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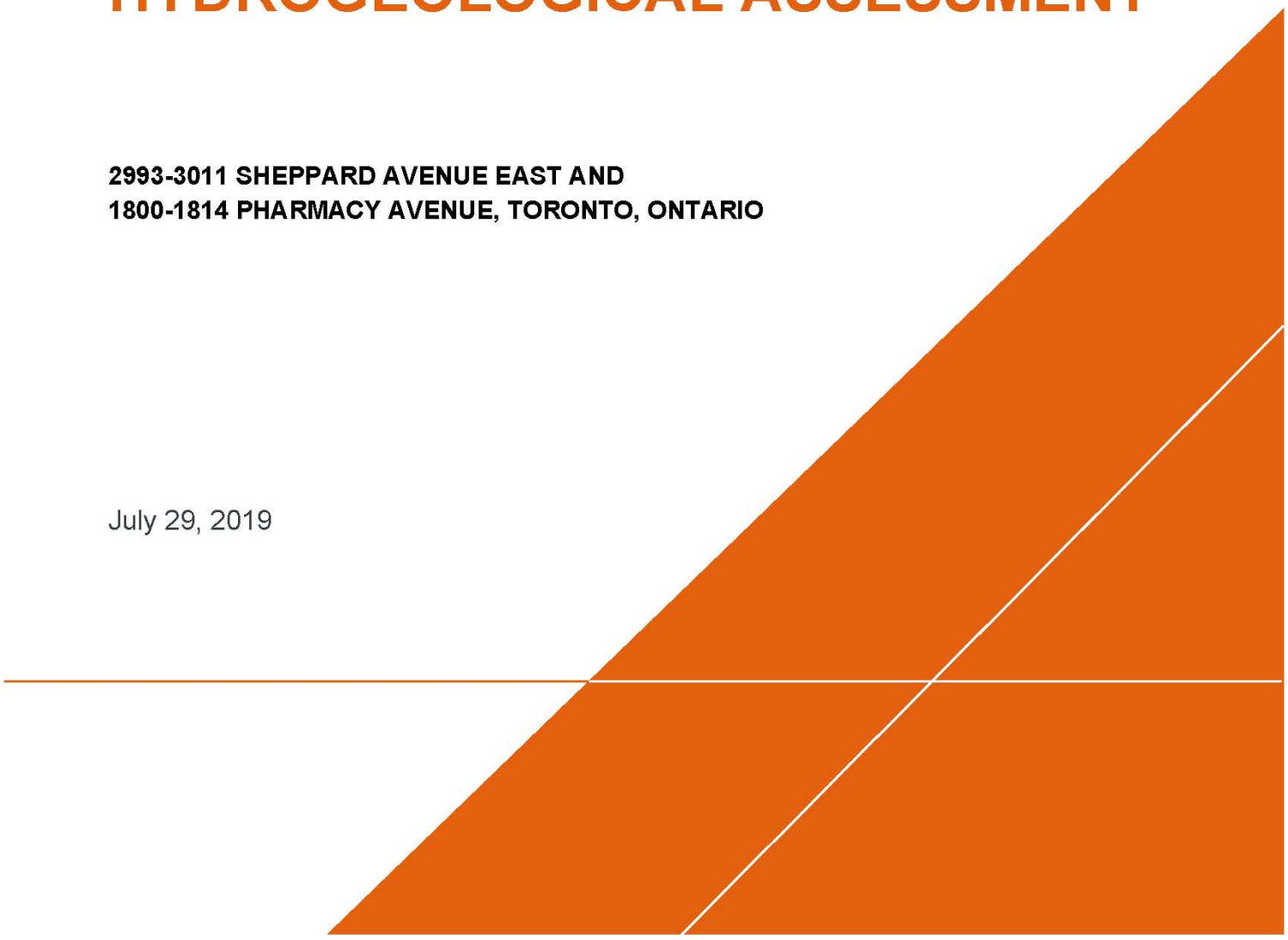
SHEPPARD PHARMACY GP INC. C/O COPE PROJECT MANAGEMENT CORPORATION

HYDROGEOLOGICAL ASSESSMENT

2993-3011 SHEPPARD AVENUE EAST AND
1800-1814 PHARMACY AVENUE, TORONTO, ONTARIO

July 29, 2019



HYDROGEOLOGICAL ASSESSMENT

2993-3011 Sheppard Avenue East and 1800-1814 Pharmacy Avenue, Toronto, Ontario

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ACRONYMS AND ABBREVIATIONS

BH	Borehole
DO	Dissolved Oxygen
EASR	Environmental Activity and Section Registry
ECA	Environmental Certificate of Approval
HDPE	High Density Polyethylene
K	Hydraulic Conductivity
m amsl	metres above mean sea level
m bg	metres below grade
m bgs	metres below ground surface
MECP	Ontario Ministry of the Environment, Conservation and Parks
MNRF	Ontario Ministry of Natural Resources and Forestry
NEP	Niagara Escarpment Plan
OGS	Ontario Geological Survey
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Ploychlorinated Biphenyls
PTTW	Permit to Take Water
PHCs	Petroleum Hydrocarbons
PWQO	Provincial Water Quality Objectives
TRCA	Toronto and Region Conservaton Authjority
Reg. 903	Ontario Well Regulation
VOC	Volatile Organoic Compounds
WWIS	Water Well Information System
WWR	Water Well Record

1.0 INTRODUCTION

1.1 General

Arcadis Canada Inc. (Arcadis) was retained by Sheppard Pharmacy GP Inc. (the Client) care of (c/o) Cope Project Management Corporation (Cope) to complete a hydrogeological assessment for the properties with the municipal addresses of 2993-3011 Sheppard Avenue East and 1800 1814 Pharmacy Avenue in Toronto, Ontario (the site; **Figure 1**).

The Phase One Property consists of two (2) parcels. The parcel on the northern portion of the site, municipally known as 2993-3011 Sheppard Avenue East, has been developed as multi tenant commercial building with a one-level basement. The eastern portion of the building is two-storeys, while the remainder of the building is single storey. The parcel on the southern portion of the site, municipally known as 1800-1814 Pharmacy Avenue, has been developed as a one-storey, slab-on-grade commercial building that is currently occupied by various commercial tenants.

1.2 Purpose

The site is owned by Sheppard Pharmacy GP Inc., who proposes to redevelop the site with a mixed-use building including retail, office and residential units, with a three-level underground parking garage. The proposed underground parking structures will occupy most of the site. The purpose of this hydrogeological assessment is to assist in underground structure design and provide an estimation of dewatering requirements during and post-construction.

1.3 Scope of Work

To support the above purpose, Arcadis completed the following tasks:

- Conduct field investigation to obtain necessary data and information about the subsurface conditions at the site;
- Evaluate hydrogeological conditions at the site and relate those conditions to the local hydrogeological setting;
- Assess the potential need for construction and post-construction dewatering and evaluate the potential for related impacts; and
- Prepare a hydrogeological assessment report.

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2.0 METHOD OF INVESTIGATION

2.1 General

Arcadis conducted geotechnical investigations at this site and prepared the following report:

- "Geotechnical Investigation, 2993-3011 Sheppard Avenue East and 1800-1814 Pharmacy Avenue, Toronto, Ontario". March 29, 2019 (Arcadis, 2019).

Additionally, Arcadis was provided and reviewed several site environmental reports, including:

- Pinchin Environmental Ltd. (Pinchin), 2014. Draft Phase II Environmental Site Assessment, 2993-3011 Sheppard Avenue East, Toronto, Ontario. December 12, 2014.
- Hemmera Envirochem Inc. (Hemmera), 2015. Draft Report Supplementary Subsurface Investigation, 3005 Sheppard Avenue East, Toronto, Ontario. September 2015.
- XCG Consulting Limited (XCG), 2017. Limited Phase II Environmental Site Assessment at Sheppard and Pharmacy, Toronto, Ontario. November 8, 2017.

The XCG 2017 Phase II Environmental Site Assessment (ESA) report includes the following report prepared by CMT Engineering Inc. (CMT) as an appendix:

- CMT Engineering Inc. (CMT), 2017. Geotechnical Investigation, 1800 Pharmacy Avenue, Toronto, Ontario. November 2, 2017.

This hydrogeological study began with a review of previous reports and published information for the area of the site, including previously published regional physiographic and geologic mapping and watershed planning reports. Many of these documents are referred to throughout various sections of this report and the relevant details can be found in the References section following the text of the report.

In particular, the work completed in association with this hydrogeological study consisted of the following tasks:

- Reviewing and interpreting available reports and published data;
- Reviewing water well records available from the Ministry of the Environment, Conservation and Parks (MECP);
- Performing in-situ hydraulic conductivity testing (bail tests) to assess the permeability of the encountered soils/bedrock adjacent to the monitoring wells;

- Measuring ground water levels in the monitoring wells located at the site on a bi-weekly basis for three (3) months;
- Collecting a ground water sample for chemical analysis;
- Evaluating proposed construction dewatering requirements; and
- Preparing this report.

2.2 Boreholes and Monitoring Wells on Site

2.2.1 Previous Site Investigations

A summary of previous site investigations is provided below based on review of the previous environmental reports:

- In 2014, five (5) monitoring wells (MW01 to MW05) were installed by Pinchin at depths ranging from approximately 5.8 to 8.4 metres below ground surface (m bgs);
- In 2015, six (6) monitoring wells (MW201 to MW206) were installed by Hemmera at depths ranging from approximately 3 to 7.6 m bgs; and
- In 2017, one (1) monitoring well (MW1-17) was installed by CMT at a depth of 16.5 m bgs.

Additionally, the CMT 2017 Phase II Environmental Site Assessment (ESA) report documented results of ground water monitoring of fourteen (14) monitoring wells installed by others at 1800-1814 Pharmacy Avenue. These monitoring wells (BH1 to BH3, BH101 to BH103, MW16-1, MW16-2, MW16-3, MW16-4S/D, MW16-5, MW16-6, and MW16-7) were installed at depths ranging from approximately 4.0 to 9.1 m bgs.

2.2.2 Arcadis 2019 Site Investigation

In March 2019, Arcadis conducted geotechnical and environmental site investigations at the site, which included drilling a total of fourteen (14) boreholes (BH19-1A/B, BH19-2, BH19-3, BH19-4, BH19-5A/B, BH19-6 to BH19-12) to depths ranging from 4.0 m to 22 m bgs and completing ten (10) of them as monitoring wells (i.e. MW19-1A/B, MW19-2, MW19-3, MW19-4, MW19-5A/B, MW19-6. MW19-7, and MW19-8). Borehole logs are provided in **Appendix A**.

Locations of existing and newly-installed s and monitoring wells are shown on **Figure 2**. Details of the borehole conditions are summarized in **Table 1**.

TABLE 1 INFORMATION ON BOREHOLES AND GROUND WATER MONITORING WELLS

BH/MW ID	Ground Surface Elevation (m amsl)	Borehole Bottom		Well Screen Interval Depth		Well Screen Interval Elevation	
		Depth (m bgs)	Elevation (m amsl)	From (m bgs)	To (m bgs)	From (m amsl)	To (m amsl)
Installed by Arcadis							
BH/MW19-1A	179.21	4.0	175.21	1.0	4.0	178.21	175.21
BH/MW19-1B	179.27	18.9	160.37	15.0	18.0	164.27	161.27
BH/MW19-2	178.66	18.9	159.76	15.0	18.0	163.66	160.66
BH/MW19-3	177.64	18.9	158.74	15.0	18.0	162.64	159.64
BH/MW19-4	178.41	22.0	156.41	19.0	22.0	159.41	156.41
BH/MW19-5A	178.16	4.0	174.16	1.0	4.0	177.16	174.16
BH/MW19-5B	178.06	7.6	170.46	4.6	7.6	173.46	170.46
BH/MW19-6	178.86	4.6	174.26	1.0	4.0	177.86	174.86
BH/MW19-7	178.76	9.1	169.66	1.0	4.0	177.76	174.76
BH/MW19-8	178.69	7.6	171.09	4.6	7.6	174.09	171.09
Installed by Others							
MW1-17	178.10	17.4	160.70	13.5	16.5	164.60	161.60
MW01	179.68[a]	5.8	173.88	3.7	5.8	175.98	173.88
MW02	178.9	7.6	171.30	4.6	7.6	174.30	171.30
MW03	179.66[a]	6.4	173.26	3.7	6.4	175.96	173.26
MW04	179.15	8.4	170.75	5.5	8.4	173.65	170.75
MW05	178.29	7.5	170.79	4.6	7.5	173.69	170.79
MW201	178.42	9.1	169.32	4.6	7.6	173.82	170.82
MW202	178.26	7.6	170.66	4.6	7.6	173.66	170.66
MW203	178.32	3.7	174.62	1.5	3.0	176.82	175.32
MW204	178.44	3.7	174.74	0.9	3.0	177.54	175.44
MW205	178.57	3.7	174.87	1.1	3.5	177.47	175.07
MW206	179.24	7.6	171.64	4.6	7.6	174.64	171.64
BH1	178.22	unknown	unknown	4.5[b]	7.5	173.72[b]	170.72
BH2	177.83	unknown	unknown	4.5[b]	7.5	173.33[b]	170.33
BH3	178.83	unknown	unknown	4.5[b]	7.5	174.33[b]	171.33
BH101	178.79	unknown	unknown	4.5[b]	7.5	174.29[b]	171.29
BH102	177.91	unknown	unknown	4.5[b]	7.5	173.41[b]	170.41
BH103	177.84	unknown	unknown	4.5[b]	7.5	173.34[b]	170.34
MW16-1	178.08	unknown	unknown	3.1[b]	6.1	174.98[b]	171.98
MW16-2	178.86[a]	unknown	unknown	1.4[b]	4.6	177.26[b]	174.26
MW16-3	178.57	unknown	unknown	6.1[b]	9.1	172.47[b]	169.47
MW16-4S	177.92	unknown	unknown	3.0[b]	6.0	174.92[b]	171.92
MW16-4D	177.92	unknown	unknown	4.9[b]	7.9	173.02[b]	170.02

TABLE 1 INFORMATION ON BOREHOLES AND GROUND WATER MONITORING WELLS

BH/MW ID	Ground Surface Elevation (m amsl)	Borehole Bottom		Well Screen Interval Depth		Well Screen Interval Elevation	
		Depth (m bgs)	Elevation (m amsl)	From (m bgs)	To (m bgs)	From (m amsl)	To (m amsl)
MW16-5	178.86[a]	unknown	unknown	1.0[b]	4.0	177.86[b]	174.86
MW16-6	177.58	unknown	unknown	3.1[b]	6.1	174.48[b]	171.48
MW16-7	178.68	unknown	unknown	3.1[b]	6.1	175.58[b]	172.58

Notes: Elevations in metres relative to geodetic datum
m bgs = metres below ground surface
m amsl = metres above mean sea level
[a] finished floor elevation
[b] assuming 3-m ling well screen

2.3 Ground Water Sampling

On March 11 and March 18, 2019, newly-installed monitoring wells MW19-1A, MW19-1B, MW19-2, MW19-3, MW19-4, MW19-5A, MW19-5B, MW19-6, MW19-7 and MW19-8 were developed to remove foreign materials introduced during drilling and to improve the hydraulic connection of the well to the soil formation. During development, wells were equipped with dedicated high-density-polyethylene (HDPE) tubing fitted with plastic inertial foot valves. Monitoring wells were then purged of approximately three (3) well volumes (calculated as the volume of standing water in the well casing), or pumped dry three (3) times.

Between March 7 and April 4, 2018, ground water samples were collected from twenty (20) existing and seven (7) newly-installed monitoring wells and were submitted for laboratory analysis. More specifically:

- Between March 7 and April 4, 2018, ground water samples were collected from twenty (20) existing monitoring wells MW03, MW202, MW203, MW205, BH1, BH2, BH3, BH101, BH102, BH103, MW16-1, MW16-2, MW16-3, MW16-4S, MW16-4D, MW16-5, MW16-6, MW16-6, MW16-7 and MW1-17, and seven (7) newly-installed monitoring wells MW19-1A, MW19-4, MW19-5A, MW19-5B, MW19-6, MW19-7 and MW19-8. Water samples were submitted for laboratory analysis of one (1) or more of volatile organic compounds (VOCs), benzene, toluene, ethylbenzene and xylenes (BTEX), the F1 to F4 fractions of petroleum hydrocarbons (F1 to F4 PHCs), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and metals. Ground water samples for laboratory analysis of metals were field filtered; and
- On April 4, 2018, a ground water sample was collected from monitoring well MW16-1 and was submitted for laboratory analysis of chemicals listed in Toronto Municipal Code, Chapter 681, Sewers: Table 1 - Limits for Sanitary and Combined Sewers Discharge

(amended 2002-10-31 by By-law No. 855-2002; 2010-07-08 by By-Law No. 868-2010; 2016-02-04 by By-Law No. 100-2016); Table 2 - Limits for Storm Sewers Discharge (amended 2010-07-08 by By-Law No. 868-2010; 2016-02-04 by By-Law No. 100-2016). Ground water samples for laboratory analysis of metals and inorganics were not field filtered.

The samples were submitted to Maxxam Analytics Inc. (Maxxam) in Mississauga, a member of the Standards Council of Canada for Laboratory Accreditation, for chemical analysis. Copies of the laboratory certificates of analysis are provided in **Appendix B**.

2.4 In-Situ Hydraulic Conductivity Testing

Between March 22 and 24, 2019, Arcadis conducted a rising head hydraulic conductivity test (bail test) each of monitoring wells MW05, MW19-6 and MW19-8 to assess the hydraulic conductivity.

A summary of the hydraulic conductivity test (bail test) methodology is as follows:

- The static ground water level in each monitoring well was initially measured and recorded;
- 2 litre (L) of water was quickly removed from the well to achieve a known decrease in water level;
- The rising water level in the well was measured and recorded at regular time intervals for a 24-hour time period using a level logger;
- AQTESOLV® Version 4.50 was used to analyse the test data and estimate the hydraulic conductivity using the method of Bouwer and Rice (1976).

The hydraulic conductivity test data and analysis is provided in **Appendix C**.

3.0 SITE CONDITIONS

3.1 Physical Setting

The site is located at the intersection of Sheppard Avenue East and Pharmacy Avenue in Toronto, Ontario. Surrounding land use is a mix of commercial and residential uses. According to the Oak Ridges Moraine Atlas available at http://www.mah.gov.on.ca/page334.aspx and the Niagara Escarpment Plan (NEP) Maps available at https://www.escarpment.org/LandPlanning/NEP/niagaraEscarpmentMaps, the site is not located within an area where either the Oak Ridges Moraine Conservation Plan or the Niagara Escarpment Plan would be applicable.

According to the interactive map provided in the Ministry of Natural Resources and Forestry (MNRF) website (https://www.ontario.ca/environment-and-energy/make-natural-heritage-area-map), the proposed development is not within a natural heritage area (**Figure 3**).

3.2 Climate Conditions

Average monthly climate data from an Environment Canada climate station located at Toronto (Station ID 6158350) for the period from 1981 to 2010 is provided in **Table 2**. The data indicates that the climate in the study area is continental with cold winters and warm summers with precipitation records showing local seasonal variation. As shown in **Table 2**, the mean annual precipitation is 831.1 mm/year, annual mean rainfall is 714 mm/year, and the mean annual daily temperature is 9.4 degrees Celsius (°C). The data also indicates that about 15% of precipitation falls as snow (Environment Canada, 2018).

The summary of climate data from the Woodbridge station (1981–2010) also shows that in the area, January is normally the coldest month with mean daily temperatures of -3.7 °C and July is the warmest month with a mean daily temperature of 22.3 °C.

TABLE 2 CLIMATE DATA SUMMARY (1981 – 2010) FROM TORONTO STATION (ID 6158350)

MONTH	Daily Average Temperature (°C)	Average Rainfall (mm)	Average Snow (cm)	Average Precipitation (mm)
January	-3.7	29.1	37.2	61.5
February	-2.6	29.7	27.0	55.4
March	1.4	33.6	19.8	53.7
April	7.9	61.1	5.0	68.0
May	14.1	82.0	0.0	82.0
June	19.4	70.9	0.0	70.9
July	22.3	63.9	0.0	63.9
August	21.5	81.1	0.0	81.1
September	17.2	84.7	0.0	84.7
October	10.7	64.3	0.1	64.4
November	4.9	75.4	8.3	84.1
December	-0.5	38.2	24.1	61.5
Year	9.4	714	121.5	831.1

Note: Data was obtained from Environment Canada website (2018) http://climate.weather.gc.ca/climate_normals/results_1981_2010_e.html?searchType=stnProv&lstProvince=ON&txtCentralLatMin=0&txtCentralLatSec=0&txtCentralLongMin=0&txtCentralLongSec=0&stnID=5051&dispBack=0

3.3 Physiography and Drainage

The site is located in the Don River watershed. More specifically the subject site is located near the Massey Creek, which is located approximately 1 km south of the site and flows south and west to join Don River.

The site is relatively flat with a gentle slope down to the southwest. The area surrounding the buildings is mostly paved. Ground surface elevation at the site ranged from 177.55 m above mean sea level (m amsl) to 179.45 m amsl.

3.4 Geological Mapping

According to Ontario Geological Survey 2010, Surficial Geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release – Data 128 – Revised, the regional geology consists of sandy silt to silty sand-textured till.

According to Ontario Geological Survey 2011, 1:250,000 Scale Bedrock Geology of Ontario; Ontario Geological Survey, Surficial Geology of Southern Ontario; Miscellaneous Release – Data 126 – Revision1, bedrock in the Phase One Study Area is described as Georgian Bay formation, Blue Mountain formation, Billings Formation, Collingwood Member.

A section of the maps showing the surficial geology in the vicinity of the site is presented on **Figure 4**.

3.5 Subsurface Soil Conditions

The subsurface soil conditions encountered during borehole drilling at the site completed by Arcadis in 2019 are shown on the borehole logs in **Appendix A**. It should be noted that the soil and ground water conditions may vary between and beyond the borehole locations. Site stratigraphy generally consists of fill materials primarily comprising sand and underlain by native silt/silty sand followed by silty clay/clayey silt, followed by silt/sandy silt and clayey silt. Bedrock was not encountered in any of the boreholes during the drilling activities.

4.0 GROUND WATER CONDITIONS

4.1 Regional Ground Water Recharge

Recharge is the process by which ground water is replenished and involves the vertical infiltration of water through the subsoil deposits and geologic materials to the saturated zone. The amount of ground water recharge in a particular area depends on surficial geology, topography, and the extent of land development in that area. Generally, regional ground water recharge is irregularly distributed temporally and spatially as interpreted from specific climatic conditions, local geology, and land development status.

The site is located in a well-developed area and it contains a mixture of commercial and residential buildings. Ground water recharge is expected to be occurring in open spaces (backyards, parks, side of roads, etc.). The project site generally has low ground water recharge rates due to surficial geologic materials (silt/silty clay/clayey silt/silty sand/sandy silt below the fill materials) and/or development activities. Therefore, no changes in recharge or discharge patterns in the site are expected after the project is completed.

4.2 Ground Water Levels

The ground water level data collected from the monitoring wells are summarized in **Table D.1 of Appendix D**. The screen elevations of these monitoring wells are shown in **Table D.1** and on the borehole logs provided in **Appendix A**. Ground water levels were monitored on a bi-weekly basis between March 21 and May 31, 2019.

The lateral flow of ground water in the area generally occurs from topographic highs to topographic lows. The regional ground water flow direction is generally towards south. The presence of subsurface structures and utilities, however, may influence the direction of ground water flow. Based on the ground water elevations measured in the monitoring wells on April 3, 2019, the shallow and intermediate deep horizontal ground water flow directions on the site were interpreted to be primarily towards the west. Interpreted shallow and intermediate deep horizontal ground water flow directions are shown on **Figures 5 and 6**.

It should be noted that ground water conditions vary depending on factors such as temperature, season, precipitation, construction activity and other situations, which may be different from those encountered at the time of the monitoring. The possibility of ground water level fluctuations at the site should be considered when designing and developing the construction plans for the project.

4.3 Inferred Hydrostratigraphy

The subsurface investigations revealed that beneath the surficial fill materials, the subsurface conditions encountered in the boreholes consisted primarily of silt/silty sand underlain by silty clay/clayey silt followed by sandy silt/silt and clayey silt. Bedrock was not encountered during previous and the current drilling activities. A summary of site stratigraphy is provided in **Table 3**.

TABLE 3 SUMMARY OF SUBSURFACE SOIL CONDITIONS

Stratigraphic Unit	Minimum Depth Encountered (m bgs)	Maximum Depth Encountered (m bgs)	Maximum Thickness Encountered (m)
Fill	0.1	1.8	1.7
Silt/Silty Sand	0.3	7.6	7.3
Silty Clay/Clayey Silt	0.6	5.3	3.1
Silt/Sandy Silt	0.3	21.3	18.6
Clayey Silt	15.2	22	6.8

Shallow ground water at the site occurs generally within the silty clay/clayey silt layer, and would be unconfined ground water. Ground water in this layer and the above silt/silty sand layer and the underlying sandy silt/silt layer will potentially affect the proposed excavation activity and that ground water control may be needed.

4.4 Results of In-Situ Hydraulic Conductivity Test

The results of hydraulic conductivity tests completed by Arcadis are summarised **Table 4** and provided in **Appendix C**. Previously XCG conducted hydraulic conductivity tests at monitoring wells MW16-1, MW16-4S, MW16-4D and BH102. XCG evaluated results of the hydraulic conductivity tests using the method of Bouwer and Rice (**Table 4; Appendix C**).

TABLE 4 SUMMARY OF HYDRAULIC CONDUCTIVITY TEST RESULTS

Monitoring Well ID	Well Screen Interval		Stratigraphic Unit	Estimated Hydraulic Conductivity
	(m bgs)	(m amsl)		(m/s)
Hydraulic Conductivity Tests Completed by Arcadis				
MW05 (1st test)	4.6 – 7.5	170.79 - 173.69	Sandy Silt	1.6×10^{-8}
MW05 (2nd test)	4.6 – 7.5	170.79 - 173.69	Sandy Silt	8.3×10^{-9}
MW19-6 (1st test)	1.0 - 4.0	174.86 – 177.86	Silty Clay	6.8×10^{-9}
MW19-6 (2nd test)	1.0 - 4.0	174.86 – 177.86	Silty Clay	2.0×10^{-8}
MW19-8	4.6 – 7.6	171.09 – 174.09	Silt	2.3×10^{-8}
Hydraulic Conductivity Tests Completed by XCG				
MW16-1	3.1 – 6.1[a]	174.98 –171.98[a]	unknown	9.0×10^{-8}
MW16-4S	3.0 – 6.0[a]	174.92 –171.92[a]	unknown	8.8×10^{-8}
MW16-4D	4.9 – 7.9[a]	173.02 –170.02[a]	unknown	2.0×10^{-7}
BH102	4.5 – 7.5[a]	173.41 –170.41[a]	unknown	2.4×10^{-8}
			Geomean Value of K	2.9×10^{-8}

Notes: [a] assuming 3-m ling well screen

The estimated hydraulic conductivity values ranged from approximately 6.8×10^{-9} m/s to 2.0×10^{-7} m/s, with a geomean value of 2.9×10^{-8} m/s.

4.5 Grain Size Analysis

One (1) soil samples (i.e. BH19-2-4) was submitted for grain size and particle distribution analysis. Grain size results are provided in **Appendix E**.

The hydraulic conductivity was also estimated from the grain size analysis results for BH19-2-4 by a using an empirical approach. Allen Hazen derived an empirical formula for approximating hydraulic conductivity from grain size analyses:

$$K = C(D_{10}{}^2)$$

where

K = Hydraulic conductivity (cm/s)
C = Hazen's empirical coefficient, which takes a value between 0.0 and 1.5 (depending on literatures), with an average value of 1.0.
D_{10} = is the diameter of the 10 percentile grain size of the material (mm)

The diameter of the 10 percentile grain size of sample BH19-2-4 was not reported; however, based on the particle distribution curve the estimated D_{10} for sample BH19-2-4 is less than

0.001 mm. Using a conservative D_{10} value of 0.001 mm, the hydraulic conductivity is calculated to be 1 x 10^{-8} m/s. Sample BH19-2-4 is collected at the depths of 2.3 to 2.9 m bgs and below the water table across the site. The hydraulic conductivity calculated based on the D_{10} value of sample BH19-2-4 is considered to be representative of the hydraulic conductivity of the main aquifer at the site.

The hydraulic conductivity values estimated based on the hydraulic conductivity tests are in the same order of magnitude of the hydraulic conductivity estimated based on the grain size results.

4.6 Ground Water Use in the Study Area

As part of this hydrogeological study, a search of the MECP Water Well Information System (WWIS) database was completed to identify active wells near the site. The database search was requested for the area located within approximately 250 m from the boundary of the site and identified eighteen (18) records.

Figure 7 presents the recorded locations of the identified wells as well as the associated water use categories within 250 m from the boundary of the site. A detailed table showing water well record (WWR) information for these wells is provided in **Appendix F**.

Sixteen (16) well records were identified within of these records listed as monitoring wells / test holes. The two (2) unknown / not stated wells were installed in 2014 and 2015, and are considered most likely to be for observation wells, monitoring wells or test holes associated with recent construction activities and/or infrastructure upgrades in the area.

4.7 Permitted Water Users

A search of permitted water takers within 1 km of the site was conducted using the MECP website (http://www.ontario.ca/environment-and-energy/map-permits-take-water). One (1) permit with a daily dewatering rate of 150,000 L/day was identified for construction dewatering purposes in this search. The closest permit was located approximately 970 m west of the site. A copy of the search results is provided as **Appendix G**.

4.8 Wellhead Protection Areas

Based on the approved source protection plan available at the using the Toronto and Region Conservation Authority (TRCA) website (https://trca.ca/app/uploads/2016/04/CTC_SOURCE_PROTECTION_PLAN_FULL.pdf), the site is not within any identified ground water quality threat areas.

4.9 Ground Water Quality

During construction, the ground water pumped in conjunction with excavation dewatering (where required) may be discharged into the City of Toronto sanitary or storm sewer systems. In this case, the discharge water quality will have to conform to the discharge limits identified in Table 1 and Table 2 of the Toronto Municipal Code, Chapter 681.

Analytical results for the sample collected from monitoring well MW16-1 collected on April 4, 2019 are presented in **Table B.1** in **Appendix B**. The City of Toronto Sanitary and Combined Sewer Discharge Limits and Storm Sewer Discharge Limits are also provided in **Table B.1**. The laboratory certificate of analysis is provided in **Appendix B**.

Comparison to Sanitary and Combined Sewer Discharge Limits

Concentrations of all analysed parameters in sample MW16-1 were below the Sanitary and Combined Sewer Discharge Limits outlined in Table 1 of Toronto Municipal Code, Chapter 681 (amended 2002-10-31 by By-law No. 855-2002; 2010-07-08 by By-Law No. 868-2010; 2016-02-04 by By-Law No. 100-2016), except for the concentrations of tetrachloroethylene (PCE) and trichloroethylene (TCE). Field temperature and pH value of the sample from MW16-1 satisfied the Toronto Municipal Code, Chapter 681 requirements for discharge water to sanitary and combined sewer system.

Comparison to Storm Sewer Discharge Limits

Concentrations of all analysed parameters in sample MW16-1 were below the Storm Sewer Discharge Limits outlined in Table 2 of Toronto Municipal Code, Chapter 681 (amended 2010-07-08 by By-Law No. 868-2010; 2016-02-04 by By-Law No. 100-2016), except for the concentrations of suspended PCE, TCE and cis-1,2-dichloroethylene (cis-1,2-DCE). Additionally, concentrations of several VOC parameters in the analysed sample MW16-1 were below the laboratory reportable detection limits (RDLs); however, the RDLs were adjusted above the Storm Sewer Discharge Limits. These VOC parameters include benzene, chloroform, 1,2-dichlorobenzene, 1,4-dichlorobenzene, trans-1,-3-dichloropropylene, ethylbenzene, methylene chloride, 1,1,2,2-tetrachloroethane, toluene and xylenes. Field temperature and pH value of the sample from MW16-1 satisfied the Toronto Municipal Code, Chapter 681 requirements for discharge water to storm sewer system.

As a result, a granular activated carbon (GAC) filtration system, at the minimum, will be required to remove the VOC concentrations in ground water to discharge the extracted water to the sanitary and/or combined sewer system, as wells as the storm sewer system.

5.0 GROUND WATER AND SURFACE WATER DEWATERING ESTIMATES

It is understood that the future on-site building with up to three (3) levels of below grade parking structures encompass the entire site. The base slab of the underground parking structure for on-site building is expected to be the depth of approximately 10 m below current ground surface (approximate elevation 167.55 to 169.45 m amsl) with an elevator pit extent approximately 2 m below the basement floor. The footing bases are generally expected to be at 1 m to 2 m below the basement floor slab. Assuming that the footing base is 2 m below the foundation, the depth of the excavation is expected to be approximately 12 m bgs (165.55 to 167.45 m amsl).

Ground water in on-site wells was measured at depths ranging from 0.67 to 13.02 m bgs (elevations ranging from 164.62 to 177.82 m amsl) and therefore dewatering will be required prior to any excavation below the ground water table. The water table is assumed to be lowered to at least 1 m below the excavation base (i.e. 13 m bgs; elevation 164.55 to 166.45 m amsl). Comparison of the ground water elevations to the design underside of footing elevations indicated that the design footing elevations are below the recorded seasonally high ground water elevations.

5.1 Ground Water Dewatering Estimates

It is assumed that open cut excavations with a temporary shoring system will be used to facilitate the construction of underground structures. For dewatering calculation purposes, a one-layer model conceptual model was used with an estimated geomean hydraulic conductivity of 2.9×10^{-8} m/s.

The ground water inflow rate (Q_R) from an unconfined aquifer to an excavation acting as an equivalent well was estimated using the following equation of Powers et al. (2007):

$$Q_R = \frac{\pi K (H^2 - h^2)}{ln\frac{R}{R_o}}$$

Where,

- K Hydraulic conductivity [m/s];
- H Depth from static water level to bottom of aquifer [m];
- h Depth from lowered water level to bottom of the aquifer [m];
- R Radius of the cone of depression (zone of influence) [m], approximately estimated using the empirical relationship $R = R_o + 3000 \times (H - h) \times \sqrt{K}$;

R_o Radius of an equivalent well, estimated as $R_o = \sqrt{\frac{w \times b}{\pi}}$

w Excavation width [m]; and

b Excavation length [m].

The following are used as inputs to the model:

- Ground surface elevation ranged from 177.55 to 179.45 m amsl at the site. Ground surface elevation at which the highest water table was detected is 177.55 m amsl;
- Excavation area is approximately 6,603 m^2 to a depth of approximately 12 m bgs (approximate elevation 165.55 to 167.45m amsl; assuming a 3-level underground parking will be constructed at the entire property area). The elevation of the base of the excavation at which the highest water table was detected is 167.55 m amsl. To be conservative, the lowest elevation of the excavation (i.e. 165.55 m amsl) was used in the model;
- Ground water in on-site wells was measured at depths ranging from 0.67 to 13.02 m bgs (elevations ranging from 164.62 to 177.82 m amsl). To be conservative, the highest water table (i.e. approximately 177.82 m amsl) was used in the model;
- Hydraulic conductivities varied from 6.8×10^{-8} m/s to 2.0×10^{-7} m/s, with a geomean value of 2.9×10^{-8} m/s. For dewatering estimate, the geomean hydraulic conductivity of 2.9×10^{-8} m/s was used;
- It is assumed that open cut excavations with a temporary shoring system will be used to facilitate the construction of underground structures;
- During construction activities, water table is assumed to maintain at 1 m below excavation (i.e. elevation 164.55 to 166.45 m amsl). To be conservative, the lowest elevation of the lowered water table (i.e. 164.55 m amsl) was used in the model;
- During long-term occupancy, water table is assumed to maintain at the elevation of the basement floor (i.e. 167.55 to 169.45 m amsl). To be conservative, the lowest elevation of the lowered water table (i.e. 167.55 m amsl) was used in the model; and
- One layer model was assumed for estimating dewatering rate.

Table 5 summarizes the input and output parameters for the dewatering estimates during site redevelopment. Allowing for variations in hydraulic conductivity and transmissivity, and the potential for a higher dewatering rate in the initial stage, it is expected that there will be variations in the amount of ground water that can be pumped during the construction of the proposed building foundations. A 50% contingency was allowed for the variability in hydraulic conductivity and other uncertainties that could be experienced.

TABLE 5 SUMMARY OF ESTIMATED GROUND WATER DEWATERING FOR PROPOSED EXCAVATION

	Geomean of Estimated Hydraulic Conductivity (m/s)	Ground water Elevation (m) From – To (H-h)	Length × Width (m)	R (m)	Estimated Dewatering Rate (L/day)	Estimated Dewatering Rate with 50% Contingency (L/day)
During Construction	2.9×10^{-8}	177.82 - 164.55	6,603	53	12,200	18,300
During Long-Term Occupancy	2.9×10^{-8}	177.82 - 167.55	6,603	52	10,500	15,800

During construction activities, the total estimated dewatering rate with 50% contingency would be approximately 18,300 L/day if the excavation for the entire site occurs at the same time.

During long-term occupancy, the total estimated dewatering rate with 50% contingency would be approximately 15,800 L/day.

The calculation of ground water dewatering rate is provided in **Appendix H**.

5.2 Stormwater Dewatering Estimates

Stormwater that reports to the surface of the site and off-site catchment areas during construction and that does not infiltrate directly into underlying soil will collect in sumps in the excavation prior recovery and discharge to sewer during and following major rainfall events. Inasmuch as ground water is expected to infiltrate into the parking garage and elevator pit excavation during construction of the building, the total anticipated quantity of stormwater that may be received must also be considered when estimating the dewatering rate during construction activities. Surface water will be managed separately from ground water following completion of construction and thus surface water quantities from storm events will not need to be considered when determining whether a permit to take water may be required to permit ground water take from beneath the lowest level of parking and the elevator core pits over the long term.

The total area of the lands that will receive surface water and contribute to the quantity that will report to the excavation for the high-rise development during construction will be approximately 6.603 m^2. Assuming no losses through infiltration or evaporation across the unexcavated portion of the total area, a 1.0 mm depth rainfall event would generate 6.6 m^3, or 6.600 L across the excavation and adjacent lands.

The Ministry of Transportation of Ontario (MTO) Intensity Duration Frequency (IDF) curves and tables for precipitation from the nearest MTO station to the property available at http://www.eng.uwaterloo.ca/~dprincz/mto_site/results_out.shtml?coords=43.648207,-79.386681 were reviewed to establish surface water management requirements. A "normal" rainfall event is considered to comprise the precipitation produced by a two-year return storm over a duration of 10 minutes (Rational Method). An extreme storm event is represented by a 100-year return storm over a similar 10-minute duration. **Table 6** presents the stormwater volumes that will be generated during construction activities at the site during the two different events.

TABLE 6 SUMMARY OF ESTIMATED STORMWATER DEWATERING FOR PROPOSED EXCAVATION

Event Return Period	Intensity (mm/hr)	Duration (min)	Depth of Accumulation (mm)	Volume (m^3)	Volume (L)
2 year	75.6	10	12.6	83	83,000
100 year	164.8	10	27.5	182	182,000

The stormwater contribution to construction dewatering management requirements during normal storm events will be 83 m^3/day, assuming no evapo-transpiration or infiltration losses on adjacent lands, in addition to groundwater. Following the completion of construction of the development, surface water and ground water will be collected and discharged separately. In the event that extreme precipitation events occur, collected water from both sources may have to be retained on site and permitted to discharge to sewer at a flow rate that can be accommodated by the municipal sewer system.

5.3 Permitting Requirements

The City of Toronto requires the following applications:

- An Environmental Activity and Sector Registry (EASR) registration for construction dewatering when a combined total of ground water taken and surface water collection (under "normal" conditions) in the excavation exceeds 50,000 L/day (50 m^3/day) but less than 400,000 L/day (400 m^3/day);
- A Permit to Take Water (PTTW) for construction dewatering purposes when the combined total of ground water taken and surface water collected (under "normal" conditions) in the excavation exceeds 400 m^3/day; and
- A PTTW for the collection and removal of groundwater reporting to the sumps below the base of the elevator pits following construction when the total taken exceeds 50 m^3/day over the long term.

Permits for Construction Activities

The total dewatering rate during construction activities is estimated to be 101,300 L/day (101.3 m^3/day), and is above the MECP threshold of 50 m^3/day for an ESAR registration application but below the MECP threshold of 400 m^3/day for a PTTW application. Therefore, an EASR is required during construction activities.

Permits for Long-Term Dewatering

The total dewatering rate during building occupancy is estimated to be 15,800 L/day (15.8 m^3/day), and is below the MECP threshold of 50 m^3/day for a PTTW application. Therefore, a PTTW is not required during building occupancy.

It is noted that the City of Toronto may require a retention tank to be installed within the building, with the capacity of the dewater rate for one day (i.e. 15.8 m^3).

5.4 Sewer Discharge Permit

It is anticipated that water taken during construction activities and building occupancy, if required, will be discharge to the City of Toronto's municipal sewer system. Permit to discharge water will be required from the City of Toronto in accordance with Toronto Municipal Code, Chapter 681.

The ground water sample collected from monitoring well MW16-1 exceeded both the City of Toronto Sanitary and Combined Sewer Discharge Criteria and the Storm Sewer Discharge Criteria. As a result, a GAC filtration system (at the minimum) will be required to remove the VOC concentrations in ground water to discharge the extracted water to the sanitary and/or combined sewer system, as wells as the storm sewer system. An Environmental Compliance of Approval (ECA) is required for system treating the extracted ground water prior to discharge meeting the City of Toronto Storm Sewer Discharge Criteria.

6.0 IMPACT ASSESSMENT

6.1 Susceptibility Criteria

Several criteria were used to evaluate the potential for an aquifer and/or existing wells being potentially susceptible to the proposed construction related impacts. These criteria included:

- Proximity to the proposed construction;
- Proximity to an excavation;
- Location of ecological features such as streams, ponds and creeks in relation to the proposed development;
- Site conditions; and
- Construction dewatering.

6.2 Assessment of Impacts

The site currently is occupied by two multi-level buildings with a one-level underground parking garage/basement. The prosed development includes with a mixed-use building including retail, office and residential units, with a three-level underground parking garage. The footprint of the current buildings and future building encompass the entire site. The proposed development will not likely significantly increase the non-permeable surfaces at the site, and therefore significant decrease/increase in the infiltration and surface runoff is not expected.

No natural heritage was identified within the estimated radius of influence of 53 m from the site (**Figure 3**). Therefore, the potential of reduced on-site infiltration is unlikely to have an impact on the hydrological and ecological function of the natural features since they are not likely ground water dependent.

Massey Creek is located approximately 1 km from the site, which is greater than the estimated radius of influence of 53 m. As a result, no impact is expected on surface water body or ecosystem due to the proposed construction or potential dewatering.

The MECP water well records identified no well classified as water supply well in 250 m form the site. The area is now serviced with municipal water and it is very unlikely that any water supply well, if exist in the area, is still active. No long-term or short-term impact on wells is expected.

One (1) water taking permit for construction purposes was identified in the vicinity of the site. The water taking permit is for construction water taking, and is located 970 m west of the site, which is beyond the estimated dewatering radius of influence (i.e. 53 m) for this project. Therefore, no

potential negative interference between the existing and proposed water takings (e.g. sharing water resources) is expected.

The estimated radius of influence is approximately 53 m. Several nearby residential houses are located within the radius of influence south and west of the site. The ground settlement due to the dewatering and its impact on the nearby buildings should be evaluated before the commencement of dewatering. According to the soil stratigraphy encountered within the proposed excavation areas, from geotechnical perspectives, no sensitive soils such as marine clay or peat are present. Therefore, no significant subsidence and potential damage to the structure integrity of the buildings within the dewatering radius of influence zone are likely to occur. However, a settlement monitoring program for adjacent structures located within the zone of influence is suggested during the dewatering activities. The condition survey and monitoring program should be developed and carried out by a qualified consultant/surveyor.

The capacity of the municipal storm and sanitary sewer systems in the vicinity of the site is unknown; but, will be confirmed with the City of Toronto prior to the construction/dewatering/discharge activities. A separate discharge permit (either to the storm or sanitary sewer system) will be required from the City of Toronto prior to initiation of dewatering and discharge at the site.

Temporary dewatering rate is estimated to be maximum 101.3 m^3/day during the construction, and is above the MECP threshold of 50 m^3/day for an ESAR registration application but below the MECP threshold of 400 m^3/day for a PTTW application. Therefore, an EASR is required during construction activities.

The total dewatering rate is estimated to be maximum 15.8 m^3/day during building occupancy, and is below the MECP threshold of 50 m^3/day for a PTTW application. Therefore, a PTTW is not required during building occupancy.

6.3 Mitigation/Protection Measures

The following monitoring plan for the monitoring of ground water in the study area is recommended in order to meet expected MECP/Regional requirements:

- Monitor ground water levels before, during and after construction is completed;
- Ensure that any ground water encountered and taken during the construction is maintained, filtered, and released as identified in the Ontario Provincial Standard Specification (OPSS) 518 – Construction Specification for Control of Water from Dewatering Operations during the design and construction phases;

- Ensure that accumulated water discharged from the construction site meets receiver objectives, such as creeks or storm sewer, discharge water sampling should be done weekly for the first month of dewatering, and assuming the water quality is suitable and consistent, monthly thereafter;
- Dewatering discharge, if required, that may be directed to nearby watercourses could potentially alter the physical, chemical, and thermal regime of the receiving watercourses. Erosion control and water retention measures such as rock check dams, discharge via ponds, and silt control should be considered in designing discharge plans to minimize the impacts; and
- Prepare a quarterly monitoring report summarizing the results of the monitoring program during construction.

Should an impact be noted, the following procedures should be undertaken:

- Investigate and confirm the impact of ground water level interference, if any;
- Identify and evaluate remedial options, and select the most cost effective option, if needed;
- Document investigation and remedial actions taken.

7.0 CONCLUSION AND RECOMMENDATIONS

Based on the hydrogeological study completed, the following conclusions and recommendations are presented:

- The site is located in the Don River watershed. Regional ground water flow direction is towards the south towards Massey Creek located approximately 1 km south of the site. Based on the April 3, 3019 ground water monitoring results, shallow and intermediate horizontal ground water flow directions are towards the west.
- Ground water in on-site wells was measured at depths ranging from 0.67 to 13.02 m bgs (elevations ranging from 164.62 to 177.82 m amsl).
- According to MECP's WWIS database, no water supply well was present within 250 m of the proposed construction site. The site and surrounding areas are now serviced with municipal water and use of the water supply well, if any, is highly suspect. Hence, long-term impact to water wells in the area is not expected.
- The proposed site is not within any identified ground water quality threat areas based on the TRCA's approved source protection plan.
- No potential negative interference with the existing water takings is expected within 53 m radius from the site.
- The total dewatering rate during construction activities is estimated to be 101.3 m^3/day, and is above the MECP threshold of 50 m^3/day for an ESAR registration application but below the MECP threshold of 400 m^3/day for a PTTW application. Therefore, an EASR is required during construction activities.
- The total dewatering rate during building occupancy is estimated to be 15.8 m^3/day, and is below the MECP threshold of 50 m^3/day for a PTTW application. Therefore, a PTTW is not required during building occupancy.
- The capacity of the municipal storm and sanitary sewer systems in the vicinity of the site is unknown; but, will be confirmed with the City of Toronto prior to the construction/dewatering/discharge activities.
- It is recommended that the dewatering system be designed by a qualified person and the dewatering operations be conducted by a licensed dewatering contractor.
- Discharge during dewatering operations can potentially be directed into the City of Toronto's sanitary and/or combined sewer system, or the storm sewer system after filtering, provided that a water discharge permit from the City of Toronto is obtained and that ongoing monitoring indicates that the discharge quality meets the relevant municipal sewer use by-law limits. Use of a GAC filtering system (at a minimum) may be necessary to remove VOC concentrations in ground water prior to discharging into municipal sewers.
- A ground water monitoring program should be implemented in the preconstruction, during construction and post construction phases. The monitoring program should include water

level measurement at frequent intervals and water quality monitoring of potentially vulnerable water supply wells, if any present nearby.

- A settlement monitoring program for adjacent structures located within the zone of influence (53 m) is suggested. Condition survey and monitoring program should be developed and carried out by a qualified consultant/surveyor.

8.0 REFERENCES

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9.0 LIMITATION OF LIABILITY, SCOPE OF REPORT AND 3RD PARTY RELIANCE

This report has been prepared and the work referred to in this report has been undertaken by Arcadis Canada Inc. (Arcadis), for the account of Bentall Kennedy (Canada) Limited Partnership, on behalf of Sun Life Assurance Company of Canada (collectively the CLIENT). Any use, reliance on or decision made by any other person other than the CLIENT based on this report is the sole responsibility of such other person. The CLIENT and Arcadis make no representation or warranty to any other person with regard to this report and the work referred to in this report and they accept no duty of care to any other person or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred by any other person as a result of the use of, reliance on, any decision made or any action taken based on this report or the work referred to in this report.

This report has been prepared in accordance with generally accepted engineering and environmental practices for the exclusive use of the CLIENT. This report is based on the historical information provided by the CLIENT and information obtained during this work program.

Third party information reviewed and used to compile the data and conclusions contained in this report is assumed to be complete and correct. Arcadis used this information in good faith and will not accept any responsibility for deficiencies, misinterpretation or incompleteness of the information contained in documents prepared by third parties.

The investigation undertaken by Arcadis with respect to this report and any conclusions or recommendations made in this report reflect Arcadis' judgment based on the site conditions observed at the time of the site inspection on the date(s) set out in this report and on information available at the time of preparation of this report. This report has been prepared for specific application to the site and it is based, in part, upon visual observation of the site, subsurface investigation at discrete locations and depths, and specific analysis of specific chemical parameters and materials during a specific time interval, all as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the site which were unavailable for direct investigation, subsurface locations which were not investigated directly, or chemical parameters, materials or analysis which were not addressed. Substances other than those addressed by the investigation described in this report may exist within the site, substances addressed by the investigation may exist in areas of the site not investigated and concentrations of substances addressed which are different than those reported may exist in areas other than the locations from which samples were taken. Notwithstanding these limitations, this report is believed to provide a reasonable representation of activities completed and site conditions as of the time of this investigation.

If site conditions or applicable standards change or if any additional information becomes available at a future date, modifications to the findings, conclusions and recommendations in this report may be necessary.

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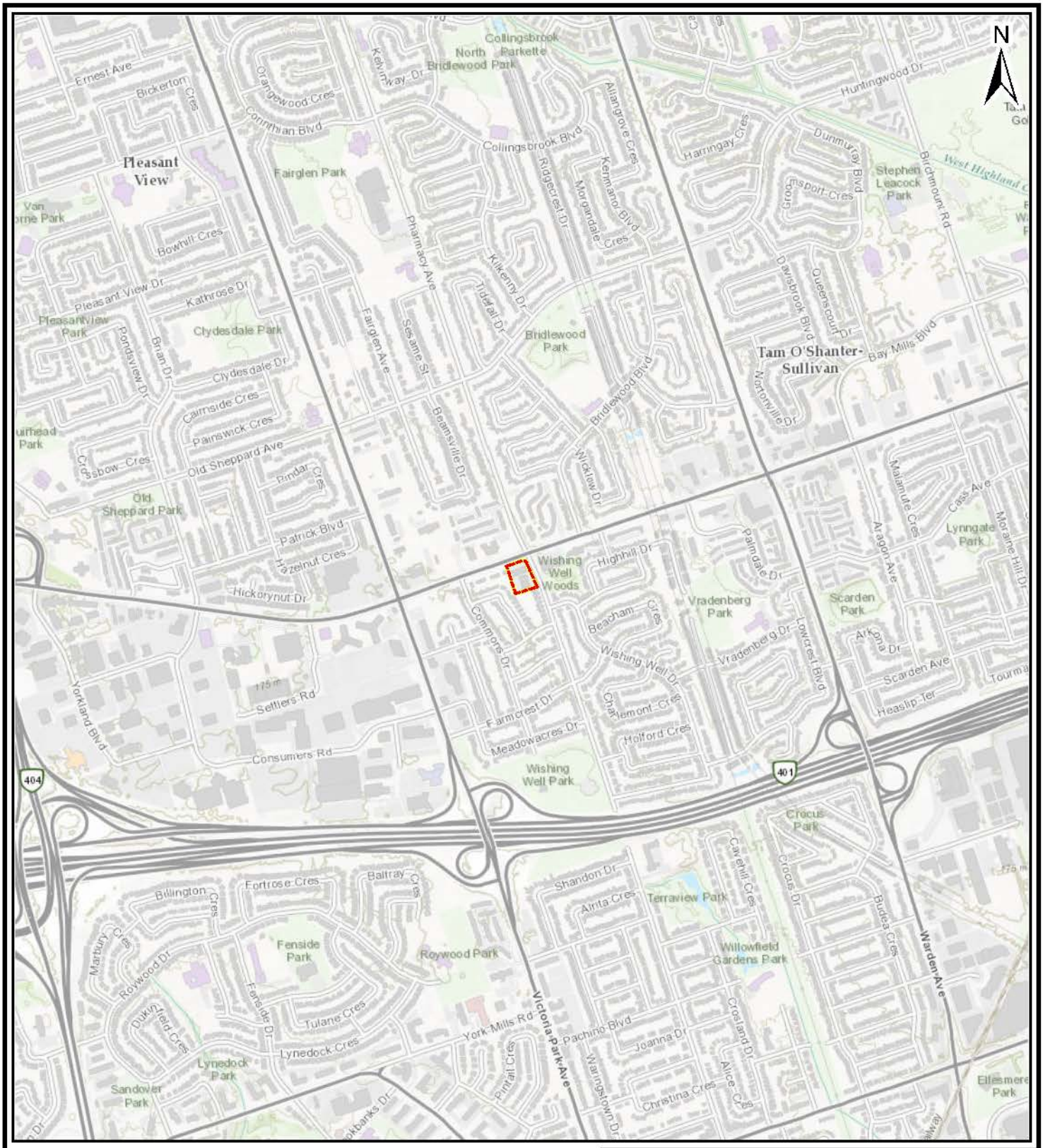
FIGURES



Legend

- Site Boundary

1:17,500

200 100 0 200 400 600 800

Metres

Title:	SITE LOCATION
Project:	HYDROGEOLOGICAL ASSESSMENT 2993-3011 SHEPPARD AVE EAST AND 1800-1814 PHARMACY AVE, SCARBOROUGH, ON
Client:	SHEPPARD PHARMACY GP INC
	ARCADIS
Date:	April 2019
Updated:	May 08, 2019
	FIGURE 1

Layout: 8.5" x 11" (Author: mzarei)

background reference: ESRI ArcGIS Online Base Map

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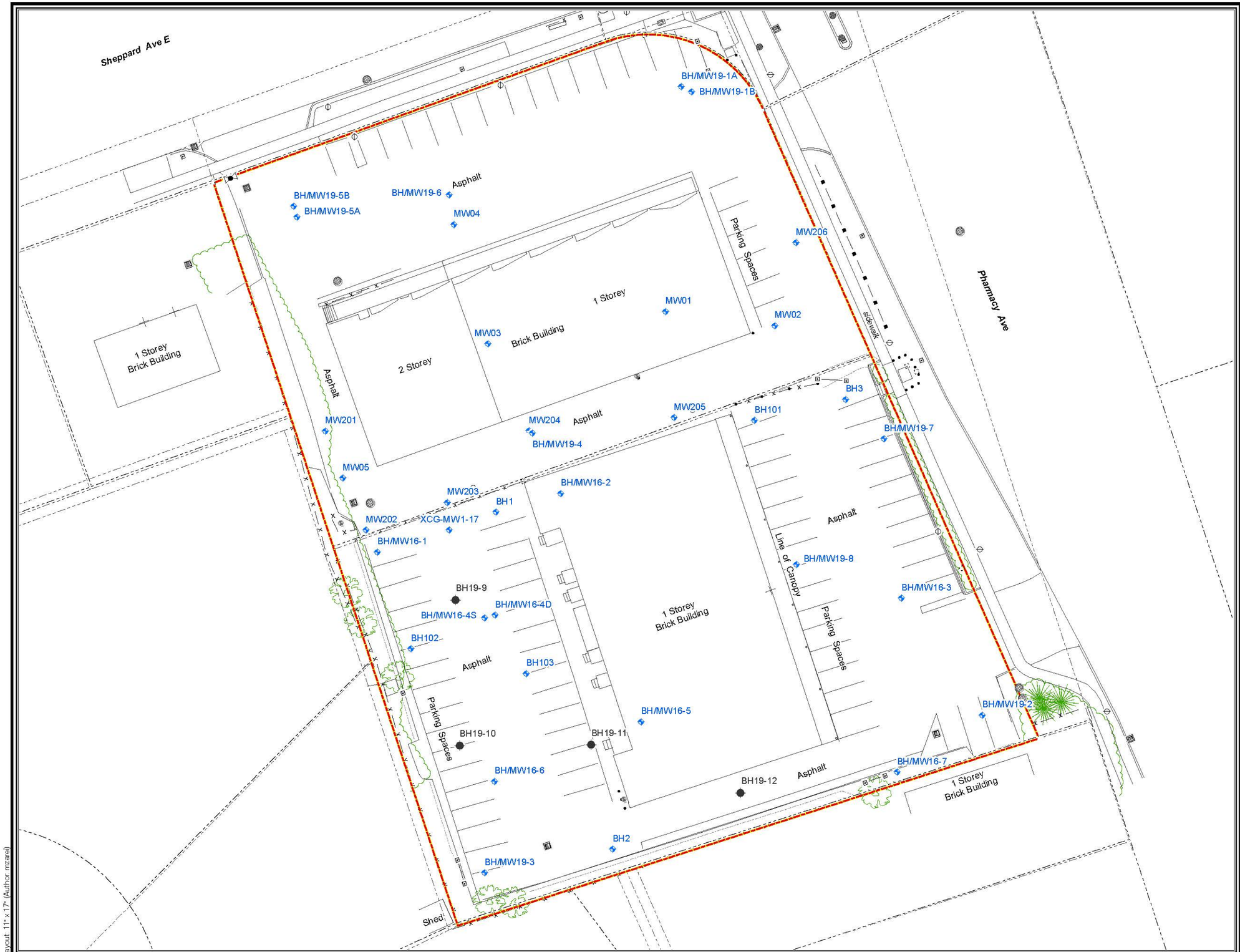

Title:
BOREHOLE AND MONITORING WELL LOCATIONS

Project:
HYDROGEOLOGICAL ASSESSMENT
2993-3011 SHEPPARD AVE EAST AND 1800-1814 PHARMACY AVE, SCARBOROUGH, ON

Client:
SHEPPARD PHARMACY GP INC

ARCADIS

Date: **April 2019**
Updated: **May 23, 2019**
FIGURE 2

Layout: 11" x 17" (Author: mzarei)

Imagery: First Base Solutions, 2018

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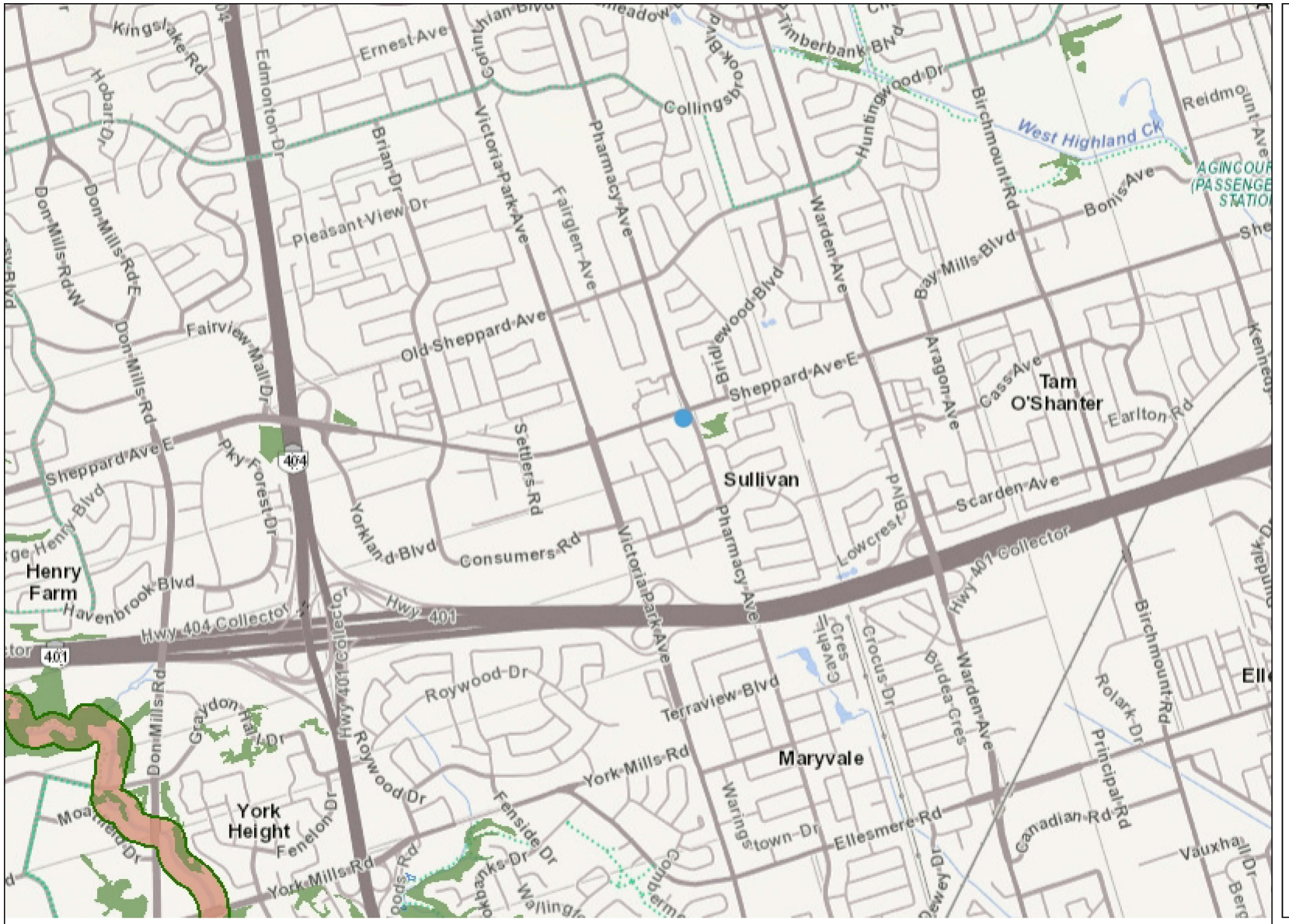
Ontario

Ministry of Natural Resources and Forestry

Make-a-Map: Natural Heritage Areas

Figure 3 - Natural Heritage Map

2993-3011 Sheppard Avenue East and 1800-1814 Pharmacy Avenue
Toronto, ON



Legend

- Assessment Parcel
- Woodland
- Conservation Reserve
- Provincial Park
- Natural Heritage System
- Ecoregion

Wetland
- Provincially Significant Wetland Evaluated
- Non - Provincially Significant Wetland Evaluated
- Unevaluated Wetland

Area of Natural Heritage & Scientific Interest (ANSI)
- Provincially Significant Life Science ANSI
- Provincially Significant Earth Science ANSI

Greenbelt Plan
- Boundary
- River Valley Connections

Land Use Designations
- Protected Countryside
- Towns and Villages
- Hamlets
- Urban River Valley
- Specialty Crop Area

Niagara Escarpment Plan (NEP)
- Boundary
- Parks and Open Space System

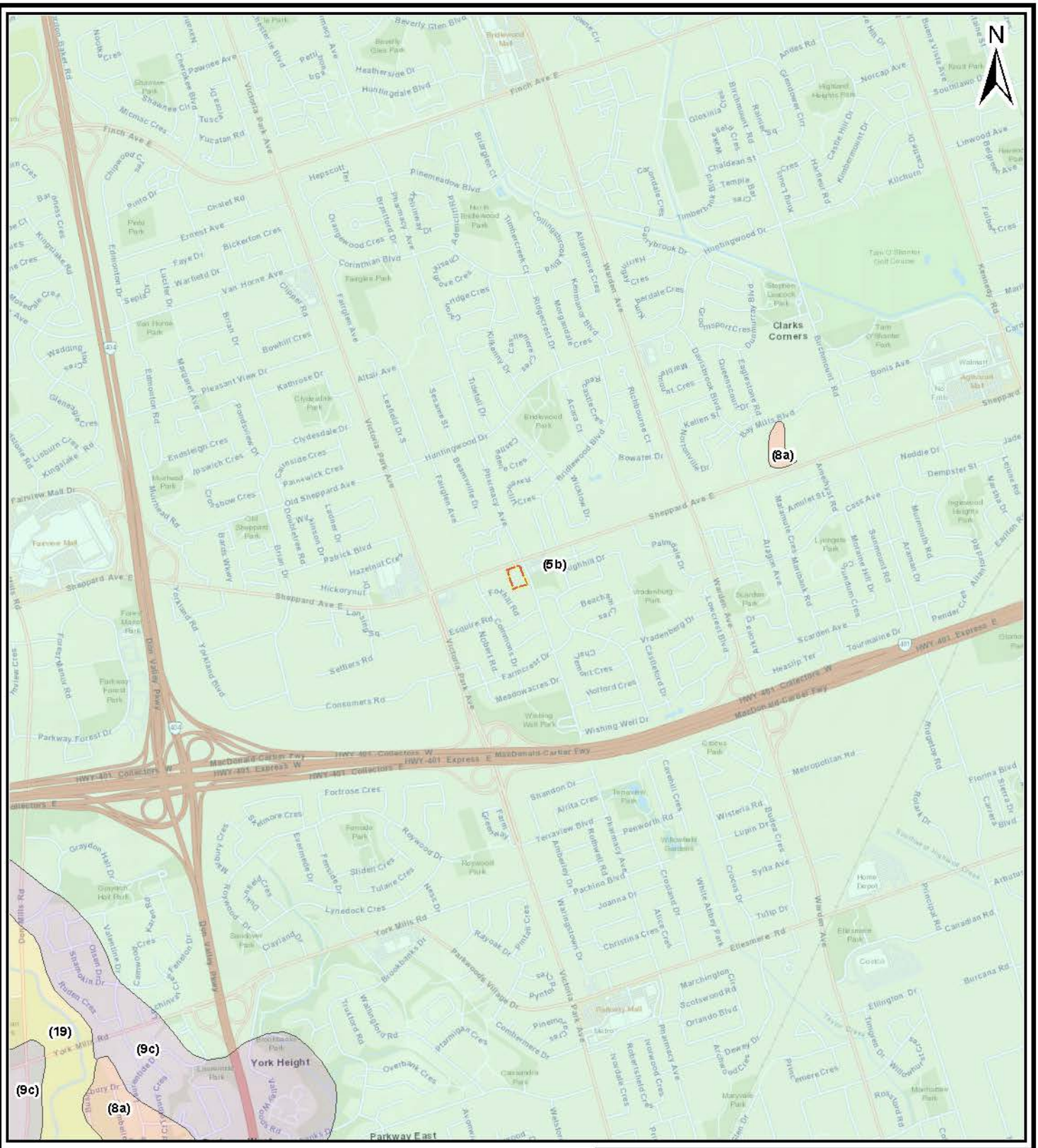
Land Use Designations
- Escarpment Natural Area
- Escarpment Protection Area
- Escarpment Rural Area
- Mineral Resource Extraction Area
- Escarpment Recreation Area
- Urban Area
- Minor Urban Centre

Oak Ridges Moraine Conservation Plan (ORM)
- Boundary

Land Use Designations
- Natural Core Area
- Natural Linkage Area
- Countryside Area
- Rural Settlement
- Palgrave Estates Residential Community
- Settlement Area

1.3 0 0.66 1.3 Kilometers

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Natural Resources and Forestry(OMNRF) shall not be liable in any way for the use of, or reliance upon, this map or any information on this map.



Legend

- Site Boundary
- (19) - River Depostis (Sand and Gravel)
- (9c) - Glacial Lake Deposits (Sand and silty sand; 1-> 50m thick; occurs in basin lows and nearshore flats)
- (8a) - Glacial Lake Deposits (Silt and Clay; massive to laminated)
- (5b) - Glacial Deposits (Sandy silt to sand fill; 3% stone content, stratified interbeds, 1-50m thick)

1:25,000
200 100 0 200 400 600
Metres

Title: **SITE GEOLOGY**

Project: **HYDROGEOLOGICAL ASSESSMENT 2993-3011 SHEPPARD AVE EAST AND 1800-1814 PHARMACY AVE, SCARBOROUGH, ON**

Client: **SHEPPARD PHARMACY GP INC**

ARCADIS

Date: **April 2019**

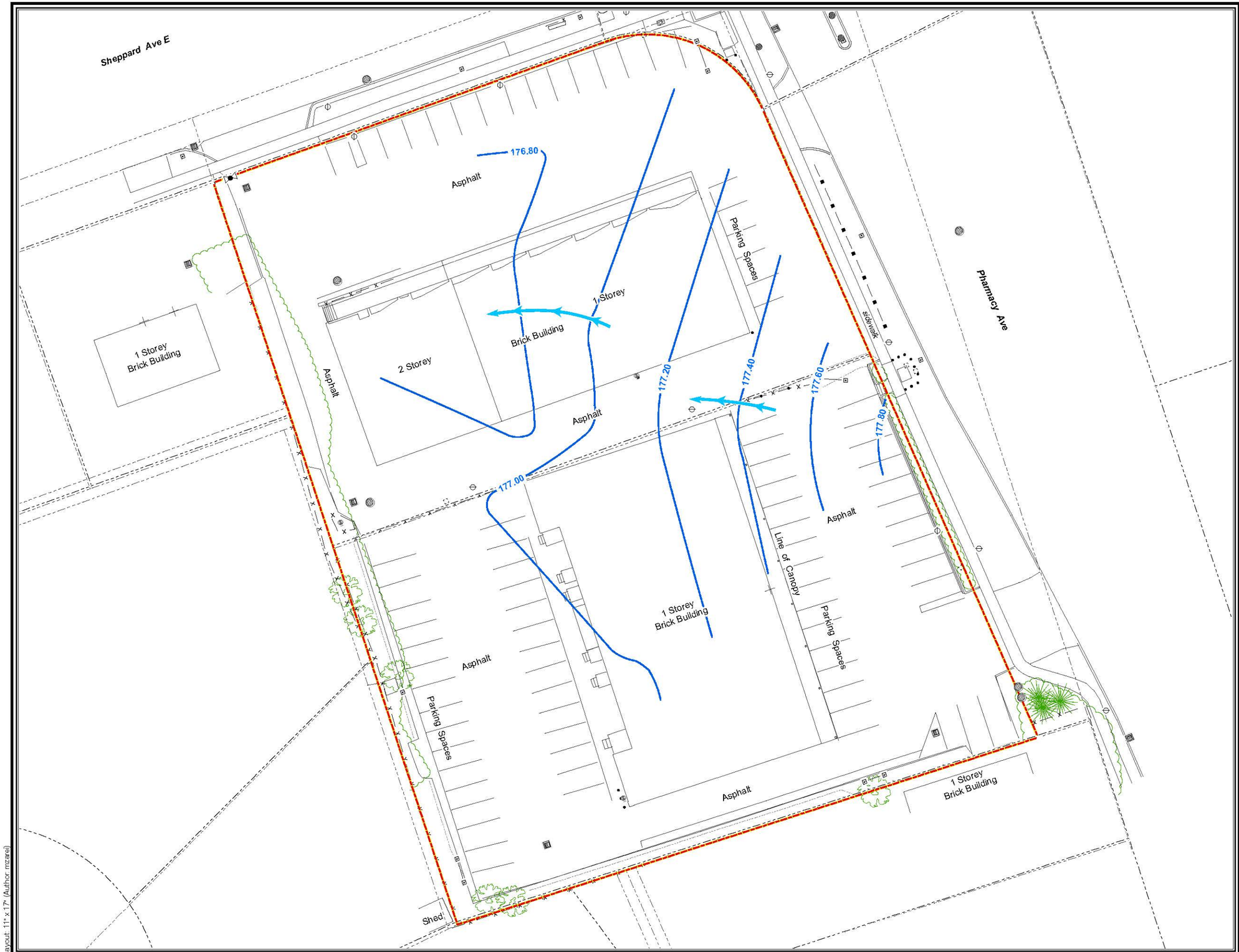
Updated: **May 08, 2019**

FIGURE 4

Ministry of Natural Resources, 1:50,000 Geological Map of Markham (OF8300) & Toronto (OF8336); Layout: 8.5" x 11" (Author: mzarei)

background reference: ESRI ArcGIS Online Base Map

{SA\mzarei} V:\GISProjects_ENV\CDN_GTA\102934_3011_ShappardAveE\000_00001_HydroG\SiteGeology.mxd



N
W E
S

Legend

- Site Boundary
- Property Line
- Fence
- Gaurd Rail
- Utility Manhole
- Catch Basin
- Monitoring Well
- (117.01) - Ground Water Elevation (m asl)
- 177.40 - Ground Water Elevation Contour (m asl)
- Ground Water Flow Direction

1:450

5 2.5 0 5 10 15 20 25 30

Metres

Title: **INTERPRETED SHALLOW HORIZONTAL GROUND WATER FLOW DIRECTIONS (APRIL 3, 2019)**

Project: **HYDROGEOLOGICAL ASSESSMENT 2993-3011 SHEPPARD AVE EAST AND 1800-1814 PHARMACY AVE, SCARBOROUGH, ON**

Client: **SHEPPARD PHARMACY GP INC**

ARCADIS

Date: **April 2019**

Updated: **May 23, 2019**

FIGURE 5

Layout: 11" x 17" (Author: mzare)

Imagery: First Base Solutions, 2018

{SA\mzare} V:\GISProjects_ENV\CDN_GTA\102934_3011_ShappardAveE\000_00001_HydroG\GWT_contours_190403_SOB.mxd

N
W E
S

Legend

- Site Boundary
- Property Line
- Fence
- Gaurd Rail
- Utility Manhole
- Catch Basin
- Monitoring Well
- (117.01) - Ground Water Elevation (m asl)
- 177.70 - Ground Water Elevation Contour (m asl)
- Ground Water Flow Direction

1:450

5 2.5 0 5 10 15 20 25 30

Metres

Title: **INTERPRETED INTERMEDIATE DEEP HORIZONTAL GROUND WATER FLOW DIRECTIONS (APRIL 3, 2019)**

Project:

HYDROGEOLOGICAL ASSESSMENT
2993-3011 SHEPPARD AVE EAST AND 1800-1814 PHARMACY AVE, SCARBOROUGH, ON

Client:

SHEPPARD PHARMACY GP INC

ARCADIS

Date: **April 2019**

Updated: **May 23, 2019**

FIGURE 6

Layout: 11" x 17" (Author: mzarei)

Imagery: First Base Solutions, 2018

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Well Number	Date	Use	Well Depth (m)	Geology (Depth to Base in m)	Approximate Depth to Water Table (m)
7272218	2016	Monitoring and Test Hole	4.3 m	Grey Other (0.2) Brown Sand/Silt (1.5) Grey Silt/Sand (3) Grey Silt Clay (4.3)	Not Listed
7227424	2014	Monitoring	7.6 m	Black Gravel (0.2) Brown Gravel/Sand (0.3) Brown Silt/Sand (5.2) Grey Silt/Clay (7.6)	Not Listed
7236367	2014	Monitoring and Test Hole	3 m	Grey Other (0.2) Brown Clay/Silt (0.9) Brown Sand/Silt (3)	Not Listed
7236368	2014	Monitoring and Test Hole	3.7 m	Grey Other (0.2) Brown Clay/Silt (0.9) Brown Sand/Silt (3.7)	Not listed
7269949	2016	Monitoring and Test Hole	7.9 m	Black Other (0.2) Brown Fill/Gravel (2.1) Brown Silt/Sand (4) Brown Silt (6) Grey Clay/Silt (7.9)	Not Listed
7269950	2016	Monitoring and Test Hole	6 m	Black Other (0.2) Brown Sand/Gravel (0.3) Brown Silt/Clay (3.7) Grey Silt/Clay (6)	Not Listed
7236369	2014	Monitoring and Test Hole	7.6 m	Black Other (0.2) Brown Sand/Gravel (0.3) Brown Sand/Silt (5.5) Grey Sand/Silt (7.6)	Not Listed
7272219	2016	Monitoring and Test Hole	4.6 m	Grey Other (0.2) Brown Fill/Sand (1.5) Grey Sand/Silt (3) Grey Silt/Sand (4.6)	Not Listed
7269948	2016	Monitoring and Test Hole	6 m	Black Other (0.2) Brown Fill/Gravel (1.8) Brown Silt/Sand (4) Brown Silt/Clay (6)	Not Listed
7252860	2015	Not Listed	Not Listed	Not Listed	Not Listed
7236370	2014	Monitoring and Test Hole	8.5 m	Black Other (0.2) Brown Sand/Gravel (0.3) Brown Sand/Silt (6) Grey Sand/Silt (8.5)	Not Listed
7272217	2016	Monitoring and Test Hole	9.1 m	Black Other (0.2) Brown Fill/Gravel (2.1) Brown Sand/Silt (3.4) Grey Silt/Clay (6.7) Brown Sand/Silt (9.1)	Not Listed
7269951	2016	Monitoring and Test Hole	6 m	Black Other (0.2) Brown Sand/Gravel (0.3) Brown Silt/Clay (3.7) Grey Silt/Clay (6)	Not Listed
7269952	2016	Monitoring and Test Hole	6 m	Brown Topsoil (0.3) Brown Sand/Silt (3) Grey Silt/Clay (6)	Not Listed
7261643	2016	Monitoring	9.1 m	Brown Sand/Gravel (1.5) Brown Silt/Sand (6) Grey Silt/Sand (9.1)	7.6 m
7266684	2014	Not Listed	Not Listed	Not Listed	Not Listed
7261642	2016	Monitoring	9.1 m	Brown Sand/Gravel (1) Brown Silt/Sand (5.6 Grey Silt/Sand (9.1)	7.6 m
7259870	2015	Monitoring and Test Hole	3 m	Brown Fill/Silt (2.2) Grey Sand/Silt (3)	1 m

N
W E
S

Legend

- Site Boundary
- Property Line
- MECP Water Well Record Location

1:2,500

30 15 0 30 60 90 120 150

Metres

Title:
WATER WELL USE MAP

Project:
HYDROGEOLOGICAL ASSESSMENT
2993-3011 SHEPPARD AVE EAST AND 1800-1814 PHARMACY AVE, SCARBOROUGH, ON

Client:
SHEPPARD PHARMACY GP INC

ARCADIS

Date: **April 2019**

Updated: **May 23, 2019**

FIGURE 7

Layout: 11"x 17" (Author: mzarei)

imagery: First Base Solutions, 2018

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APPENDIX A – BOREHOLE LOGS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-6** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Strata Drilling Group**

Drilling Method: **Geoprobe 7822DT - Direct Push**

Borehole: **BH/MW19-1A**

Monitoring Well: **Installed**

Sheet 1 of 1

Scale (m)	Elev. (m) Depth (m)	Description (Ground Surface Elevation: 179.21m)	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
	179.11 0.10	**ASPHALT** - 100 mm -Borehole Augered to 4 m - Lithology assumed as BH19-1B											
		GRAVELLY SAND (FILL), brown, dry to moist, compact											
	178.45 0.76	**SILTY CLAY (NATIVE)**, dark brown, moist, some grey mottling, soft											
1													
		-becomes clayey silt, moist to wet, trace gravel, firm @ 1.52 m											
2					▽								
	176.92 2.29	**SILT**, brown, moist, trace gravel, dense to very dense -dark brown oxidation from 2.29 to 3.81 m											
3													
		-gravel in mouth of spoon @ 3.66 m											
		-becomes dry to moist, orange-brown oxidation @ 3.81 m											
4	175.21 4.00	**End of Borehole @ 4.00 m** Water Level @ 3.10 m bgs (el. 176.10) on 21 Mar. 2019 Water Level @ 2.20 m bgs (el. 177.01) on 3 Apr. 2019											Groundwater Analyzed for: Metals, PAHs, PHCs, PCBs, VOCs
5													

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-12** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Geo-Environmental Drillilng Inc.**

Drilling Method: **CME 75 Truckmount w/ HSA**

Borehole: **BH/MW19-1B**

Monitoring Well: **Installed**

Sheet 1 of 4

Scale (m)	Elev. (m) Depth (m)	Description (Ground Surface Elevation: 179.27m)	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
	179.17	**ASPHALT** - 100 mm				SS-1		8 6 5 3	17		N	⊕	
	0.10	**GRAVELLY SAND (FILL)**, brown, dry to moist, compact											
	178.51												
1	0.76	**SILTY CLAY (NATIVE)**, dark brown, moist, some grey mottling, soft				SS-2		2 2 2 3	50		N	⊕	Analyses: Metals, PAHs, PHCs, VOCs PCBs, pH
		-becomes clayey silt, moist to wet, trace gravel, firm @ 1.52 m				SS-3		2 3 5 11	88		N	⊕	
2													
	176.98												
	2.29	**SILT**, brown, moist, trace gravel, dense to very dense -dark brown oxidation from 2.29 to 3.81 m				SS-4		7 12 18 30	92		N	⊕	
3						SS-5		16 12 24 50/ 75 mm	86		N	⊕	Analyses: Metals, PAHs, PCBs, pH
		-gravel in mouth of spoon @ 3.66 m											
		-becomes dry to moist @ 3.81 m				SS-6		26 50/ 125 mm	100		N	⊕	Analyses: PHCs, VOCs
4		-orange-brown oxidation from 3.81 to 5.33 m											
						SS-7		40 50/ 75 mm	67		N	⊕	
5													
		-gravel @ 5.18 m											
		-becomes grey, trace sand @ 5.33 m				SS-8		26 50/ 100 mm	80		N	⊕	

Continued

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-12** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Geo-Environmental Drillilng Inc.**

Drilling Method: **CME 75 Truckmount w/ HSA**

Borehole: **BH/MW19-1B**

Monitoring Well: **Installed**

Sheet 2 of 4

Scale (m)	Stratigraphy: Elev. (m) Depth (m)	Description	Symbol	Samples: Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
	173.02												
	6.25	**SAND**, grey, wet, dense				SS-9		12 20 29 40	75		N	⊕	
	172.72												
7	6.55	**SILT**, grey, moist, trace gravel, very dense			▽	SS-10		24 33 29 47	75		N	⊕	
						SS-11		20 28 38 40	75		N	⊕	
8						SS-12		22 30 32 50/ 100 mm	73		N	⊕	
9						SS-13		16 30 40 45	75		N	⊕	
10													
						SS-14		17 25 32 33	75		N	⊕	
11													

Continued

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-12** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Geo-Environmental Drillilng Inc.**

Drilling Method: **CME 75 Truckmount w/ HSA**

Borehole: **BH/MW19-1B**

Monitoring Well: **Installed**

Sheet 3 of 4

Scale (m)	Stratigraphy: Elev. (m) Depth (m)	Stratigraphy: Description	Stratigraphy: Symbol	Samples: Well Details	Samples: Water Level	Samples: Sample Type and Number	Samples: Condition	Samples: Blows/ 300mm	Samples: % Recovery	Samples: RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
		-becomes wet, compact, trace clay @ 12.19 m				SS-15		7 8 9 10	75		N	⊕	
13													
						SS-16		3 6 5 8	83		N	⊕	
14													
15	164.03 15.24	**CLAYEY SILT**, grey, wet, trace gravel, stiff				SS-17		4 7 7 7	75		N	⊕	
16													
		-becomes firm @ 16.76 m				SS-18		1 2 3 4	100		N	⊕	
17													

Continued

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-12** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Geo-Environmental Drillilng Inc.**

Drilling Method: **CME 75 Truckmount w/ HSA**

Borehole: **BH/MW19-1B**

Monitoring Well: **Installed**

Sheet 4 of 4

Scale (m)	Stratigraphy: Elev. (m) Depth (m)	Stratigraphy: Description	Stratigraphy: Symbol	Samples: Well Details	Samples: Water Level	Samples: Sample Type and Number	Samples: Condition	Samples: Blows/ 300mm	Samples: % Recovery	Samples: RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
		-trace sand @ 18.29 m				SS-19		1 3 5 7	83		N		
19	160.37 18.90	**End of Borehole @ 18.90 m** Water Level @ 7.60 m bgs (el. 171.67) on 21 Mar. 2019 Water Level @ 7.53 m bgs (el. 171.75) on 3 Apr. 2019											
20													
21													
22													
23													

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-14** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Geo-Environmental Drillilng Inc.**

Drilling Method: **CME 75 Truckmount w/ HSA**

Borehole: **BH/MW19-2**

Monitoring Well: **Installed**

Sheet 1 of 4

Scale (m)	Elev. (m) Depth (m)	Description (Ground Surface Elevation: 178.66m)	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
	178.56	**ASPHALT** - 100 mm				SS-1		24	75		N	⊕	
	0.10	**SAND AND GRAVEL (FILL)**, brown, dry						16					
	178.36							24					
	0.30	**SANDY SILT (NATIVE)**, brown, moist, trace gravel, dense						24					
	177.90												
	0.76	**SILT**, dark brown to brown, moist, trace gravel, loose				SS-2		7	83		N	⊕	
1		-trace fine sand from 0.76 to 2.29 m						3					
								4					
								6					
		-trace to some orange-brown oxidation from 1.52 to 6.10 m				SS-3		2	75		N	⊕	
								3					
2								4					
								7					
		-becomes compact @ 2.29 m				SS-4		7	100		N	⊕	
								9					
								15					
								26					
3		-becomes very dense @ 3.05 m				SS-5		18	79		N	⊕	
								28					
								35					
								41					
						SS-6		20	100		N	⊕	
4								38					
								50/ 125 mm					
						SS-7		22	94		N	⊕	
								26					
								50/ 125 mm					
5													
		-becomes brown-grey @ 5.33 m				SS-8		22	83		N	⊕	
								30					
								38					
								35					

Continued

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-14** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Geo-Environmental Drillilng Inc.**

Drilling Method: **CME 75 Truckmount w/ HSA**

Borehole: **BH/MW19-2**

Monitoring Well: **Installed**

Sheet 2 of 4

Scale (m)	Stratigraphy: Elev. (m) Depth (m)	Stratigraphy: Description	Stratigraphy: Symbol	Samples: Well Details	Samples: Water Level	Samples: Sample Type and Number	Samples: Condition	Samples: Blows/ 300mm	Samples: % Recovery	Samples: RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
		-becomes grey, compact @ 6.10 m				SS-9		9 12 15 22	92		N		
7		-becomes very dense @ 6.86 m				SS-10		15 27 35 32	75		N		
						SS-11		22 32 36 50/ 100 mm	75		N		
8						SS-12		26 50/ 100 mm	100		N		
9					▽	SS-13		21 35 40 50/ 125 mm	61		N		
10													
						SS-14		16 29 38 42	67		N		
11													

Continued

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-14** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Geo-Environmental Drillilng Inc.**

Drilling Method: **CME 75 Truckmount w/ HSA**

Borehole: **BH/MW19-2**

Monitoring Well: **Installed**

Sheet 3 of 4

Scale (m)	Elev. (m) Depth (m)	Description	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
13		-becomes moist to wet, trace sand, dense to compact @ 12.19 m				SS-15		11 15 19 19	75		N		
14						SS-16		6 11 18 18	75		N		
15	163.42 15.24	**SANDY SILT**, grey, moist to wet, trace gravel, compact				SS-17		8 8 15 20	50		N		
16	161.90 16.76	**SILT**, grey, moist to wet, trace gravel, trace sand, compact				SS-18		9 11 11 14	63		N		
17													

Continued

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-14** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Geo-Environmental Drillilng Inc.**

Drilling Method: **CME 75 Truckmount w/ HSA**

Borehole: **BH/MW19-2**

Monitoring Well: **Installed**

Sheet 4 of 4

Scale (m)	Elev. (m) Depth (m)	Description	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
	160.37												
	18.29	**SANDY SILT**, grey, wet, trace gravel, very loose to loose				SS-19		1 2 2 2	67		N	⊕	
	159.76												
19	18.90	**End of Borehole @ 18.90 m** Water Level @ 9.64 m bgs (el. 169.03) on 21 Mar. 2019 Water Level @ 9.53 m bgs (el. 169.13) on 3 Apr. 2019											
20													
21													
22													
23													

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-15** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Geo-Environmental Drillilng Inc.**

Drilling Method: **CME 75 Truckmount w/ HSA**

Borehole: **BH/MW19-3**

Monitoring Well: **Installed**

Sheet 1 of 4

Scale (m)	Elev. (m) Depth (m)	Description (Ground Surface Elevation: 177.64m)	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
	177.54	**ASPHALT** - 100 mm				SS-1		10	75		N	⊕	Analyses: Metals, PAHs, pH
	0.10	**SAND AND GRAVEL (FILL)**, brown, moist to wet						10					
	177.34							8					
	0.30	**SILTY SAND (NATIVE)**, brown, some dark brown, moist to wet, trace gravel, loose						4					
1						SS-2		2	50		N	⊕	Analyses: PAHs
								3					
								5					
								5					
	176.12												
	1.52	**SANDY CLAYEY SILT**, brown, moist to wet, trace gravel, firm				SS-3		3	50		N	⊕	
2								3					
								2					
								3					
	175.35												
	2.29	**SILT**, brown, moist, trace gravel, trace gravel, oxidation, compact to dense				SS-4		6	100		N	⊕	
								11					
								15					
								17					
3						SS-5		8	75		N	⊕	Analyses: Metals, PAHs, PHCs, VOCs
								16					
								22					
								35					
		-becomes very dense @ 3.81 m				SS-6		12	100		N	⊕	
4								18					
								35					
								33					
		-becomes dense @ 4.57 m				SS-7		12	67		N	⊕	Analyses: PHCs, VOCs
								20					
5								26					
								42					
		-becomes brown-grey @ 5.33 m				SS-8		23	92		N	⊕	
								31					
								16					
								20					

Continued

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-15** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Geo-Environmental Drillilng Inc.**

Drilling Method: **CME 75 Truckmount w/ HSA**

Borehole: **BH/MW19-3**

Monitoring Well: **Installed**

Sheet 2 of 4

Scale (m)	Elev. (m) Depth (m)	Description	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
	171.54												
	6.10	**CLAYEY SILT**, grey, moist, crushed rock in mouth of spoon -boulder from 6.25 to 6.55 m				SS-9		6 50/ 50 mm	100		N	⊕	
7	170.63												
	7.01	**SILT**, grey, moist to wet, trace gravel, dense -trace sand from 7.01 to 7.62 m				SS-10		12 15 20 28	58		N	⊕	
						SS-11		7 15 18 22	83		N	⊕	
8													
	169.26												
	8.38	**SANDY SILT**, grey, moist to wet, trace gravel, very dense				SS-12		10 25 38 48	75		N	⊕	
9													
		-becomes compact @ 9.14 m				SS-13		12 15 11 9	83		N	⊕	
10													
	166.97												
	10.67	**SILT**, grey, moist, trace gravel, trace fine sand, very dense to dense				SS-14		16 22 38 35	75		N	⊕	
11													

Continued

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-15** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Geo-Environmental Drillilng Inc.**

Drilling Method: **CME 75 Truckmount w/ HSA**

Borehole: **BH/MW19-3**

Monitoring Well: **Installed**

Sheet 3 of 4

Scale (m)	Elev. (m) Depth (m)	Description	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
13					▽	SS-15		12 20 20 26	75		N	⊕	
	163.92 13.72	**SANDY CLAYEY SILT**, grey, wet, trace gravel, firm				SS-16		4 4 4 6	100		N	⊕	
14													
15													
	162.40 15.24	**SANDY SILT**, grey, wet, trace gravel, loose				SS-17		3 4 5 5	75		N	⊕	
16													
						SS-18		6 4 5 7	75		N	⊕	
17													

Continued

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-15** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Geo-Environmental Drillilng Inc.**

Drilling Method: **CME 75 Truckmount w/ HSA**

Borehole: **BH/MW19-3**

Monitoring Well: **Installed**

Sheet 4 of 4

Scale (m)	Elev. (m) Depth (m)	Description	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
	159.35												
	18.29	**SILT**, grey, wet, very loose to loose				SS-19		2 2 2 3	42		N	⊕	
	158.74												
19	18.90	**End of Borehole @ 18.90 m** Water Level @ 13.02 m bgs (el. 164.62) on 21 Mar. 2019 Water Level @ 12.88 m bgs (el. 164.77) on 3 Apr. 2019											
20													
21													
22													
23													

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-13** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Geo-Environmental Drillilng Inc.**

Drilling Method: **CME 75 Truckmount w/ HSA**

Borehole: **BH/MW19-4**

Monitoring Well: **Installed**

Sheet 1 of 4

Scale (m)	Elev. (m) Depth (m)	Description (Ground Surface Elevation: 178.41m)	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
		-hole daylighted from 0 to 2.13 m											
1													
2													
	176.12 2.29	**CLAYEY SILT (NATIVE)**, brown, wet to moist, trace gravel, some oxidation staining, stiff to very stiff				SS-4		3 6 7 11	83		N	⊕	
3						SS-5		6 8 14 22	100		N	⊕	
	174.60 3.81	**SILT**, brown, moist, trace gravel, very dense -orange-brown oxidation staining from 3.81 to 6.10 m				SS-6		11 20 33 43	75		N	⊕	Analyses: PHCs, VOCs
4						SS-7		17 30 35 45	100		N	⊕	
5						SS-8		12 33 50/ 125 mm	71		N	⊕	Analyses: PHCs, VOCs

Continued

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-13** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Geo-Environmental Drillilng Inc.**

Drilling Method: **CME 75 Truckmount w/ HSA**

Borehole: **BH/MW19-4**

Monitoring Well: **Installed**

Sheet 2 of 4

Scale (m)	Elev. (m) Depth (m)	Description	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
		-becomes grey, dry to moist, dense @ 6.10 m				SS-9		15 23 20 27	100		N	⊕	
7		-becomes moist to wet, very dense @ 6.86 m				SS-10		14 24 34 40	75		N	⊕	
						SS-11		18 32 36 40	75		N	⊕	
8						SS-12		10 25 27 32	75		N	⊕	
9		-fine sand layer from 8.92 to 9.00 m				SS-13		19 30 39 40	75		N	⊕	
10													
		-becomes moist, dense, trace gravel ends @ 10.67 m				SS-14		10 16 18 23	100		N	⊕	
11													

Continued

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-13** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Geo-Environmental Drillilng Inc.**

Drilling Method: **CME 75 Truckmount w/ HSA**

Borehole: **BH/MW19-4**

Monitoring Well: **Installed**

Sheet 3 of 4

Scale (m)	Stratigraphy: Elev. (m) Depth (m)	Stratigraphy: Description	Stratigraphy: Symbol	Samples: Well Details	Samples: Water Level	Samples: Sample Type and Number	Samples: Condition	Samples: Blows/300mm	Samples: % Recovery	Samples: RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
13		-becomes moist to wet, compact, trace gravel, trace fine sand begin @ 12.19 m				SS-15		6 11 10 9	100		N	⊕	
	164.69 13.72	**SANDY SILT**, grey, moist to wet, loose, trace gravel				SS-16		2 4 4 7	92		N	⊕	
14													
15						SS-17		3 3 5 5	100		N	⊕	
16													
17						SS-18		2 3 4 8	92		N	⊕	

Continued

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-13** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Geo-Environmental Drillilng Inc.**

Drilling Method: **CME 75 Truckmount w/ HSA**

Borehole: **BH/MW19-4**

Monitoring Well: **Installed**

Sheet 4 of 4

Scale (m)	Elev. (m) Depth (m)	Description	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
19						SS-19		2 4 5 7	100		N		
20	158.60 19.81	**SILT**, grey, wet, trace gravel, trace sand, compact				SS-20		4 6 8 10	92		N		
21	157.07 21.34	**CLAYEY SILT**, grey, moist to wet, trace gravel, very stiff				SS-21		4 6 10 15	100		N		
22	156.46 21.95	**End of Borehole @ 21.95 m** Water Level @ 5.95 m bgs (el. 172.46) on 21 Mar. 2019 Water Level @ 5.81 m bgs (el. 172.60) on 3 Apr. 2019											Groundwater Analyzed for: PHCs, VOCs
23													

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-6** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Strata Drilling Group**

Drilling Method: **Geoprobe 7822DT - Direct Push**

Borehole: **BH/MW19-5A**

Monitoring Well: **Installed**

Sheet 1 of 1

Scale (m)	Elev. (m) Depth (m)	Description (Ground Surface Elevation: 178.16m)	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
	178.06	**ASPHALT** - 100 mm											
	0.10	-Borehole Augered to 4 m - Lithology assumed as BH19-5B											
	177.86												
	0.30	**SAND AND GRAVEL (FILL)**, brown, dry											
		SILT (NATIVE), brown, moist, trace clay											
	177.40												
	0.76	**CLAYEY SILT**, dark brown to brown, moist											
1		-trace orange-brown oxidation from 0.76 to 1.52 m											
		-grey mottling from 1.52 to 2.29 m			▽								
		-trace gravel begins @ 1.52 m											
2		-oxidation from 2.29 to 3.05 m											
3		-becomes wet @ 3.05 m											
	174.35												
	3.81	**SILT**, brown, moist, trace gravel, oxidation											
4	174.16												
	4.00	**End of Borehole @ 4.00 m**											Groundwater analyzed for: Metals, PAHs, PHCs, VOCs
		Water Level @ 1.57 m bgs (el. 176.59) on 21 Mar. 2019											
		Water Level @ 1.54 m bgs (el. 176.62) on 3 Apr. 2019											
5													

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-6** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Strata Drilling Group**

Drilling Method: **Geoprobe 7822DT - Direct Push**

Borehole: **BH/MW19-5B**

Monitoring Well: **Installed**

Sheet 1 of 2

Ground Surface Elevation: 178.06m

Scale (m)	Elev. (m) Depth (m)	Description	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
	177.96	**ASPHALT** - 100 mm				SS-1			100		N	⊕	Analyzed for: Metals
	0.10	**SAND AND GRAVEL (FILL)**, brown, dry											
	177.76												
	0.30	**SILT (NATIVE)**, brown, moist, trace clay											
	177.30												
	0.76	**CLAYEY SILT**, dark brown to brown, moist -trace orange-brown oxidation from 0.76 to 1.52 m				SS-2			100		N	⊕	Analyzed for: PAHs
1													
		-grey mottling from 1.52 to 2.29 m -trace gravel begins @ 1.52 m			▽	SS-3			100		N	⊕	
2													
		-oxidation from 2.29 to 3.05 m				SS-4			100		N	⊕	
3													
		-becomes wet @ 3.05 m				SS-5			100		N	⊕	Analyzed for: Metals, PAHs, PHCs, VOCs
	174.25												
	3.81	**SILT**, brown, moist, trace gravel -oxidation from 3.81 to 4.57 m				SS-6			100		N	⊕	Analyzed for: PHCs, VOCs
4													
						SS-7			100		N	⊕	
5													
	172.73												
	5.33	**SANDY SILT**, brown, moist				SS-8			100		N	⊕	
		-becomes grey @ 5.79 m											

Continued

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-6** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Strata Drilling Group**

Drilling Method: **Geoprobe 7822DT - Direct Push**

Borehole: **BH/MW19-5B**

Monitoring Well: **Installed**

Sheet 2 of 2

Scale (m)	Elev. (m) Depth (m)	Description	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
	171.96												
	6.10	**SILT**, grey, moist to wet				SS-9			100		N	⊕	
7						SS-10			100		N	⊕	
	170.44												
	7.62	**End of Borehole @ 7.62 m** Water Level @ 1.58 m bgs (el. 176.48) on 21 Mar. 2019 Water Level @ 1.68 m bgs (el. 176.38) on 3 Apr. 2019											Groundwater analyzed for: PHCs, VOCs
8													
9													
10													
11													

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-7** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Strata Drilling Group**

Drilling Method: **Geoprobe 7822DT - Direct Push**

Borehole: **BH/MW19-6**

Monitoring Well: **Installed**

Sheet 1 of 1

Scale (m)	Elev. (m) Depth (m)	Description (Ground Surface Elevation: 178.86m)	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
0	178.79 0.08	**ASPHALT** - 75 mm				SS-1			80		N	⊕	Analyzed for: Metals, PHCs, pH
	178.56 0.30	**SAND AND GRAVEL (FILL)**, dry, crushed red brick present											
		SILT (NATIVE), brown to grey, moist -trace gravel from 0.3 to 0.76 m											
1		-becomes dark brown, trace grey mottling @ 0.76 m				SS-2			80		N	⊕	Analyzed for: PAHs
	177.34 1.52	**SILTY CLAY**, dark brown, moist to wet				SS-3			90		N	⊕	Analyzed for: PHCs, VOCs
2		-becomes brown, trace gravel, some grey mottling @ 2.29 m			▽	SS-4			90		N	⊕	Analyzed for: Metals, PAHs
3	175.81 3.05	**SANDY SILT**, brown, moist, trace gravel, trace oxidation				SS-5			100		N	⊕	Analyzed for: PHCs, VOCs, pH
4						SS-6			100		N	⊕	
	174.29 4.57	**End of Borehole @ 4.57 m**											Groundwater analyzed for: PHCs, VOCs
5		Water Level @ 2.46 m bgs (el. 176.40) on 21 Mar. 2019 Water Level @ 2.22 m bgs (el. 176.64) on 3 Apr. 2019											

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-7** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Strata Drilling Group**

Drilling Method: **Geoprobe 7822DT - Direct Push**

Borehole: **BH/MW19-7**

Monitoring Well: **Installed**

Sheet 1 of 2

Scale (m)	Elev. (m) Depth (m)	Description (Ground Surface Elevation: 178.76m)	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
	178.66	**ASPHALT** - 100 mm				SS-1			90		N	⊕	Analyzed for: Metals, PAHs
	0.10	**SANDY GRAVELLY SILT (FILL)**, brown, dry											
	178.00												
	0.76	**CLAYEY SILT (FILL)**, dark brown to brown, moist, trace gravel			▽	SS-2			90		N	⊕	Analyzed for: PAHs, PHCs
1		-crushed red brick from 1.52 to 1.83 m				SS-3			100		N	⊕	
	176.93												
	1.83	**CLAYEY SILT (NATIVE)**, dark brown to brown, moist, trace gravel											
2		-orange-brown oxidation from 2.29 to 3.05 m				SS-4			100		N	⊕	Analyzed for: Metals, PAHs
3						SS-5			100		N	⊕	
	174.95												
	3.81	**SILT**, brown, moist, trace gravel				SS-6					N	⊕	
4		-oxidation from 3.81 to 5.49 m											
						SS-7			100		N	⊕	Analyzed for: PHCs, VOCs
5													
						SS-8					N	⊕	
		-becomes light grey to grey @ 5.49 m											

Continued

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-7** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Strata Drilling Group**

Drilling Method: **Geoprobe 7822DT - Direct Push**

Borehole: **BH/MW19-7**

Monitoring Well: **Installed**

Sheet 2 of 2

Scale (m)	Elev. (m) Depth (m)	Description	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
		-wet from 6.1 to 6.25 m				SS-9			100		N		Analyzed for: PHCs, VOCs
7						SS-10					N		
						SS-11					N		
8													
						SS-12					N		
9	169.62												
	9.14	**End of Borehole @ 9.14 m** Water Level @ 1.09 m bgs (el. 177.66) on 21 Mar. 2019 Water Level @ 0.94 m bgs (el. 177.82) on 3 Apr. 2019											Groundwater Analyzed for: Metals, PAHs, PHCs, VOCs
10													
11													

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-7** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Strata Drilling Group**

Drilling Method: **Geoprobe 7822DT - Direct Push**

Borehole: **BH/MW19-8**

Monitoring Well: **Installed**

Sheet 1 of 2

Scale (m)	Elev. (m) Depth (m)	Description (Ground Surface Elevation: 178.69m)	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
	178.62 0.08	**ASPHALT** - 75 mm				SS-1			80		N		Analyzed for: Metals
	178.39 0.30	**SAND AND GRAVEL (FILL)**, dry											
		SILT (NATIVE), dark brown, moist, trace gravel, trace black staining											
	177.93 0.76	**SANDY SILT**, brown, moist, trace oxidation				SS-2					N		Analyzed for: PAHs
1					▽								
	177.17 1.52	**SILT**, brown, moist to wet, trace gravel -grey mottling from 1.52 to 3.05 m -some orange-brown oxidation from 1.52 to 5.33 m				SS-3					N		
2						SS-4					N		Analyzed for: Metals, PAHs
3						SS-5					N		Analyzed for: PHCs, VOCs
4						SS-6					N		
						SS-7					N		Analyzed for: PHCs, VOCs
5													
		-becomes grey @ 5.33 m				SS-8					N		
		-gravel layer from 5.79 to 5.94 m											

Continued

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-7** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Strata Drilling Group**

Drilling Method: **Geoprobe 7822DT - Direct Push**

Borehole: **BH/MW19-8**

Monitoring Well: **Installed**

Sheet 2 of 2

Scale (m)	Elev. (m) Depth (m)	Description	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
7						SS-9					N ⊕		
						SS-10					N ⊕		
	171.07												
	7.62	**End of Borehole @ 7.62 m** Water Level @ 1.56 m bgs (el. 177.14) on 21 Mar. 2019 Water Level @ 1.39 m bgs (el. 177.31) on 3 Apr. 2019											Groundwater analyzed for: Metals, PAHs, PHCs, VOCs
8													
9													
10													
11													

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-8** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Strata Drilling Group**

Drilling Method: **Geoprobe 7822DT - Direct Push**

Borehole: **BH19-9**

Monitoring Well: **n/a**

Sheet 1 of 2

Scale (m)	Elev. (m) Depth (m)	Description (Ground Surface Elevation: 177.92m)	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
	177.85	**ASPHALT** - 75 mm				SS-1			70		N	⊕	
	0.08 177.62	**SAND AND GRAVEL (FILL)**, brown, with black staining											
	0.30	**SILT (NATIVE)**, black to dark brown, moist, trace gravel											
		-trace oxidation from 0.76 to 2.29 m				SS-2					N	⊕	
1													
						SS-3			70		N	⊕	
2													
						SS-4					N	⊕	
		-becomes light brown @ 2.67 m -wet from 2.67 to 3.05 m											
3		-some to trace oxidation staining from 3.05 to 6.86 m				SS-5			90		N	⊕	
						SS-6					N	⊕	
4													
		-wet from 4.57 to 5.11 m				SS-7			100		N	⊕	Analyses: PHCs, VOCs
5													
						SS-8					N	⊕	
		-wet from 5.56 to 6.1 m											

Continued

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-8** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Strata Drilling Group**

Drilling Method: **Geoprobe 7822DT - Direct Push**

Borehole: **BH19-9**

Monitoring Well: **n/a**

Sheet 2 of 2

Scale (m)	Stratigraphy: Elev. (m) Depth (m)	Stratigraphy: Description	Stratigraphy: Symbol	Samples: Well Details	Samples: Water Level	Samples: Sample Type and Number	Samples: Condition	Samples: Blows/ 300mm	Samples: % Recovery	Samples: RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
7		-becomes grey @ 6.86 m				SS-9			100		N		Analyses: PHCs, VOCs
						SS-10					N		
	170.30 7.62	**End of Borehole @ 7.62 m**											
8													
9													
10													
11													

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-8** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Strata Drilling Group**

Drilling Method: **Geoprobe 7822DT - Direct Push**

Borehole: **BH19-10**

Monitoring Well: **n/a**

Sheet 1 of 2

Scale (m)	Elev. (m) Depth (m)	Description (Ground Surface Elevation: 177.72m)	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
	177.62	**ASPHALT** - 100 mm				SS-1			90		N		
	0.10 177.42	**SAND AND GRAVEL (FILL)**, dry, some black staining											
	0.30	**SILT (NATIVE)**, brown, moist, trace gravel											
		-becomes grey, loose @ 0.76 m				SS-2					N		
1													
		-wet from 1.52 to 2.29 m				SS-3			90		N		
2													
		-becomes brown, some light orange-brown oxidation @ 2.29 m				SS-4					N		
3		-becomes wet @ 3.05 m				SS-5			100		N		
						SS-6					N		
4													
	173.15 4.57	**CLAYEY SILT**, brown, wet, trace oxidation				SS-7			100		N		Analyses: PHCs, VOCs
5													
	172.39 5.33	**SILT**, brown, moist to wet, trace sand				SS-8					N		

Continued

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-8** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Strata Drilling Group**

Drilling Method: **Geoprobe 7822DT - Direct Push**

Borehole: **BH19-10**

Monitoring Well: **n/a**

Sheet 2 of 2

Scale (m)	Stratigraphy: Elev. (m) Depth (m)	Description	Symbol	Samples: Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
	171.70 6.02	-sand layers from 5.92 to 6.02 m **SANDY SILT**, brown, wet to moist				SS-9					N		Analyses: PHCs, VOCs
7		-becomes grey @ 6.86 m				SS-10					N		
	170.10 7.62	**End of Borehole @ 7.62 m**											
8													
9													
10													
11													

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-8** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Strata Drilling Group**

Drilling Method: **Geoprobe 7822DT - Direct Push**

Borehole: **BH19-11**

Monitoring Well: **n/a**

Sheet 1 of 2

Scale (m)	Elev. (m) Depth (m)	Description (Ground Surface Elevation: 177.96m)	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
	177.86	**ASPHALT** - 100 mm				SS-1			70		N		
	0.10 177.66	**SAND AND GRAVEL (FILL)**, black											
	0.30	**SILT (FILL)**, brown, moist, trace gravel											
						SS-2					N		
1													
	176.28	-white ash layer @ 1.52 m				SS-3			90		N		
	1.68	**SILT (NATIVE)**, brown, moist -trace gravel and grey mottling from 1.68 to 2.29 m											
2													
		-some to trace orange-brown oxidation from 2.29 to 5.33 m				SS-4					N		
3													
		-becomes wet @ 3.05 m				SS-5					N		
						SS-6					N		
4													
		-trace gravel @ 4.57 m				SS-7					N		Analyses: PHCs, VOCs
5													
		-becomes grey @ 5.33 m				SS-8					N		

Continued

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-8** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Strata Drilling Group**

Drilling Method: **Geoprobe 7822DT - Direct Push**

Borehole: **BH19-11**

Monitoring Well: **n/a**

Sheet 2 of 2

Scale (m)	Stratigraphy: Elev. (m) Depth (m)	Stratigraphy: Description	Stratigraphy: Symbol	Samples: Well Details	Samples: Water Level	Samples: Sample Type and Number	Samples: Condition	Samples: Blows/ 300mm	Samples: % Recovery	Samples: RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
7						SS-9					N ⊕		Analyses: PHCs, VOCs
						SS-10					N ⊕		
	170.34 7.62	**End of Borehole @ 7.62 m**											
8													
9													
10													
11													

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-8** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Strata Drilling Group**

Drilling Method: **Geoprobe 7822DT - Direct Push**

Borehole: **BH19-12**

Monitoring Well: **n/a**

Sheet 1 of 2

Scale (m)	Elev. (m) Depth (m)	Description (Ground Surface Elevation: 178.41m)	Symbol	Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
	178.34	**ASPHALT** - 75 mm				SS-1			80		N	⊕	
	0.08	**SAND AND GRAVEL (FILL)**											
	178.11												
	0.30	**SILT (NATIVE)**, brown with some orange, moist											
		-becomes dark brown @ 0.76 m				SS-2					N	⊕	
1													
	176.89												
	1.52	**CLAYEY SILT**, dark brown to brown, moist to wet, trace gravel				SS-3			60		N	⊕	
2													
						SS-4					N	⊕	Analyses: PHCs, VOCs
3	175.36												
	3.05	**SILT**, brown, wet, trace gravel -trace to some orange-brown oxidation from 3.05 to 5.33 m				SS-5			100		N	⊕	
						SS-6					N	⊕	Analyses: PHCs, VOCs
4													
						SS-7			100		N	⊕	
5													
		-becomes grey @ 5.33 m				SS-8					N	⊕	

Continued

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

Project: **Sheppard Pharmacy GP Inc.** Contract No: **102934-000**

Boring date: **2019-3-8** Supervised by: **H. Saeed**

Borehole Location: **3005 Sheppard Ave East, 1800 Pharmacy Ave**

Driller: **Strata Drilling Group**

Drilling Method: **Geoprobe 7822DT - Direct Push**

Borehole: **BH19-12**

Monitoring Well: **n/a**

Sheet 2 of 2

Scale (m)	Stratigraphy: Elev. (m) Depth (m)	Description	Symbol	Samples: Well Details	Water Level	Sample Type and Number	Condition	Blows/ 300mm	% Recovery	RQD	Odour	Headspace TOV ⊕ (ppm) 100 200 300 400 / Headspace TOV □ (%LEL) 20 40 60 80	Remarks and Sample Analyses
7						SS-9					N ⊕		
						SS-10					N ⊕		
	170.79												
	7.62	**End of Borehole @ 7.62 m**											
8													
9													
10													
11													

ODOUR:
N - None
T - Trace
M - Moderate
S - Strong
VS- Very Strong

Prepared by: **J. Grift**

Checked by: **B.H.Cooke**

Date: **19-4-29**

ARCADIS

APPENDIX B – WATER QUALITY CERTIFICATES OF ANALYSIS

TABLE B.1 **WATER ANALYTICAL RESULTS**

2993-3011 Sheppard Avenue East and 1800-1814 Pharmacy Avenue, Toronto, ON

Sample ID	Units	City of Toronto Sanitary and Combined Sewer By-Law Limit[1]	City of Toronto Storm Sewer By-Law Limit[2]	MW16-1
Consultant	na	na	na	Arcadis
Sampling Date	na	na	na	4-Apr-19
Biochemical Oxygen Demand (BOD)	mg/L	300	15	<2
Escherichia coli	CFU/100 mL	nc	200	<10
Cyanide (total)	mg/L	2	0.02	<0.0050
Fluoride	mg/L	10	nc	0.15
Total Kjeldahl Nitrogen (TKN)	mg/L	100	nc	0.42
Oil and Grease - Animal and Vegetable	mg/L	150	nc	<0.50
Oil and Grease - Mineral and Synthetic/hydrocarbon	mg/L	15	nc	<0.50
Total Oil and Grease	mg/L	nc	nc	<0.50
Phenolics (4AAP)	mg/L	1.0	0.008	<0.0010
Phosphorus (total)	mg/L	10	0.4	<0.05
Suspended Solids (total)	mg/L	350	15	<10
Aluminum (total)	mg/L	50	nc	<0.1
Antimony (total)	mg/L	5	nc	<0.02
Arsenic (total)	mg/L	1	0.02	<0.01
Cadmium (total)	mg/L	0.7	0.008	<0.002
Chromium (VI)	mg/L	2	0.08	0.00051
Chromium (total)	mg/L	4	0.04	<0.01
Cobalt (total)	mg/L	5	nc	<0.002
Copper (total)	mg/L	2	0.04	<0.01
Lead (total)	mg/L	1	0.12	<0.01
Manganese (total)	mg/L	5	0.05	0.041
Mercury (total)	mg/L	0.01	0.0004	<0.0001
Molybdenum (total)	mg/L	5	nc	<0.005
Nickel (total)	mg/L	2	0.08	<0.005
Selenium (total)	mg/L	1	0.02	<0.02
Silver (total)	mg/L	5	0.12	<0.01
Tin (total)	mg/L	5	nc	<0.02
Titanium (total)	mg/L	5	nc	<0.005
Zinc (total)	mg/L	2	0.04	<0.005
Benzene	mg/L	0.01	0.002	*<0.01*
Chloroform	mg/L	0.04	0.002	*<0.01*
1,2-Dichlorobenzene	mg/L	0.05	0.0056	*<0.025*
1,4-Dichlorobenzene	mg/L	0.08	0.0068	*<0.025*
Cis-1,2-dichloroethylene	mg/L	4	0.0056	*0.13*
Trans-1,-3-dichloropropylene	mg/L	0.14	0.0056	*<0.02*
Ethylbenzene	mg/L	0.16	0.002	*<0.01*
Methylene Chloride	mg/L	2	0.0052	*<0.1*
1,1,2,2-tetrachloroethane	mg/L	1.4	0.017	*<0.025*
Tetrachloroethylene	mg/L	1	0.0044	**3**
Toluene	mg/L	0.016	0.002	*<0.01*
Trichloroethylene	mg/L	0.4	0.0076	**0.94**
Xylenes (total)	mg/L	1.4	0.0044	*<0.01*
Di-n-butyl phthalate	mg/L	0.08	0.015	<0.002
Bis (2-ethylhexyl)phthalate	mg/L	0.012	0.0088	<0.002
3,3'-dichlorobenzidine	mg/L	0.002	0.0008	<0.0008
Pentachlorophenol	mg/L	0.005	0.002	<0.001
Total PAHs	mg/L	0.005	0.002	<0.001
Nonylphenols	mg/L	0.02	0.001	<0.001
Nonylphenolethoxylates	mg/L	0.2	0.01	<0.005
PCBs	mg/L	0.001	0.0004	<0.00005
pH	na	>6.0 to <11.5	>6.0 to <9.5	7.78
Temperature	Degree	<60	<40	7.82

mg/L	milligrams per litre
RDL	reportable detection limit unless noted
na	not applicable
nc	no criterion
<###	less than RDL (###)
1	Toronto Municipal Code, Chapter 681, Sewers: Table 1 - Limits for Sanitary and Combined Sewers Discharge (amended 2002-10-31 by By-law No. 855-2002; 2010-07-08 by By-Law No. 868-2010; 2016-02-04 by By-Law No. 100-2016
2	Toronto Municipal Code, Chapter 681, Sewers: Table 2 - Limits for Storm Sewers Discharge (amended 2010-07-08 by By-Law No. 868-2010; 2016-02-04 by By-Law No. 100-2016
#####	underlined value exceeds the Storm Sewer Bylaw Limit
#####	bold and underlined value exceeds the Sanitary and Combined Sewer Bylaw Limit
< ###	adjusted RDL greater than the applicable criterion

Maxxam
A Bureau Veritas Group Company

Your Project #: 102934-000
Site Location: ESA II / SPG-1800 PHARMACY
Your C.O.C. #: 706949-01-01

Attention: Lucy Zhang

ARCADIS Canada Inc
121 Granton Dr
Unit 12
Richmond Hill, ON
CANADA L4B 3N4

Report Date: 2019/04/15
Report #: R5671421
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B988424
Received: 2019/04/04, 16:21

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Sewer Use By-Law Semivolatile Organics	1	2019/04/09	2019/04/10	CAM SOP 00301	EPA 8270 m
Biochemical Oxygen Demand (BOD)	1	2019/04/06	2019/04/11	CAM SOP-00427	SM 23 5210B m
Chromium (VI) in Water	1	N/A	2019/04/05	CAM SOP-00436	EPA 7199 m
Total Cyanide	1	2019/04/08	2019/04/08	CAM SOP-00457	OMOE E3015 5 m
Fluoride	1	2019/04/05	2019/04/08	CAM SOP-00449	SM 23 4500-F C m
Mercury in Water by CVAA	1	2019/04/08	2019/04/08	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by Axial ICP	1	2019/04/08	2019/04/08	CAM SOP-00408	EPA 6010D m
E.coli, (CFU/100mL)	1	N/A	2019/04/04	CAM SOP-00552	MOE LSB E3371
Total Nonylphenol in Liquids by HPLC	1	2019/04/08	2019/04/09	CAM SOP-00313	In-house Method
Nonylphenol Ethoxylates in Liquids: HPLC	1	2019/04/08	2019/04/09	CAM SOP-00313	In-house Method
Animal and Vegetable Oil and Grease	1	N/A	2019/04/09	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/04/09	2019/04/09	CAM SOP-00326	EPA1664B m,SM5520A m
Polychlorinated Biphenyl in Water	1	2019/04/05	2019/04/06	CAM SOP-00309	EPA 8082A m
pH	1	2019/04/05	2019/04/08	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/04/08	CAM SOP-00444	OMOE E3179 m
Total Kjeldahl Nitrogen in Water	1	2019/04/06	2019/04/08	CAM SOP-00938	OMOE E3516 m
Total PAHs (1)	1	N/A	2019/04/11	CAM SOP - 00301	EPA 8270 m
Mineral/Synthetic O & G (TPH Heavy Oil) (2)	1	2019/04/09	2019/04/09	CAM SOP-00326	EPA1664B m,SM5520F m
Total Suspended Solids	1	2019/04/06	2019/04/08	CAM SOP-00428	SM 23 2540D m
Volatile Organic Compounds in Water	1	N/A	2019/04/08	CAM SOP-00228	EPA 8260C m

Remarks:

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

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

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed

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

Your Project #: 102934-000
Site Location: ESA II / SPG-1800 PHARMACY
Your C.O.C. #: 706949-01-01

Attention: Lucy Zhang

ARCADIS Canada Inc
121 Granton Dr
Unit 12
Richmond Hill, ON
CANADA L4B 3N4

Report Date: 2019/04/15
Report #: R5671421
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B988424
Received: 2019/04/04, 16:21

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.
Marijane Cruz, Senior Project Manager
Email: MCruz@maxxam.ca
Phone# (905)817-5756
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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

Maxxam Job #: B988424
Report Date: 2019/04/15

ARCADIS Canada Inc
Client Project #: 102934-000
Site Location: ESA II / SPG-1800 PHARMACY
Sampler Initials: HS

TORONTO SANITARY & COMBINED BYLAW 2016 (WATER)

Maxxam ID			JJG620		
Sampling Date			2019/04/04 15:00		
COC Number			706949-01-01		
	UNITS	Criteria	MW16-1 (SANITARY)	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	150	<0.50	0.50	6053375
Inorganics					
Total BOD	mg/L	300	<2	2	6057333
Fluoride (F-)	mg/L	10	0.15	0.10	6056588
Total Kjeldahl Nitrogen (TKN)	mg/L	100	0.42	0.10	6057487
pH	pH	6.0:11.5	7.78		6056590
Phenols-4AAP	mg/L	1.0	<0.0010	0.0010	6058264
Total Suspended Solids	mg/L	350	<10	10	6055446
Total Cyanide (CN)	mg/L	2	<0.0050	0.0050	6058465
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	-	<0.50	0.50	6060120
Total Oil & Grease Mineral/Synthetic	mg/L	15	<0.50	0.50	6060122
Miscellaneous Parameters					
Nonylphenol Ethoxylate (Total)	mg/L	0.2	<0.005	0.005	6058303
Nonylphenol (Total)	mg/L	0.02	<0.001	0.001	6058297
Metals					
Total Aluminum (Al)	mg/L	50	<0.1	0.1	6058339
Total Antimony (Sb)	mg/L	5	<0.02	0.02	6058339
Total Arsenic (As)	mg/L	1	<0.01	0.01	6058339
Total Cadmium (Cd)	mg/L	0.7	<0.002	0.002	6058339
Total Chromium (Cr)	mg/L	4	<0.01	0.01	6058339
Chromium (VI)	ug/L	2000	0.51	0.50	6053951
Total Cobalt (Co)	mg/L	5	<0.002	0.002	6058339
Total Copper (Cu)	mg/L	2	<0.01	0.01	6058339
Total Lead (Pb)	mg/L	1	<0.01	0.01	6058339
Total Manganese (Mn)	mg/L	5	0.041	0.001	6058339
Mercury (Hg)	mg/L	0.01	<0.0001	0.0001	6058569
Total Molybdenum (Mo)	mg/L	5	<0.005	0.005	6058339
Total Nickel (Ni)	mg/L	2	<0.005	0.005	6058339

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

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Toronto Sanitary and Combined Sewers Discharge Guidelines. Referenced to the Chapter 681.

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Maxxam Job #: B988424
Report Date: 2019/04/15

ARCADIS Canada Inc
Client Project #: 102934-000
Site Location: ESA II / SPG-1800 PHARMACY
Sampler Initials: HS

TORONTO SANITARY & COMBINED BYLAW 2016 (WATER)

Maxxam ID			JJG620		
Sampling Date			2019/04/04 15:00		
COC Number			706949-01-01		
	UNITS	Criteria	MW16-1 (SANITARY)	RDL	QC Batch
Total Phosphorus (P)	mg/L	10	<0.05	0.05	6058339
Total Selenium (Se)	mg/L	1	<0.02	0.02	6058339
Total Silver (Ag)	mg/L	5	<0.01	0.01	6058339
Total Tin (Sn)	mg/L	5	<0.02	0.02	6058339
Total Titanium (Ti)	mg/L	5	<0.005	0.005	6058339
Total Zinc (Zn)	mg/L	2	<0.005	0.005	6058339
Semivolatile Organics					
Di-N-butyl phthalate	ug/L	80	<2	2	6061400
Bis(2-ethylhexyl)phthalate	ug/L	12	<2	2	6061400
3,3'-Dichlorobenzidine	ug/L	2	<0.8	0.8	6061400
Pentachlorophenol	ug/L	5	<1	1	6061400
Phenanthrene	ug/L	-	<0.2	0.2	6061400
Anthracene	ug/L	-	<0.2	0.2	6061400
Fluoranthene	ug/L	-	<0.2	0.2	6061400
Pyrene	ug/L	-	<0.2	0.2	6061400
Benzo(a)anthracene	ug/L	-	<0.2	0.2	6061400
Chrysene	ug/L	-	<0.2	0.2	6061400
Benzo(b/j)fluoranthene	ug/L	-	<0.2	0.2	6061400
Benzo(k)fluoranthene	ug/L	-	<0.2	0.2	6061400
Benzo(a)pyrene	ug/L	-	<0.2	0.2	6061400
Indeno(1,2,3-cd)pyrene	ug/L	-	<0.2	0.2	6061400
Dibenz(a,h)anthracene	ug/L	-	<0.2	0.2	6061400
Benzo(g,h,i)perylene	ug/L	-	<0.2	0.2	6061400
Dibenzo(a,i)pyrene	ug/L	-	<0.2	0.2	6061400
Benzo(e)pyrene	ug/L	-	<0.2	0.2	6061400
Perylene	ug/L	-	<0.2	0.2	6061400
Dibenzo(a,j) acridine	ug/L	-	<0.4	0.4	6061400
7H-Dibenzo(c,g) Carbazole	ug/L	-	<0.4	0.4	6061400
1,6-Dinitropyrene	ug/L	-	<0.4	0.4	6061400
1,3-Dinitropyrene	ug/L	-	<0.4	0.4	6061400

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

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Toronto Sanitary and Combined Sewers Discharge Guidelines. Referenced to the Chapter 681.

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ARCADIS Canada Inc
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Site Location: ESA II / SPG-1800 PHARMACY
Sampler Initials: HS

TORONTO SANITARY & COMBINED BYLAW 2016 (WATER)

Maxxam ID			JJG620		
Sampling Date			2019/04/04 15:00		
COC Number			706949-01-01		
	UNITS	Criteria	MW16-1 (SANITARY)	RDL	QC Batch
1,8-Dinitropyrene	ug/L	-	<0.4	0.4	6061400
Calculated Parameters					
Total PAHs (18 PAHs)	ug/L	5	<1	1	6054060
Volatile Organics					
Benzene	ug/L	10	<10	10	6055464
Chloroform	ug/L	40	<10	10	6055464
1,2-Dichlorobenzene	ug/L	50	<25	25	6055464
1,4-Dichlorobenzene	ug/L	80	<25	25	6055464
cis-1,2-Dichloroethylene	ug/L	4000	130	25	6055464
trans-1,3-Dichloropropene	ug/L	140	<20	20	6055464
Ethylbenzene	ug/L	160	<10	10	6055464
Methylene Chloride(Dichloromethane)	ug/L	2000	<100	100	6055464
1,1,2,2-Tetrachloroethane	ug/L	1400	<25	25	6055464
Tetrachloroethylene	ug/L	1000	**3000**	10	6055464
Toluene	ug/L	16	<10	10	6055464
Trichloroethylene	ug/L	400	**940**	10	6055464
p+m-Xylene	ug/L	-	<10	10	6055464
o-Xylene	ug/L	-	<10	10	6055464
Total Xylenes	ug/L	1400	<10	10	6055464
PCBs					
Total PCB	ug/L	1	<0.05	0.05	6055732
Surrogate Recovery (%)					
2,4,6-Tribromophenol	%	-	83		6061400
2-Fluorobiphenyl	%	-	48		6061400
D14-Terphenyl (FS)	%	-	100		6061400
D5-Nitrobenzene	%	-	45		6061400
D8-Acenaphthylene	%	-	55		6061400
Decachlorobiphenyl	%	-	90		6055732
4-Bromofluorobenzene	%	-	95		6055464
D4-1,2-Dichloroethane	%	-	93		6055464

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

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Toronto Sanitary and Combined Sewers Discharge Guidelines. Referenced to the Chapter 681.

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Site Location: ESA II / SPG-1800 PHARMACY
Sampler Initials: HS

TORONTO SANITARY & COMBINED BYLAW 2016 (WATER)

Maxxam ID			JJG620		
Sampling Date			2019/04/04 15:00		
COC Number			706949-01-01		
	UNITS	Criteria	MW16-1 (SANITARY)	RDL	QC Batch
D8-Toluene	%	-	100		6055464

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

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Toronto Sanitary and Combined Sewers Discharge Guidelines. Referenced to the Chapter 681.

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Sampler Initials: HS

MICROBIOLOGY (WATER)

Maxxam ID		JJG620		
Sampling Date		2019/04/04 15:00		
COC Number		706949-01-01		
	UNITS	MW16-1 (SANITARY)	RDL	QC Batch
Microbiological				
Escherichia coli	CFU/100mL	<10	10	6054843

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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ARCADIS Canada Inc
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Sampler Initials: HS

GENERAL COMMENTS

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

Package 1	5.3°C

Cooler custody seal was present and intact.

Sample JJG620 [MW16-1 (SANITARY)] : VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

ARCADIS Canada Inc
Client Project #: 102934-000
Site Location: ESA II / SPG-1800 PHARMACY
Sampler Initials: HS

			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
6055464	4-Bromofluorobenzene	2019/04/08	98	70 - 130	99	70 - 130	99	%				
6055464	D4-1,2-Dichloroethane	2019/04/08	105	70 - 130	103	70 - 130	101	%				
6055464	D8-Toluene	2019/04/08	100	70 - 130	100	70 - 130	99	%				
6055732	Decachlorobiphenyl	2019/04/05	87	60 - 130	67	60 - 130	79	%				
6061400	2,4,6-Tribromophenol	2019/04/10	60	10 - 130	60	10 - 130	37	%				
6061400	2-Fluorobiphenyl	2019/04/10	46	30 - 130	51	30 - 130	57	%				
6061400	D14-Terphenyl (FS)	2019/04/10	85	30 - 130	81	30 - 130	84	%				
6061400	D5-Nitrobenzene	2019/04/10	61	30 - 130	83	30 - 130	89	%				
6061400	D8-Acenaphthylene	2019/04/10	62	30 - 130	63	30 - 130	64	%				
6053951	Chromium (VI)	2019/04/05	98	80 - 120	100	80 - 120	<0.50	ug/L	1.9 (1)	20		
6055446	Total Suspended Solids	2019/04/08					<10	mg/L	11 (1)	25	96	85 - 115
6055464	1,1,2,2-Tetrachloroethane	2019/04/08	103	70 - 130	97	70 - 130	<0.50	ug/L	NC (1)	30		
6055464	1,2-Dichlorobenzene	2019/04/08	92	70 - 130	92	70 - 130	<0.50	ug/L	NC (1)	30		
6055464	1,4-Dichlorobenzene	2019/04/08	93	70 - 130	95	70 - 130	<0.50	ug/L	NC (1)	30		
6055464	Benzene	2019/04/08	95	70 - 130	102	70 - 130	<0.20	ug/L	NC (1)	30		
6055464	Chloroform	2019/04/08	97	70 - 130	103	70 - 130	<0.20	ug/L	NC (1)	30		
6055464	cis-1,2-Dichloroethylene	2019/04/08	100	70 - 130	104	70 - 130	<0.50	ug/L	NC (1)	30		
6055464	Ethylbenzene	2019/04/08	90	70 - 130	96	70 - 130	<0.20	ug/L	NC (1)	30		
6055464	Methylene Chloride(Dichloromethane)	2019/04/08	100	70 - 130	104	70 - 130	<2.0	ug/L	NC (1)	30		
6055464	o-Xylene	2019/04/08	87	70 - 130	94	70 - 130	<0.20	ug/L	NC (1)	30		
6055464	p+m-Xylene	2019/04/08	89	70 - 130	96	70 - 130	<0.20	ug/L	NC (1)	30		
6055464	Tetrachloroethylene	2019/04/08	91	70 - 130	99	70 - 130	<0.20	ug/L	NC (1)	30		
6055464	Toluene	2019/04/08	92	70 - 130	97	70 - 130	<0.20	ug/L	NC (1)	30		
6055464	Total Xylenes	2019/04/08					<0.20	ug/L	NC (1)	30		
6055464	trans-1,3-Dichloropropene	2019/04/08	114	70 - 130	115	70 - 130	<0.40	ug/L	NC (1)	30		
6055464	Trichloroethylene	2019/04/08	91	70 - 130	99	70 - 130	<0.20	ug/L	NC (1)	30		
6055732	Total PCB	2019/04/05	83	60 - 130	73	60 - 130	<0.05	ug/L	NC (1)	40		
6056588	Fluoride (F-)	2019/04/08	92	80 - 120	100	80 - 120	<0.10	mg/L	NC (1)	20		
6056590	pH	2019/04/08			101	98 - 103			1.3 (1)	N/A		
6057333	Total BOD	2019/04/11					<2	mg/L	5.5 (1)	30	88	80 - 120
6057487	Total Kjeldahl Nitrogen (TKN)	2019/04/08	96	80 - 120	94	80 - 120	<0.10	mg/L	NC (1)	20	91	80 - 120
6058264	Phenols-4AAP	2019/04/08	96	80 - 120	95	80 - 120	<0.0010	mg/L	NC (1)	20		

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QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada Inc
Client Project #: 102934-000
Site Location: ESA II / SPG-1800 PHARMACY
Sampler Initials: HS

			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
6058297	Nonylphenol (Total)	2019/04/08	98	50 - 130	95	50 - 130	<0.001	mg/L	NC (1)	40		
6058303	Nonylphenol Ethoxylate (Total)	2019/04/08	116	50 - 130	89	50 - 130	<0.005	mg/L	NC (1)	40		
6058339	Total Aluminum (Al)	2019/04/08	NC	80 - 120	99	80 - 120	<0.1	mg/L				
6058339	Total Antimony (Sb)	2019/04/08	107	80 - 120	106	80 - 120	<0.02	mg/L				
6058339	Total Arsenic (As)	2019/04/08	107	80 - 120	101	80 - 120	<0.01	mg/L				
6058339	Total Cadmium (Cd)	2019/04/08	102	80 - 120	101	80 - 120	<0.002	mg/L				
6058339	Total Chromium (Cr)	2019/04/08	97	80 - 120	100	80 - 120	<0.01	mg/L				
6058339	Total Cobalt (Co)	2019/04/08	102	80 - 120	105	80 - 120	<0.002	mg/L				
6058339	Total Copper (Cu)	2019/04/08	101	80 - 120	102	80 - 120	<0.01	mg/L				
6058339	Total Lead (Pb)	2019/04/08	97	80 - 120	103	80 - 120	<0.01	mg/L				
6058339	Total Manganese (Mn)	2019/04/08	99	80 - 120	102	80 - 120	<0.001	mg/L				
6058339	Total Molybdenum (Mo)	2019/04/08	101	80 - 120	101	80 - 120	<0.005	mg/L				
6058339	Total Nickel (Ni)	2019/04/08	100	80 - 120	103	80 - 120	<0.005	mg/L				
6058339	Total Phosphorus (P)	2019/04/08	NC	80 - 120	100	80 - 120	<0.05	mg/L	2.5 (1)	20		
6058339	Total Selenium (Se)	2019/04/08	118	80 - 120	105	80 - 120	<0.02	mg/L				
6058339	Total Silver (Ag)	2019/04/08	96	80 - 120	100	80 - 120	<0.01	mg/L				
6058339	Total Tin (Sn)	2019/04/08	96	80 - 120	101	80 - 120	<0.02	mg/L				
6058339	Total Titanium (Ti)	2019/04/08	104	80 - 120	104	80 - 120	<0.005	mg/L				
6058339	Total Zinc (Zn)	2019/04/08	108	80 - 120	107	80 - 120	<0.005	mg/L				
6058465	Total Cyanide (CN)	2019/04/08	86	80 - 120	106	80 - 120	<0.0050	mg/L	6.4 (1)	20		
6058569	Mercury (Hg)	2019/04/08	97	75 - 125	97	80 - 120	<0.0001	mg/L	NC (1)	20		
6060120	Total Oil & Grease	2019/04/09			97	85 - 115	<0.50	mg/L	3.8 (1)	25		
6060122	Total Oil & Grease Mineral/Synthetic	2019/04/09			92	85 - 115	<0.50	mg/L	3.2 (1)	25		
6061400	1,3-Dinitropyrene	2019/04/10	129	30 - 130	118	30 - 130	<0.4	ug/L	NC (1)	40		
6061400	1,6-Dinitropyrene	2019/04/10	98	30 - 130	93	30 - 130	<0.4	ug/L	NC (1)	40		
6061400	1,8-Dinitropyrene	2019/04/10	88	30 - 130	86	30 - 130	<0.4	ug/L	NC (1)	40		
6061400	3,3'-Dichlorobenzidine	2019/04/10	21 (2)	30 - 130	59	30 - 130	<0.8	ug/L	NC (1)	40		
6061400	7H-Dibenzo(c,g) Carbazole	2019/04/10	61	30 - 130	74	30 - 130	<0.4	ug/L	NC (1)	40		
6061400	Anthracene	2019/04/10	93	30 - 130	90	30 - 130	<0.2	ug/L	NC (1)	40		
6061400	Benzo(a)anthracene	2019/04/10	114	30 - 130	108	30 - 130	<0.2	ug/L	NC (1)	40		
6061400	Benzo(a)pyrene	2019/04/10	93	30 - 130	90	30 - 130	<0.2	ug/L	NC (1)	40		
6061400	Benzo(b/j)fluoranthene	2019/04/10	95	30 - 130	95	30 - 130	<0.2	ug/L	NC (1)	40		

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QUALITY ASSURANCE REPORT(CONT'D)

ARCADIS Canada Inc
Client Project #: 102934-000
Site Location: ESA II / SPG-1800 PHARMACY
Sampler Initials: HS

			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
6061400	Benzo(e)pyrene	2019/04/10	96	30 - 130	95	30 - 130	<0.2	ug/L	NC (1)	40		
6061400	Benzo(g,h,i)perylene	2019/04/10	87	30 - 130	91	30 - 130	<0.2	ug/L	NC (1)	40		
6061400	Benzo(k)fluoranthene	2019/04/10	97	30 - 130	93	30 - 130	<0.2	ug/L	NC (1)	40		
6061400	Bis(2-ethylhexyl)phthalate	2019/04/10	116	30 - 130	110	30 - 130	<2	ug/L	NC (1)	40		
6061400	Chrysene	2019/04/10	101	30 - 130	100	30 - 130	<0.2	ug/L	NC (1)	40		
6061400	Dibenz(a,h)anthracene	2019/04/10	93	30 - 130	98	30 - 130	<0.2	ug/L	NC (1)	40		
6061400	Dibenzo(a,i)pyrene	2019/04/10	70	30 - 130	73	30 - 130	<0.2	ug/L	NC (1)	40		
6061400	Dibenzo(a,j) acridine	2019/04/10	81	30 - 130	87	30 - 130	<0.4	ug/L	NC (1)	40		
6061400	Di-N-butyl phthalate	2019/04/10	106	30 - 130	101	30 - 130	<2	ug/L	NC (1)	40		
6061400	Fluoranthene	2019/04/10	118	30 - 130	113	30 - 130	<0.2	ug/L	NC (1)	40		
6061400	Indeno(1,2,3-cd)pyrene	2019/04/10	93	30 - 130	97	30 - 130	<0.2	ug/L	NC (1)	40		
6061400	Pentachlorophenol	2019/04/10	57	30 - 130	41	30 - 130	<1	ug/L	NC (1)	40		
6061400	Perylene	2019/04/10	98	30 - 130	102	30 - 130	<0.2	ug/L	NC (1)	40		
6061400	Phenanthrene	2019/04/10	100	30 - 130	95	30 - 130	<0.2	ug/L	NC (1)	40		
6061400	Pyrene	2019/04/10	119	30 - 130	113	30 - 130	<0.2	ug/L	NC (1)	40		

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).

(1) Duplicate Parent ID

(2) The recovery was below the lower control limit. This may represent a low bias in some results for this specific analyte.

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Client Project #: 102934-000
Site Location: ESA II / SPG-1800 PHARMACY
Sampler Initials: HS

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

Krishnakant Patel, Analyst 1

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.

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MICRO

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CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:	REPORT TO:	PROJECT INFORMATION:	Laboratory Use Only:
Company Name: #1037 ARCADIS Canada Inc	Company Name:	Quotation #: B81974	Maxxam Job #: / Bottle Order #: 706949
Attention: Lucy Zhang	Attention: 1- Lucy Zhang	P.O. #:	
Address: 121 Granton Dr Unit 12	Address: 2-STEWART ARNOTT STEWART.ARNOTT@ARCADIS.COM	Project: 102934-000	COC #: / Project Manager:
Richmond Hill ON L4B 3N4		Project Name: ESA II	C#706949-01-01 / Marijane Cruz
Tel: (289) 327-0903 Fax: (905) 882-8962	Tel: (289) 327-0903 Fax:	Site #: SPG-1800 Pharmacy	
Email: lucy.zhang@arcadis.com	Email: lucy.zhang@arcadis.com	Sampled By: HAMMAD SAEED	

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)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

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

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

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

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	Toronto Sanitary & combined Bylaw 2016	E.coli (CFU/100mL)	# of Bottles	Comments
1		MW16-1 (SANITARY)	2019/04/04	15:00	WATER	N.A.	X	X	20	(2x500 mL FOR HPLC) NO PRESERVATIVE
2										
3										
4										
5										
6										
7										
8										
9										
10										

04-Apr-19 16:21
Marijane Cruz
B988424
GK1 ENV-265

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
HAMMAD SAEED	2019/04/04	16:00	DIPIKA SINGH	2019/04/04	16:21	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	5/5/6	Present	✓	
		Intact	✓	

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

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

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

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

White: Maxxa Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam Job #: B988424
Report Date: 2019/04/15

ARCADIS Canada Inc
Client Project #: 102934-000
Site Location: ESA II / SPG-1800 PHARMACY
Sampler Initials: HS

Exceedence Summary Table – Toronto Sanitary Sewer

Result Exceedences

Sample ID	Maxxam ID	Parameter	Criteria	Result	DL	Units
MW16-1 (SANITARY)	JJG620-14	Tetrachloroethylene	1000	3000	10	ug/L
MW16-1 (SANITARY)	JJG620-14	Trichloroethylene	400	940	10	ug/L

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

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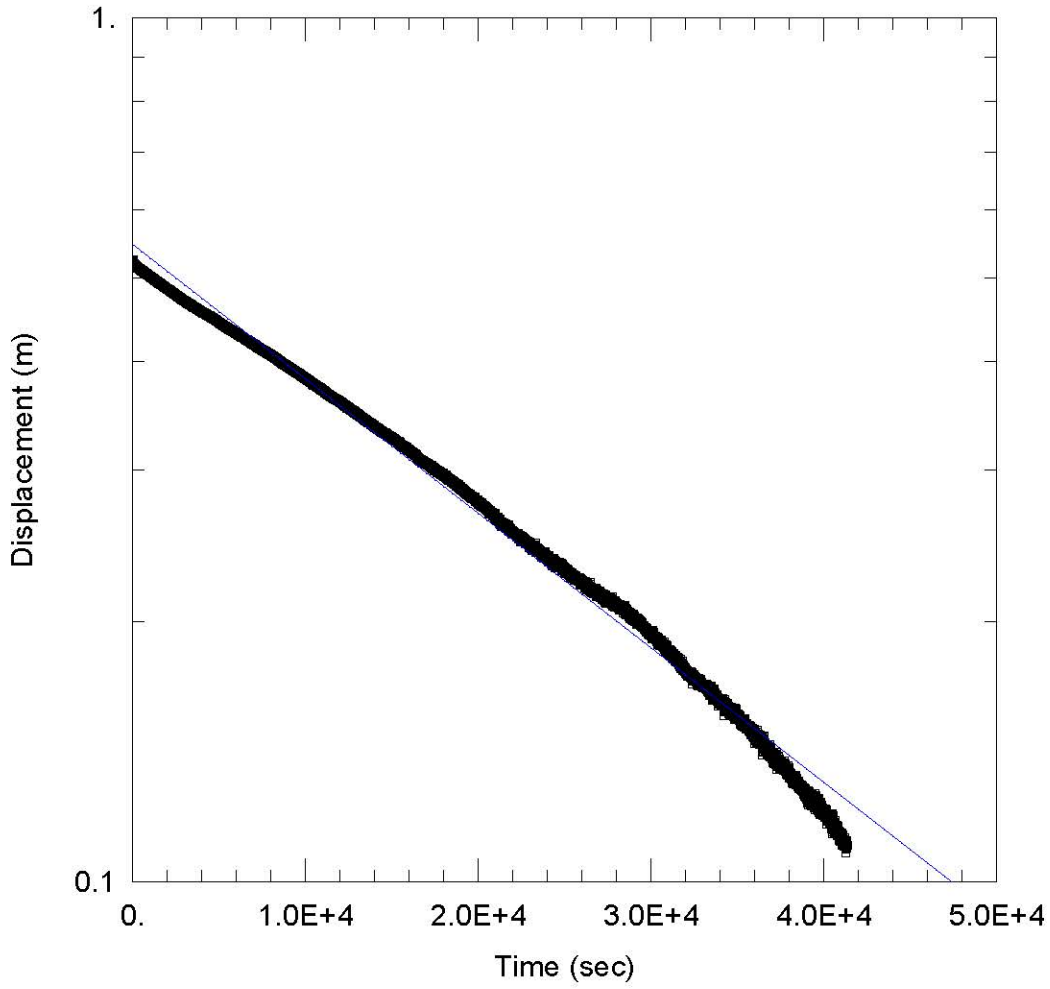
APPENDIX C – IN-SITU HYDRAULIC CONDUCTIVITY TESTING RESULTS



WELL TEST ANALYSIS

Data Set: G:\...\MW05 Test 1.aqt
Date: 04/02/19 Time: 11:32:23

PROJECT INFORMATION

Company: Arcadis Canada Inc.
Project: 102934-000
Location: Sheppard & Pharmacy, Toronto
Test Well: MW05 Test 1
Test Date: 2019-03-22

AQUIFER DATA

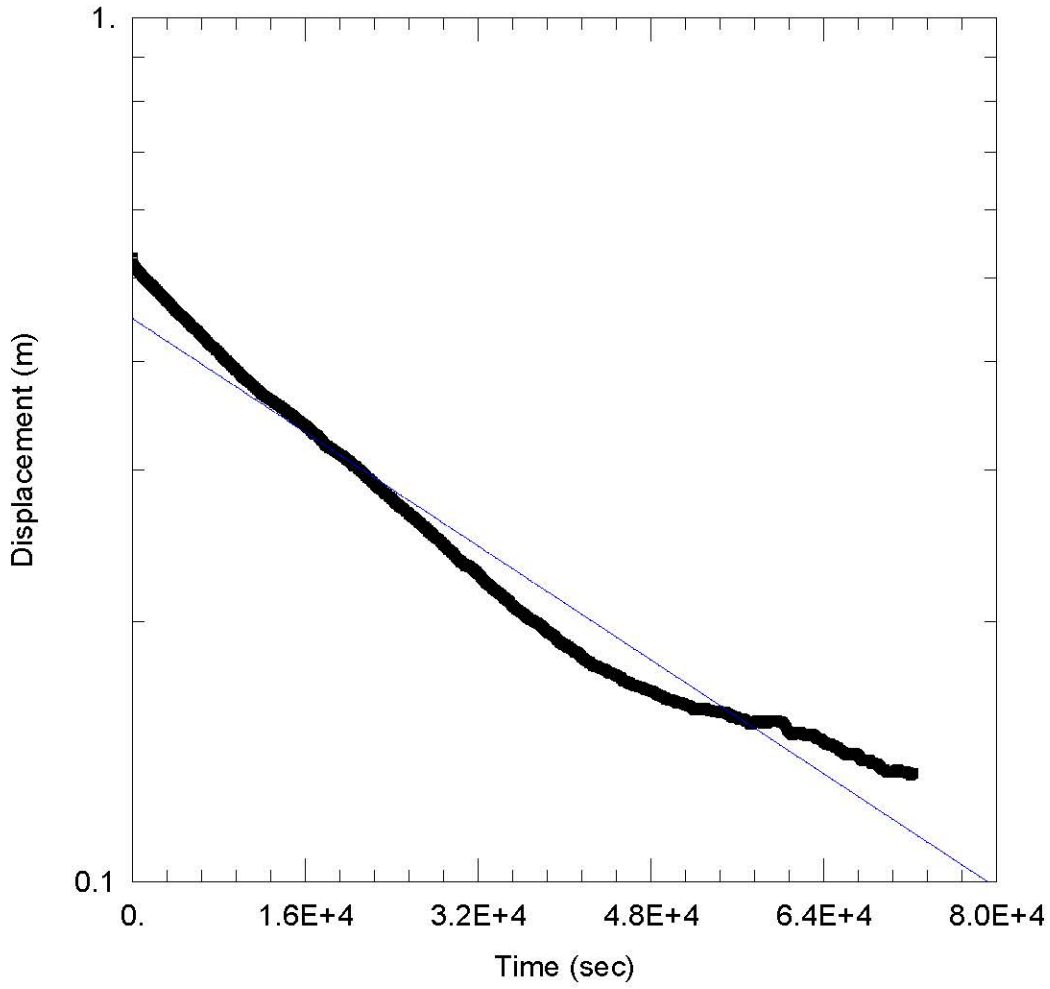
Saturated Thickness: 3.05 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW05)

Initial Displacement: 0.5246 m
Total Well Penetration Depth: 7.62 m
Casing Radius: 0.0255 m
Static Water Column Height: 5.633 m
Screen Length: 3.05 m
Well Radius: 0.0255 m
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 1.569E-8 m/sec
y0 = 0.5462 m



WELL TEST ANALYSIS

Data Set: G:\...\MW05 Test 2.aqt
Date: 04/02/19 Time: 11:37:05

PROJECT INFORMATION

Company: Arcadis Canada Inc.
Project: 102934-000
Location: Sheppard & Pharmacy, Toronto
Test Well: MW05 Test 2
Test Date: 2019-03-23

AQUIFER DATA

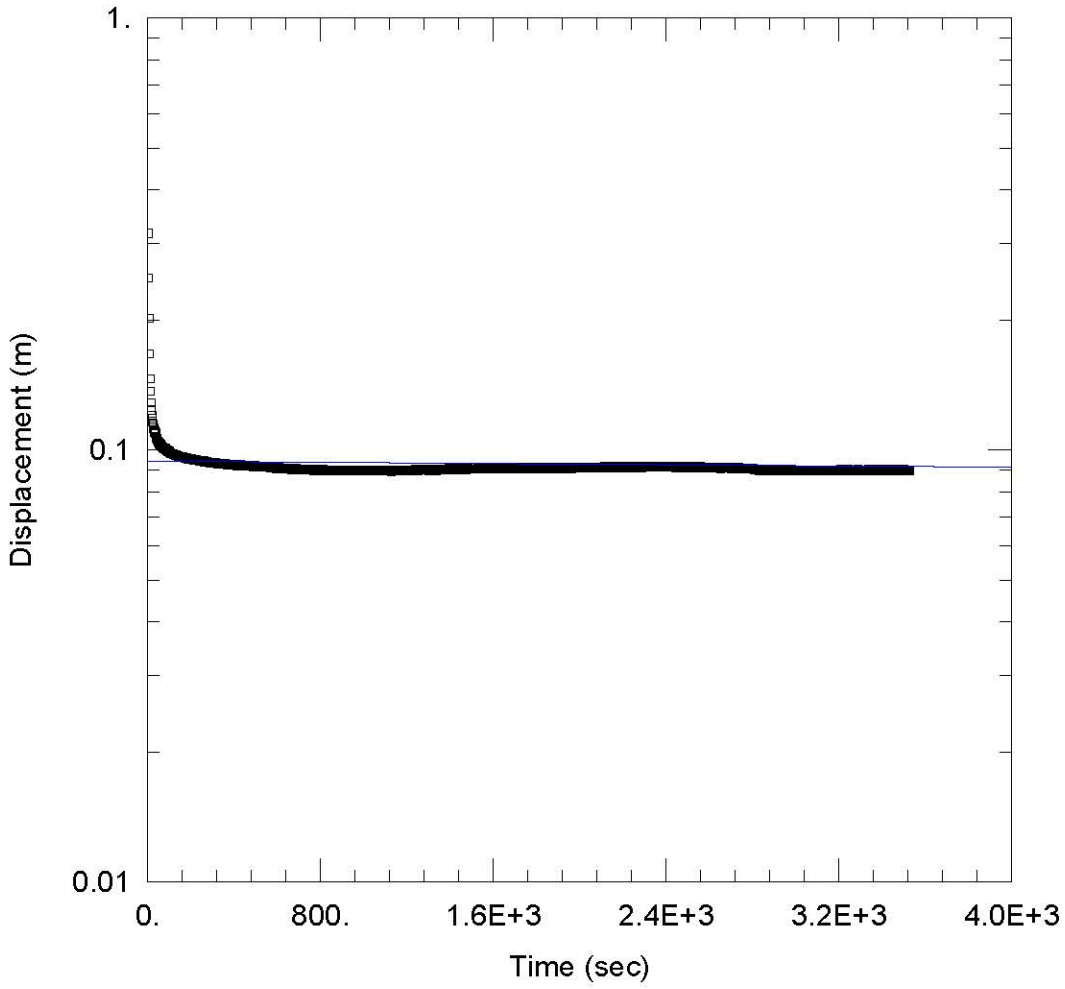
Saturated Thickness: 3.05 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW05 Test 2)

Initial Displacement: 0.5293 m
Total Well Penetration Depth: 7.62 m
Casing Radius: 0.0255 m
Static Water Column Height: 5.621 m
Screen Length: 3.05 m
Well Radius: 0.0255 m
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 8.305E-9 m/sec
y0 = 0.4486 m



WELL TEST ANALYSIS

Data Set: G:\...\MW19-6 Test 1.aqt
Date: 04/02/19 Time: 11:46:11

PROJECT INFORMATION

Company: Arcadis Canada Inc.
Project: 102934-000
Location: Sheppard & Pharmacy, Toronto
Test Well: MW19-6 Test 1
Test Date: 2019-03-22

AQUIFER DATA

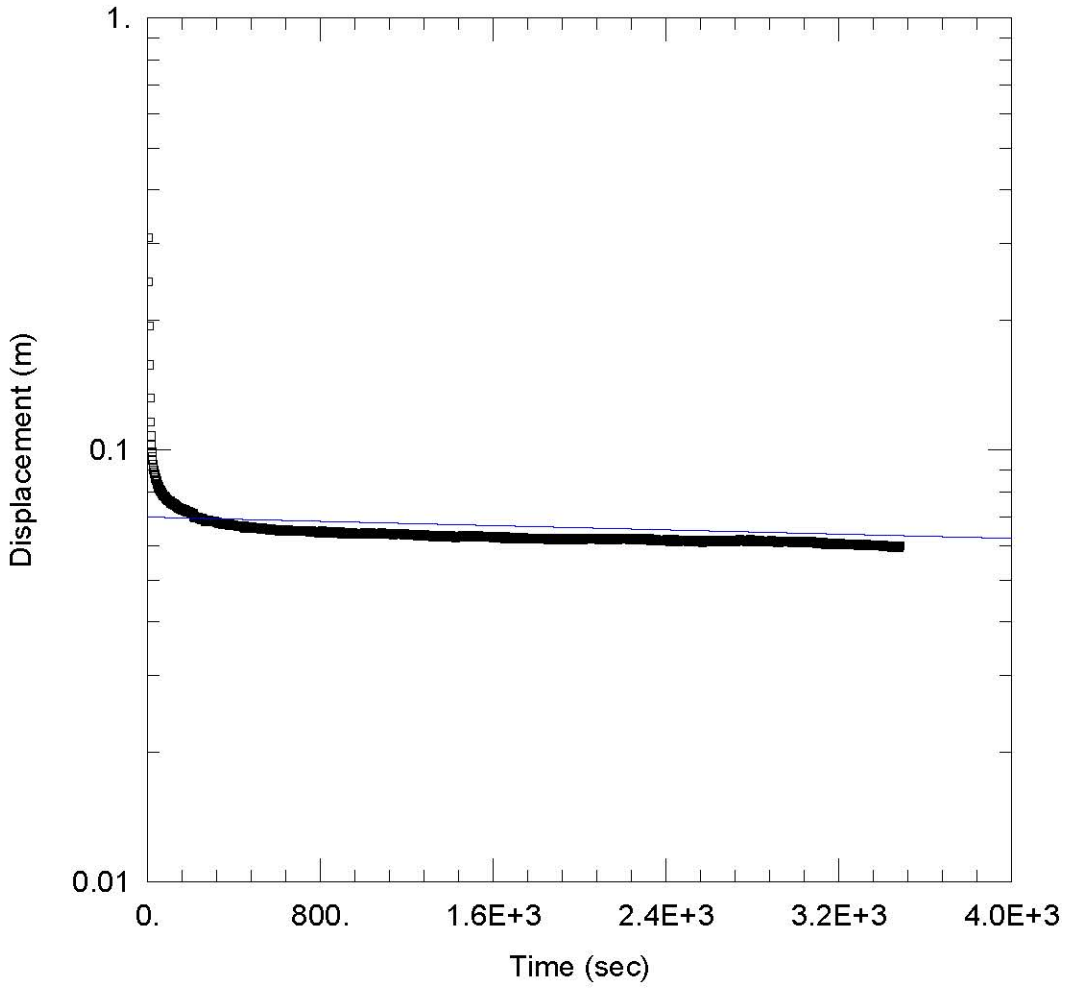
Saturated Thickness: 1.365 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW19-6)

Initial Displacement: 0.3175 m
Total Well Penetration Depth: 4. m
Casing Radius: 0.0254 m
Static Water Column Height: 1.635 m
Screen Length: 3.05 m
Well Radius: 0.0254 m
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 6.825E-9 m/sec
y0 = 0.09422 m



WELL TEST ANALYSIS

Data Set: G:\...\MW19-6 Test 2.aqt
Date: 04/02/19 Time: 12:01:49

PROJECT INFORMATION

Company: Arcadis Canada Inc.
Project: 102934-000
Location: Sheppard & Pharmacy, Toronto
Test Well: MW19-6 Test 2
Test Date: 2019-03-22

AQUIFER DATA

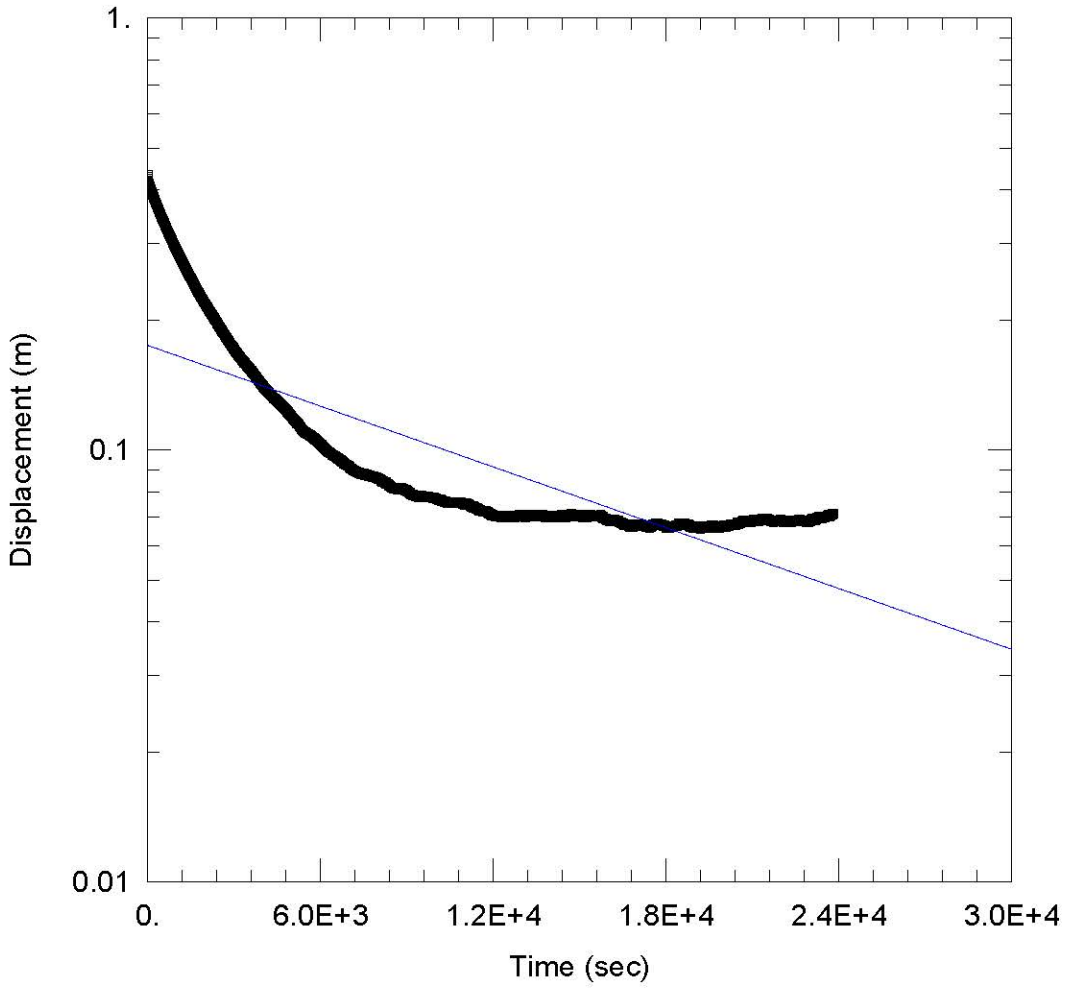
Saturated Thickness: 1.635 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW19-6)

Initial Displacement: 0.3099 m
Total Well Penetration Depth: 4. m
Casing Radius: 0.0254 m
Static Water Column Height: 1.635 m
Screen Length: 3.05 m
Well Radius: 0.0254 m
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 2.026E-8 m/sec
y0 = 0.0699 m



WELL TEST ANALYSIS

Data Set: G:\...\MW19-8.aqt
Date: 04/02/19 Time: 12:26:18

PROJECT INFORMATION

Company: Arcadis Canada Inc.
Project: 102934-000
Location: Sheppard & Pharmacy, Toronto
Test Well: MW19-6 Test 2
Test Date: 2019-03-24

AQUIFER DATA

Saturated Thickness: 3.05 m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW19-8)

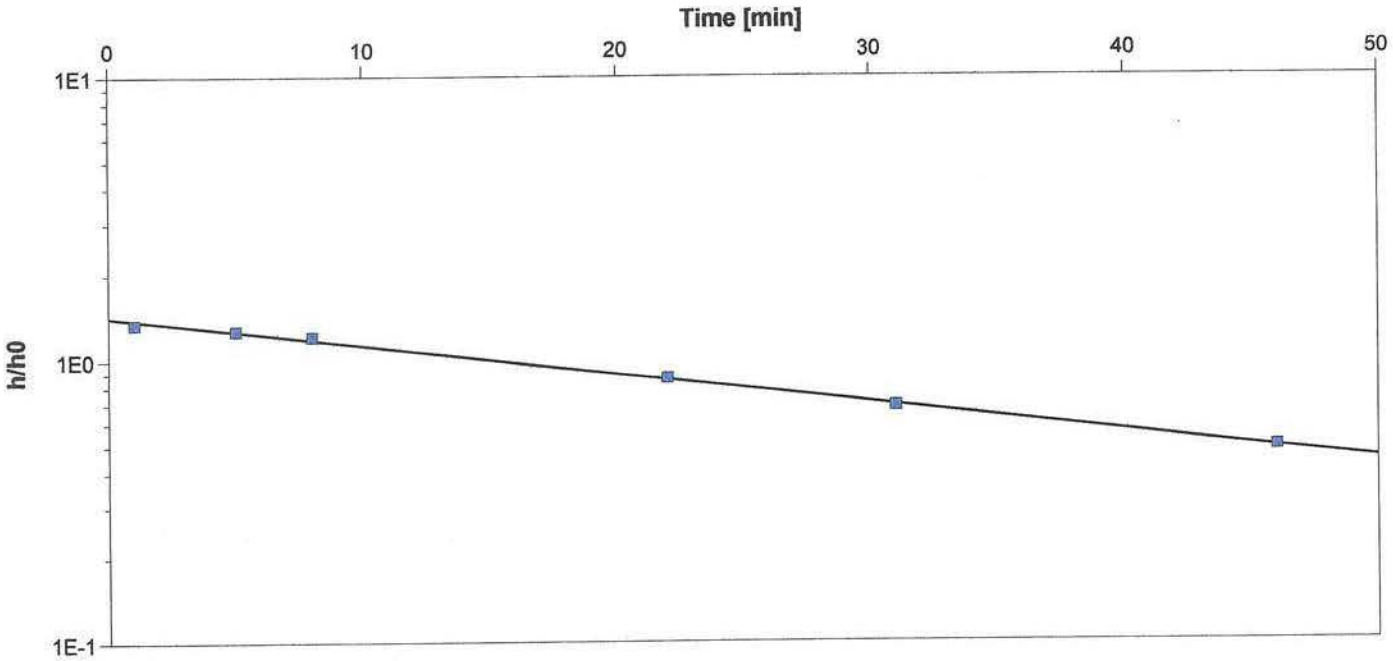
Initial Displacement: 0.4348 m
Total Well Penetration Depth: 7.62 m
Casing Radius: 0.0254 m
Static Water Column Height: 6.27 m
Screen Length: 3.05 m
Well Radius: 0.0254 m
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 2.346E-8 m/sec
y0 = 0.1745 m

XCG Consulting Limited 820 Trillium Drive Kitchener, ON	Slug Test Analysis Report
	Project: Hydrogeological Investigation
	Number: 5-4227-03-02
	Client: Freshway Developments Inc.

Location: 1800 Pharmacy Ave Toronto ON	Slug Test: MW16-1	Test Well: MW16-1
Test Conducted by: MS/AC		Test Date: 10/26/2017
Analysis Performed by: MPS	MW16-1Bouwer-Rice	Analysis Date: 10/30/2017
Aquifer Thickness: 20.00 m		

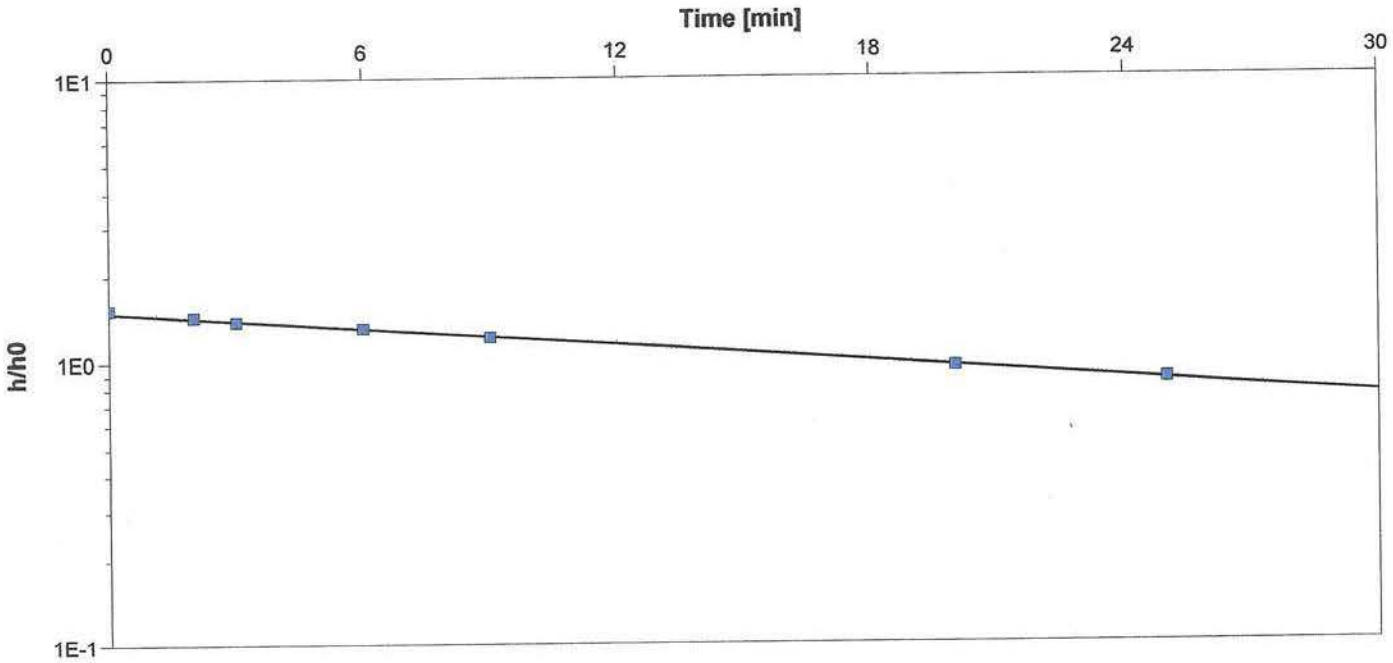


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/min]	
MW16-1	5.38×10^{-6}	

XCG Consulting Limited 820 Trillium Drive Kitchener, ON	Slug Test Analysis Report
	Project: Hydrogeological Investigation
	Number: 5-4227-03-01
	Client: Freshway Developments Inc.

Location: 1800 Pharmacy Ave Toronto ON	Slug Test: MW16-4s	Test Well: MW16-4s
Test Conducted by: MS/AC		Test Date: 10/26/2017
Analysis Performed by: MPS	Bouwer_Rice	Analysis Date: 10/30/2017
Aquifer Thickness: 20.00 m		

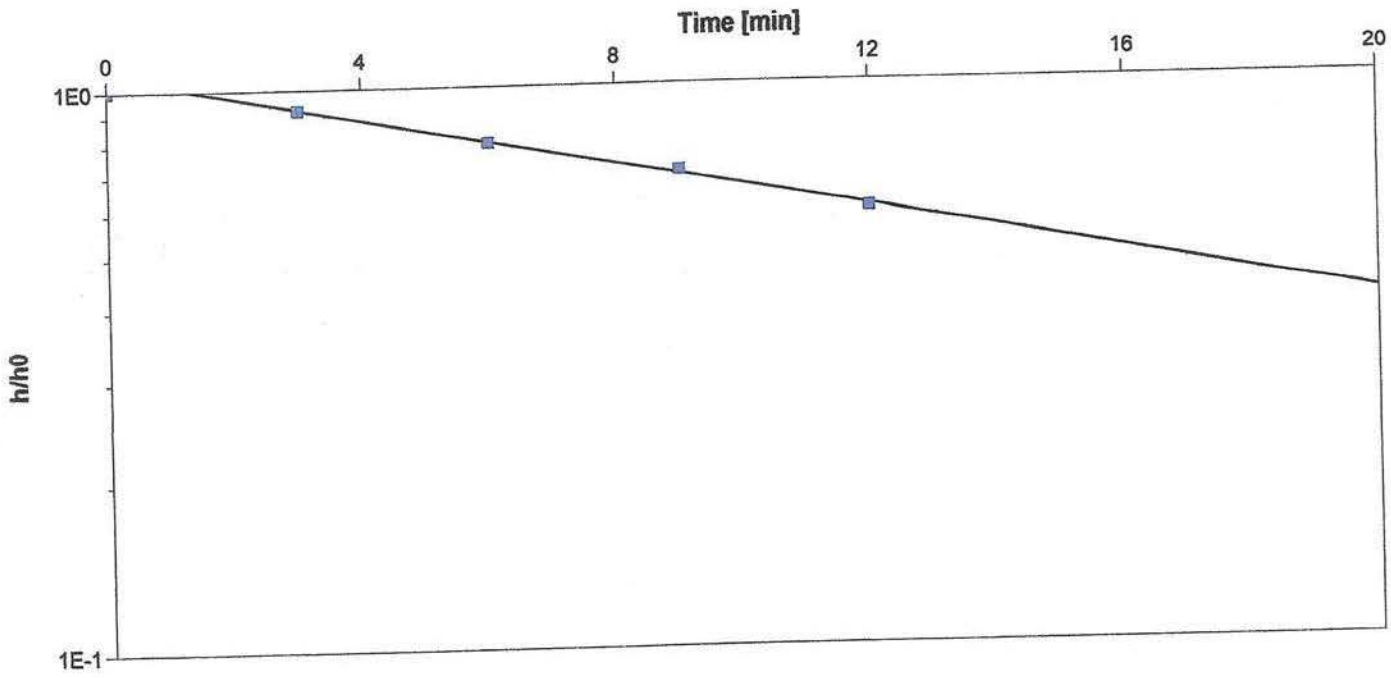


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/min]	
MW16-4s	5.29×10^{-6}	

XCG Consulting Limited 820 Trillium Drive Kitchener, ON	Slug Test Analysis Report
	Project: Hydrogeological Investigation
	Number: 5-4227-03-02
	Client: Freshway Developments Inc.

Location: 1800 Pharmacy Ave Toronto ON	Slug Test: MW16-4D	Test Well: MW16-4d
Test Conducted by: MS/AC		Test Date: 10/26/2017
Analysis Performed by: MPS	MW16-4d_BouwerRice	Analysis Date: 10/30/2017
Aquifer Thickness: 20.00 m		

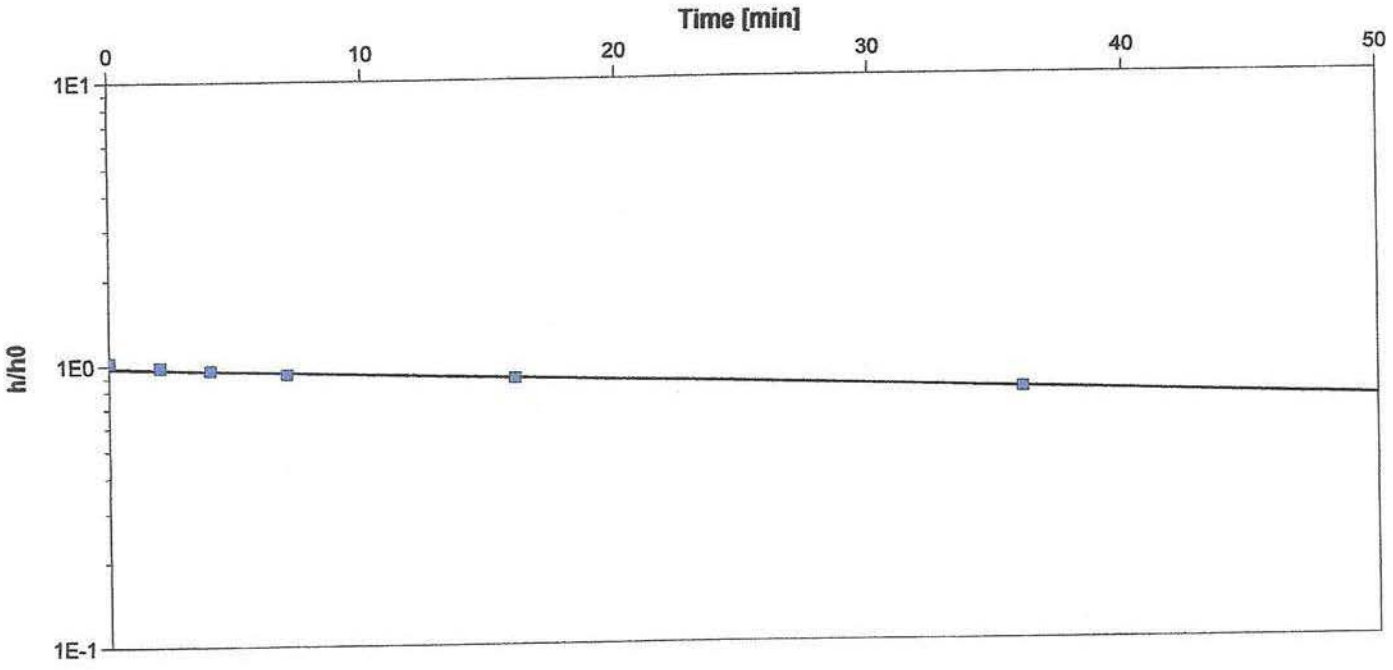


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/min]	
MW16-4d	1.21×10^{-5}	

XCG Consulting Limited 820 Trillium Drive Kitchener, ON	Slug Test Analysis Report
	Project: Hydrogeological Investigation
	Number: 5-4227-03-02
	Client: Freshway Developments Inc.

Location: 1800 Pharmacy Ave Toronto ON	Slug Test: BH102	Test Well: BH102
Test Conducted by: MS/AC		Test Date: 10/26/2017
Analysis Performed by: mps	BH102_BouwerRice	Analysis Date: 10/30/2017
Aquifer Thickness: 20.00 m		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/min]	
BH102	1.43×10^{-6}	

APPENDIX D – GROUND WATER MONITORING REUSLTS

ARCADIS

TABLE D.1 - GROUNDWATER MONITORING AND SURVEY DATA

Monitoring Well	Ground Surface Elevation	Top of Casing Elevation	Screen Interval Depth	18-Mar-19			21-Mar-19			03-Apr-19		
				Depth to Ground Water	Depth to Ground Water	Ground Water Elevation	Depth to Ground Water	Depth to Ground Water	Ground Water Elevation	Depth to Ground Water	Depth to Ground Water	Ground Water Elevation
	(m amsl)	(m amsl)	(m bgs)	(m btoc)	(m bgs)	(m amsl)	(m btoc)	(m bgs)	(m amsl)	(m btoc)	(m bgs)	(m amsl)
MW01	179.68[a]	176.84	3.7 - 5.8	-	-	-	0.22	2.12	176.62	0.10	2.00	176.74
MW02	178.90	178.84	4.6 - 7.6	-	-	-	1.73	1.79	177.12	1.73	1.79	177.11
MW03	179.66[a]	176.82	3.7 - 6.4	0.86	2.59	175.96	0.48	2.21	176.34	0.35	2.08	176.47
MW04	179.15	179.05	5.5 - 8.4	-	-	-	Buried under snow/ice			NM	NM	NM
MW05	178.29	178.19	4.6 - 7.6	-	-	-	2.05	2.15	176.14	2.03	2.13	176.17
BH1	178.22	NS	4.5 - 7.5[b]	-	-	-	Buried under snow/ice			1.54	1.64	176.58
BH2	177.83	177.75	4.5 - 7.5[b]	1.37	1.45	176.38	1.34	1.42	176.41	1.06	1.13	176.70
BH3	178.83	178.71	4.5 - 7.5[b]	-	-	-	Buried under snow/ice			1.24	1.36	177.47
BH101	178.79	178.71	4.5 - 7.5[b]	-	-	-	Buried under snow/ice			1.54	1.62	177.17
BH102	177.91	177.79	4.5 - 7.5[b]	1.20	1.32	176.59	Buried under snow/ice			1.11	1.23	176.68
BH103	177.84	177.76	4.5 - 7.5[b]	1.36	1.43	176.41	0.90	0.98	176.86	0.91	0.99	176.85
MW201	178.42	178.36	4.6 - 7.6	-	-	-	1.63	1.69	176.73	1.67	1.73	176.69
MW202	178.26	178.00	4.6 - 7.6	-	-	-	Buried under snow/ice			1.51	1.77	176.49
MW203	178.32	178.18	1.5 - 3.0	-	-	-	Buried under snow/ice			1.24	1.38	176.94
MW204	178.44	178.32	0.9 - 3.0	-	-	-	Buried under snow/ice			1.54	1.66	176.78
MW205	178.57	178.42	1.1 - 3.5	-	-	-	Buried under snow/ice			1.20	1.35	177.23
MW206	179.24	179.17	4.6 - 7.6	-	-	-	2.20	2.27	176.97	2.19	2.26	176.98
MW16-1	178.08	177.99	3.1 - 6.1[b]	-	-	-	Buried under snow/ice			1.10	1.19	176.89
MW16-2	178.86[a]	178.79	1.6 - 4.6[b]	1.85	1.14	176.94	2.69	1.98	176.11	1.63	0.92	177.17
MW16-3	178.57	178.47	6.1 - 9.1[b]	2.02	2.12	176.45	1.42	1.52	177.05	1.08	1.18	177.39
MW16-4S	177.92	177.81	3.0 - 6.0[b]	1.48	1.59	176.33	1.27	1.37	176.55	0.89	1.00	176.92
MW16-4D	177.92	177.78	4.9 - 7.9[b]	1.53	1.67	176.26	1.43	1.57	176.35	1.37	1.51	176.42
MW16-5	178.86[a]	178.78	1.0 - 4.0[b]	1.91	0.80	176.87	1.86	0.75	176.92	1.84	0.73	176.94
MW16-6	177.58	177.44	3.1 - 6.1[b]	1.49	1.63	175.95	Buried under snow/ice			1.16	1.29	176.29
MW16-7	178.68	178.52	3.1 - 6.1[b]	-	-	-	Buried under snow/ice			1.35	1.51	177.17
MW1-17	178.10	177.97	13.5 - 16.5	-	-	-	Buried under snow/ice			3.51	3.64	174.46
MW19-1A	179.21	179.10	1.0 - 4.0	2.92	3.03	176.18	3.00	3.10	176.10	2.09	2.20	177.01
MW19-1B	179.27	179.10	15.0 - 18.0	-	-	-	7.43	7.60	171.67	7.36	7.53	171.75
MW19-2	178.66	178.50	15.0 - 18.0	-	-	-	9.48	9.64	169.03	9.37	9.53	169.13
MW19-3	177.64	177.52	15.0 - 18.0	-	-	-	12.90	13.02	164.62	12.76	12.88	164.77
MW19-4	178.41	178.24	19.0 - 22.0	-	-	-	5.78	5.95	172.46	5.65	5.81	172.60
MW19-5A	178.16	178.09	1.0 - 4.0	1.56	1.62	176.54	1.50	1.57	176.59	1.48	1.54	176.62
MW19-5B	178.06	177.98	4.6 - 7.6	1.59	1.68	176.39	1.50	1.58	176.48	1.60	1.68	176.38
MW19-6	178.86	178.79	1.0 - 4.0	2.44	2.51	176.35	2.39	2.46	176.40	2.15	2.22	176.64
MW19-7	178.76	178.67	1.0 - 4.0	-	-	-	1.00	1.09	177.66	0.85	0.94	177.82
MW19-8	178.69	178.56	4.6 - 7.6	1.57	1.71	176.99	1.42	1.56	177.14	1.25	1.39	177.31

Notes:

- = not monitored
NS = not surveyed
[a] finished floor elevation
[b] assuming 3-m long well screen
Elevations are relative to City of Toronto Benchmark No. S665 having a published elevation of 177.212 m.

m = metres
m amsl = metres above mean sea level
m btoc = metres below top of casing
m bgs = metres below ground surface

ARCADIS

TABLE D.1 - GROUNDWATER MONITORING AND SURVEY DATA

Monitoring Well	Ground Surface Elevation	Top of Casing Elevation	Screen Interval Depth	18-Apr-19			03-May-19			16-May-19		
				Depth to Ground Water	Depth to Ground Water	Ground Water Elevation	Depth to Ground Water	Depth to Ground Water	Ground Water Elevation	Depth to Ground Water	Depth to Ground Water	Ground Water Elevation
	(m amsl)	(m amsl)	(m bgs)	(m btoc)	(m bgs)	(m amsl)	(m btoc)	(m bgs)	(m amsl)	(m btoc)	(m bgs)	(m amsl)
MW01	179.68[a]	176.84	3.7 - 5.8	0.11	2.01	176.73	0.13	2.03	176.71	0.13	2.03	176.71
MW02	178.90	178.84	4.6 - 7.6	1.80	1.86	177.04	1.83	1.89	177.01	1.86	1.92	176.98
MW03	179.66[a]	176.82	3.7 - 6.4	0.35	2.08	176.47	0.33	2.06	176.50	0.33	2.06	176.49
MW04	179.15	179.05	5.5 - 8.4	NM	NM	NM	NM	NM	NM	NM	NM	NM
MW05	178.29	178.19	4.6 - 7.6	1.17	1.27	177.02	2.11	2.21	176.08	2.16	2.26	176.04
BH1	178.22	NS	4.5 - 7.5[b]	1.34	1.45	176.77	1.16	1.26	176.96	1.30	1.40	176.82
BH2	177.83	177.75	4.5 - 7.5[b]	1.13	1.21	176.62	1.06	1.13	176.70	1.13	1.21	176.62
BH3	178.83	178.71	4.5 - 7.5[b]	1.43	1.55	177.29	1.44	1.56	177.27	1.49	1.61	177.22
BH101	178.79	178.71	4.5 - 7.5[b]	1.52	1.60	177.19	1.50	1.57	177.22	1.56	1.64	177.15
BH102	177.91	177.79	4.5 - 7.5[b]	1.18	1.30	176.61	0.98	1.10	176.81	1.18	1.30	176.61
BH103	177.84	177.76	4.5 - 7.5[b]	0.98	1.06	176.78	0.94	1.01	176.83	1.00	1.08	176.76
MW201	178.42	178.36	4.6 - 7.6	1.72	1.78	176.64	1.61	1.67	176.75	1.76	1.82	176.60
MW202	178.26	178.00	4.6 - 7.6	1.55	1.81	176.45	1.39	1.65	176.61	1.57	1.83	176.43
MW203	178.32	178.18	1.5 - 3.0	1.32	1.46	176.86	0.97	1.11	177.21	1.36	1.50	176.82
MW204	178.44	178.32	0.9 - 3.0	1.54	1.66	176.78	0.93	1.05	177.39	1.36	1.48	176.96
MW205	178.57	178.42	1.1 - 3.5	1.30	1.45	177.13	0.96	1.11	177.46	1.28	1.43	177.14
MW206	179.24	179.17	4.6 - 7.6	2.18	2.25	176.99	2.08	2.15	177.09	2.16	2.23	177.01
MW16-1	178.08	177.99	3.1 - 6.1[b]	1.20	1.29	176.79	1.15	1.24	176.84	1.22	1.31	176.78
MW16-2	178.86[a]	178.79	1.6 - 4.6[b]	1.72	1.01	177.07	1.43	0.72	177.36	1.70	0.99	177.09
MW16-3	178.57	178.47	6.1 - 9.1[b]	1.14	1.23	177.34	1.15	1.25	177.32	1.19	1.29	177.28
MW16-4S	177.92	177.81	3.0 - 6.0[b]	0.93	1.04	176.88	0.94	1.04	176.88	0.99	1.10	176.82
MW16-4D	177.92	177.78	4.9 - 7.9[b]	1.21	1.35	176.57	1.07	1.21	176.71	1.13	1.27	176.65
MW16-5	178.86[a]	178.78	1.0 - 4.0[b]	1.81	0.70	176.97	1.78	0.67	177.00	1.81	0.70	176.97
MW16-6	177.58	177.44	3.1 - 6.1[b]	1.17	1.31	176.27	1.05	1.19	176.39	1.10	1.24	176.34
MW16-7	178.68	178.52	3.1 - 6.1[b]	1.38	1.54	177.14	1.45	1.61	177.07	1.45	1.61	177.07
MW1-17	178.10	177.97	13.5 - 16.5	3.39	3.52	174.59	3.38	3.51	174.60	3.33	3.46	174.64
MW19-1A	179.21	179.10	1.0 - 4.0	1.95	2.06	177.15	1.89	2.00	177.21	1.94	2.05	177.16
MW19-1B	179.27	179.10	15.0 - 18.0	7.25	7.42	171.85	7.15	7.32	171.95	7.07	7.24	172.03
MW19-2	178.66	178.50	15.0 - 18.0	9.27	9.43	169.24	9.28	9.44	169.23	9.09	9.25	169.41
MW19-3	177.64	177.52	15.0 - 18.0	12.64	12.76	164.89	12.49	12.61	165.03	12.35	12.47	165.17
MW19-4	178.41	178.24	19.0 - 22.0	5.64	5.81	172.60	5.55	5.71	172.70	5.50	5.67	172.74
MW19-5A	178.16	178.09	1.0 - 4.0	1.53	1.59	176.57	1.51	1.58	176.58	1.57	1.64	176.52
MW19-5B	178.06	177.98	4.6 - 7.6	1.66	1.74	176.33	1.62	1.70	176.37	1.66	1.74	176.32
MW19-6	178.86	178.79	1.0 - 4.0	2.17	2.24	176.62	2.16	2.23	176.63	2.06	2.14	176.73
MW19-7	178.76	178.67	1.0 - 4.0	1.18	1.27	177.49	1.21	1.30	177.46	1.22	1.31	177.44
MW19-8	178.69	178.56	4.6 - 7.6	1.33	1.46	177.23	1.38	1.51	177.18	1.40	1.53	177.16

Notes:

- = not monitored
NS = not surveyed
[a] finished floor elevation
[b] assuming 3-m long well screen
Elevations are relative to City of Toronto Benchmark No. S665 having a published elevation of 177.212 m.

m = metres
m amsl = metres above mean sea level
m btoc = metres below top of casing
m bgs = metres below ground surface

ARCADIS

TABLE D.1 - GROUNDWATER MONITORING AND SURVEY DATA

Monitoring Well	Ground Surface Elevation	Top of Casing Elevation	Screen Interval Depth	31-May-19		
				Depth to Ground Water	Depth to Ground Water	Ground Water Elevation
	(m amsl)	(m amsl)	(m bgs)	(m btoc)	(m bgs)	(m amsl)
MW01	179.68[a]	176.84	3.7 - 5.8	0.15	2.05	176.69
MW02	178.90	178.84	4.6 - 7.6	1.93	1.99	176.91
MW03	179.66[a]	176.82	3.7 - 6.4	0.35	2.08	176.47
MW04	179.15	179.05	5.5 - 8.4	NM	NM	NM
MW05	178.29	178.19	4.6 - 7.6	2.23	2.33	175.97
BH1	178.22	NS	4.5 - 7.5[b]	1.40	1.50	176.72
BH2	177.83	177.75	4.5 - 7.5[b]	1.20	1.28	176.55
BH3	178.83	178.71	4.5 - 7.5[b]	1.75	1.87	176.96
BH101	178.79	178.71	4.5 - 7.5[b]	1.63	1.71	177.08
BH102	177.91	177.79	4.5 - 7.5[b]	1.44	1.56	176.35
BH103	177.84	177.76	4.5 - 7.5[b]	1.06	1.14	176.70
MW201	178.42	178.36	4.6 - 7.6	1.92	1.98	176.44
MW202	178.26	178.00	4.6 - 7.6	NM	NM	NM
MW203	178.32	178.18	1.5 - 3.0	1.49	1.62	176.70
MW204	178.44	178.32	0.9 - 3.0	0.92	1.04	177.40
MW205	178.57	178.42	1.1 - 3.5	1.40	1.55	177.02
MW206	179.24	179.17	4.6 - 7.6	2.27	2.34	176.91
MW16-1	178.08	177.99	3.1 - 6.1[b]	1.46	1.55	176.53
MW16-2	178.86[a]	178.79	1.6 - 4.6[b]	1.78	1.07	177.01
MW16-3	178.57	178.47	6.1 - 9.1[b]	1.47	1.57	177.00
MW16-4S	177.92	177.81	3.0 - 6.0[b]	1.05	1.16	176.76
MW16-4D	177.92	177.78	4.9 - 7.9[b]	1.14	1.28	176.64
MW16-5	178.86[a]	178.78	1.0 - 4.0[b]	1.84	0.73	176.94
MW16-6	177.58	177.44	3.1 - 6.1[b]	1.18	1.32	176.26
MW16-7	178.68	178.52	3.1 - 6.1[b]	1.61	1.77	176.91
MW1-17	178.10	177.97	13.5 - 16.5	3.48	3.61	174.49
MW19-1A	179.21	179.10	1.0 - 4.0	2.02	2.13	177.08
MW19-1B	179.27	179.10	15.0 - 18.0	7.17	7.34	171.93
MW19-2	178.66	178.50	15.0 - 18.0	9.23	9.39	169.27
MW19-3	177.64	177.52	15.0 - 18.0	12.37	12.49	165.15
MW19-4	178.41	178.24	19.0 - 22.0	5.57	5.74	172.67
MW19-5A	178.16	178.09	1.0 - 4.0	1.70	1.77	176.39
MW19-5B	178.06	177.98	4.6 - 7.6	1.72	1.81	176.26
MW19-6	178.86	178.79	1.0 - 4.0	2.24	2.31	176.55
MW19-7	178.76	178.67	1.0 - 4.0	1.52	1.61	177.15
MW19-8	178.69	178.56	4.6 - 7.6	1.57	1.70	176.99

Notes:

- = not monitored
NS = not surveyed
[a] finished floor elevation
[b] assuming 3-m long well screen
Elevations are relative to City of Toronto Benchmark No. S665 having a published elevation of 177.212 m.

m = metres
m amsl = metres above mean sea level
m btoc = metres below top of casing
m bgs = metres below ground surface

APPENDIX E – GRAIN SIZE ANALYSIS RESULTS

Grain Size Analysis Report

Client Sample ID: BH19-2-4 (JGS614)
Maxxam Sample ID: VM2110-01
Maxxam Job #: B924982

Tot. Sample Wt (g)*: 10.54
> 2 mm Sample Wt (g)*: 0.39
* Dry mass based on Sieve Aliquot

Batch # (Sieve): 9374465
Batch # (Hydro): 9374138

Analysis Date (Sieve): 2019/04/09
Analysis Date (Hydro): 2019/04/08

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	96.3
	Sieve 20	0.850	93.6
	Sieve 40	0.425	90.2
	Sieve 100	0.150	77.6
	Sieve 200	0.075	63.2
Hydrometer	R1min	0.0470	49.6
	R3min	0.0277	42.5
	R10min	0.0154	37.8
	R30min	0.0091	30.7
	R90min	0.0053	23.6
	R270min	0.0031	17.7
	R1080min	0.0016	14.2

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	47.0
Silt	0.002	0.050	37.3
Clay	-	0.002	15.7

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

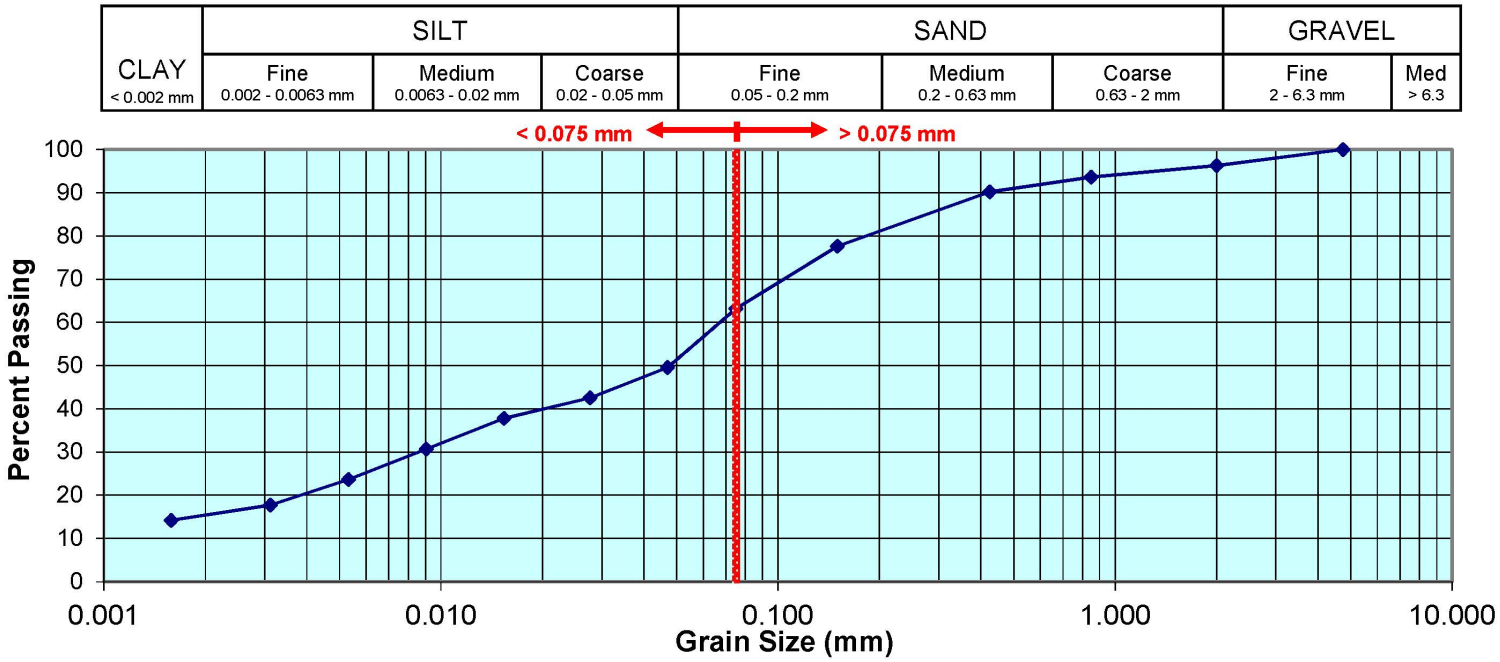
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 63.2
Classification = Fine Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 65.6
Classification = Fine Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report

Client Sample ID: BH19-2-4 (JGS614)
Maxxam Sample ID: DUP VM2110-01
Maxxam Job #: B924982

Tot. Sample Wt (g)*: 10.79
> 2 mm Sample Wt (g)*: 0.29
* Dry mass based on Sieve Aliquot

Batch # (Sieve): 9374465
Batch # (Hydro): 9374138

Analysis Date (Sieve): 2019/04/09
Analysis Date (Hydro): 2019/04/08

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	100.0
	Sieve 10	2.000	97.3
	Sieve 20	0.850	95.0
	Sieve 40	0.425	91.5
	Sieve 100	0.150	77.6
	Sieve 200	0.075	64.0
Hydrometer	R1min	0.0470	50.4
	R3min	0.0277	43.2
	R10min	0.0154	38.4
	R30min	0.0091	31.2
	R90min	0.0053	24.0
	R270min	0.0031	18.0
	R1080min	0.0016	14.4

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	46.7
Silt	0.002	0.050	37.5
Clay	-	0.002	15.8

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

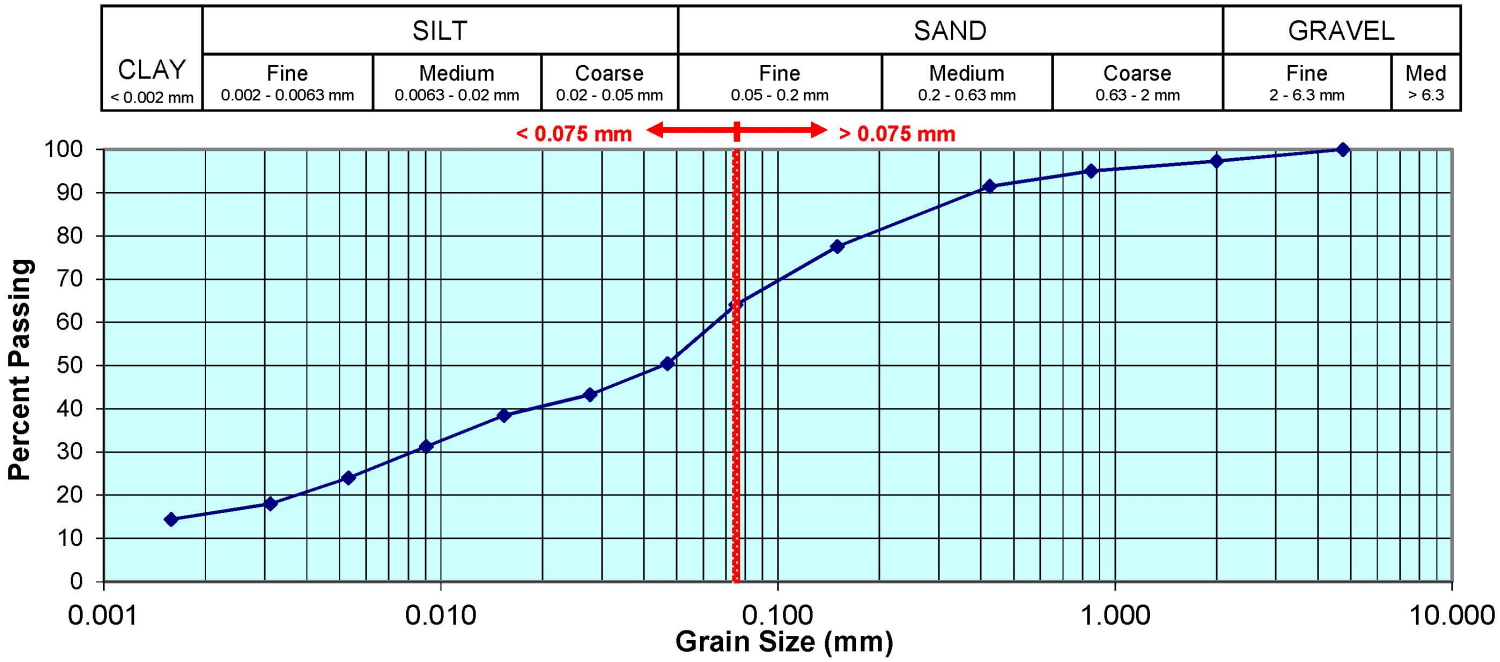
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 64.0
Classification = Fine Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 65.8
Classification = Fine Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report

Client Sample ID: BH19-2-4 (JGS614)
Maxxam Sample ID: DUP VM2110-01
Maxxam Job #: B924982

Tot. Sample Wt (g)*: 10.24
> 2 mm Sample Wt (g)*: 0.59
* Dry mass based on Sieve Aliquot

Batch # (Sieve): 9374465
Batch # (Hydro): 9374138

Analysis Date (Sieve): 2019/04/09
Analysis Date (Hydro): 2019/04/08

	Description	Particle Size (mm)	Percent Passing
Sieve	Sieve 4	4.750	95.1
	Sieve 10	2.000	94.2
	Sieve 20	0.850	91.7
	Sieve 40	0.425	88.1
	Sieve 100	0.150	74.7
	Sieve 200	0.075	61.0
Hydrometer	R1min	0.0470	48.8
	R3min	0.0277	41.9
	R10min	0.0154	37.2
	R30min	0.0091	30.2
	R90min	0.0053	23.3
	R270min	0.0031	17.4
	R1080min	0.0016	14.0

Grain Size Proportion (%)**:

	Min (mm)	Max (mm)	Percentage
Sand	0.050	2.000	46.8
Silt	0.002	0.050	37.4
Clay	-	0.002	15.8

** Calculations based only on sub 2 mm fraction.
Compatible with USDA and Canadian Soil Triangles

Soil Classification***:

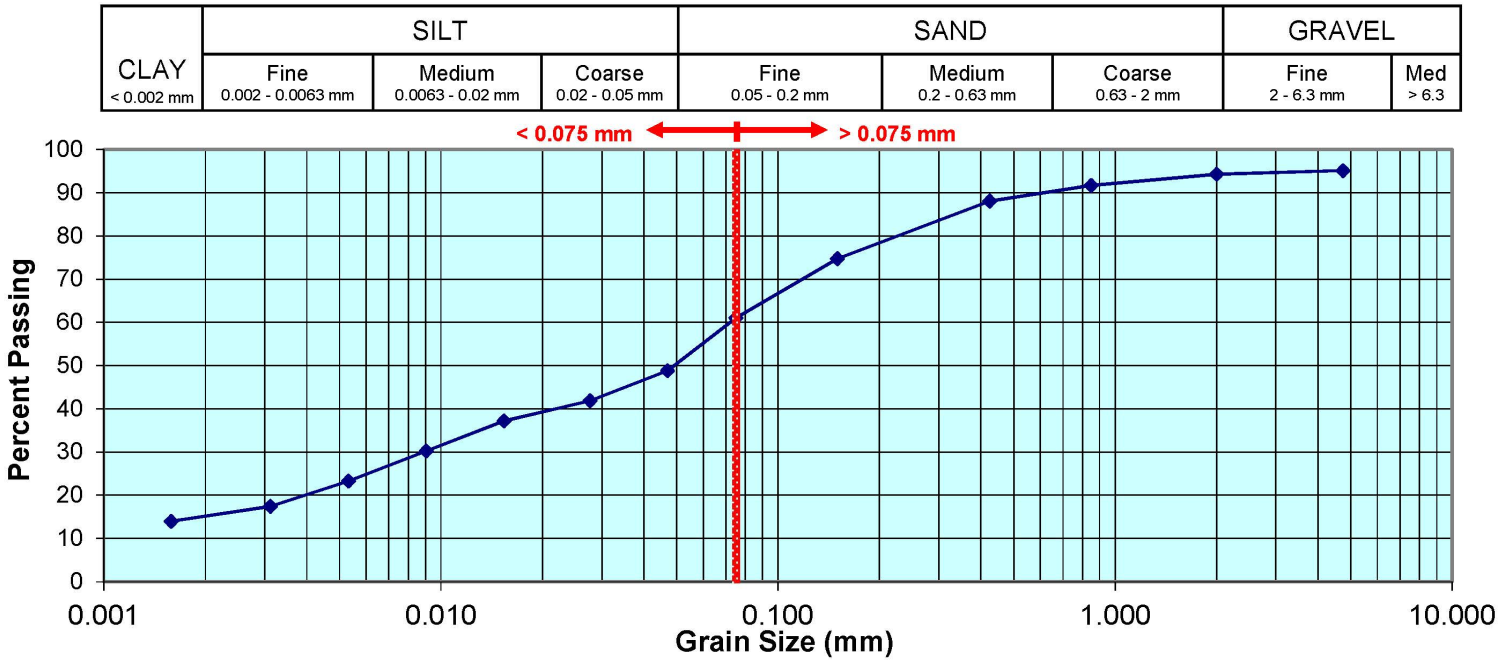
Based on the entire sample

Percentage (by mass) less than 0.075 mm = 61.0
Classification = Fine Textured Soil

Based on the < 2 mm fraction **

Percentage (by mass) less than 0.075 mm = 64.8
Classification = Fine Textured Soil

**** Grain size analysis performed to classify the soil material according to the criteria prescribed in Section 42.2 of Ontario Regulation 153/04 as amended by Ontario Regulation 511/09, and conducted in accordance with test procedures outlined in ASTM D422.



*** ON Regulation 153/04 requires coarse:fine determination on the < 2 mm fraction. Other jurisdictions may require the entire sample, thus both classifications are provided

Note: Clay/Silt/Sand/Gravel Graphic above Graph: Sand | Silt | Clay fractions in accordance with USDA and Canadian System of Soil Classification. Sub fractions in accordance with the British (BSI) system for information purposes.

Grain Size Analysis Report (QA-SRM)

Sieve Batch #: 9374465
Hydrometer Batch #: 9374138

Standard Reference Material

			Acceptance Limits	
	Fraction	% Recovery	Minimum	Maximum
Sieve	> 0.075 mm	103	75	125
	< 0.075 mm	99	75	125
Hydrometer	Sand	103	87	113
	Silt	107	90	110
	Clay	80	79	121

Grain Size Analysis Report (QA-DUP)

Sieve Batch #: 9374465
Hydrometer Batch #: 9374138
Maxxam Job #: B924982

Duplicate Sample ID: VM2110

			Acceptance Limit
	Fraction (mm)	% RPD	Maximum
Sieve	4.750	NC	30
	2.000	31.7	30
	0.850	13.6	30
	0.425	3.1	30
	0.150	9.7	30
	0.075	6.3	30
Hydrometer	0.0470	NC	30
	0.0277	NC	30
	0.0154	NC	30
	0.0091	NC	30
	0.0053	NC	30
	0.0031	NC	30
	0.0016	NC	30

Grain Size Analysis Report (QA-DUP)

Sieve Batch #: 9374465
Hydrometer Batch #: 9374138
Maxxam Job #: B924982

Duplicate Sample ID: VM2110

			Acceptance Limit
	Fraction (mm)	% RPD	Maximum
Sieve	4.750	200.0	30
	2.000	123.2	30
	0.850	4.5	30
	0.425	5.6	30
	0.150	5.9	30
	0.075	5.3	30
Hydrometer	0.0470	NC	30
	0.0277	NC	30
	0.0154	NC	30
	0.0091	NC	30
	0.0053	NC	30
	0.0031	NC	30
	0.0016	NC	30

APPENDIX F – INFORMATION ON WATER WELL RECORDS RECEIVED FROM MECP

ARCADIS Design & Consultancy for natural and built assets

TABLE F.1 SUMMARY OF WELL RECORDS
2993-3011 Sheppard Avenue East and 1800-1814 Pharmacy Avenue, Toronto, Ontario

Well Number	Approximate Distance from Phase One Property	Date	Use	Well Depth (m)	Geology (Depth to Base in m)	Approximate Depth to Water Table (m)
7272218	Site	2016	Monitoring and Test Hole	4.3 m	Grey Other (0.2) Brown Sand/Silt (1.5) Grey Silt/Sand (3) Grey Silt Clay (4.3)	Not Listed
7227424	Site	2014	Monitoring	7.6 m	Black Gravel (0.2) Brown Gravel/Sand (0.3) Brown Silt/Sand (5.2) Grey Silt/Clay (7.6)	Not Listed
7236367	Site	2014	Monitoring and Test Hole	3 m	Grey Other (0.2) Brown Clay/Silt (0.9) Brown Sand/Silt (3)	Not Listed
7236368	Site	2014	Monitoring and Test Hole	3.7 m	Grey Other (0.2) Brown Clay/Silt (0.9) Brown Sand/Silt (3.7)	Not listed
7269949	Site	2016	Monitoring and Test Hole	7.9 m	Black Other (0.2) Brown Fill/Gravel (2.1) Brown Silt/Sand (4) Brown Silt (6) Grey Clay/Silt (7.9)	Not Listed
7269950	Site	2016	Monitoring and Test Hole	6 m	Black Other (0.2) Brown Sand/Gravel (0.3) Brown Silt/Clay (3.7) Grey Silt/Clay (6)	Not Listed
7236369	Site	2014	Monitoring and Test Hole	7.6 m	Black Other (0.2) Brown Sand/Gravel (0.3) Brown Sand/Silt (5.5) Grey Sand/Silt (7.6)	Not Listed
7272219	Site	2016	Monitoring and Test Hole	4.6 m	Grey Other (0.2) Brown Fill/Sand (1.5) Grey Sand/Silt (3) Grey Silt/Sand (4.6)	Not Listed
7269948	Site	2016	Monitoring and Test Hole	6 m	Black Other (0.2) Brown Fill/Gravel (1.8) Brown Silt/Sand (4) Brown Silt/Clay (6)	Not Listed
7252860	Site	2015	Not Listed	Not Listed	Not Listed	Not Listed
7236370	Site	2014	Monitoring and Test Hole	8.5 m	Black Other (0.2) Brown Sand/Gravel (0.3) Brown Sand/Silt (6) Grey Sand/Silt (8.5)	Not Listed
7272217	Site	2016	Monitoring and Test Hole	9.1 m	Black Other (0.2) Brown Fill/Gravel (2.1) Brown Sand/Silt (3.4) Grey Silt/Clay (6.7) Brown Sand/Silt (9.1)	Not Listed
7269951	Site	2016	Monitoring and Test Hole	6 m	Black Other (0.2) Brown Sand/Gravel (0.3) Brown Silt/Clay (3.7) Grey Silt/Clay (6)	Not Listed
7269952	Site	2016	Monitoring and Test Hole	6 m	Brown Topsoil (0.3) Brown Sand/Silt (3) Grey Silt/Clay (6)	Not Listed
7261643	34 m Northeast	2016	Monitoring	9.1 m	Brown Sand/Gravel (1.5) Brown Silt/Sand (6) Grey Silt/Sand (9.1)	7.6 m
7266684	44 m Northeast	2014	Not Listed	Not Listed	Not Listed	Not Listed
7261642	74 m Northeast	2016	Monitoring	9.1 m	Brown Sand/Gravel (1) Brown Silt/Sand (5.6 Grey Silt/Sand (9.1)	7.6 m
7259870	197 m South	2015	Monitoring and Test Hole	3 m	Brown Fill/Silt (2.2) Grey Sand/Silt (3)	1 m

APPENDIX G – INFORMATION ON PERMIT TO TAKE WATER RECEIVED FROM MECP

Map: Permits to take water

Search for and view water-taking locations linked to active permits across Ontario.

Full dataset is available in the Open Data Catalogue

Recommended for you

How to use a Ministry of the Environment map

Technical documentation: Metadata record

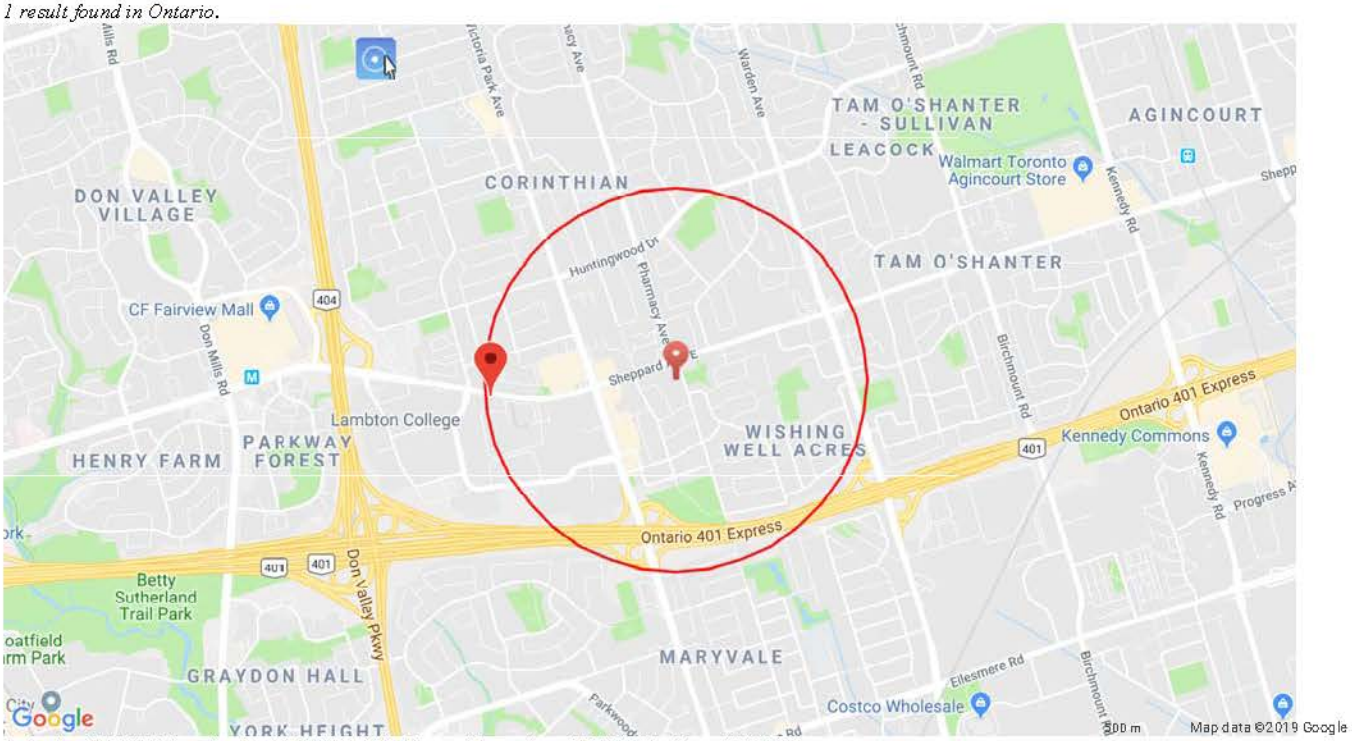
Search the map

You may search by **watershed**, **permit holder name**, **address** or see help for advanced options.

1800 Pharmacy Avenue, Toronto Search

Watershed Permit Holder Name Address with Radius of 1 km

1 result found in Ontario.



Latitude:43.76357, Longitude:-79.29935 (UTM Zone:17, Easting:636889, Northing:4847019)

Note: Data is in English only.The Distance(KM) column represents the distance between your search location and the permit location in the specific row.

Show 10 **entries** **Search:**

Permit Number	Permit Holder Name	Purpose	Specific Purpose	Max Litres per Day	Source Type	Distance (KM)
8268-9YPK4E	Residences At Atria Inc.	Dewatering Construction	Construction	150000	Ground Water	0.97

Showing 1 to 1 of 1 entries

First Previous 1 Next Last

Updated: February 20, 2019
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- Taxes and benefits
- Travel and recreation

APPENDIX H – CALCULATION OF GROUND WATER DEWATERING RATE DURING CONSTRUCTION ACTIVITIES

Dewatering Evaluation - Radial unconfined flow into a circular excavation

Proposed 3-Level Underground Parking at 2993-3011 Sheppard Avenue East and 1800-1814 Pharmacy Avenue, Toronto (Constructior

Parameter	Units	Value	User-specified units
Hydraulic conductivity, K	L/T	2.9E-08	m/s
Elevation of base of aquifer, z_{bot}	L	162.6	m
Distance from centre of excavation to constant-head boundary, R	L	53.0	m
Distance from centre to boundary of excavation, R_0	L	45.8	m
Head at the constant-head boundary, H	L	177.8	m
Head in the excavation, h_d	L	165.6	m

Result

Calculated inflow, Q	L^3/T	m^3/s	L/d
If K as stated above		**1.408E-04**	**12,168**
If K is 10X higher		**1.408E-03**	**121,682**
If K is 10X lower		**1.408E-05**	**1,217**

The inflow into the excavation is:

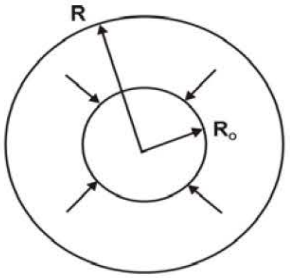
$$Q = -\pi K \frac{(H^2 - h_d^2)}{\ln\left\{\frac{R}{R_0}\right\}}$$

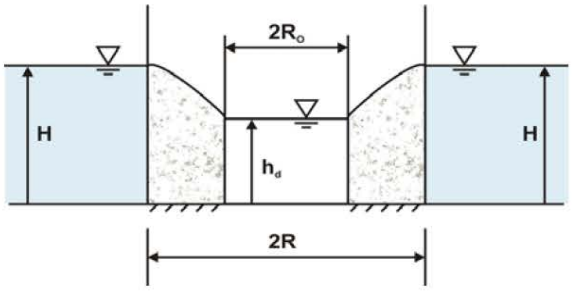
The negative sign denotes flow out of the aquifer into the excavation for $h_d < H$.

The heads H and h_d are measured with respect to the base of the aquifer.

The term R_o represents the equivalent radius of the excavation. The equivalent radius may be calculated based on equal area

$$R_o = \sqrt{\frac{ab}{\pi}}$$





Ref:

Powers, J.P., 1981. Construction Dewatering: A Guide to Theory & Practice, pp 98-109. A Wiley-Interscience Publication

Dewatering Evaluation - Radial unconfined flow into a circular excavation

Proposed 3-Level Underground Parking at 2993-3011 Sheppard Avenue East and 1800-1814 Pharmacy Avenue, Toronto (Long Term

Parameter	Units	Value	User-specified units
Hydraulic conductivity, K	L/T	2.9E-08	m/s
Elevation of base of aquifer, z_{bot}	L	164.6	m
Distance from centre of excavation to constant-head boundary, R	L	52.0	m
Distance from centre to boundary of excavation, R_0	L	45.8	m
Head at the constant-head boundary, H	L	177.8	m
Head in the excavation, h_d	L	167.6	m

Result

Calculated inflow, Q	L^3/T	m^3/s	L/d
If K as stated above		**1.208E-04**	**10,441**
If K is 10X higher		**1.208E-03**	**104,413**
If K is 10X lower		**1.208E-05**	**1,044**

The inflow into the excavation is:

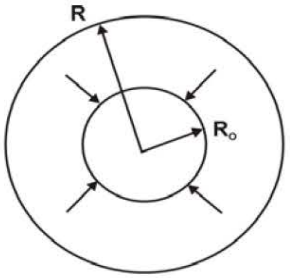
$$Q = -\pi K \frac{(H^2 - h_d^2)}{\ln\left\{\frac{R}{R_0}\right\}}$$

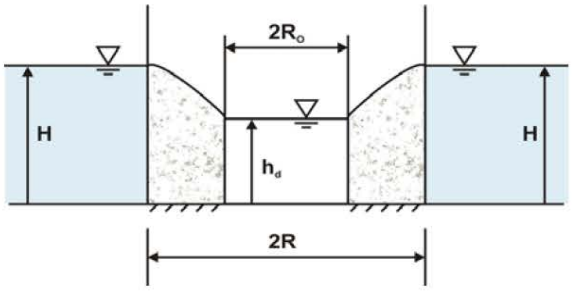
The negative sign denotes flow out of the aquifer into the excavation for $h_d < H$.

The heads H and h_d are measured with respect to the base of the aquifer.

The term R_o represents the equivalent radius of the excavation. The equivalent radius may be calculated based on equal area

$$R_o = \sqrt{\frac{ab}{\pi}}$$





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