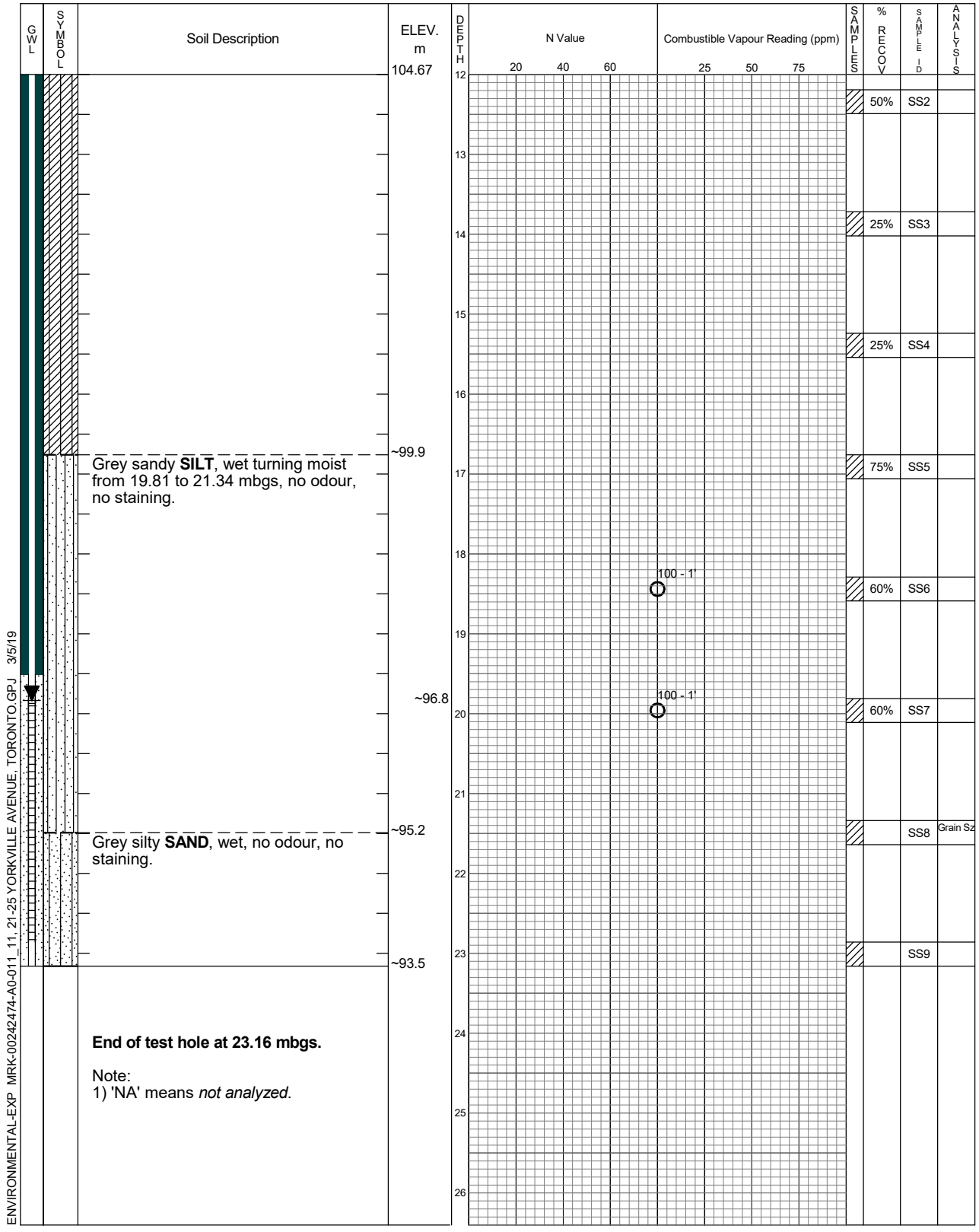
exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Time	Water Level (m)	Depth to Cave (m)
December 11, 2018	19.873	
January 14, 2019	19.882	

Log of Borehole TH105D

Project No. MRK-00242474-A0-011 Drawing No. 7

Project: Supplemental Phase II ESA and Hydrogeological Investigation Sheet No. 2 of 2



Time	Water Level (m)	Depth to Cave (m)
December 11, 2018	19.873	
January 14, 2019	19.882	

exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Log of Borehole TH105I

Project No. MRK-00242474-A0-011 Drawing No. 6

Project: Supplemental Phase II ESA and Hydrogeological Investigation Sheet No. 1 of 1

Location: 11-25 Yorkville Avenue, Toronto, Ontario

21 Yorkville Avenue, southwest portion of ground floor, 1 m W of TH105D

Date Drilled: November 20-21, 2018

Drill Type: Hilti

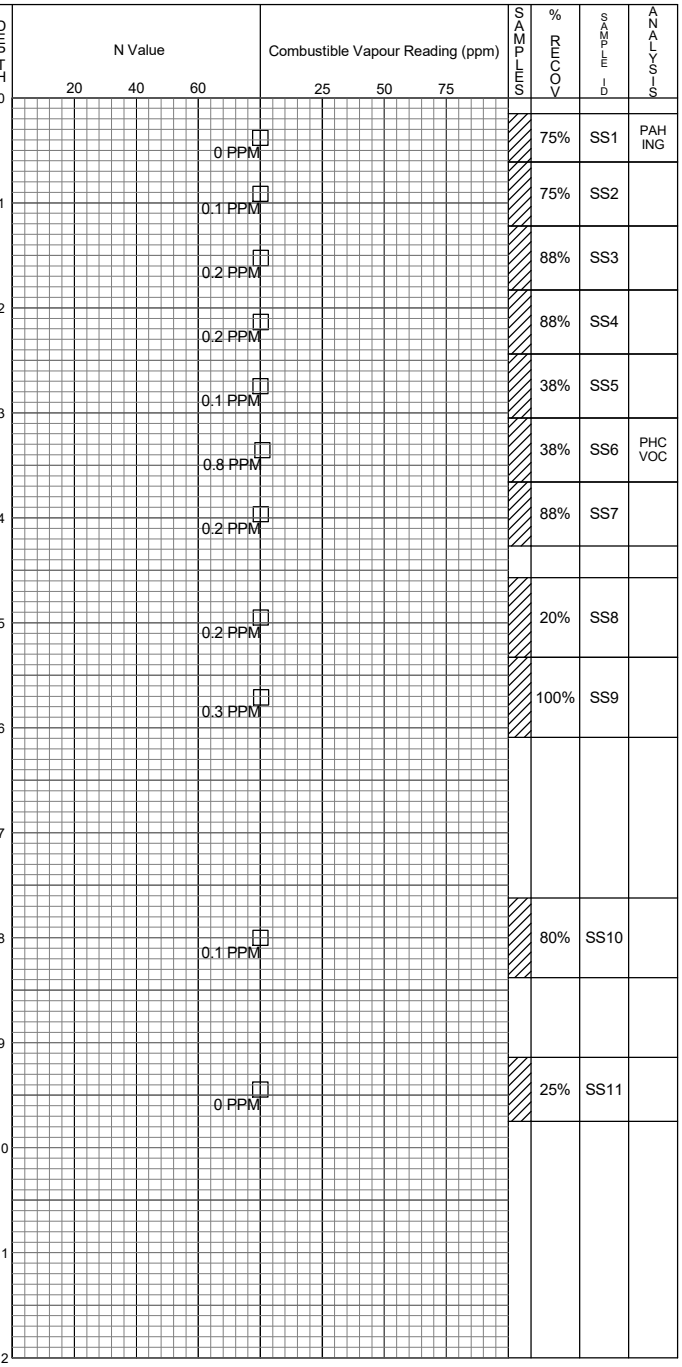
Datum: City of Toronto BM# CT828

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH
		15 cm **CONCRETE** slab.	116.67 ~116.5	0
		8 cm of sand and gravel **FILL** overlying 8 cm of brown sandy **FILL**, trace silt, moist, no odour, no staining.	~116.4	
		Black **GRAVEL**, no odour, no staining.	~116.3	
		Brown silty **SAND** turning grey at 1.83 mbgs, coarse sand seam from 2.29 to 2.36 mbgs, trace gravel, peat and brick at 2.59 mbgs, moist turning wet at 3.05 mbgs, no odour, no staining.		1 2
		Grey clayey **SILT**, wet, no odour, no staining.	~113.5	3
		Grey silty **CLAY**, moist, no odour, no staining.	~113.0	4
			~111.6	5
		Grey clayey **SILT**, wet turning moist from 7.62 mbgs to 9.14 mbgs, no odour, no staining.	~111.3	6 7 8 9
			~106.6	10 11 12
		End of test hole at 10.06 mbgs.		

Notes:
1) Vapour readings of total VOCs by Mini RAE LITE PID-116 and RKI Eagle II Gas Detector. Measurements from PID are shown.
2) 'NA' means *not analyzed*.



SAMPLES	% RECOV	SAMPLE ID	ANALYSIS
	75%	SS1	PAH ING
	75%	SS2	
	88%	SS3	
	88%	SS4	
	38%	SS5	
	38%	SS6	PHC VOC
	88%	SS7	
	20%	SS8	
	100%	SS9	
	80%	SS10	
	25%	SS11	

Time	Water Level (m)	Depth to Cave (m)
November 30, 2018	5.053	
January 14, 2019	7.769	

exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Log of Borehole TH106D

Project No. MRK-00242474-A0-011 Drawing No. 9

Project: Supplemental Phase II ESA and Hydrogeological Investigation Sheet No. 1 of 2

Location: 11-25 Yorkville Avenue, Toronto, Ontario

11 Yorkville Avenue, 2 m S of N-wall, 3.6 m W of E-wall

Date Drilled: November 26 to 28, 2018

Drill Type: K40, track mounted

Datum: City of Toronto BM# CT828

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH	N Value (20, 40, 60)	Combustible Vapour Reading (ppm) (25, 50, 75)	SAMPLES	% RECOV	SAMPLE ID	ANALYSIS
		Straight augered to 4.57 mbgs. Strata same as TH106S.	113.08	0						
				1						
				2						
				3						
				4						
			~108.5							
		Grey sandy **SILT**, moist to wet turning moist below 6.10 mbgs, no odour, no staining.		5	50 - 6"				SS1	
				6	50 - 6"			40%	SS2	
				7						
				8	50 - 6"			40%	SS3	
				9						
					50 - 6"			30%	SS4	
				10						
			~102.4							
		Grey silty **SAND**, some sandy silt from 12.19 to 15.24 mbgs, wet, faint rotten odour from 15.24 to 18.29 mbgs, no staining.		11					SS5	
				12						

ENVIRONMENTAL-EXP MRK-00242474-A0-011_11, 21-25 YORKVILLE AVENUE, TORONTO.GPJ 3/5/19

Continued Next Page

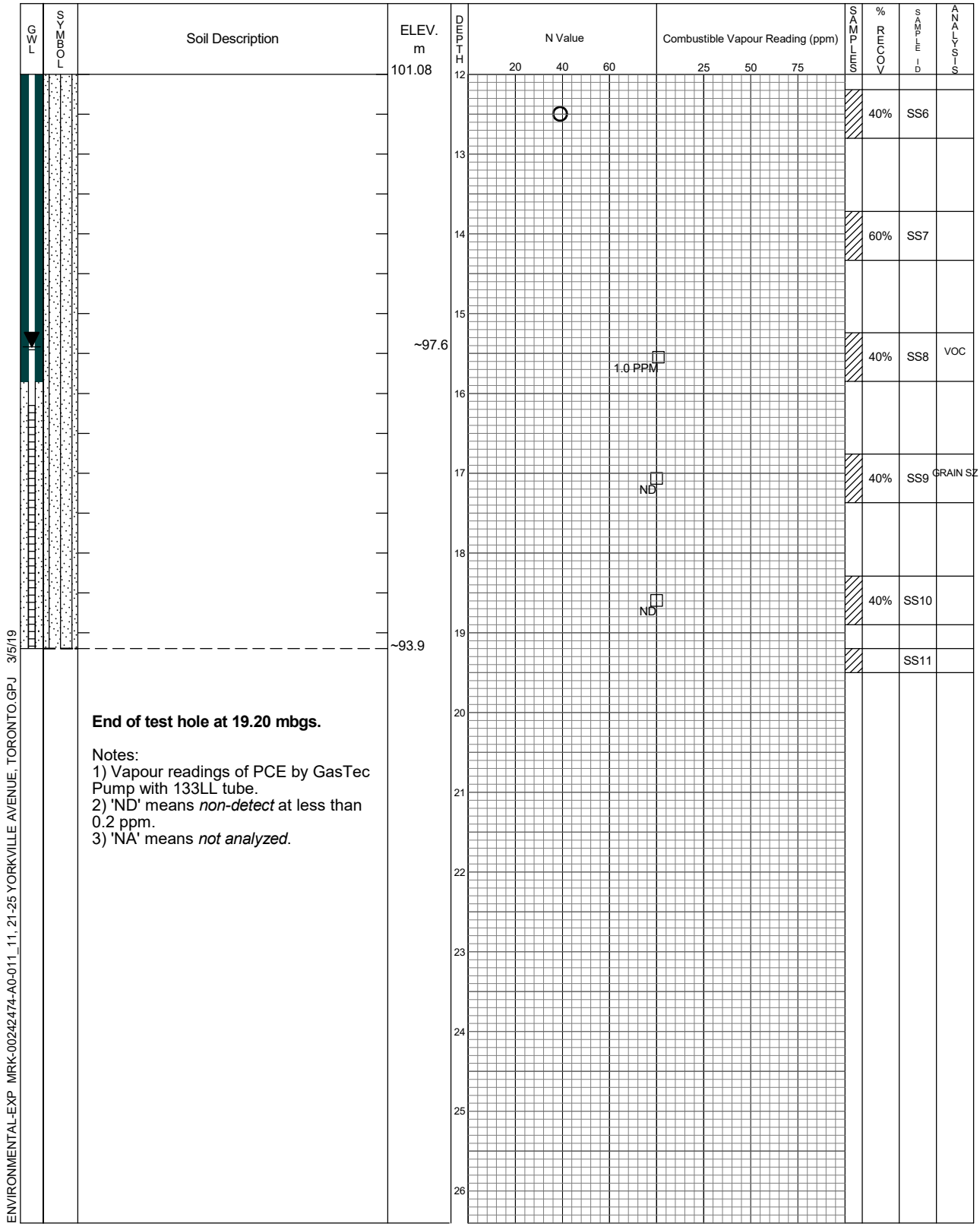
Time	Water Level (m)	Depth to Cave (m)
December 11, 2018	15.453	
January 14, 2019	16.168	

exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Log of Borehole TH106D

Project No. MRK-00242474-A0-011 Drawing No. 9

Project: Supplemental Phase II ESA and Hydrogeological Investigation Sheet No. 2 of 2



Time	Water Level (m)	Depth to Cave (m)
December 11, 2018	15.453	
January 14, 2019	16.168	

exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Log of Borehole TH106S

Project No. MRK-00242474-A0-011 Drawing No. 8

Project: Supplemental Phase II ESA and Hydrogeological Investigation Sheet No. 1 of 1

Location: 11-25 Yorkville Avenue, Toronto, Ontario

11 Yorkville Avenue, 2 m S of N-wall, 2.8 m W of E-wall

Date Drilled: November 23, 2018

Drill Type: K40, track mounted

Datum: City of Toronto BM# CT828

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH	N Value (20, 40, 60)	Combustible Vapour Reading (ppm) (25, 50, 75)	SAMPLES	% RECOV	SAMPLE ID	ANALYSIS
		18 cm **CONCRETE** slab.	113.08	0		340 PPM		60%	SS1	ING PAH PHC VOC
		5 cm of gravel **FILL**.	~112.9							
		Grey silty **SAND**, trace gravel, brick, no odour, some black staining.	~112.9							
		Grey silty **CLAY**, moist, no odour, no staining.	~112.3	1		310 PPM		40%	SS2	
				2		ND		80%	SS3	EC SAR
				3		ND		80%	SS4	
				4		ND		80%	SS5	
				5		ND		80%	SS6	
				6		ND		80%	SS7	
			~108.8	7						
				8						
				9						
				10						
				11						
				12						

End of test hole at 4.27 mbgs.

Notes:
1) Vapour readings of PCE by GasTec Pump with 133LL tube and RKI Eagle II Gas Detector. Measurements from RKI Eagle II are shown.
2) 'ND' means *non-detect* at less than 25 ppm.
3) 'NA' means *not analyzed*.

ENVIRONMENTAL-EXP MRK-00242474-A0-011_11, 21-25 YORKVILLE AVENUE, TORONTO.GPJ 3/5/19

Time	Water Level (m)	Depth to Cave (m)
January 14, 2019	Dry	

exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Log of Borehole TH107

Project No. MRK-00242474-A0-011 Drawing No. 10

Project: Supplemental Phase II ESA and Hydrogeological Investigation Sheet No. 1 of 1

Location: 11-25 Yorkville Avenue, Toronto, Ontario

11 Yorkville Avenue, 17.9 m S of N-wall, 2.7 m E of W-wall

Date Drilled: November 22, 2018

Drill Type: K40, track mounted

Datum: City of Toronto BM# CT828

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH	N Value	Combustible Vapour Reading (ppm)	SAMPLES	% RECOV	SAMPLE ID	ANALYSIS
		18 cm **CONCRETE** slab.	113.00	0	20 40 60	25 50 75				
		3 cm of gravel **FILL** overlying grey silty sand **FILL**, wet, no odour, no staining.	~112.8			0.4 PPM		30%	SS1	ING PAH
		Grey silty **CLAY**, moist, no odour, no staining.	~112.1	1		0.7 PPM		70%	SS2	PHC VOC
						0 PPM		30%	SS3	PAH SAR
				2		0 PPM		80%	SS4	
						0 PPM		80%	SS5	
				3		0 PPM			SS6	
				4		0 PPM			SS7	
		End of test hole at 4.57 mbgs.	~108.4	5						
		Notes: 1) Vapour readings of total VOCs by MINI RAE LITE PID-116 and RKI Eagle II Gas Detector. Measurements from PID are shown. 2) 'NA' means *not analyzed*.		6						
				7						
				8						
				9						
				10						
				11						
				12						

ENVIRONMENTAL-EXP MRK-00242474-A0-011_11, 21-25 YORKVILLE AVENUE, TORONTO.GPJ 3/5/19

exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Time	Water Level (m)	Depth to Cave (m)
November 28, 2018	4.515	
December 4, 2018	4.602	
January 14, 2019	4.408	

Log of Borehole TH108

Project No. MRK-00242474-A0-011 Drawing No. 11

Project: Supplemental Phase II ESA and Hydrogeological Investigation Sheet No. 1 of 1

Location: 11-25 Yorkville Avenue, Toronto, Ontario

11 Yorkville Avenue, 16.5 m N of S-wall, 2.8 m W of E-wall

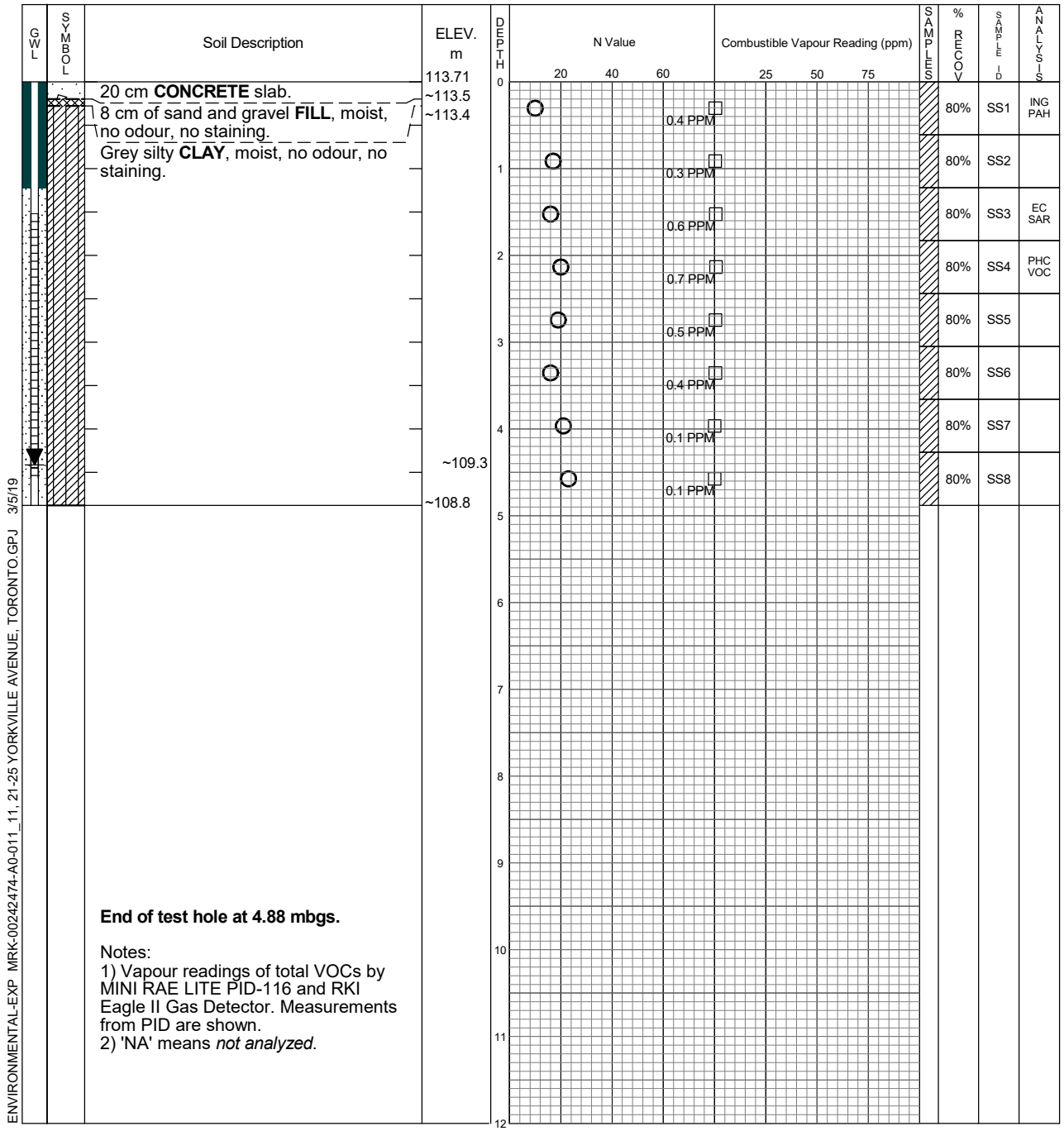
Date Drilled: November 21, 2018

Drill Type: K40, track mounted

Datum: City of Toronto BM# CT828

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		



Time	Water Level (m)	Depth to Cave (m)
November 30, 2018	4.451	
January 14, 2019	1.029	

exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Log of Borehole TH109D

Project No. MRK-00242474-A0-011 Drawing No. 13

Project: Supplemental Phase II ESA and Hydrogeological Investigation Sheet No. 1 of 2

Location: 11-25 Yorkville Avenue, Toronto, Ontario

11 Yorkville Avenue, 2.7 m N of S-wall, 7.7 m E of W-wall

Date Drilled: November 15 to 16, 2018

Drill Type: K40, track mounted

Datum: City of Toronto BM# CT828

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH	N Value (20, 40, 60)	Combustible Vapour Reading (ppm) (25, 50, 75)	SAMPLES	% RECOV	SAMPLE ID	ANALYSIS
		11 cm **CONCRETE** slab.	113.72	0						
		Straight augered to 9.14 mbgs. Strata same as TH109S.	~113.6	1						
				2						
				3						
				4						
				5						
				6						
				7						
				8						
				9						
		Grey sandy **SILT**, moist turning wet below 13.72 mbgs, no odour, no staining.	~104.6	10				90%	SS1	
				11				80%	SS2	
				12						

ENVIRONMENTAL-EXP MRK-00242474-A0-011_11, 21-25 YORKVILLE AVENUE, TORONTO.GPJ 3/5/19

Continued Next Page

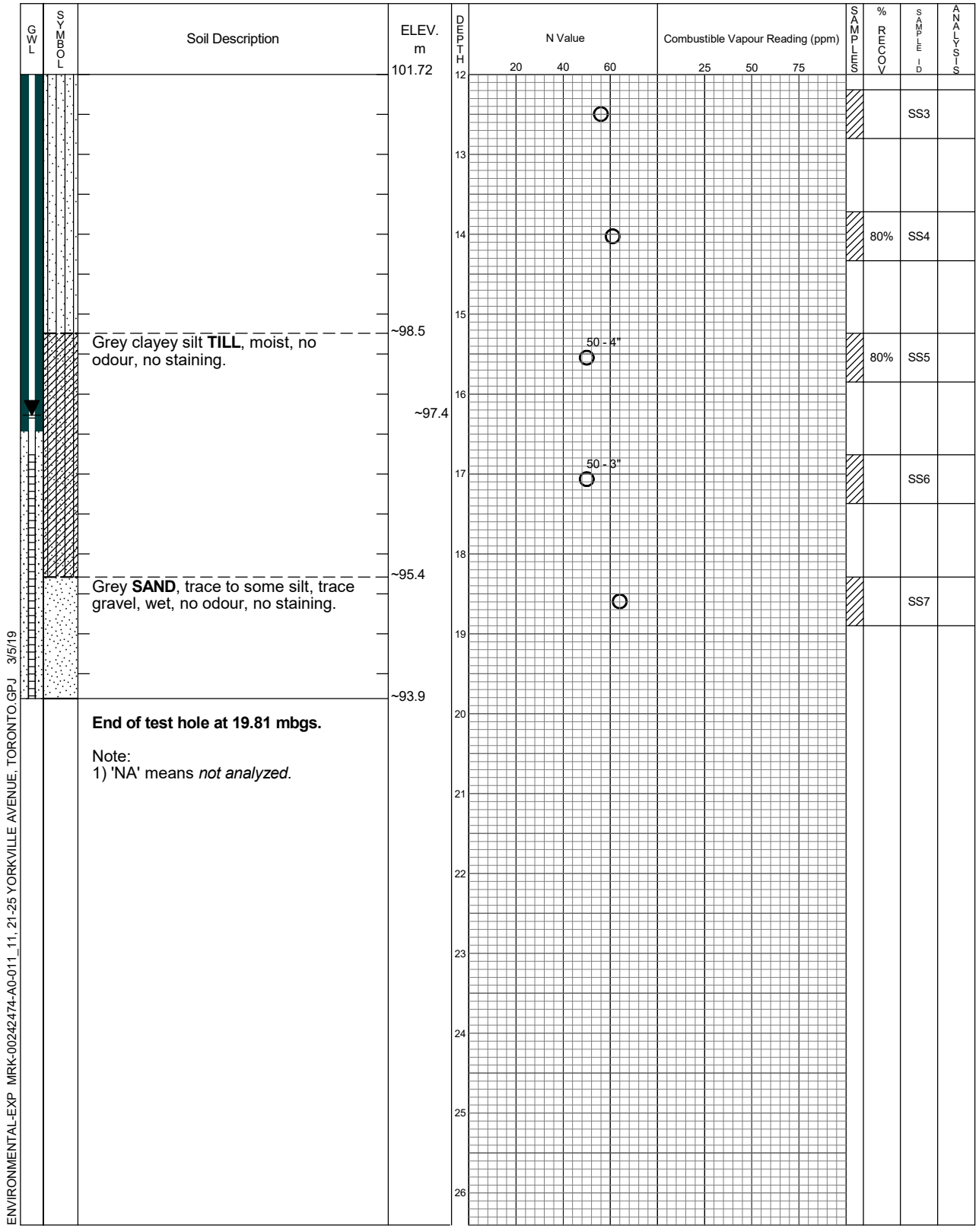
Time	Water Level (m)	Depth to Cave (m)
December 11, 2018	16.301	
January 14, 2019	15.279	

exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Log of Borehole TH109D

Project No. MRK-00242474-A0-011 Drawing No. 13

Project: Supplemental Phase II ESA and Hydrogeological Investigation Sheet No. 2 of 2



Time	Water Level (m)	Depth to Cave (m)
December 11, 2018	16.301	
January 14, 2019	15.279	

exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

Log of Borehole TH109S

Project No. MRK-00242474-A0-011 Drawing No. 12

Project: Supplemental Phase II ESA and Hydrogeological Investigation Sheet No. 1 of 1

Location: 11-25 Yorkville Avenue, Toronto, Ontario

11 Yorkville Avenue, 1.7 m N of S-wall, 7.7 m E of W-wall

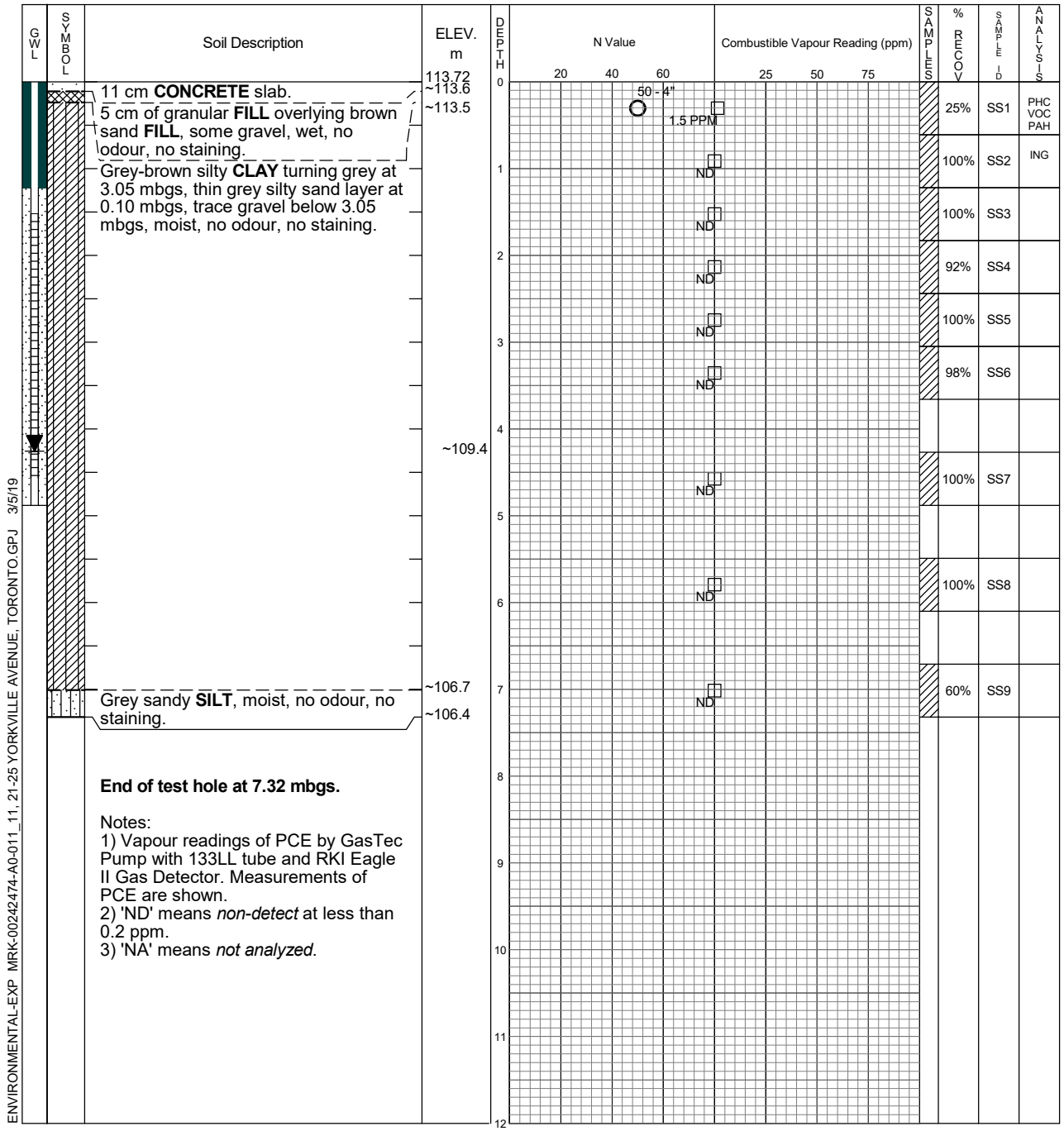
Date Drilled: November 14, 2018

Drill Type: K40, track mounted

Datum: City of Toronto BM# CT828

Chemical Analysis

BTEX	Benzene, Toluene, Ethylbenzene and Xylenes	*	Duplicate Sample
ING	Metals and Inorganics	PCB	Polychlorinated Biphenyls
MET	Metals	PHC	Petroleum Hydrocarbons (F1-F4)
PAH	Polycyclic Aromatic Hydrocarbons	VOC	Volatile Organic Compounds
PEST	Organochlorine Pesticides		



End of test hole at 7.32 mbgs.

Notes:
1) Vapour readings of PCE by GasTec Pump with 133LL tube and RKI Eagle II Gas Detector. Measurements of PCE are shown.
2) 'ND' means *non-detect* at less than 0.2 ppm.
3) 'NA' means *not analyzed*.

Time	Water Level (m)	Depth to Cave (m)
November 26, 2018	4.291	
January 14, 2019	4.286	

exp Services Inc.
Markham, Ontario
Telephone: 905.695.3217

RECORD OF BOREHOLE 1

PROJECT : E4703
LOCATION : 19 Yorkville Avenue, Toronto, Ontario
STARTED : February 22, 2016
COMPLETED : February 24, 2016

MC CLYMONT & RAK ENGINEERS, INC.

SHEET 1 OF 1
DATUM Geodetic

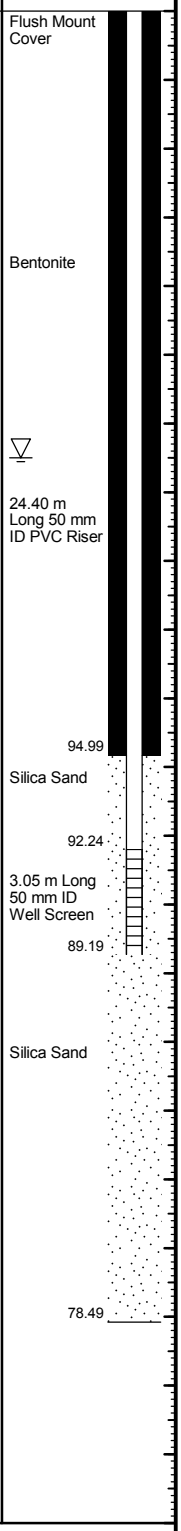
DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m
		GROUND SURFACE		116.64			
		50 mm ASPHALT		116.49 0.15	1	SS	36
		FILL: sand and gravel, trace of brick, coal, asphalt and concrete pieces, brown, moist, compact.		115.12 1.52	2	AS	
2		SILTY SAND: brown, moist, loose to compact. -wet below 3.05 m depth.			3	SS	9
					4	SS	19
					5	SS	20
4				112.07 4.57			
		SILTY CLAY: grey, moist, stiff to very stiff.			6	SS	13
6					7	SS	29
					8	SS	24
8					9	SS	14
10				105.97 10.67	10	SS	17
		SILTY CLAY TILL: trace of sand and gravel, grey moist, very stiff.		104.45 12.19	11	SS	31
12		SILTY SAND: grey, wet, dense.		102.92 13.72	12	SS	>100
		SANDY SILT: grey, moist, very dense.		101.40 15.24	13	SS	39
14		SILTY SAND: grey, moist to wet, dense to very dense.			14	SS	>100
16	POWER BORING	-wet at 16.8 m depth.			15	SS	83
18	ROTARY MUD DRILLING			96.83 19.81	16	SS	60
20		CLAYEY SILT TILL: trace of sand and gravel, grey, moist, hard. -some sand below 21.3 m depth.			17	SS	78
22		SILTY SAND: grey, wet, very dense.		93.78 22.86	18	SS	54
24		SANDY SILT: grey, wet, very dense.		92.26 24.38	19	SS	61
26		SILTY SAND: grey, wet, very dense.		90.73 25.91	20	SS	64
28					21	SS	74
					22	SS	61
30		SAND: grey, wet, very dense.		86.16 30.48	23	SS	66
32					24	SS	>100
34		CLAYEY SILT TILL: trace of sand, gravel and shale fragments, grey, moist, hard.		83.11 33.53	25	SS	>100
					26	SS	>100
36					27	SS	>100
38		-tricone bit grinding below 36.9 m depth (possible shale bedrock).		78.54	28	SS	>100
		WEATHERED SHALE: grey, moist.		78.49 38.10 38.15			
40		End of Borehole.					
42		Note: 1) Water level was not measured on completion of drilling due to use of mud. 2) Water level was measured at 13.0 m bgs on February 25, 2016.					

ORGANIC VAPOUR READINGS (ppm) ⊗ — 100 200 300 400
% LEL (hexane) □ — 20 40 60 80

SHEAR STRENGTH: Cu, KPa — nat V - ✤ rem V - ● Q - ✖ U - ▲ — 20 40 60 80
WATER CONTENT, PERCENT — wp w wl — 10 20 30 40

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION



GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : VSL
CHECKED : JB

RAK6 4703.GPJ 3/4/16

Log of Borehole: MW01

Project #: 110954 **Logged By:** B.B.

Project: Phase II Environmental Site Assessment

Client: KingSett Capital

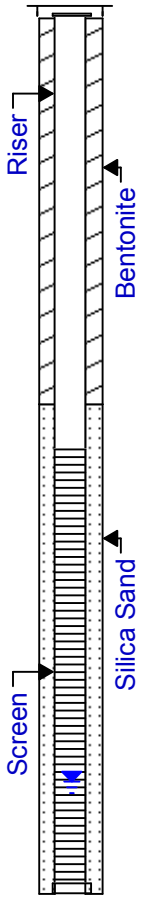
Location: 21-25 Yorkville Avenue, Toronto, ON

Drill Date: December 17, 2015 **Project Manager:** R.R.

SUBSURFACE PROFILE

Depth (ft)	Depth (m)	Symbol	Description	Measured Depth (m)
0	0		Ground Surface	0.00
			Concrete	0.30
1			***Sand*** Fine to medium grained, moist, brown	0.61
2	1		Trace oxidation from 0.6 to 1.8 mbgs	
3				
4				
5				
6	2			
7				2.44
8			Grey-brown, coarse grained sand from 2.44 to 2.59 mbgs	
9				
10	3			3.05
11			***Clay*** Trace silt, wet to saturated, grey, trace oxidation from 3.05 to 3.66 mbgs	3.66
12				
13	4		Moist	
14				
15				
16				
17	5			
18				
19				
20	6			6.10
21			End of Borehole	
22			Soil Vapours measured using a photoionization detector (PID) and an RKI Eagle hydrocarbon surveyor.	
23	7			
24				
25				

Monitoring Well Details



Water level measured at 5.325 mbgs on December 22, 2105.

SAMPLE

Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration RKI/PID	Laboratory Analysis
1	10	S1	10/0	
2	30	S2	10/0	pH
3	90			
		S3	5/0	
		S4	5/0	
4	100	S5	5/0	VOCs
		S6	5/0	Grain Size
5	100	S7	0/0	
		S8	0/0	
6	100	S9	10/0	VOCs

Contractor: Strata Drilling Group

Drilling Method: Direct Push

Well Casing Size: 2.54cm

Pinchin Ltd.
2470 Milltower Court
Mississauga, ON L5N 7W5

Grade Elevation: NM

Top of Casing Elevation: NM

Sheet: 1 of 1

Log of Borehole: MW02

Project #: 110954 **Logged By:** B.B.

Project: Phase II Environmental Site Assessment

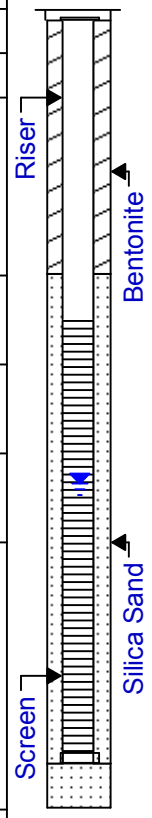
Client: KingSett Capital

Location: 21-25 Yorkville Avenue, Toronto, ON

Drill Date: December 17, 2015 **Project Manager:** R.R.

SUBSURFACE PROFILE

Depth (ft / m)	Symbol	Description	Measured Depth (m)
0 / 0		Ground Surface	0.00
		Concrete	0.30
1 / 0		***Sand*** Fine to medium grained, moist, brown	0.61
2 / 1		Trace oxidation from 0.6 to 1.2 mbgs	
4 / 1			1.83
5 / 2		Grey-brown	
7 / 2			2.44
8 / 2		Coarse grained sand from 2.44 to 2.59 mbgs	
10 / 3			3.05
11 / 3		***Clay*** Trace silt, wet to saturated, grey, trace oxidation from 3.05 to 3.66 mbgs	3.66
13 / 4		Moist	
16 / 5			5.49
18 / 5		End of Borehole	
19 / 6			
23 / 7		Soil Vapours measured using a photoionization detector (PID) and an RKI Eagle hydrocarbon surveyor.	



Water level measured at 3.254 mbgs on December 22, 2105.

SAMPLE

Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration RKI/PID	Laboratory Analysis
1	25	S1	0/1	
2	60	S2	15/0	Metals
		S3	5/1	
3	80	S4	0/0	
		S5	0/0	
4	100	S6	35/5	VOCs
		S7	25/0	
5	100	S8	5/0	
		S9	5/0	

Contractor: Strata Drilling Group

Drilling Method: Direct Push

Well Casing Size: 2.54cm

Pinchin Ltd.
2470 Milltower Court
Mississauga, ON L5N 7W5

Grade Elevation: NM

Top of Casing Elevation: NM

Sheet: 1 of 1

Log of Borehole: MW03

Project #: 110954 **Logged By:** B.B.

Project: Phase II Environmental Site Assessment

Client: KingSett Capital

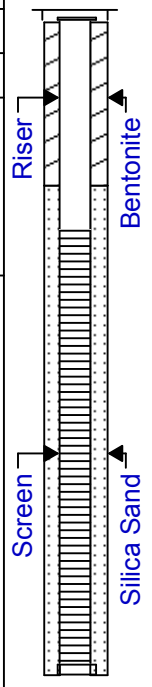
Location: 21-25 Yorkville Avenue, Toronto, ON

Drill Date: December 17, 2015 **Project Manager:** R.R.

SUBSURFACE PROFILE

Depth (ft / m)	Symbol	Description	Measured Depth (m)
0 / 0		Basement Surface	0.00
		Concrete Basement floor slab	0.30
1		***Clay*** Trace silt, moist, grey	0.61
2 / 1		Moist to wet	
3			
4			
5			1.83
6 / 2		Wet	
7			
8			
9			
10 / 3			
11			
12			
13 / 4			
14			
15			
16 / 5			4.88
17		End of Borehole	
18			
19			
20 / 6			
21			
22			
23 / 7			
24			
25			

Soil Vapours measured using a photoionization detector (PID) and an RKI Eagle hydrocarbon surveyor.



Monitoring well was dry on December 22, 2105.

SAMPLE

Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration RKI/PID	Laboratory Analysis
1	50	S1	25/0	
2	100	S2	25/0	Metals
		S3	25/0	VOCs, PHCs, pH, Grain Size
3	100	S4	5/0	PAHs
		S5	5/0	
4	100	S6	0/0	
		S7	0/0	
5	50	S8	0/0	

Contractor: Strata Drilling Group

Drilling Method: Direct Push

Well Casing Size: 2.54cm

Pinchin Ltd.
2470 Milltower Court
Mississauga, ON L5N 7W5

Grade Elevation: NM

Top of Casing Elevation: NM

Sheet: 1 of 1

Log of Borehole: MW04

Project #: 110954 **Logged By:** B.B.

Project: Phase II Environmental Site Assessment

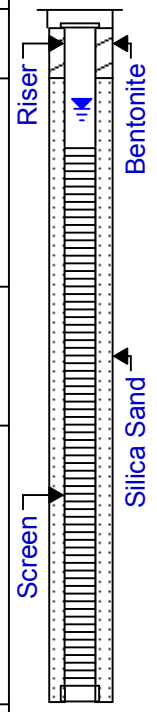
Client: KingSett Capital

Location: 21-25 Yorkville Avenue, Toronto, ON

Drill Date: December 18, 2015 **Project Manager:** R.R.

SUBSURFACE PROFILE

SAMPLE

Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration RKI/PID	Laboratory Analysis
0 / 0		Basement Surface	0.00						
1		***Concrete*** Basement floor slab	0.30						
2 / 1		***Sand*** Fine to coarse grained, saturated, brown grey	1.22		1	40	S1	20/1	
3					2	100	S2	15/1	Metals
4 / 2		***Clay*** Trace silt, moist to wet, grey	1.83				S3	15/0	
5									
6		Saturated							
7 / 3					3	100	S4	25/0	VOCs
8							S5	15/0	
9									
10			3.05						
11		End of Borehole							
12									
13 / 4									
14		Soil Vapours measured using a photoionization detector (PID) and an RKI Eagle hydrocarbon surveyor.		Water level measured at 0.439 mbgs on December 22, 2015.					
15									
16									

Contractor: Strata Drilling Group

Drilling Method: Direct Push

Well Casing Size: 2.54cm

Pinchin Ltd.
2470 Milltower Court
Mississauga, ON L5N 7W5

Grade Elevation: NM

Top of Casing Elevation: NM

Sheet: 1 of 1

Log of Borehole: MW05

Project #: 110954 **Logged By:** B.B.

Project: Phase II Environmental Site Assessment

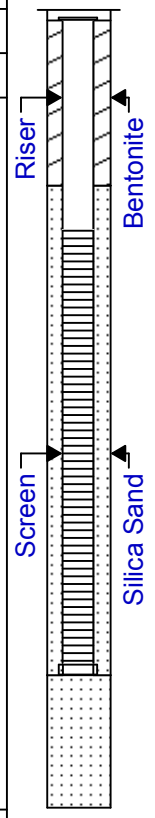
Client: KingSett Capital

Location: 21-25 Yorkville Avenue, Toronto, ON

Drill Date: December 18, 2015 **Project Manager:** R.R.

SUBSURFACE PROFILE

SAMPLE

Depth (ft / m)	Symbol	Description	Measured Depth (m)	Monitoring Well Details	Sampler #	Recovery (%)	Sample ID	Soil Vapour Concentration RKI/PID	Laboratory Analysis
0 / 0		Basement Surface	0.00						
1		***Concrete*** Basement floor slab	0.30						
2			0.61		1	75	S1	5/0	
3 / 1		***Clay*** Trace silt, moist, grey			2	100	S2	5/0	VOCs
4		Moist to wet					S3	0/0	
5					3	100	S4	0/0	
6 / 2							S5	0/0	
7					4	100	S6	0/0	
8							S7	0/0	
9					5	100	S8	0/0	
10 / 3							S9	0/0	
11									
12									
13 / 4									
14									
15									
16 / 5									
17									
18			5.49						
19		End of Borehole							
20 / 6									
21									
22		Soil Vapours measured using a photoionization detector (PID) and an RKI Eagle hydrocarbon surveyor.		Monitoring well was dry on December 22, 2105.					
23 / 7									
24									
25									

Contractor: Strata Drilling Group

Drilling Method: Direct Push

Well Casing Size: 2.54cm

Pinchin Ltd.
2470 Milltower Court
Mississauga, ON L5N 7W5

Grade Elevation: NM

Top of Casing Elevation: NM

Sheet: 1 of 1

SPL Consultants Limited
Geotechnical Environmental Materials Hydrogeology

LOG OF BOREHOLE BH15-3

PROJECT: Environmental Soil & Groundwater Investigation
CLIENT: Bazis Inc.
PROJECT LOCATION: 11-17 Yorkville Avenue, Toronto, Ontario
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

DRILLING DATA
Method: Hollow Stem Augers
Diameter: 203mm
Date: Jan/24/2015

REF. NO.: 10001354-100
ENCL NO.: 2

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
116.3							
116.2 / 0.1	**CONCRETE:** 100mm						
116.1 / 0.2	**FILL:** silty sand to sand, trace clay, trace brick fragments, brownish grey to brown, moist to very moist, very loose to compact		1	SS	19		116
			2	SS	3		
114.0			3	SS	5		
2.3	**FINE SAND:** trace silt, brown to grey, moist, compact		4	SS	12		114
112.8	wet below 3.1m		5	SS	10		
3.5	**SILTY CLAY** trace sand, occasional seams of fine sand and silt, grey, moist, stiff to very stiff						112
			6	SS	10		
			7	SS	15		110
			8	SS	14		
			9	SS	12		108
105.9							
10.4	**SILT:** trace sand, trace clay, grey, wet, compact		10	SS	23		106
	some clay, moist below 12.2m		11	SS	59		104
			12	SS	72		102
101.5							
14.8	**SANDY SILT:** trace clay, grey, wet, dense		13	SS	58		
99.8							100
16.5	**SILT:** trace clay, grey, wet, very dense		14	SS	66	▽	W. L. 99.4 m Jan 28, 2015
98.3							
18.0	**SANDY SILT TO SILTY SAND:** frequent clayey silt seams/layers, grey, wet, very dense		15	SS	64		98
97.0							
19.3	**CLAYEY SILT TILL:** some sand to sandy, trace gravel, grey, moist, hard		16	SS	46		96
94.7							
94.6 / 21.9	**SANDY SILT:** trace clay, grey, wet, dense		17	SS	43		
	END OF BOREHOLE						

Notes:
1) 50mm dia. monitoring well installed in the borehole upon completion.

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (Mg/m³)

REMARKS AND GRAIN SIZE DISTRIBUTION (%)	GR	SA	SI	CL

SPL SOIL LOG 10001354-17YORKVILLE,-BOREHOLE LOGS.GPJ SPL.GDT 2/11/15

GROUNDWATER ELEVATIONS
Shallow/ Single Installation ▽ ▼ Deep/Dual Installation ▼ ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

SPL Consultants Limited
Geotechnical Environmental Materials Hydrogeology

LOG OF BOREHOLE BH15-3

PROJECT: Environmental Soil & Groundwater Investigation
CLIENT: Bazis Inc.
PROJECT LOCATION: 11-17 Yorkville Avenue, Toronto, Ontario
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan

DRILLING DATA
Method: Hollow Stem Augers
Diameter: 203mm
Date: Jan/24/2015

REF. NO.: 10001354-100
ENCL NO.: 2

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
116.3							
116.2 / 0.1	**CONCRETE:** 100mm						
116.1 / 0.2	**FILL:** silty sand to sand, trace clay, trace brick fragments, brownish grey to brown, moist to very moist, very loose to compact		1	SS	19		116
			2	SS	3		
114.0			3	SS	5		
2.3	**FINE SAND:** trace silt, brown to grey, moist, compact		4	SS	12		114
112.8	wet below 3.1m		5	SS	10		
3.5	**SILTY CLAY** trace sand, occasional seams of fine sand and silt, grey, moist, stiff to very stiff						112
			6	SS	10		
			7	SS	15		110
			8	SS	14		
			9	SS	12		108
105.9							
10.4	**SILT:** trace sand, trace clay, grey, wet, compact		10	SS	23		106
	some clay, moist below 12.2m		11	SS	59		104
			12	SS	72		102
101.5							
14.8	**SANDY SILT:** trace clay, grey, wet, dense		13	SS	58		
99.8							100
16.5	**SILT:** trace clay, grey, wet, very dense		14	SS	66	▽	W. L. 99.4 m Jan 28, 2015
98.3							
18.0	**SANDY SILT TO SILTY SAND:** frequent clayey silt seams/layers, grey, wet, very dense		15	SS	64		98
97.0							
19.3	**CLAYEY SILT TILL:** some sand to sandy, trace gravel, grey, moist, hard		16	SS	46		96
94.7							
94.6 / 21.9	**SANDY SILT:** trace clay, grey, wet, dense		17	SS	43		
	END OF BOREHOLE						

Notes:
1) 50mm dia. monitoring well installed in the borehole upon completion.

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (Mg/m³)

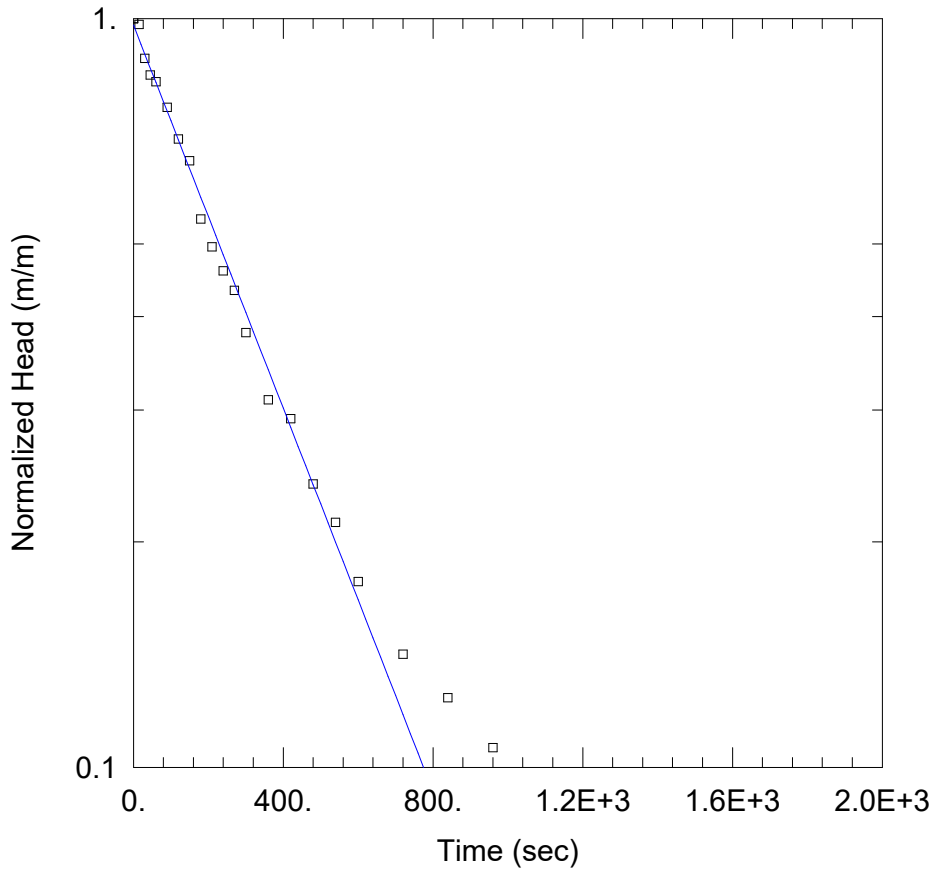
REMARKS AND GRAIN SIZE DISTRIBUTION (%)	GR	SA	SI	CL

SPL SOIL LOG 10001354-17YORKVILLE,-BOREHOLE LOGS.GPJ SPL.GDT 2/11/15

GROUNDWATER ELEVATIONS
Shallow/ Single Installation ▽ ▼ Deep/Dual Installation ▼ ▼

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

Appendix C – SWRT Procedures and Results



BH1-FALLING HEAD SWRT TEST

Data Set: F:\...\AqtwBH1.aqt
Date: 02/22/18 Time: 16:42:17

PROJECT INFORMATION

Company: exp Services Inc.
Client: 11 Yorkville Partners Inc.
Project: MRK00242474-A0
Location: 11 to 25 Yorkville Ave.
Test Well: BH1
Test Date: Feb 5, 2018

AQUIFER DATA

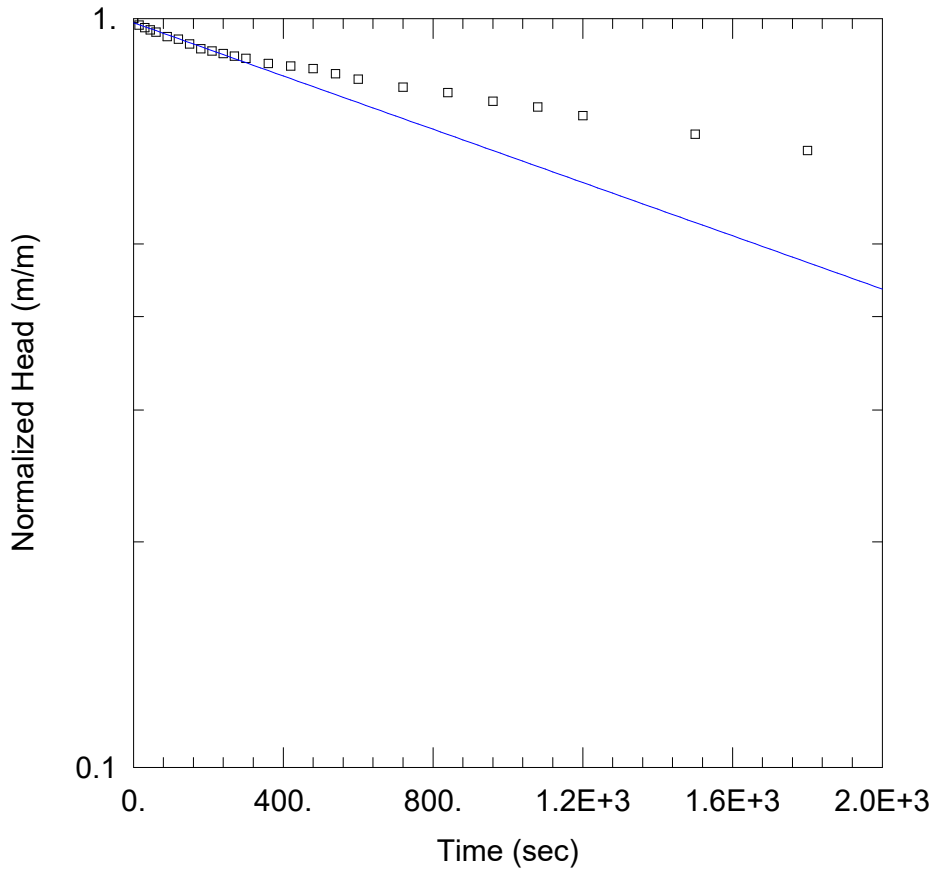
Saturated Thickness: 7.65 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH1)

Initial Displacement: 1.13 m
Total Well Penetration Depth: 7.65 m
Casing Radius: 0.0254 m
Static Water Column Height: 7.65 m
Screen Length: 3. m
Well Radius: 0.1016 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 9.874E-7 m/sec
y0 = 1.108 m



BH15-3-FALLING HEAD SWRT TEST

Data Set: F:\...\AqtwBH15-3.aqt
Date: 02/22/18 Time: 16:43:09

PROJECT INFORMATION

Company: exp Services Inc.
Client: 11 Yorkville Partners Inc.
Project: MRK00242474-A0
Location: 11 to 25 Yorkville Ave.
Test Well: BH15-3
Test Date: Feb 5, 2018

AQUIFER DATA

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

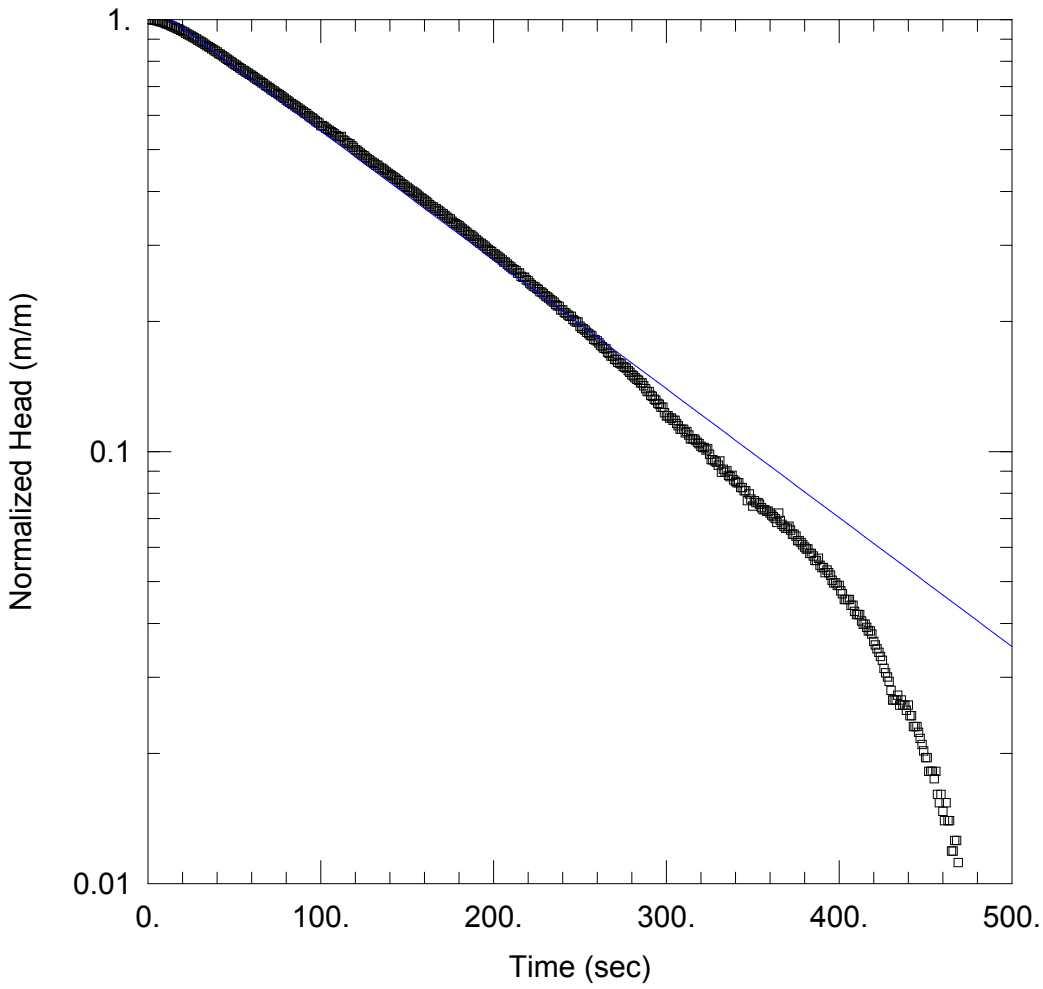
WELL DATA (BH15-3)

Initial Displacement: 1.47 m
Static Water Column Height: 3.89 m
Total Well Penetration Depth: 3.89 m
Screen Length: 3. m
Casing Radius: 0.0254 m
Well Radius: 0.1016 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.197E-7 m/sec
y0 = 1.451 m



SWRT FALLING HEAD - BH-105D

Data Set: C:\Users\tkachn\Desktop\BH-105D.aqt
Date: 03/19/19 Time: 12:41:30

PROJECT INFORMATION

Company: EXP Services Inc
Client: METROPIA
Project: MRK-00242474-A0
Location: 11 Yorkville Avenue, Toronto,
Test Well: BH-105D
Test Date: January 14, 2019

AQUIFER DATA

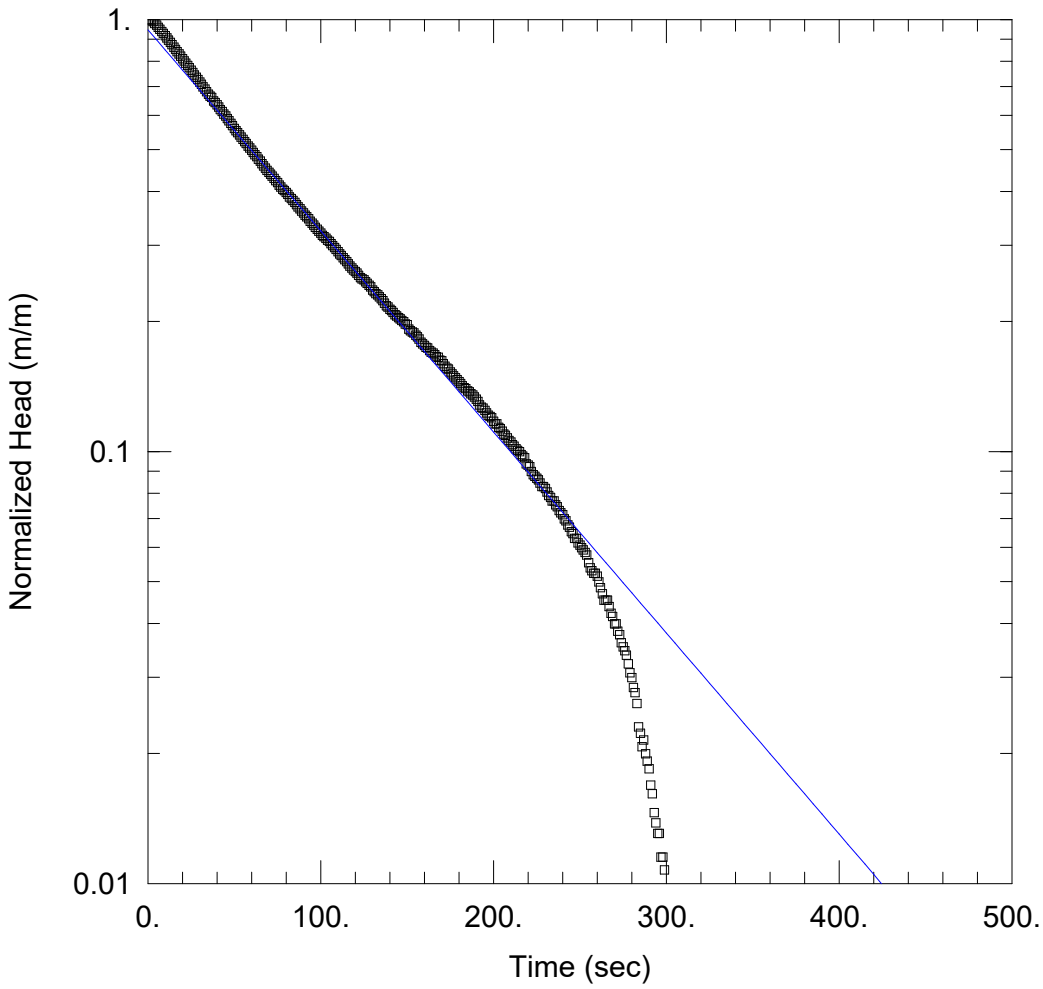
Saturated Thickness: 2.94 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH-105D)

Initial Displacement: 1.43 m
Total Well Penetration Depth: 3. m
Casing Radius: 0.025 m
Static Water Column Height: 2.94 m
Screen Length: 3. m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 3.868E-6 m/sec
y0 = 1.569 m



SWRT FALLING HEAD - BH-106D

Data Set: C:\Users\HeckyT\Documents\Yorkville\Working Files\BH-106D.aqt
Date: 03/18/19 Time: 17:26:01

PROJECT INFORMATION

Company: EXP Services Inc
Client: METROPIA
Project: MRK-00242474-A0
Location: 11 Yorkville Avenue, Toronto,
Test Well: BH-106D
Test Date: January 14, 2019

AQUIFER DATA

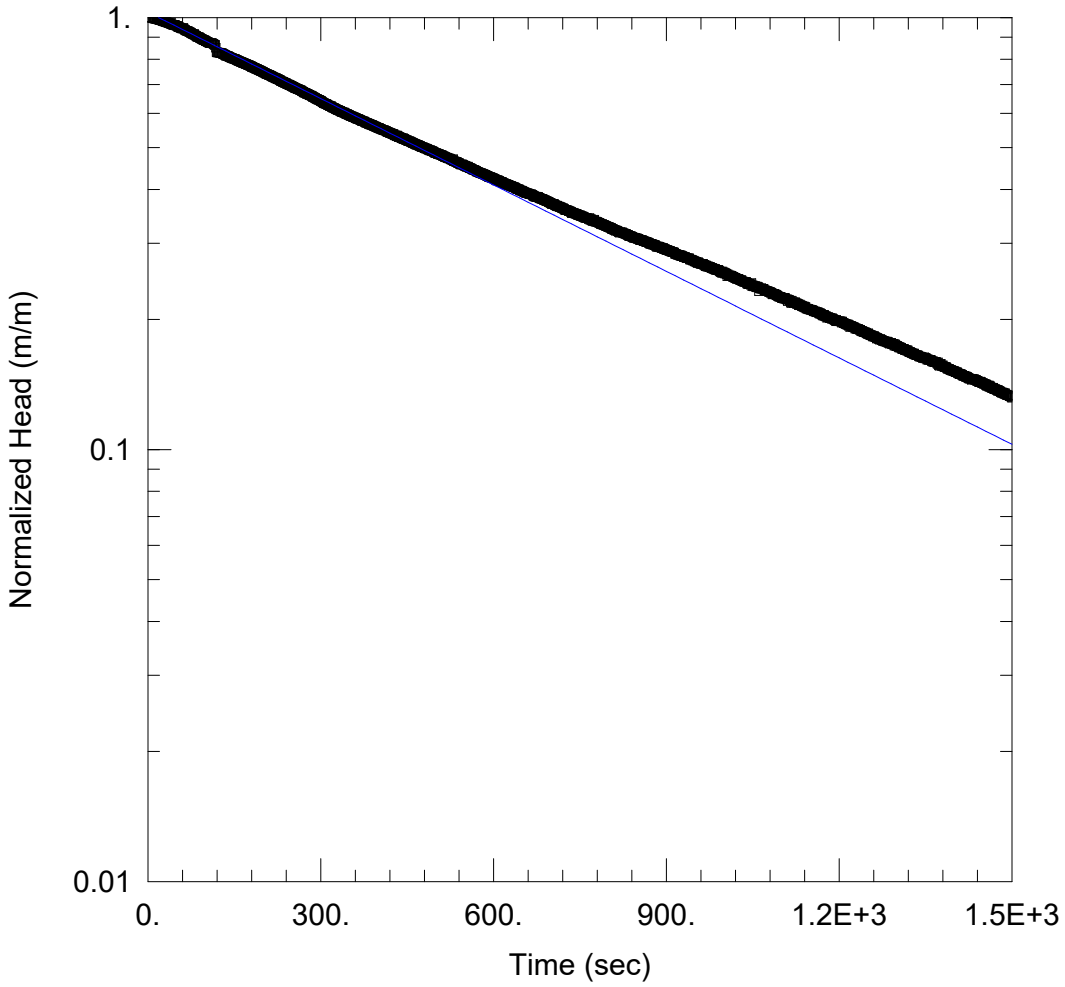
Saturated Thickness: 2.982 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH-106D)

Initial Displacement: 1.302 m
Total Well Penetration Depth: 3. m
Casing Radius: 0.025 m
Static Water Column Height: 2.982 m
Screen Length: 3. m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 5.95E-6 m/sec
y0 = 1.232 m



SWRT FALLING HEAD - BH-109D

Data Set: C:\Users\HeckyT\Documents\Yorkville\BH-109D.aqt
Date: 03/18/19 Time: 17:12:39

PROJECT INFORMATION

Company: EXP Services Inc
Client: METROPIA
Project: MRK-00242474-A0
Location: 11 Yorkville Avenue, Toronto,
Test Well: BH-109D
Test Date: January 14, 2019

AQUIFER DATA

Saturated Thickness: 4.199 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH-109D)

Initial Displacement: 1.754 m
Total Well Penetration Depth: 4.99 m
Casing Radius: 0.025 m
Static Water Column Height: 4.199 m
Screen Length: 3. m
Well Radius: 0.025 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 8.765E-7 m/sec y0 = 1.805 m

Single Well Response Testing

Standard Operating Procedure No: 2012-8
Version 1.0
Revision Date: September, 2012

Prepared By:

exp
1595 Clark Boulevard
Brampton, ON L6T 4V1
Canada
T: +1.905.793.9800
F: +1.905.793.0641
www.exp.com

Standard Operating Procedure - Single Well Response Tests (SWRT)

1.0 Introduction

This standard operating procedure describes the use of **SWRT** (also commonly known as a slug test) to obtain estimates of the saturated hydraulic conductivity (K) in a groundwater formation. The in-situ determination of the saturated hydraulic conductivity and other hydraulic properties in an aquifer is important for characterizing groundwater flow.

Single well response tests are short–duration tests that provide estimates of the horizontal hydraulic conductivity of the geological formation in the immediate area around the well screen.

These tests involve the creation of an instantaneous change in water level and monitoring the response of the water level until it recovers to near static conditions. The instantaneous change in water level is accomplished by displacing a know volume of water through the introduction or withdrawal of water or a solid object (referred to as a 'slug') of known volume and monitoring the changes in the water level over time.

Monitoring the decrease in water level following the introduction of a slug is referred to a falling head test.

Monitoring the rise in water levels following the withdrawal of a slug is referred to as a rising head test.

It is critical to ensure:

- that the monitoring well was constructed appropriately and construction details are known;
- that the monitoring well to be tested is completely developed;
- that the well screen is free of any soil material.

If the well has not been developed recently, the well should be developed prior to commencing the SRWT.

SWRT Strengths

- Can be applied for low conductive layers where a pumping test is not feasible;
- Volume of purged water is minimal; therefore, does not need large amount of water disposal (important when testing potentially contaminated sites);
- Can be completed with minimal cost and a short period of time; and,
- No observation wells required.

SWRT Weaknesses

- Hydraulic Conductivity is given only for the immediately well area; and,
- If the formation is disturbed during MW installation, observed hydraulic conductivity maybe biased high.

2.0 Applicable Regulations/Guidelines

The following regulations and guidelines apply to this SOP:

- ASTM D4044-96 – Standard Test method for (Field Procedures) for Instantaneous Change in Head (Slug) Tests for Determining Hydraulic Properties of Aquifers
- ASTM D4104-96 e-1 – Standard Test Method (Analytical Procedures) for determining Transmissivity of Non-leaky Confined Aquifers by Over-damped Well Response to Instantaneous Change in Head (Slug Test).
- ASTM 5785-95 - Standard Test Method (Analytical Procedures) for determining Transmissivity of Non-leaky Confined Aquifers by Under-damped Well Response to Instantaneous Change in Head (Slug Test).

3.0 Related SOPs

Prior to commencing SWRT procedures, field personnel are required to refer the following additional SOPs:

- Monitoring Well Development (No. 2012-6); and,
- Groundwater Sampling (No. 2012-7).

4.0 Attachments

- Static Water Level Measurement and Data Logger Installation Form (Attachment 1); and,
- Single Well Response Test Field Data Entry Form (Attachment 2).

5.0 Planning & Preparation

Prior to conducting an intrusive investigation program, the follow tasks/activities are required:

- review the project specific Health and Safety Plan (HASP) noting all Site-specific hazards and personnel protective equipment requirements.
- review the approved scope of work and other relevant project documentation regarding:
    - the project objectives;
    - site conditions;
    - specific issues of concern;
    - field methodologies:
    - sampling requirements including data quality objectives: and,
    - quality assurance/quality control (QA/QC) measures.
- review any maps, borehole logs or other information relevant to the Site.
- obtain any available well logs and/or previous water level/water quality information on all the wells to be tested.

  Required well information includes the following:

    - borehole diameter (inner diameter of the well);
    - well depth;
    - static water levels;
    - screen interval/depth;
    - gravel pack interval/depth; and,
    - geological unit screened.
- prepare an equipment check list and assemble all necessary equipment, forms, sampling containers, reagents, calibration standards.
- if not already on site, arrange for the provision of drums/containers for the collecting and storage of groundwater.
- gather equipment required to complete the SWRT. Rent and pick-up any equipment required to complete the test (see section 6.0 for a complete list of equipment).
- if using data loggers: check all the equipment for proper calibration; DLs to be reset; set the measuring interval to at least five (5) seconds, more frequent water level measurements; if a rapid water level change is expected, it is preferred to set-up the measuring interval to one (1) second.
- arrange access to the site, obtain any keys required to open wells or entrance gates.
- inform client, land owner, regulatory authorities etc. as appropriate; obtain any access/working permits to the site (e.g. City permit to work along the roads).

Note:

When dealing with contaminated sites, pre-plan the testing sequence: 'clean' wells should be tested prior to 'contaminated wells' to avoid cross contamination.

6.0 Equipment/Documentation List:

The equipment to conduct a SWRT program is to include the following:

- Copy of a signed health and safety plan
- Copy of the approved Scope of Work
- 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
- Closed containers to collect decontamination fluids

7.0 Field Procedures

Single Well Response Tests can be performed using electronic water level meters to manually record water levels or pressure transducers (data loggers) with subsequent data transfer to a computer for analysis. In the case of a falling head slug test, it is critical that the static water level is above the top of the well screen interval, otherwise the test is measuring the response of the unsaturated sand pack and not of the surrounding saturated formation.

Slug tests should be performed on undisturbed wells. A minimum of one week should be allowed between completion of a well and conducting a slug test.

The well should be developed and the water level recovered to within 3 cm of its static level prior to performing the slug test.

The field procedures provided are proposed, assuming that the well has been previously developed. If the monitoring well is not properly developed, the test results may not be reliable.

General

- Inspect the monitoring wells and record static water levels moving from up-gradient to down-gradient.
- If the tests are being performed in an area of know groundwater contamination, proceed from the least contaminated to the most contaminated well.
- The volume of the slug should be sufficient to create minimum 50 cm (0.5 m) change in water level
- Prepare a decontamination area with two layers of 6 mil plastic sheeting and containers to collect wash and rinse waters.
- Decontaminate the slug prior to initial use and between monitoring well locations. The slug should be decontaminated by washing first with a mixture of municipal water and phosphate free detergent, followed by rinses with municipal water, ethyl alcohol, isopropyl alcohol or Alconox and deionized water.
- The disposable rope used to lower the slug at each monitoring well location should be changed between wells.

The general procedure for completing a SWRT using three different methods is summarized below followed by a more detailed discussion on how to record water levels (manually and electronically).

Note:

The volume of the slug (or water) should be sufficient to change the water level at least 0.5 m. If the SWL is within the gravel pack, the volume calculation must account for the porosity (0.3 in general) of the sand pack. For bail-down tests, the volume of water removed must be recorded.

SWRT Methods

a) SWRT Using a Solid Slug

- Identify the well, clean the work area if required, measure static water level and time, total well depth, and record data logger serial number.
- Install the data logger at a sufficient depth below the water table, so that the slug will not strike the data logger upon insertion into the well; record the data logger depth.
- Set the slug just above the water table.
- If using a baro logger, install just below the top of the casing (ie. 1 meter below the casing).
- Pre-measure the length of string holding the slug - the slug must be completely submerged in water once dropped into the well.
- Release the slug instantaneously into water.
- Measure water level manually at intervals specified on the field form along with the time elapsed and the time of day (the time of day is required to correspond measurements with the data logger).
- Leave the slug in the well until water column has recovered by at least 90%.

  Once 90% recovery is achieved, the slug and data logger can be removed.

b) SWRT By Injecting a Slug of Water

- Identify the well, clean the work area if required, measure:
    - static water level and time;
    - total well depth; and,
    - record data logger serial number.
- Calculate the required volume of water to raise the water table for approximately 1.0 to 2.0 m from the static water level.

  It is preferred to add enough water to raise the water level by at least 0.5 m from the static water level.

  If the SWL is within the gravel pack, the volume calculation must account for the porosity (0.3 in general) of the sand pack.
- Add a known volume of water rapidly to the well.
- Measure water level manually at intervals specified on the field form along with the time elapsed and the time of day (the time of day is required to correspond measurements with the data logger).
- Leave the data logger in the well until water column has recovered by at least 90%.
- Take one last manual measurement of the water level and remove the data logger from the well.

c) SWRT By Removing A Known Volume of Water (Bail-down Test)

- Identify the well, clean the work area if required, measure static water level and time, total well depth, and record data logger serial number.
- Pre-determine the data logger installation depth and keep the data logger ready to install, as it will be installed immediately after bailing the well.
- Remove water from the well using a bailer (this must be done as quickly as possible!).
- Pour the removed water into a container – the volume of water removed must be measured once the test is completed.
- Install the data logger to the pre-determined depth, record the depth.
- Measure water level manually at intervals specified on the field form along with the time elapsed and the time of day (the time of day is required to correspond measurements with the data logger).
- Leave the data logger in the well until the water column has recovered by at least 90%.
- Take one last manual water level measurement and remove the data logger from the well, documenting the time of removal.

Note:

A bailer that has the proper diameter can be used to rapidly remove required amount of water from the well.

Procedures for Water Level Measurements

a) Manual Measurements (Electronic Water Level Meter)

- Decontaminate the electronic water level meter prior to use.
- For a falling head test, position the slug just above the static water level and the water level meter immediately above the slug.

  Quickly release the slug to create an instantaneous water level change and ensure that the slug is completely submerged.
- Upon release of the slug, quickly re-position the water level meter to record the water level and assign the level as the time zero reading.
- Start the stop watch and record the water level and the elapsed time at successive intervals as indicated on the field form.

  The recording intervals and the initial response period will be determined by the aquifer specific conditions.

  If the aquifer response is extremely quick, the measurement increments should be adjusted accordingly.
- If water is to be introduced into the well, ensure that it is from a clean source and transported in a clean container.
- Continue to record water levels for the falling head test until the water level has recovered to within 90% of its initial level.
- Upon 90% recovery, remove the water level probe and quickly remove the slug from the well to conduct the rising head test.
- Quickly re-position the water level meter to record the zero time water level.
- Record water levels over 10 second intervals or the shortest time interval as possible during the initial response period.
- Continue to record water levels for the rising head test until the water column has recovered by at least 90%.
- Be sure to document the monitoring well location, the date and time of the slug test, the model and make of the pressure transducer and data logger, the slug volume, the tests performed, depth to water and any comments in a slug test form or in a bound field notebook.

b) Level Logger Measurements (Pressure Transducers)

- Check the response and range of the pressure transducer and review the operations of the date recorder.

  Ensure that the transducer pressure range is appropriate for the water column depth.

- Decontaminate the pressure transducer and cable.
- Prior to positioning of the pressure transducer, line the edges of the well casing to protect the transducer cable.
- Set up the data logger and enter required data to initiate data logging according to the manufactures instructions.
- Position the pressure transducer at a depth where it will not be struck by the slug and at least 60 cm above the bottom of the well.

  It is critical that the data logger depth be recorded in order to calibrate the readings once the test is completed.

- Set the pressure transducer to record water levels at 1 second intervals and at shorter intervals for more coarse textured media.
    - Record water levels to the nearest 0.5 cm
    - Record the time of day to the nearest second.

  The number of measurements and intervals will depend on the formation specific conditions.

- Take manual water level measurements using an electronic water level meter at regular intervals to confirm the pressure transducer readings.
- For the falling head test, position the slug just above the static water level and quickly release the slug to create an instantaneous water level change.

  Ensure that the slug is completely submerged.

- If water is to be introduced into the well, ensure that it is from a clean source and transported in a clean container.
- Continue to record water levels for the falling head test until the water column has recovered to at least 90% of the documented static water level.
- Upon 90% recovery, quickly remove the slug from the well to conduct the rising head test.
- Continue to record water levels for the rising head test until the water column has recovered by at least 90% of the documented static water level.
- Continue to record water levels manually using an electronic water level meter (to calibrate / confirm the data logger readings).
- On completion of the rising head test, remove the data logger and download the water level and time data from to a computer.
- Be sure to document:
    - the monitoring well location;
    - the date and time of the Single Well Response Test:
    - the make and model of any equipment used (pressure transducer, data logger);
    - the slug volume;
    - the tests performed;

- depth to water;and,
- any comments in a slug test form or in a bound field notebook.

Additional Notes:

- *All manual measurements used to calibrate data logger data should correspond with the time of day (as the data logger will record levels that correspond to time of day).*
- *Ensure the starting time and measuring intervals of the data logger are properly aligned (start at the same time of day).*

Further Readings:

C.W. Fetter *Applied Hydrogeology*

END OF SOP

Appendix D – Laboratory Certificates of Analysis

Maxxam
A Bureau Veritas Group Company

Your Project #: MRK-00242474-A0
Site Location: 19 YORKVILLE
Your C.O.C. #: 649244-01-01

Attention: Robert Ferris

exp Services Inc
Markham Branch
220 Commerce Valley Dr W
Suite 500
Markham, ON
L3T 0A8

Report Date: 2018/02/13
Report #: R4984388
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B828879
Received: 2018/02/07, 15:12

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Sewer Use By-Law Semivolatile Organics	1	2018/02/09	2018/02/11	EPA 8270 CAM SOP 00301	EPA 8270 m
Biochemical Oxygen Demand (BOD)	1	2018/02/07	2018/02/12	CAM SOP-00427	SM 23 5210B m
Chromium (VI) in Water	1	N/A	2018/02/12	CAM SOP-00436	EPA 7199 m
Total Cyanide	1	2018/02/09	2018/02/09	CAM SOP-00457	OMOE E3015 5 m
Fluoride	1	2018/02/09	2018/02/12	CAM SOP-00449	SM 23 4500-F C m
Mercury in Water by CVAA	1	2018/02/08	2018/02/09	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by ICPMS	1	N/A	2018/02/13	CAM SOP-00447	EPA 6020B m
E.coli, (CFU/100mL)	1	N/A	2018/02/07	CAM SOP-00552	MOE LSB E3371
Total Nonylphenol in Liquids by HPLC	1	2018/02/08	2018/02/09	CAM SOP-00313	In-house Method
Nonylphenol Ethoxylates in Liquids: HPLC	1	2018/02/08	2018/02/09	CAM SOP-00313	In-house Method
Animal and Vegetable Oil and Grease	1	N/A	2018/02/09	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2018/02/09	2018/02/09	CAM SOP-00326	EPA1664B m,SM5520A m
Polychlorinated Biphenyl in Water	1	2018/02/08	2018/02/08	CAM SOP-00309	EPA 8082A m
pH	1	N/A	2018/02/12	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2018/02/12	CAM SOP-00444	OMOE E3179 m
Total Kjeldahl Nitrogen in Water	1	2018/02/09	2018/02/09	CAM SOP-00938	OMOE E3516 m
Total PAHs (1)	1	N/A	2018/02/12	CAM SOP - 00301	EPA 8270 m
Mineral/Synthetic O & G (TPH Heavy Oil) (2)	1	2018/02/09	2018/02/09	CAM SOP-00326	EPA1664B m,SM5520F m
Total Suspended Solids	1	2018/02/08	2018/02/08	CAM SOP-00428	SM 23 2540D m
Volatile Organic Compounds in Water	1	N/A	2018/02/09	CAM SOP-00226	EPA 8260C m

Remarks:

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

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

Maxxam Analytics 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 #: MRK-00242474-A0
Site Location: 19 YORKVILLE
Your C.O.C. #: 649244-01-01

Attention: Robert Ferris

exp Services Inc
Markham Branch
220 Commerce Valley Dr W
Suite 500
Markham, ON
L3T 0A8

Report Date: 2018/02/13
Report #: R4984388
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B828879
Received: 2018/02/07, 15:12

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

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

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) 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.
Deepthi Shaji, Project Manager
Email: dshaji@maxxam.ca
Phone# (905)817-5700 Ext:5807
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B828879
Report Date: 2018/02/13

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 19 YORKVILLE
Sampler Initials: PS

TORONTO SANITARY & STORM SEWER PACKAGE (WATER)

Maxxam ID				GBA094			GBA094		
Sampling Date				2018/02/07 11:30			2018/02/07 11:30		
COC Number				649244-01-01			649244-01-01		
	UNITS	**Criteria**	**Criteria-2**	**BH15-3**	**RDL**	**QC Batch**	**BH15-3 Lab-Dup**	**RDL**	**QC Batch**
Calculated Parameters									
Total Animal/Vegetable Oil and Grease	mg/L	150	-	3.8	0.50	5388315			
Inorganics									
Total BOD	mg/L	300	15	8	2	5388675			
Fluoride (F-)	mg/L	10	-	0.16	0.10	5393435			
Total Kjeldahl Nitrogen (TKN)	mg/L	100	-	2.1	0.10	5392265			
pH	pH	6.0:11.5	6.0:9.5	7.93		5393439			
Phenols-4AAP	mg/L	1.0	0.008	<0.0010	0.0010	5394856			
Total Suspended Solids	mg/L	350	15	12000	50	5390802			
Total Cyanide (CN)	mg/L	2	0.02	<0.0050	0.0050	5392358	<0.0050	0.0050	5392358
Petroleum Hydrocarbons									
Total Oil & Grease	mg/L	-	-	5.7	0.50	5392153			
Total Oil & Grease Mineral/Synthetic	mg/L	15	-	1.9	0.50	5392155			
Miscellaneous Parameters									
Nonylphenol Ethoxylate (Total)	mg/L	0.2	0.01	<0.005	0.005	5390589			
Nonylphenol (Total)	mg/L	0.02	0.001	<0.001	0.001	5390573			
Metals									
Chromium (VI)	ug/L	2000	40	<0.50	0.50	5395203	<0.50	0.50	5395203
Mercury (Hg)	mg/L	0.01	0.0004	<0.0001	0.0001	5391083			
Total Aluminum (Al)	ug/L	50000	-	19000	25	5392751			
Total Antimony (Sb)	ug/L	5000	-	1.3	0.50	5392751			
Total Arsenic (As)	ug/L	1000	20	5.5	1.0	5392751			
Total Cadmium (Cd)	ug/L	700	8	0.29	0.10	5392751			
Total Chromium (Cr)	ug/L	4000	80	44	5.0	5392751			
Total Cobalt (Co)	ug/L	5000	-	16	0.50	5392751			
Total Copper (Cu)	ug/L	2000	40	36	1.0	5392751			
Total Lead (Pb)	ug/L	1000	120	14	0.50	5392751			
Total Manganese (Mn)	ug/L	5000	50	940	2.0	5392751			
Total Molybdenum (Mo)	ug/L	5000	-	2.1	0.50	5392751			
Total Nickel (Ni)	ug/L	2000	80	37	1.0	5392751			
Total Phosphorus (P)	ug/L	10000	400	1700	100	5392751			
Total Selenium (Se)	ug/L	1000	20	<2.0	2.0	5392751			

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

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 #: B828879
Report Date: 2018/02/13

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 19 YORKVILLE
Sampler Initials: PS

TORONTO SANITARY & STORM SEWER PACKAGE (WATER)

Maxxam ID				GBA094			GBA094		
Sampling Date				2018/02/07 11:30			2018/02/07 11:30		
COC Number				649244-01-01			649244-01-01		
	UNITS	**Criteria**	**Criteria-2**	**BH15-3**	**RDL**	**QC Batch**	**BH15-3 Lab-Dup**	**RDL**	**QC Batch**
Total Silver (Ag)	ug/L	5000	120	<0.10	0.10	5392751			
Total Tin (Sn)	ug/L	5000	-	1.4	1.0	5392751			
Total Titanium (Ti)	ug/L	5000	-	880	25	5392751			
Total Zinc (Zn)	ug/L	2000	40	76	5.0	5392751			
Semivolatile Organics									
Di-N-butyl phthalate	ug/L	80	15	<2	2	5393106			
Bis(2-ethylhexyl)phthalate	ug/L	12	8.8	<2	2	5393106			
3,3'-Dichlorobenzidine	ug/L	2	0.8	<0.8	0.8	5393106			
Pentachlorophenol	ug/L	5	2	<1	1	5393106			
Phenanthrene	ug/L	-	-	<0.2	0.2	5393106			
Anthracene	ug/L	-	-	<0.2	0.2	5393106			
Fluoranthene	ug/L	-	-	<0.2	0.2	5393106			
Pyrene	ug/L	-	-	<0.2	0.2	5393106			
Benzo(a)anthracene	ug/L	-	-	<0.2	0.2	5393106			
Chrysene	ug/L	-	-	<0.2	0.2	5393106			
Benzo(b/j)fluoranthene	ug/L	-	-	<0.2	0.2	5393106			
Benzo(k)fluoranthene	ug/L	-	-	<0.2	0.2	5393106			
Benzo(a)pyrene	ug/L	-	-	<0.2	0.2	5393106			
Indeno(1,2,3-cd)pyrene	ug/L	-	-	<0.2	0.2	5393106			
Dibenz(a,h)anthracene	ug/L	-	-	<0.2	0.2	5393106			
Benzo(g,h,i)perylene	ug/L	-	-	<0.2	0.2	5393106			
Dibenzo(a,i)pyrene	ug/L	-	-	<0.2	0.2	5393106			
Benzo(e)pyrene	ug/L	-	-	<0.2	0.2	5393106			
Perylene	ug/L	-	-	0.5	0.2	5393106			
Dibenzo(a,j) acridine	ug/L	-	-	<0.4	0.4	5393106			
7H-Dibenzo(c,g) Carbazole	ug/L	-	-	<0.4	0.4	5393106			
1,6-Dinitropyrene	ug/L	-	-	<0.4	0.4	5393106			
1,3-Dinitropyrene	ug/L	-	-	<0.4	0.4	5393106			
1,8-Dinitropyrene	ug/L	-	-	<0.4	0.4	5393106			
Calculated Parameters									
Total PAHs (18 PAHs)	ug/L	5	2	<1	1	5389478			

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

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 #: B828879
Report Date: 2018/02/13

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 19 YORKVILLE
Sampler Initials: PS

TORONTO SANITARY & STORM SEWER PACKAGE (WATER)

Maxxam ID				GBA094			GBA094		
Sampling Date				2018/02/07 11:30			2018/02/07 11:30		
COC Number				649244-01-01			649244-01-01		
	UNITS	**Criteria**	**Criteria-2**	**BH15-3**	**RDL**	**QC Batch**	**BH15-3 Lab-Dup**	**RDL**	**QC Batch**
Volatile Organics									
Benzene	ug/L	10	2	<0.10	0.10	5391155	<0.10	0.10	5391155
Chloroform	ug/L	40	2	<0.10	0.10	5391155	<0.10	0.10	5391155
1,2-Dichlorobenzene	ug/L	50	5.6	<0.20	0.20	5391155	<0.20	0.20	5391155
1,4-Dichlorobenzene	ug/L	80	6.8	<0.20	0.20	5391155	<0.20	0.20	5391155
cis-1,2-Dichloroethylene	ug/L	4000	5.6	<0.10	0.10	5391155	<0.10	0.10	5391155
trans-1,3-Dichloropropene	ug/L	140	5.6	<0.20	0.20	5391155	<0.20	0.20	5391155
Ethylbenzene	ug/L	160	2	<0.10	0.10	5391155	<0.10	0.10	5391155
Methylene Chloride(Dichloromethane)	ug/L	2000	5.2	<0.50	0.50	5391155	<0.50	0.50	5391155
1,1,2,2-Tetrachloroethane	ug/L	1400	17	<0.20	0.20	5391155	<0.20	0.20	5391155
Tetrachloroethylene	ug/L	1000	4.4	<0.10	0.10	5391155	<0.10	0.10	5391155
Toluene	ug/L	16	2	<0.20	0.20	5391155	<0.20	0.20	5391155
Trichloroethylene	ug/L	400	7.6	<0.10	0.10	5391155	<0.10	0.10	5391155
p+m-Xylene	ug/L	-	-	<0.10	0.10	5391155	<0.10	0.10	5391155
o-Xylene	ug/L	-	-	<0.10	0.10	5391155	<0.10	0.10	5391155
Total Xylenes	ug/L	1400	4.4	<0.10	0.10	5391155	<0.10	0.10	5391155
PCBs									
Total PCB	ug/L	1	0.4	<0.05	0.05	5390822			
Microbiological									
Escherichia coli	CFU/100mL	-	200	<10	10	5389800			
Surrogate Recovery (%)									
2,4,6-Tribromophenol	%	-	-	81		5393106			
2-Fluorobiphenyl	%	-	-	38		5393106			
D14-Terphenyl (FS)	%	-	-	88		5393106			
D5-Nitrobenzene	%	-	-	32		5393106			
D8-Acenaphthylene	%	-	-	57		5393106			
Decachlorobiphenyl	%	-	-	75		5390822			
4-Bromofluorobenzene	%	-	-	97		5391155	98		5391155
D4-1,2-Dichloroethane	%	-	-	103		5391155	104		5391155
D8-Toluene	%	-	-	97		5391155	98		5391155

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

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 #: B828879
Report Date: 2018/02/13

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 19 YORKVILLE
Sampler Initials: PS

TEST SUMMARY

Maxxam ID: GBA094
Sample ID: BH15-3
Matrix: Water

Collected: 2018/02/07
Shipped:
Received: 2018/02/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sewer Use By-Law Semivolatile Organics	GC/MS	5393106	2018/02/09	2018/02/11	Kathy Horvat
Biochemical Oxygen Demand (BOD)	DO	5388675	2018/02/07	2018/02/12	Barbara Kalbasi Esfahani
Chromium (VI) in Water	IC	5395203	N/A	2018/02/12	Sally Coughlin
Total Cyanide	SKAL/CN	5392358	2018/02/09	2018/02/09	Xuanhong Qiu
Fluoride	ISE	5393435	2018/02/09	2018/02/12	Surinder Rai
Mercury in Water by CVAA	CV/AA	5391083	2018/02/08	2018/02/09	Ron Morrison
Total Metals Analysis by ICPMS	ICP/MS	5392751	N/A	2018/02/13	Prempal Bhatti
E.coli, (CFU/100mL)	PL	5389800	N/A	2018/02/07	Sirimathie Aluthwala
Total Nonylphenol in Liquids by HPLC	LC/FLU	5390573	2018/02/08	2018/02/09	Dennis Boodram
Nonylphenol Ethoxylates in Liquids: HPLC	LC/FLU	5390589	2018/02/08	2018/02/09	Dennis Boodram
Animal and Vegetable Oil and Grease	BAL	5388315	N/A	2018/02/09	Automated Statchk
Total Oil and Grease	BAL	5392153	2018/02/09	2018/02/09	Francis Afonso
Polychlorinated Biphenyl in Water	GC/ECD	5390822	2018/02/08	2018/02/08	Sarah Huang
pH	AT	5393439	N/A	2018/02/12	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5394856	N/A	2018/02/12	Bramdeo Motiram
Total Kjeldahl Nitrogen in Water	SKAL	5392265	2018/02/09	2018/02/09	Rajni Tyagi
Total PAHs	CALC	5389478	N/A	2018/02/12	Automated Statchk
Mineral/Synthetic O & G (TPH Heavy Oil)	BAL	5392155	2018/02/09	2018/02/09	Francis Afonso
Total Suspended Solids	BAL	5390802	2018/02/08	2018/02/08	Nusrat Naz
Volatile Organic Compounds in Water	P&T/MS	5391155	N/A	2018/02/09	Rebecca McClean

Maxxam ID: GBA094 Dup
Sample ID: BH15-3
Matrix: Water

Collected: 2018/02/07
Shipped:
Received: 2018/02/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chromium (VI) in Water	IC	5395203	N/A	2018/02/12	Sally Coughlin
Total Cyanide	SKAL/CN	5392358	2018/02/09	2018/02/09	Xuanhong Qiu
Volatile Organic Compounds in Water	P&T/MS	5391155	N/A	2018/02/09	Rebecca McClean

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 #: B828879
Report Date: 2018/02/13

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 19 YORKVILLE
Sampler Initials: PS

GENERAL COMMENTS

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

Package 1	2.3°C

TORONTO SANITARY & STORM SEWER PACKAGE (WATER)

Nonylphenol Ethoxylates in Liquids: HPLC: The recovery in the matrix spike was not calculated (NC) due to background interference.

Total Nonylphenol in Liquids by HPLC: The recovery in the matrix spike was not calculated (NC) due to background interference.

Results relate only to the items tested.

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 #: B828879
Report Date: 2018/02/13

QUALITY ASSURANCE REPORT

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 19 YORKVILLE
Sampler Initials: PS

			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
5390822	Decachlorobiphenyl	2018/02/08	105	60 - 130	83	60 - 130	85	%				
5391155	4-Bromofluorobenzene	2018/02/09	102	70 - 130	101	70 - 130	99	%				
5391155	D4-1,2-Dichloroethane	2018/02/09	103	70 - 130	100	70 - 130	102	%				
5391155	D8-Toluene	2018/02/09	99	70 - 130	100	70 - 130	98	%				
5393106	2,4,6-Tribromophenol	2018/02/11	90	10 - 130	88	10 - 130	77	%				
5393106	2-Fluorobiphenyl	2018/02/11	73	30 - 130	60	30 - 130	67	%				
5393106	D14-Terphenyl (FS)	2018/02/11	96	30 - 130	103	30 - 130	100	%				
5393106	D5-Nitrobenzene	2018/02/11	76	30 - 130	61	30 - 130	63	%				
5393106	D8-Acenaphthylene	2018/02/11	82	30 - 130	70	30 - 130	70	%				
5388675	Total BOD	2018/02/12					<2	mg/L	NC	30	100	80 - 120
5390573	Nonylphenol (Total)	2018/02/09	NC	50 - 130	106	50 - 130	<0.001	mg/L	7.3	40		
5390589	Nonylphenol Ethoxylate (Total)	2018/02/09	NC	50 - 130	103	50 - 130	<0.005	mg/L	0.69	40		
5390802	Total Suspended Solids	2018/02/08					<10	mg/L	1.0	25	100	85 - 115
5390822	Total PCB	2018/02/08	108	60 - 130	78	60 - 130	<0.05	ug/L	NC	40		
5391083	Mercury (Hg)	2018/02/09	102	75 - 125	99	80 - 120	<0.0001	mg/L	NC	20		
5391155	1,1,2,2-Tetrachloroethane	2018/02/09	110	70 - 130	101	70 - 130	<0.20	ug/L	NC	30		
5391155	1,2-Dichlorobenzene	2018/02/09	101	70 - 130	94	70 - 130	<0.20	ug/L	NC	30		
5391155	1,4-Dichlorobenzene	2018/02/09	102	70 - 130	95	70 - 130	<0.20	ug/L	NC	30		
5391155	Benzene	2018/02/09	100	70 - 130	90	70 - 130	<0.10	ug/L	NC	30		
5391155	Chloroform	2018/02/09	103	70 - 130	91	70 - 130	<0.10	ug/L	NC	30		
5391155	cis-1,2-Dichloroethylene	2018/02/09	104	70 - 130	92	70 - 130	<0.10	ug/L	NC	30		
5391155	Ethylbenzene	2018/02/09	103	70 - 130	92	70 - 130	<0.10	ug/L	NC	30		
5391155	Methylene Chloride(Dichloromethane)	2018/02/09	105	70 - 130	91	70 - 130	<0.50	ug/L	NC	30		
5391155	o-Xylene	2018/02/09	105	70 - 130	95	70 - 130	<0.10	ug/L	NC	30		
5391155	p+m-Xylene	2018/02/09	105	70 - 130	94	70 - 130	<0.10	ug/L	NC	30		
5391155	Tetrachloroethylene	2018/02/09	98	70 - 130	88	70 - 130	<0.10	ug/L	NC	30		
5391155	Toluene	2018/02/09	100	70 - 130	90	70 - 130	<0.20	ug/L	NC	30		
5391155	Total Xylenes	2018/02/09					<0.10	ug/L	NC	30		
5391155	trans-1,3-Dichloropropene	2018/02/09	110	70 - 130	98	70 - 130	<0.20	ug/L	NC	30		
5391155	Trichloroethylene	2018/02/09	102	70 - 130	91	70 - 130	<0.10	ug/L	NC	30		
5392153	Total Oil & Grease	2018/02/09			101	85 - 115	<0.50	mg/L	4.5	25		

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 #: B828879
Report Date: 2018/02/13

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 19 YORKVILLE
Sampler Initials: PS

			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
5392155	Total Oil & Grease Mineral/Synthetic	2018/02/09			92	85 - 115	<0.50	mg/L	3.0	25		
5392265	Total Kjeldahl Nitrogen (TKN)	2018/02/09	NC	80 - 120	100	80 - 120	<0.10	mg/L	1.7	20	99	80 - 120
5392358	Total Cyanide (CN)	2018/02/09	102	80 - 120	99	80 - 120	<0.0050	mg/L	NC	20		
5392751	Total Aluminum (Al)	2018/02/13	109	80 - 120	105	80 - 120	<5.0	ug/L	NC	20		
5392751	Total Antimony (Sb)	2018/02/13	105	80 - 120	98	80 - 120	<0.50	ug/L	NC	20		
5392751	Total Arsenic (As)	2018/02/13	102	80 - 120	98	80 - 120	<1.0	ug/L	NC	20		
5392751	Total Cadmium (Cd)	2018/02/13	102	80 - 120	97	80 - 120	<0.10	ug/L	NC	20		
5392751	Total Chromium (Cr)	2018/02/13	101	80 - 120	98	80 - 120	<5.0	ug/L	NC	20		
5392751	Total Cobalt (Co)	2018/02/13	106	80 - 120	101	80 - 120	<0.50	ug/L	NC	20		
5392751	Total Copper (Cu)	2018/02/13	112	80 - 120	104	80 - 120	<1.0	ug/L	NC	20		
5392751	Total Lead (Pb)	2018/02/13	97	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		
5392751	Total Manganese (Mn)	2018/02/13	101	80 - 120	98	80 - 120	<2.0	ug/L	0.26	20		
5392751	Total Molybdenum (Mo)	2018/02/13	107	80 - 120	95	80 - 120	<0.50	ug/L	5.3	20		
5392751	Total Nickel (Ni)	2018/02/13	102	80 - 120	100	80 - 120	<1.0	ug/L	NC	20		
5392751	Total Phosphorus (P)	2018/02/12	102	80 - 120	96	80 - 120	<100	ug/L				
5392751	Total Selenium (Se)	2018/02/13	105	80 - 120	108	80 - 120	<2.0	ug/L	NC	20		
5392751	Total Silver (Ag)	2018/02/13	100	80 - 120	98	80 - 120	<0.10	ug/L	NC	20		
5392751	Total Tin (Sn)	2018/02/13	102	80 - 120	94	80 - 120	<1.0	ug/L	NC	20		
5392751	Total Titanium (Ti)	2018/02/13	101	80 - 120	98	80 - 120	<5.0	ug/L	NC	20		
5392751	Total Zinc (Zn)	2018/02/13	97	80 - 120	96	80 - 120	<5.0	ug/L	NC	20		
5393106	1,3-Dinitropyrene	2018/02/12	76	30 - 130	94	30 - 130	<0.4	ug/L	NC	40		
5393106	1,6-Dinitropyrene	2018/02/12	83	30 - 130	95	30 - 130	<0.4	ug/L	NC	40		
5393106	1,8-Dinitropyrene	2018/02/12	86	30 - 130	103	30 - 130	<0.4	ug/L	NC	40		
5393106	3,3'-Dichlorobenzidine	2018/02/12	93	30 - 130	112	30 - 130	<0.8	ug/L	NC	40		
5393106	7H-Dibenzo(c,g) Carbazole	2018/02/12	94	30 - 130	85	30 - 130	<0.4	ug/L	NC	40		
5393106	Anthracene	2018/02/12	89	30 - 130	88	30 - 130	<0.2	ug/L	NC	40		
5393106	Benzo(a)anthracene	2018/02/12	91	30 - 130	98	30 - 130	<0.2	ug/L	NC	40		
5393106	Benzo(a)pyrene	2018/02/12	93	30 - 130	98	30 - 130	<0.2	ug/L	NC	40		
5393106	Benzo(b/j)fluoranthene	2018/02/12	99	30 - 130	99	30 - 130	<0.2	ug/L	NC	40		
5393106	Benzo(e)pyrene	2018/02/12	98	30 - 130	102	30 - 130	<0.2	ug/L	NC	40		
5393106	Benzo(g,h,i)perylene	2018/02/12	102	30 - 130	93	30 - 130	<0.2	ug/L	NC	40		

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 #: B828879
Report Date: 2018/02/13

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 19 YORKVILLE
Sampler Initials: PS

			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
5393106	Benzo(k)fluoranthene	2018/02/12	88	30 - 130	100	30 - 130	<0.2	ug/L	NC	40		
5393106	Bis(2-ethylhexyl)phthalate	2018/02/12	91	30 - 130	98	30 - 130	<2	ug/L	NC	40		
5393106	Chrysene	2018/02/12	99	30 - 130	101	30 - 130	<0.2	ug/L	NC	40		
5393106	Dibenz(a,h)anthracene	2018/02/12	104	30 - 130	95	30 - 130	<0.2	ug/L	NC	40		
5393106	Dibenzo(a,i)pyrene	2018/02/12	120	30 - 130	123	30 - 130	<0.2	ug/L	NC	40		
5393106	Dibenzo(a,j) acridine	2018/02/12	97	30 - 130	88	30 - 130	<0.4	ug/L	NC	40		
5393106	Di-N-butyl phthalate	2018/02/12	103	30 - 130	102	30 - 130	<2	ug/L	NC	40		
5393106	Fluoranthene	2018/02/12	95	30 - 130	101	30 - 130	<0.2	ug/L	NC	40		
5393106	Indeno(1,2,3-cd)pyrene	2018/02/12	107	30 - 130	99	30 - 130	<0.2	ug/L	NC	40		
5393106	Pentachlorophenol	2018/02/12	88	30 - 130	68	30 - 130	<1	ug/L	NC	40		
5393106	Perylene	2018/02/12	92	30 - 130	92	30 - 130	<0.2	ug/L	NC	40		
5393106	Phenanthrene	2018/02/12	90	30 - 130	91	30 - 130	<0.2	ug/L	NC	40		
5393106	Pyrene	2018/02/12	96	30 - 130	101	30 - 130	<0.2	ug/L	NC	40		
5393435	Fluoride (F-)	2018/02/12	105	80 - 120	101	80 - 120	<0.10	mg/L	3.3	20		
5393439	pH	2018/02/12			101	98 - 103			0.43	N/A		
5394856	Phenols-4AAP	2018/02/12	103	80 - 120	98	80 - 120	<0.0010	mg/L	6.1	20		
5395203	Chromium (VI)	2018/02/12	96	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		

N/A = Not Applicable

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

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

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

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

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

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).

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

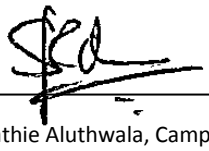
Maxxam Job #: B828879
Report Date: 2018/02/13

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 19 YORKVILLE
Sampler Initials: PS

VALIDATION SIGNATURE PAGE

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

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist



Sirimathie Aluthwala, Campobello Micro

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

MICRO

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

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17485 exp Services Inc	Company Name:		Quotation #:	B45998	Maxxam Job #:	Bottle Order #:
Attention:	Simon Lan	Attention:	Robert Ferris, Poyam Sabori	P.O. #:			649244
Address:	220 Commerce Valley Dr W Suite 500	Address:	Robert.ferris@exp.com	Project:	19. Yorkville		
	Markham ON L3T 0A8		Poyam.Sabori@exp.com	Project Name:	MAK-00242474-A0	COC #:	Project Manager:
Tel:	(905) 695-3217 x Fax:	Tel:	Fax:	Site #:		C#649244-01-01	Deepthi Shaji
Email:	simon.lan@exp.com	Email:	robert.ferris@exp.com	Sampled By:	RS		

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	☐ CCME ☒ Sanitary Sewer Bylaw	
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ Reg 558 ☒ Storm Sewer Bylaw	
☐ Table 3 ☐ Agri/Other ☐ For RSC	☐ MISA Municipality Toronto	
☐ Table ___	☐ PWQO	
	☐ Other ___	

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

ANALYSIS REQUESTED (PLEASE BE SPECIFIC):

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Toronto Sanitary & Storm Sewer Package	# of Bottles	Comments
1		BH 15-3	~~Feb 7~~/18	11:30am	GW		X	19	
2									
3									
4									
5									
6									
7									
8									
9									
10									

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 #)*

07-Feb-18 15:12
Deepthi Shaji
B828879
TSP ENV-908

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Poyam Sabori / Poyam Sabori	18/02/07	3:30pm	GURMEHAK	18/02/07	15:12	

Laboratory Use Only
Time Sensitive
Temperature (°C) on Recei: 4 | 2 | 1
Custody Seal Present: Yes / No
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

Job Number: B828879

INCOMING ADDITIONAL SAMPLES

CLIENT: Exp services, IQ- 17485 Maxxam Campobello

Bottle Codes

Line	Sample ID	MVIA	F245/ORG	F385/VOC	INOT	VOCW	F24	DRSW/SV OC	OG	...PCB	P/H	G	BOD	CR	WGHC	M	DF/NDMA	OTHER
1	BH15-3																	
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Instructions:

Add samples to existing job.

Relinquished By:	Date:	Time:	Received By	Date	Time	Custody Seal Y/N	Temperature on Receipt
Maxxam Sabrina	19/02/19	10:30	[illegible]	20/02/19	1418	Y	1/5/4

MWP 435204

Your Project #: MRK-00242474-A0
Site Location: 11 YORKVILLE
Your C.O.C. #: 699942-54-01

Attention: Robert Ferris

exp Services Inc
Markham Branch
220 Commerce Valley Dr W
Suite 500
Markham, ON
CANADA L3T 0A8

Report Date: 2019/03/12
Report #: R5625336
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B956166
Received: 2019/03/04, 18:58

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Sewer Use By-Law Semivolatile Organics	1	2019/03/05	2019/03/06	CAM SOP 00301	EPA 8270 m
Biochemical Oxygen Demand (BOD)	1	2019/03/06	2019/03/11	CAM SOP-00427	SM 23 5210B m
Chromium (VI) in Water	1	N/A	2019/03/06	CAM SOP-00436	EPA 7199 m
Total Cyanide	1	2019/03/06	2019/03/06	CAM SOP-00457	OMOE E3015 5 m
Fluoride	1	2019/03/06	2019/03/06	CAM SOP-00449	SM 23 4500-F C m
Mercury in Water by CVAA	1	2019/03/06	2019/03/06	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by ICPMS	1	N/A	2019/03/07	CAM SOP-00447	EPA 6020B m
E.coli, (CFU/100mL)	1	N/A	2019/03/04	CAM SOP-00552	MOE LSB E3371
Total Nonylphenol in Liquids by HPLC	1	2019/03/07	2019/03/08	CAM SOP-00313	In-house Method
Nonylphenol Ethoxylates in Liquids: HPLC	1	2019/03/07	2019/03/08	CAM SOP-00313	In-house Method
Animal and Vegetable Oil and Grease	1	N/A	2019/03/07	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/03/07	2019/03/07	CAM SOP-00326	EPA1664B m,SM5520A m
Polychlorinated Biphenyl in Water	1	2019/03/06	2019/03/06	CAM SOP-00309	EPA 8082A m
pH	1	N/A	2019/03/06	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/03/06	CAM SOP-00444	OMOE E3179 m
Total Kjeldahl Nitrogen in Water	1	2019/03/06	2019/03/08	CAM SOP-00938	OMOE E3516 m
Total PAHs (1)	1	N/A	2019/03/07	CAM SOP - 00301	EPA 8270 m
Mineral/Synthetic O & G (TPH Heavy Oil) (2)	1	2019/03/07	2019/03/07	CAM SOP-00326	EPA1664B m,SM5520F m
Total Suspended Solids	1	2019/03/05	2019/03/06	CAM SOP-00428	SM 23 2540D m
Volatile Organic Compounds in Water	1	N/A	2019/03/06	CAM SOP-00228	EPA 8260C m

Remarks:

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

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

Your Project #: MRK-00242474-A0
Site Location: 11 YORKVILLE
Your C.O.C. #: 699942-54-01

Attention: Robert Ferris

exp Services Inc
Markham Branch
220 Commerce Valley Dr W
Suite 500
Markham, ON
CANADA L3T 0A8

Report Date: 2019/03/12
Report #: R5625336
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B956166
Received: 2019/03/04, 18:58

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. 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.
Tanya Fidlin, Project Manager
Email: tfidlin@maxxam.ca
Phone# (905)817-5700
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B956166
Report Date: 2019/03/12

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 11 YORKVILLE
Sampler Initials: PS

TORONTO SANITARY & STORM SEWER PACKAGE (WATER)

Maxxam ID				JCQ330			JCQ330		
Sampling Date				2019/03/04 10:30			2019/03/04 10:30		
COC Number				699942-54-01			699942-54-01		
	UNITS	**San**	**Stm**	**TH-109D**	**RDL**	**QC Batch**	**TH-109D Lab-Dup**	**RDL**	**QC Batch**
Calculated Parameters									
Total Animal/Vegetable Oil and Grease	mg/L	150	-	<0.50	0.50	6000560			
Inorganics									
Total BOD	mg/L	300	15	<2	2	6004412			
Fluoride (F-)	mg/L	10	-	0.15	0.10	6004184			
Total Kjeldahl Nitrogen (TKN)	mg/L	100	-	1.6	0.10	6004526	1.6	0.10	6004526
pH	pH	6.0:11.5	6.0:9.5	7.96		6004180			
Phenols-4AAP	mg/L	1.0	0.008	<0.0010	0.0010	6004239			
Total Suspended Solids	mg/L	350	15	**37**	10	6002459			
Total Cyanide (CN)	mg/L	2	0.02	<0.0050	0.0050	6005125			
Petroleum Hydrocarbons									
Total Oil & Grease	mg/L	-	-	<0.50	0.50	6006845			
Total Oil & Grease Mineral/Synthetic	mg/L	15	-	<0.50	0.50	6006846			
Miscellaneous Parameters									
Nonylphenol Ethoxylate (Total)	mg/L	0.2	0.01	<0.005	0.005	6006477			
Nonylphenol (Total)	mg/L	0.02	0.001	<0.001	0.001	6006473			
Metals									
Chromium (VI)	ug/L	2000	40	0.70	0.50	6002476			
Mercury (Hg)	mg/L	0.01	0.0004	<0.0001	0.0001	6004254			
Total Aluminum (Al)	ug/L	50000	-	380	5.0	6004470			
Total Antimony (Sb)	ug/L	5000	-	<0.50	0.50	6004470			
Total Arsenic (As)	ug/L	1000	20	1.4	1.0	6004470			
Total Cadmium (Cd)	ug/L	700	8	<0.10	0.10	6004470			
Total Chromium (Cr)	ug/L	4000	80	<5.0	5.0	6004470			
Total Cobalt (Co)	ug/L	5000	-	<0.50	0.50	6004470			
Total Copper (Cu)	ug/L	2000	40	2.1	1.0	6004470			
Total Lead (Pb)	ug/L	1000	120	1.3	0.50	6004470			
Total Manganese (Mn)	ug/L	5000	50	**86**	2.0	6004470			
Total Molybdenum (Mo)	ug/L	5000	-	1.7	0.50	6004470			
Total Nickel (Ni)	ug/L	2000	80	4.0	1.0	6004470			

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
San,Stm: Toronto Sanitary and Storm Sewer Use By Law Guidelines, respectively. Referenced to Chapter 681

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 #: B956166
Report Date: 2019/03/12

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 11 YORKVILLE
Sampler Initials: PS

TORONTO SANITARY & STORM SEWER PACKAGE (WATER)

Maxxam ID				JCQ330			JCQ330		
Sampling Date				2019/03/04 10:30			2019/03/04 10:30		
COC Number				699942-54-01			699942-54-01		
	UNITS	**San**	**Stm**	**TH-109D**	**RDL**	**QC Batch**	**TH-109D Lab-Dup**	**RDL**	**QC Batch**
Total Phosphorus (P)	ug/L	10000	400	**490**	100	6004470			
Total Selenium (Se)	ug/L	1000	20	<2.0	2.0	6004470			
Total Silver (Ag)	ug/L	5000	120	<0.10	0.10	6004470			
Total Tin (Sn)	ug/L	5000	-	<1.0	1.0	6004470			
Total Titanium (Ti)	ug/L	5000	-	15	5.0	6004470			
Total Zinc (Zn)	ug/L	2000	40	5.9	5.0	6004470			
Semivolatile Organics									
Di-N-butyl phthalate	ug/L	80	15	<2	2	6002244			
Bis(2-ethylhexyl)phthalate	ug/L	12	8.8	4	2	6002244			
3,3'-Dichlorobenzidine	ug/L	2	0.8	<0.8	0.8	6002244			
Pentachlorophenol	ug/L	5	2	<1	1	6002244			
Phenanthrene	ug/L	-	-	<0.2	0.2	6002244			
Anthracene	ug/L	-	-	<0.2	0.2	6002244			
Fluoranthene	ug/L	-	-	<0.2	0.2	6002244			
Pyrene	ug/L	-	-	<0.2	0.2	6002244			
Benzo(a)anthracene	ug/L	-	-	<0.2	0.2	6002244			
Chrysene	ug/L	-	-	<0.2	0.2	6002244			
Benzo(b/j)fluoranthene	ug/L	-	-	<0.2	0.2	6002244			
Benzo(k)fluoranthene	ug/L	-	-	<0.2	0.2	6002244			
Benzo(a)pyrene	ug/L	-	-	<0.2	0.2	6002244			
Indeno(1,2,3-cd)pyrene	ug/L	-	-	<0.2	0.2	6002244			
Dibenz(a,h)anthracene	ug/L	-	-	<0.2	0.2	6002244			
Benzo(g,h,i)perylene	ug/L	-	-	<0.2	0.2	6002244			
Dibenzo(a,i)pyrene	ug/L	-	-	<0.2	0.2	6002244			
Benzo(e)pyrene	ug/L	-	-	<0.2	0.2	6002244			
Perylene	ug/L	-	-	<0.2	0.2	6002244			
Dibenzo(a,j) acridine	ug/L	-	-	<0.4	0.4	6002244			
7H-Dibenzo(c,g) Carbazole	ug/L	-	-	<0.4	0.4	6002244			
1,6-Dinitropyrene	ug/L	-	-	<0.4	0.4	6002244			
1,3-Dinitropyrene	ug/L	-	-	<0.4	0.4	6002244			

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
San,Stm: Toronto Sanitary and Storm Sewer Use By Law Guidelines, respectively. Referenced to Chapter 681

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 #: B956166
Report Date: 2019/03/12

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 11 YORKVILLE
Sampler Initials: PS

TORONTO SANITARY & STORM SEWER PACKAGE (WATER)

Maxxam ID				JCQ330			JCQ330		
Sampling Date				2019/03/04 10:30			2019/03/04 10:30		
COC Number				699942-54-01			699942-54-01		
	UNITS	**San**	**Stm**	**TH-109D**	**RDL**	**QC Batch**	**TH-109D Lab-Dup**	**RDL**	**QC Batch**
1,8-Dinitropyrene	ug/L	-	-	<0.4	0.4	6002244			
Calculated Parameters									
Total PAHs (18 PAHs)	ug/L	5	2	<1	1	6001299			
Volatile Organics									
Benzene	ug/L	10	2	<0.50	0.50	6002384			
Chloroform	ug/L	40	2	<0.50	0.50	6002384			
1,2-Dichlorobenzene	ug/L	50	5.6	<1.3	1.3	6002384			
1,4-Dichlorobenzene	ug/L	80	6.8	<1.3	1.3	6002384			
cis-1,2-Dichloroethylene	ug/L	4000	5.6	<1.3	1.3	6002384			
trans-1,3-Dichloropropene	ug/L	140	5.6	<1.0	1.0	6002384			
Ethylbenzene	ug/L	160	2	<0.50	0.50	6002384			
Methylene Chloride(Dichloromethane)	ug/L	2000	5.2	<5.0	5.0	6002384			
1,1,2,2-Tetrachloroethane	ug/L	1400	17	<1.3	1.3	6002384			
Tetrachloroethylene	ug/L	1000	4.4	<0.50	0.50	6002384			
Toluene	ug/L	16	2	<0.50	0.50	6002384			
Trichloroethylene	ug/L	400	7.6	<0.50	0.50	6002384			
p+m-Xylene	ug/L	1400	4.4	<0.50	0.50	6002384			
o-Xylene	ug/L	1400	4.4	<0.50	0.50	6002384			
Total Xylenes	ug/L	1400	4.4	<0.50	0.50	6002384			
PCBs									
Total PCB	ug/L	1	0.4	<0.05	0.05	6004426			
Microbiological									
Escherichia coli	CFU/100mL	-	200	<10	10	6001603			
Surrogate Recovery (%)									
2,4,6-Tribromophenol	%	-	-	95		6002244			
2-Fluorobiphenyl	%	-	-	58		6002244			
D14-Terphenyl (FS)	%	-	-	106		6002244			
D5-Nitrobenzene	%	-	-	66		6002244			
D8-Acenaphthylene	%	-	-	71		6002244			
Decachlorobiphenyl	%	-	-	107		6004426			

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
San,Stm: Toronto Sanitary and Storm Sewer Use By Law Guidelines, respectively. Referenced to Chapter 681

Maxxam Job #: B956166
Report Date: 2019/03/12

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 11 YORKVILLE
Sampler Initials: PS

TORONTO SANITARY & STORM SEWER PACKAGE (WATER)

Maxxam ID				JCQ330			JCQ330		
Sampling Date				2019/03/04 10:30			2019/03/04 10:30		
COC Number				699942-54-01			699942-54-01		
	UNITS	**San**	**Stm**	**TH-109D**	**RDL**	**QC Batch**	**TH-109D Lab-Dup**	**RDL**	**QC Batch**
4-Bromofluorobenzene	%	-	-	92		6002384			
D4-1,2-Dichloroethane	%	-	-	102		6002384			
D8-Toluene	%	-	-	94		6002384			

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
San,Stm: Toronto Sanitary and Storm Sewer Use By Law Guidelines, respectively. Referenced to Chapter 681

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 #: B956166
Report Date: 2019/03/12

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 11 YORKVILLE
Sampler Initials: PS

TEST SUMMARY

Maxxam ID: JCQ330
Sample ID: TH-109D
Matrix: Water

Collected: 2019/03/04
Shipped:
Received: 2019/03/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sewer Use By-Law Semivolatile Organics	GC/MS	6002244	2019/03/05	2019/03/06	Milijana Avramovic
Biochemical Oxygen Demand (BOD)	DO	6004412	2019/03/06	2019/03/11	Althea Gonzalez
Chromium (VI) in Water	IC	6002476	N/A	2019/03/06	Lang Le
Total Cyanide	SKAL/CN	6005125	2019/03/06	2019/03/06	Xuanhong Qiu
Fluoride	ISE	6004184	2019/03/06	2019/03/06	Surinder Rai
Mercury in Water by CVAA	CV/AA	6004254	2019/03/06	2019/03/06	Ron Morrison
Total Metals Analysis by ICPMS	ICP/MS	6004470	N/A	2019/03/07	Arefa Dabhad
E.coli, (CFU/100mL)	PL	6001603	N/A	2019/03/04	Farhana Rahman
Total Nonylphenol in Liquids by HPLC	LC/FLU	6006473	2019/03/07	2019/03/08	Tonghui (Jenny) Chen
Nonylphenol Ethoxylates in Liquids: HPLC	LC/FLU	6006477	2019/03/07	2019/03/08	Tonghui (Jenny) Chen
Animal and Vegetable Oil and Grease	BAL	6000560	N/A	2019/03/07	Automated Statchk
Total Oil and Grease	BAL	6006845	2019/03/07	2019/03/07	Sukhhardey Pal Singh Khangura
Polychlorinated Biphenyl in Water	GC/ECD	6004426	2019/03/06	2019/03/06	Sarah Huang
pH	AT	6004180	N/A	2019/03/06	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6004239	N/A	2019/03/06	Bramdeo Motiram
Total Kjeldahl Nitrogen in Water	SKAL	6004526	2019/03/06	2019/03/08	Rajni Tyagi
Total PAHs	CALC	6001299	N/A	2019/03/07	Automated Statchk
Mineral/Synthetic O & G (TPH Heavy Oil)	BAL	6006846	2019/03/07	2019/03/07	Sukhhardey Pal Singh Khangura
Total Suspended Solids	BAL	6002459	2019/03/05	2019/03/06	Massarat Jan
Volatile Organic Compounds in Water	GC/MS	6002384	N/A	2019/03/06	Manpreet Sarao

Maxxam ID: JCQ330 Dup
Sample ID: TH-109D
Matrix: Water

Collected: 2019/03/04
Shipped:
Received: 2019/03/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Kjeldahl Nitrogen in Water	SKAL	6004526	2019/03/06	2019/03/08	Rajni Tyagi

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 #: B956166
Report Date: 2019/03/12

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 11 YORKVILLE
Sampler Initials: PS

GENERAL COMMENTS

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

Package 1	3.7°C

Revised Report (2019/03/12): Regulatory criteria added as per client request

Sample JCQ330 [TH-109D] : VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

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 #: B956166
Report Date: 2019/03/12

QUALITY ASSURANCE REPORT

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 11 YORKVILLE
Sampler Initials: PS

			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
6002244	2,4,6-Tribromophenol	2019/03/05	50	10 - 130	63	10 - 130	45	%				
6002244	2-Fluorobiphenyl	2019/03/05	47	30 - 130	74	30 - 130	66	%				
6002244	D14-Terphenyl (FS)	2019/03/05	89	30 - 130	88	30 - 130	92	%				
6002244	D5-Nitrobenzene	2019/03/05	62	30 - 130	82	30 - 130	76	%				
6002244	D8-Acenaphthylene	2019/03/05	49	30 - 130	73	30 - 130	69	%				
6002384	4-Bromofluorobenzene	2019/03/06	102	70 - 130	100	70 - 130	97	%				
6002384	D4-1,2-Dichloroethane	2019/03/06	101	70 - 130	98	70 - 130	103	%				
6002384	D8-Toluene	2019/03/06	103	70 - 130	104	70 - 130	94	%				
6004426	Decachlorobiphenyl	2019/03/06	112	60 - 130	107	60 - 130	115	%				
6002244	1,3-Dinitropyrene	2019/03/05	99	30 - 130	101	30 - 130	<0.4	ug/L				
6002244	1,6-Dinitropyrene	2019/03/05	82	30 - 130	84	30 - 130	<0.4	ug/L				
6002244	1,8-Dinitropyrene	2019/03/05	57	30 - 130	65	30 - 130	<0.4	ug/L				
6002244	3,3'-Dichlorobenzidine	2019/03/05	39	30 - 130	68	30 - 130	<0.8	ug/L				
6002244	7H-Dibenzo(c,g) Carbazole	2019/03/05	76	30 - 130	90	30 - 130	<0.4	ug/L				
6002244	Anthracene	2019/03/05	70	30 - 130	90	30 - 130	<0.2	ug/L				
6002244	Benzo(a)anthracene	2019/03/05	111	30 - 130	113	30 - 130	<0.2	ug/L				
6002244	Benzo(a)pyrene	2019/03/05	88	30 - 130	95	30 - 130	<0.2	ug/L				
6002244	Benzo(b/j)fluoranthene	2019/03/05	94	30 - 130	102	30 - 130	<0.2	ug/L				
6002244	Benzo(e)pyrene	2019/03/05	99	30 - 130	105	30 - 130	<0.2	ug/L				
6002244	Benzo(g,h,i)perylene	2019/03/05	94	30 - 130	105	30 - 130	<0.2	ug/L				
6002244	Benzo(k)fluoranthene	2019/03/05	89	30 - 130	87	30 - 130	<0.2	ug/L				
6002244	Bis(2-ethylhexyl)phthalate	2019/03/05	112	30 - 130	114	30 - 130	<2	ug/L				
6002244	Chrysene	2019/03/05	102	30 - 130	104	30 - 130	<0.2	ug/L				
6002244	Dibenz(a,h)anthracene	2019/03/05	100	30 - 130	109	30 - 130	<0.2	ug/L				
6002244	Dibenzo(a,i)pyrene	2019/03/05	77	30 - 130	101	30 - 130	<0.2	ug/L				
6002244	Dibenzo(a,j) acridine	2019/03/05	99	30 - 130	106	30 - 130	<0.4	ug/L				
6002244	Di-N-butyl phthalate	2019/03/05	94	30 - 130	98	30 - 130	<2	ug/L				
6002244	Fluoranthene	2019/03/05	105	30 - 130	109	30 - 130	<0.2	ug/L				
6002244	Indeno(1,2,3-cd)pyrene	2019/03/05	96	30 - 130	110	30 - 130	<0.2	ug/L				
6002244	Pentachlorophenol	2019/03/05	79	30 - 130	63	30 - 130	<1	ug/L				
6002244	Perylene	2019/03/05	111	30 - 130	113	30 - 130	<0.2	ug/L				
6002244	Phenanthrene	2019/03/05	73	30 - 130	94	30 - 130	<0.2	ug/L				

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
A Bureau Veritas Group Company

Maxxam Job #: B956166
Report Date: 2019/03/12

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 11 YORKVILLE
Sampler Initials: PS

			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
6002244	Pyrene	2019/03/05	106	30 - 130	110	30 - 130	<0.2	ug/L				
6002384	1,1,2,2-Tetrachloroethane	2019/03/06	99	70 - 130	95	70 - 130	<0.50	ug/L	NC	30		
6002384	1,2-Dichlorobenzene	2019/03/06	96	70 - 130	96	70 - 130	<0.50	ug/L	NC	30		
6002384	1,4-Dichlorobenzene	2019/03/06	99	70 - 130	100	70 - 130	<0.50	ug/L	NC	30		
6002384	Benzene	2019/03/06	93	70 - 130	94	70 - 130	<0.20	ug/L	NC	30		
6002384	Chloroform	2019/03/06	95	70 - 130	96	70 - 130	<0.20	ug/L	0.35	30		
6002384	cis-1,2-Dichloroethylene	2019/03/06	95	70 - 130	96	70 - 130	<0.50	ug/L	NC	30		
6002384	Ethylbenzene	2019/03/06	97	70 - 130	99	70 - 130	<0.20	ug/L	NC	30		
6002384	Methylene Chloride(Dichloromethane)	2019/03/06	90	70 - 130	89	70 - 130	<2.0	ug/L	NC	30		
6002384	o-Xylene	2019/03/06	96	70 - 130	100	70 - 130	<0.20	ug/L	NC	30		
6002384	p+m-Xylene	2019/03/06	100	70 - 130	102	70 - 130	<0.20	ug/L	NC	30		
6002384	Tetrachloroethylene	2019/03/06	95	70 - 130	97	70 - 130	<0.20	ug/L	1.4	30		
6002384	Toluene	2019/03/06	96	70 - 130	97	70 - 130	<0.20	ug/L	NC	30		
6002384	Total Xylenes	2019/03/06					<0.20	ug/L	NC	30		
6002384	trans-1,3-Dichloropropene	2019/03/06	104	70 - 130	93	70 - 130	<0.40	ug/L	NC	30		
6002384	Trichloroethylene	2019/03/06	94	70 - 130	96	70 - 130	<0.20	ug/L	1.3	30		
6002459	Total Suspended Solids	2019/03/06					<10	mg/L	NC	25	98	85 - 115
6002476	Chromium (VI)	2019/03/06	99	80 - 120	100	80 - 120	<0.50	ug/L	NC	20		
6004180	pH	2019/03/06			102	98 - 103			0.48	N/A		
6004184	Fluoride (F-)	2019/03/06	85	80 - 120	101	80 - 120	<0.10	mg/L	1.0	20		
6004239	Phenols-4AAP	2019/03/06	97	80 - 120	98	80 - 120	<0.0010	mg/L	NC	20		
6004254	Mercury (Hg)	2019/03/06	94	75 - 125	94	80 - 120	<0.0001	mg/L	NC	20		
6004412	Total BOD	2019/03/11					<2	mg/L	NC	30	97	80 - 120
6004426	Total PCB	2019/03/06	118	60 - 130	105	60 - 130	<0.05	ug/L	NC	40		
6004470	Total Aluminum (Al)	2019/03/07	104	80 - 120	99	80 - 120	<5.0	ug/L				
6004470	Total Antimony (Sb)	2019/03/07	106	80 - 120	103	80 - 120	<0.50	ug/L				
6004470	Total Arsenic (As)	2019/03/07	100	80 - 120	98	80 - 120	<1.0	ug/L				
6004470	Total Cadmium (Cd)	2019/03/07	101	80 - 120	100	80 - 120	<0.10	ug/L				
6004470	Total Chromium (Cr)	2019/03/07	94	80 - 120	91	80 - 120	<5.0	ug/L				
6004470	Total Cobalt (Co)	2019/03/07	100	80 - 120	99	80 - 120	<0.50	ug/L				
6004470	Total Copper (Cu)	2019/03/07	100	80 - 120	97	80 - 120	<1.0	ug/L				
6004470	Total Lead (Pb)	2019/03/07	98	80 - 120	99	80 - 120	<0.50	ug/L				

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 #: B956166
Report Date: 2019/03/12

QUALITY ASSURANCE REPORT(CONT'D)

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 11 YORKVILLE
Sampler Initials: PS

			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
6004470	Total Manganese (Mn)	2019/03/07	96	80 - 120	96	80 - 120	<2.0	ug/L	2.2	20		
6004470	Total Molybdenum (Mo)	2019/03/07	104	80 - 120	97	80 - 120	<0.50	ug/L				
6004470	Total Nickel (Ni)	2019/03/07	93	80 - 120	101	80 - 120	<1.0	ug/L				
6004470	Total Phosphorus (P)	2019/03/07	103	80 - 120	100	80 - 120	<100	ug/L				
6004470	Total Selenium (Se)	2019/03/07	103	80 - 120	98	80 - 120	<2.0	ug/L				
6004470	Total Silver (Ag)	2019/03/07	96	80 - 120	95	80 - 120	<0.10	ug/L				
6004470	Total Tin (Sn)	2019/03/07	105	80 - 120	103	80 - 120	<1.0	ug/L				
6004470	Total Titanium (Ti)	2019/03/07	101	80 - 120	96	80 - 120	<5.0	ug/L				
6004470	Total Zinc (Zn)	2019/03/07	97	80 - 120	97	80 - 120	<5.0	ug/L	3.4	20		
6004526	Total Kjeldahl Nitrogen (TKN)	2019/03/08	93	80 - 120	101	80 - 120	<0.10	mg/L	0	20	100	80 - 120
6005125	Total Cyanide (CN)	2019/03/06	100	80 - 120	106	80 - 120	<0.0050	mg/L	NC	20		
6006473	Nonylphenol (Total)	2019/03/08	106	50 - 130	111	50 - 130	<0.001	mg/L	NC	40		
6006477	Nonylphenol Ethoxylate (Total)	2019/03/08	79	50 - 130	92	50 - 130	<0.005	mg/L	NC	40		
6006845	Total Oil & Grease	2019/03/07			100	85 - 115	<0.50	mg/L	0.25	25		
6006846	Total Oil & Grease Mineral/Synthetic	2019/03/07			94	85 - 115	<0.50	mg/L	1.6	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 (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).

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 #: B956166
Report Date: 2019/03/12

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 11 YORKVILLE
Sampler Initials: PS

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

Farhana Rahman

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

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

MICRO

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:
*Company Name: #17485 exp Services Inc
Attention: Simon Lan
Address: 220 Commerce Valley Dr W Suite 500
Markham ON L3T 0A8
Tel: (905) 695-3217 Fax:
Email: simon.lan@exp.com

REPORT TO:
Company Name: Robert.Ferris@exp.com
Attention:
Address: Payam-Sabori@exp-Com
Tel: Fax:
Email:

PROJECT INFORMATION:
Quotation #: B45998
P.O. #:
Project:
Project Name: MRK-00242474-A0
Site #: 11 Yorkville
Sampled By: PS

Laboratory Use Only:
Maxxam Job #:
Bottle Order #: 699942
COC #: C#699942-54-01
Project Manager: Tanya Fidlin

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

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

Other Regulations
☐ CCME ☒ Sanitary Sewer Bylaw
☐ Reg 558 ☒ Storm Sewer Bylaw
☐ MISA Municipality Toronto
☐ PWQO
☐ Other

Special Instructions

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

Field Filtered (please circle): Metals / Hg / Cr VI

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Toronto Sani bylaw Storm	# of Bottles	Comments
1		TH-89D	19/03/04	10:30am	GW	X	19	
2								
3								
4								
5								
6								
7								
8								
9								
10								

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 #)*

04-Mar-19 18:58
Tanya Fidlin
B956166
KVG ENV-1112

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Payam Sabori / Payam Sabori	19/03/04	12:00pm	[illegible]	19/03/04	18:58	

Laboratory Use Only
Time Sensitive | Temperature (°C) on Recei: 6/4/1 | Custody Seal Present: Yes ✓ | Intact: No

* 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 #: B956166
Report Date: 2019/03/12

exp Services Inc
Client Project #: MRK-00242474-A0
Site Location: 11 YORKVILLE
Sampler Initials: PS

Exceedence Summary Table – Toronto San/Stm 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.

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

Appendix E – Construction Flow Rate Calculations

Appendix E: Construction Dewatering Calculations

Project: MRK-00242474-A0

11to 21 Yorkville Avenue and 16 to 18 Cumberland Street, Toronto, Ontario

Table E-1: Assumptions - Flow from All Sides of the Excavation

Input Parameter	Units	Items	Notes
Geological Formation		**Sandy Silt/Silty Sand**	From borehole logs
Proposed ground elevation	masl	116.35	Estimated from Drawing A201 by Sweeny & Company Architects, date May 11, 2019 revised July 8, 2019.
Highest Groundwater Elevation (HGE)	masl	100	The highest representative groundwater elevation measured across the Site (BH15-3 April 12, 2019) plus 1 m to account for seasonal high water table.
Bottom of Overburden Aquifer	masl	93.9	base of monitoring well TH109D for foundation calculation purposes see Appendix B
Thickness of Aquifer	m	6.1	calculated
(H) Water level Height above base of Aquifer	m	6.1	calculated
Proposed base of excavation for Matt Slab	mbgs	97.0	Estimated from Drawing A101b by Sweeny & Company Architects, date May 11, 2019 revised July 8, 2019.
Dewatering Elevation Target	masl	96.0	1 m below base of footing excavation
(h) (dewatered water table above bottom of aquifer	m	2.10	calculated
(K) Shallow Hydraulic Conductivity (Highest)	m/s	5.9E-06	Appendix C
(T) Transmissivity	m^2/s	1.2E-05	calculated
Dimension of area (a) below HGE	m	42.1	Estimated from Drawing A101 by Sweeny & Company Architects, date May 11, 2019 revised July 8, 2019.
Dimension of area (b) below HGE.	m	22.7	Estimated from Drawing A101 by Sweeny & Company Architects, date May 11, 2019 revised July 8, 2019.
Area of Construction below HGE	m^2	956	Estimated from Drawing A101 by Sweeny & Company Architects, date May 11, 2019 revised July 8, 2019.
Method to Calculate Radius of Influence (R_o)		Sichardt	
(R_o) Radius of Influence	m	29.1	calculated ($R_o = 3000(H-h)\sqrt{K}$)
(L_o) Distance of Influence from Sides of Excavation ($L_o = R_o/2$)	m	14.6	calculated Zone of Influence
(Q_w) Dewatering Flow Rate (unconfined linear flow component)	m^3/day	149	calculated (see formula below)
Factor of Safety		2	
Groundwater Dewatering Flow Rate with Factor of Safety	m^3/day	297	calculated

Note: masl - meters above sea level mbgs - metres below ground surface

Dupuit - Analytical Solution for Estimating Groundwater Flow from an Unconfined Aquifer to a fully Penetrating Excavation

$$Q_w = xK(H^2 - h^2)/L_o$$

where:

Q_w = Rate of Pumping (m^3/s)

x = Length of the excavation (m)

K= Hydraulic conductivity (m/s)

H= Head beyond zone of influence of pumping above base of water bearing zone (static groundwater elevation) (m)

h= Head above base of water bearing zone (m)

L_o = Distance of Influence (m)

Table E-2: Precipitation Estimate

Location	Assumed Precipitation Event (mm)	Total Excavation Area Unencumbered P4 (m^2)
	15	2352
Calculated Volume of Precipitation (m^3)		35

Table E-3: Total Construction Dewatering Flow Rate

Location		Total Construction Dewatering Flow
Excavation (m^3/day)		333