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an Englobe Company

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Welding &
Structural Steel

May 18, 2023

C&P Architects
Suite 200, 2345 Yonge Street
Toronto, Ontario
M4P 2E5

Attention: Ms. Chelsea Alexander

File No. 02210387.000.0200
Brampton Office

**RE: HYDROGEOLOGICAL REVIEW SUMMARY AND REPORT
99 CARTWRIGHT AVENUE
TORONTO, ONTARIO**

Dear Ms. Chelsea Alexander:

Terraprobe Inc. is pleased to provide C&P Architects with the result of the hydrogeological assessment for 99 Cartwright Avenue, Toronto, Ontario. The following documents are provided as part of this package:

- City of Toronto Hydrogeological Review Summary Form
- Hydrogeological Assessment Report

The hydrogeological assessment report prepared to address the City of Toronto Terms of Reference (ToR) dated August 2018. It includes findings for groundwater monitoring program, groundwater quality assessment, short-term construction dewatering flow rate and long-term foundation drainage flow rate estimation.

Further, the Toronto Water required that the water quality data must be collected within nine (9) months prior to the date of submission. If the submission is nine (9) months after the sample collection date noted in the report, new groundwater samples will have to be collected prior to submission.

If you have any questions or concerns regarding either of the documents, please do not hesitate to contact the undersigned.

Yours truly,

Terraprobe Inc.

Alaa Alborno, B.Eng., EIT
Project Engineer

Narjes Alijani, M.Sc., P.Geo.
Team Lead

Terraprobe an Englobe Company

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www.terraprobe.ca

August 2018

HYDROLOGICAL REVIEW SUMMARY

The form is to be completed by the Professional that prepared the Hydrological Review.
Use of the form by the City of Toronto is not to be construed as verification of engineering/hydrological content.

Refer to the Terms of Reference, Hydrological Review:

[Link to Terms of Reference Hydrological Review](#)

For City Staff Use Only:

Name of ECS Case Manager (Please print)

Date Review Summary provided to
to TW, EM&P

IF ANY OF THE REQUIREMENTS LISTED BELOW HAVE NOT BEEN INCLUDED IN THE HYDROLOGICAL REVIEW, THE REVIEW WILL BE CONSIDERED INCOMPLETE.

THE GREY SHADED BOXES WILL REQUIRE A CONSISTANCY CHECK BY THE ECS CASE MANAGER.

Summary of Key Information:

SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
Site Address	99 Cartwright Avenue, Toronto	Cover Page, Executive Summary page ii, Introduction page 1.	
Postal Code	M6A 1V4	Cover Page	
Property Owner (on request for comments memo)	CS&P Architects	Cover Page, Executive Summary page ii, Introduction page 1.	
Proposed description of the project (if applicable) (point towers, number of podiums)	Developing one 2-storey slab-on-grade buildings with partial basement	Executive Summary page ii, Introduction page 1., Section 7.1 page 18.	
Land Use (ex. commercial, residential, mixed, institutional, industrial)	99 Cartwright Ave.: Institutional (Existing) 109 Cartwright Ave.: Commercial (Existing) 130 Bentworth Ave.: Commercial (Existing)	Executive Summary page ii, Introduction page 1	
Number of below grade levels for the proposed structure	One partial basement	Executive Summary page ii, Introduction page 1, Section 7.1 page 18.	
HYDROLOGICAL REVIEW INFORMATION			
Date Hydrological Review was prepared:	May 18, 2023	Cover Page	
Who Performed the Hydrological Review (Consulting Firm)	Terraprobe an Englobe Company	Cover page, Executive Summary page ii, Introduction page 1.	
Name of Author of Hydrological Review	Narjes Alijani, M.Sc., P.Geo. Alaa Alborn, B.Eng., EIT	Section 9, page 25.	

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HYDROLOGICAL REVIEW SUMMARY

SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
Check the directories on the website for Professional Geoscientists and/or Professional Engineers of Ontario been checked to ensure that the Hydrological Report has been prepared by a qualified person who is a licensed Professional Geoscientist as set out in the Professional Geoscientist Act of Ontario or a Professional Engineer? PEO: Professional Engineers of Ontario APGO: Association of Professional Geoscientists of Ontario	✓ Yes	N/A	
Has the Hydrological Review been prepared in accordance with all the following: - Ontario Water Resources Act - Ontario Regulation 387/04 - Toronto Municipal Code Chapter 681-Sewers	✓ Yes	Section 1.2, page 2-3	
		Page # & Section # of every occurrence in the Review	Review Includes this Information City Staff (Check)

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HYDROLOGICAL REVIEW SUMMARY

SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
Total Volume (L/day) Short Term Discharge of groundwater (construction dewatering) with safety factor included	What safety factor was used? 1.5 (Groundwater seepage only) Groundwater seepage: 6,500 L/day 25 mm rainfall event: 5,500 L/day Total (Groundwater + Stormwater) 12,000 L/day	Executive Summary page iii, Section 7.4 page 19-20, Section 8 page 23.	
Total Volume (L/day) Short Term Discharge of groundwater (construction dewatering) without safety factor included	4,333.3 L/day without safety factor and 2-years storm event	Section 7.4 page 19	
Total Volume (L/day) Long Term drainage of groundwater (from foundation drainage, weeping tiles, sub slab drainage) with safety factor included If the development is part of a multiple tower complex, include total volume for each separate tower	Total 6,500 L/day	Executive Summary page ii, Section 7.5 page 20	
List the nearest surface water (river, creek, lake)	Lake Ontario is 19 km approximately to the south and Humber river is approximately 6.2 km west of the site.	Section 4.5 page 10	

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HYDROLOGICAL REVIEW SUMMARY

SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
Lowest basement elevation	Slab-on-grade: finished floor elevation (FFE) 181.75 masl	Executive Summary page ii, Table II, Section 7-1 page 18	
Foundation elevation	180.75 masl	Executive Summary page ii Table II. Section 7.4, Table 7-1-page 19	
Ground elevation	The existing ground surface elevation 183.7 masl	Executive Summary page ii Table II, section 7.4, Table 7-1-page 19	
STUDY AREA MAP		Page # & Section # of every occurrence in the Review	Review Includes this Information City Staff (Check)
Study area map(s) have been included in the report.	✓ Yes	Figures 1-7	N/A
Study area map(s) been prepared according to the Hydrological Review Terms of Reference.	✓ Yes	Figures 1-7	N/A
WATER LEVEL AND WELLS		Page # & Section # of every occurrence	Review Includes this Information (City Staff Initial)

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HYDROLOGICAL REVIEW SUMMARY

SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
		in the Review	
The groundwater level has been monitored using all wells located on site (within property boundary).	✓ Yes	Section 6.1 page 20. Appendix C.	
The static water level measurements have been monitored at all monitoring wells for a minimum of 3 months with samples taken every 2 weeks for a minimum of 6 samples. The intent is for the qualified professional to use professional judgement to estimate the seasonally high groundwater level.	✓ Yes	Section 6.1 page 14. Appendix C.	
All water levels in the wells have been measured with respect to masl.	✓ Yes	Section 6.1 page 14. Appendix C.	
A table of geology/soil stratigraphy for the property has been included.	✓ Yes	Executive Summary page ii, Section 5 page 12-13, Appendix A.	
GEOLOGY AND PHYSICAL HYDROLOGY		Page # & Section # of every occurrence in the Review	Review Includes this Information (City Staff Initial)
The review has made reference to the soil materials including thickness, composition and texture, and bedrock environments.	✓ Yes	Executive Summary page ii, Section 5 page 12-13, Appendix A.	
Key aquifers and the site's proximity to nearby surface water has been identified.	✓ Yes	Section 4.1 page 9, Section 4.5 page 10-11	N/A

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HYDROLOGICAL REVIEW SUMMARY

SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
PUMP TEST/SLUG TEST/DRAWDOWN ANALYSIS		Page # & Section # of every occurrence in the Review	Review Includes this Information City Staff (Check)
A summary of the pumping test data and analysis is included in the review.	A pumping test was not conducted.	N/A	
The pump test been carried out for at least 24 hours if possible. If not, has a slug test been conducted?	The pump test was not conducted. In-situ hydraulic conductivity tests were conducted.	Executive Summary page ii, Section 6.2.1 page 15, Appendix D.	
Have the monitoring well(s) have been monitored using digital devices? If yes how frequently?	No. Water level measurements have been taken manually.	Section 6.1 page 14, Appendix C.	
If a slug or pump test has been conducted has the static groundwater level been monitored at all monitoring well(s) multiple times to measure recovery? -prior to the slug or pumping test(s)? -post slug or pumping test(s)?	✓ Yes ✓ Yes ✓ Yes	Executive Summary page ii Table III, Section 3.4 page 7, Section 6.2.1 page 15, Appendix D.	N/A
The above noted slug or pump tests have been included in the report.	✓ Yes	Executive Summary page ii Table III, Section 6.2.1 page 15, Appendix D.	
WATER QUALITY		Page # & Section # of every occurrence in the Review	Review Includes this Information City Staff (Check)

HYDROLOGICAL REVIEW SUMMARY

SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
The report includes baseline water quality samples from a laboratory. The water quality must be analyzed for all parameters listed in Tables 1 and 2 of Chapter 681 Sewers of the Toronto Municipal Code (found in Appendix A) and the samples must have to be taken unfiltered within 9 months of the date of submission.	✓ Yes	Executive Summary page iii, Section 6.3 page 16-17, Appendix F	
The water quality data templates in Appendix A have been completed for each sample taken for both sanitary/combined and storm sewer limits.	For sanitary discharge- See the sanitary/combined sewer parameter limit template For storm discharge- See the storm sewer parameter limit template	Appendix F	
Qualified professional to list all sample parameters that have violated the Bylaw limits for each sample taken for the sanitary/combined Bylaw limits If there are any sample parameter Exceedances the groundwater can't be discharged as is.	Samples met the City of Toronto Sewer Use Bylaw limits for Sanitary/Combined.	Executive summary page iii, Section 6.4 page 16-17, Appendix F.	
Qualified professional to list all sample parameters that have violated the Bylaw limits for each sample taken for the storm Bylaw limits. If there are any sample parameter exceedances the groundwater can't be discharged as is.	Storm Sewer By-law: - Total Suspended Solid (the result is 71 mg/L, the limit is 15 mg/L) - Total Manganese (the result is 0.311 mg/L and the limit is 0.05 mg/L)	Executive summary page iii, Section 6.3-page 16-17 Appendix F.	
The water quality samples have been analyzed by a Canadian laboratory accredited and licensed by Standards Council of Canada and/or Canadian Association for Laboratory Accreditation.	✓ Yes	Section 3.6 page 8, Section 6.3 page 16, Appendix F.	N/A

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HYDROLOGICAL REVIEW SUMMARY

SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
List of Canadian accredited laboratories: Standards Council of Canada			
A chain of custody record for the samples is included with the report.	✓Yes	Appendix F	
Has the chain of custody reference any filtered sample? If yes, the report has to be amended and re-submitted to include only non-filtered samples.	⊗No	Appendix F	
List any of the sample parameters that exceed the Bylaw limits with the reporting detection limit (RDL) included.	Storm Sewer By-law: - Total Suspended Solid (the result is 71 mg/L, the limit is 15 mg/L) - Total Manganese (the result is 0.311 mg/L and the limit is 0.05 mg/L)	Executive Summary, page iii Table V, Section 6.3 page 16-17, Appendix F.	
A true copy of the Certificate of Analysis report, is included with the report.	✓Yes	Appendix F	
EVALUATION OF IMPACT		Page # & Section # of every occurrence in the Review	Review Includes this Information City Staff (Check)
Does the report recommend a back-up system or relief safety valve(s)?	○Yes ⊗No	N/A	
Does the associated Geotechnical report recommend a back-up system or relief safety valve(s)?	○Yes ⊗No	N/A	
The taking and discharging of groundwater on site has been analyzed to ensure that no negative	✓Yes	Section 7.9 page 21-22.	N/A

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HYDROLOGICAL REVIEW SUMMARY

SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
impacts will occur to: the City sewage works in terms of quality and quantity (including existing infrastructure), the natural environment, and settlement issues.			
Has it been determined that there will be a negative impact to the natural environment, City sewage works, or surrounding properties has the study identified the following: the extent of the negative impact, the detail of the precondition state of all the infrastructure, City sewage works, and natural environment within the effected zone and the proposed remediation and monitoring plan?	Yes If yes, identify impact: Potential ground settlement due to dewatering for construction of the foundation. Groundwater Quality	Sections 7.9.1 to 7.9.5, pages 21-22.	N/A

Summary of Additional Information and Key Items (if applicable):

August 2018

HYDROLOGICAL REVIEW SUMMARY

Appendix A:

SANITARY/COMBINED

Sample Location: Monitoring well BH5

Inorganics		Sample Result	Sample Result with upper RDL included	
<u>Parameter</u>	<u>mg/L</u>			<u>ug/L</u>
BOD	300	4	4-2	300,000
Fluoride	10	0.20	0.20-0.06	10,000
TKN	100	<0.5	<0.5-0.5	100,000
pH	6.0 - 11.5	7.26	7.26-0.05	6.0 - 11.5
Phenolics 4AAP	1	<0.002	<0.002-0.002	1,000
TSS	350	71	71-2	350,000
Total Cyanide	2	<0.01	<0.01-0.01	2,000
Metals				
Chromium Hexavalent	2	0.0004	0.0004-0.0002	2,000
Mercury	0.01	<0.00001	<0.00001-0.00001	10
Total Aluminum	50	1.48	1.48-0.001	50,000
Total Antimony	5	<0.0009	<0.0009-0.0009	5,000
Total Arsenic	1	0.0008	0.0008-0.0002	1,000
Total Cadmium	0.7	0.000036	0.000036-0.000003	700
Total Chromium	4	0.00314	0.00314-0.00008	4,000
Total Cobalt	5	0.00217	0.00217-0.000004	5,000
Total Copper	2	0.0031	0.0031-0.0002	2,000
Total Lead	1	0.00115	0.00115-0.00009	1,000
Total Manganese	5	0.311	0.311-0.00001	5,000
Total Molybdenum	5	0.00284	0.00284-0.00004	5,000
Total Nickel	2	0.0060	0.0060-0.0001	2,000
Total Phosphorus	10	0.083	0.083-0.003	10,000
Total Selenium	1	0.00039	0.00039-0.00004	1,000
Total Silver	5	< 0.00005	< 0.00005-0.00005	5,000
Total Tin	5	0.00477	0.00477-0.00006	5,000
Total Titanium	5	0.0607	0.0607-0.00005	5,000
Total Zinc	2	0.016	0.016-0.002	2,000
Animal/Vegetable Oil & Grease	150	<4	<4-4	150,000
Mineral/Synthetic Oil & Grease	15	<4	<4-4	15,000

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HYDROLOGICAL REVIEW SUMMARY

Volatile Organics		Sample Result	Sample Result with upper RDL included	
<u>Parameter</u>	<u>mg/L</u>			<u>ug/L</u>
Benzene	0.01	< 0.0005	<0.0005-0.0005	10
Chloroform	0.04	< 0.0005	<0.0005-0.0005	40
1,2-Dichlorobenzene	0.05	< 0.0005	<0.0005-0.0005	50
1,4-Dichlorobenzene	0.08	< 0.0005	<0.0005-0.0005	80
Cis-1,2-Dichloroethylene	4	< 0.0005	<0.0005-0.0005	4,000
Trans-1,3-Dichloropropylene	0.14	< 0.0005	<0.0005-0.0005	140
Ethyl Benzene	0.16	< 0.0005	<0.0005-0.0005	160
Methylene Chloride	2	< 0.0005	<0.0005-0.0005	2,000
1,1,2,2-Tetrachloroethane	1.4	< 0.0005	<0.0005-0.0005	1,400
Tetrachloroethylene	1	< 0.0005	<0.0005-0.0005	1,000
Toluene	0.016	< 0.0005	<0.0005-0.0005	16
Trichloroethylene	0.4	< 0.0005	<0.0005-0.0005	400
Total Xylenes	1.4	< 0.0005	<0.0005-0.0005	1,400
Semi-Volatile Organics				
Di-n-butyl Phthalate	0.08	<0.002	<0.002-0.002	80
Bis (2-ethylhexyl) Phthalate	0.012	<0.002	<0.002-0.002	12
3,3'-Dichlorobenzidine	0.002	<0.0005	<0.0005-0.0005	2
Pentachlorophenol	0.005	<0.0005	<0.0005-0.0005	5
Total PAHs	0.005	<0.001	-	5
Misc Parameters				
Nonylphenols	0.02	<0.001	<0.001-0.001	20
Nonylphenol Ethoxylates	0.2	<0.01	<0.01-0.01	200

Sample Collected: January 23, 2023
Temperature: 8° C

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HYDROLOGICAL REVIEW SUMMARY

STORM

Sample Location: Monitoring well BH5

Inorganics		Sample Result	Sample Result with upper RDL included	
Parameter	mg/L			ug/L
pH	6.0 - 9.5	7.26	7.26-0.05	
BOD	15	4	4-2	15,000
Phenolics 4AAP	0.008	<0.002	<0.002-0.002	8
TSS	15	71	71-2	15,000
Total Cyanide	0.02	<0.01	<0.01-0.01	20
Metals				
Total Arsenic	0.02	0.0008	0.0008-0.0002	20
Total Cadmium	0.008	0.000036	0.000036-0.000003	8
Total Chromium	0.08	0.00314	0.00314-0.00008	80
Chromium Hexavalent	0.04	0.0004	0.0004-0.0002	40
Total Copper	0.04	0.0031	0.0031-0.0002	40
Total Lead	0.12	0.00115	0.00115-0.00009	120
Total Manganese	0.05	0.311	0.311-0.00001	50
Total Mercury	0.0004	<0.00001	<0.00001-0.00001	0.4
Total Nickel	0.08	0.0060	0.0060-0.0001	80
Total Phosphorus	0.4	0.083	0.083-0.003	400
Total Selenium	0.02	0.00039	0.00039-0.00004	20
Total Silver	0.12	< 0.00005	< 0.00005-0.00005	120
Total Zinc	0.04	0.016	0.016-0.002	40
Microbiology				
E.coli	200	<2	<2-0	200,000
Volatile Organics				
Parameter	mg/L			ug/L
Benzene	0.002	< 0.0005	< 0.0005-0.0005	2
Chloroform	0.002	< 0.0005	< 0.0005-0.0005	2
1,2-Dichlorobenzene	0.0056	< 0.0005	< 0.0005-0.0005	6
1,4-Dichlorobenzene	0.0068	< 0.0005	< 0.0005-0.0005	7
Cis-1,2-Dichloroethylene	0.0056	< 0.0005	< 0.0005-0.0005	6
Trans-1,3-Dichloropropylene	0.0056	< 0.0005	< 0.0005-0.0005	6
Ethyl Benzene	0.002	< 0.0005	< 0.0005-0.0005	2
Methylene Chloride	0.0052	< 0.0005	< 0.0005-0.0005	5
1,1,1,2-Tetrachloroethane	0.017	< 0.0005	< 0.0005-0.0005	17
Tetrachloroethylene	0.0044	< 0.0005	< 0.0005-0.0005	4
Toluene	0.002	< 0.0005	< 0.0005-0.0005	2
Trichloroethylene	0.0076	< 0.0005	< 0.0005-0.0005	8
Total Xylenes	0.0044	< 0.0005	< 0.0005-0.0005	4

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HYDROLOGICAL REVIEW SUMMARY

Semi-Volatile Organics		Sample Result	Sample Result with upper RDL included	
Di-n-butyl Phthalate	0.015	< 0.002	< 0.002-0.002	5
Bis (2-ethylhexyl) Phthalate	0.0088	< 0.002	< 0.002-0.002	8.8
3,3'-Dichlorobenzidine	0.0008	<0.0005	<0.0005-0.0005	0.8
Pentachlorophenol	0.002	<0.0005	<0.0005-0.0005	2
Total PAHs	0.002	<0.001	-	2
PCBs	0.0004	<0.0001	<0.0001-0.0001	0.4
Misc Parameters				
Nonylphenols	0.001	<0.001	<0.001-0.001	1
Nonylphenol Ethoxylates	0.01	<0.01	<0.01-0.01	10

Sample Collected: January 23, 2023

Temperature: 8° C

Consulting Firm that prepared Hydrological Report: Terraprobe Inc.

Qualified Professional who completed the report summary: Narjes Alijani, M. Sc., P.Geo.

Print Name

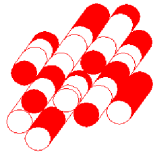


Qualified Professional who completed the report summary: _____

Signature



Date & Stamp



Terraprobe

an Englobe Company

**HYDROGEOLOGICAL ASSESSMENT
99 CARTWRIGHT AVENUE
TORONTO, ONTARIO
M6A 1V4**

Prepared For: CS&P Architects
2345 Yonge Street, Suite 200
Toronto, Ontario
M4P 2E5

Attention: Ms. Chelsea Alexander, Associate, OAA

File No. 02210387.000.0200

May 18, 2023

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EXECUTIVE SUMMARY

Terraprobe, an Englobe Company was retained by CS&P Architects to conduct a hydrogeological assessment and provide recommendations for the proposed additions at the properties with the municipal addresses of 99 and 109 Cartwright Avenue and 130 Bentworth Avenue, Toronto, Ontario (the Site).

99 Cartwright Avenue currently consists of an institutional building (The Sterling Hall School), and associated sport facilities, at-grade parking lots and roads. 109 Cartwright Avenue comprises a 1-story commercial building and associated at-grade parking lot. 130 Bentworth Avenue currently consists of a paved area and an at-grade parking lot.

Based on a review of the overall site plan prepared by CS&P Architects dated November 15, 2022 it is understood the existing building at 109 Cartwright Avenue will be demolished to facilitate construction of a 2-storey building that will be added to the existing 1-storey building at 99 Cartwright Avenue. The proposed development details are summarized in **Table II**.

Table II: Proposed Development Details

Proposed Development						
Description	Above Grade Levels	Below Grade Levels				The Highest Groundwater Elevation (masl)
		Underground Structure	Lowest Finished Floor		Approximate Proposed Foundation Elevation (masl)	
			Depth (m)	Elevation (masl)		
2-Story Building with Partial Basement	2	Partial Basement	1.95*	181.75	180.75**	183.08

* Considering the existing ground surface elevation at 183.7 masl

** As recommended by geotechnical engineer

In general, two (2) main local stratigraphic units were encountered beneath the Site to termination depth of investigation. A summary of the units and the estimated hydraulic conductivity for each unit are summarized in **Table III**.

Table III: Summary of Subsoil Profile and Estimated Hydraulic Conductivity

Stratum/Formation	Thickness (m)	Bottom Elevation Range (masl)	Hydraulic Conductivity (m/s)
Fill and Weathered Soil	0.8 – 3.0	182.9 – 180.4	1.00×10^{-6} *
Sandy Silt (Till)	at least 13	at least 169.2	8.75×10^{-8} **

*Indicates conductivity was estimated using Freeze and Cherry (1979)

**Indicates conductivity was estimated using in-situ hydraulic conductivity test

The groundwater elevation considered for the current short-term dewatering and long-term foundation drainage flow rate estimates and the anticipated conceptual zone of influence are presented in **Table IV**.

Table IV: Summary of Groundwater Conditions

The Highest Groundwater Elevation	183.08 masl
Zone of Influence	3.4 m

masl: meters above sea level



Details of the groundwater exceedances in comparison to the City of Toronto Sewer Use By-Law limits are presented in **Table V**.

Table V: Summary of Groundwater Exceedances to the City of Toronto Sewer Use By-law limits

Sample ID	Untreated Sample (Yes/No)	Sample Collection Date	Sample Expiry Date	City of Toronto Storm Sewer Limits	City of Toronto Sanitary and Combined Sewer Limits
BH4S	Yes	January 30, 2023	October 30, 2023	Exceeds for Total Suspended Solids and total manganese	No exceedances

The anticipated requirements for short term and long term are summarized in **Table VI**.

Table VI: Water taking requirements for groundwater control

Groundwater Quantity: Short-Term (Construction)						
Description	Groundwater Seepage Safety Factor 1.5		2-Year Rainfall (25 mm Design Storm Event)		Total Discharge Volume (Seepage + Rainfall)	
	L/day	L/min	L/day	L/min	L/day	L/min
	6,500	4.5	5,500	3.8	12,000	8.3
Groundwater Quantity: Long-Term (Post-Construction)						
Description	Groundwater Seepage		Infiltration (25 mm Design Storm Event)		Total Discharge Volume (Seepage + Infiltration)	
	L/day	L/min	L/day	L/min	L/day	L/min
<i>Building 1 and Building 2</i>	5,500	3.8	1,000	0.7	6,500	4.5
Regulatory Requirements						
Short-Term Environmental Activity and Sector Registry (EASR) Posting			Not Required			
Short-Term Permit to Take Water (PTTW)			Not Required			
Long-Term Permit to Take Water (PTTW)			Not Required			
Short-Term Discharge Agreement City of Toronto			Required (If discharge water is directed to the City's Sewer System)			
Long-Term Discharge Agreement City of Toronto			Required			



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1.0 INTRODUCTION

1.1 Site Location and Project Description

Terraprobe, an Englobe Company was retained by CS&P Architects to conduct a hydrogeological assessment and provide recommendations for the proposed addition at the properties with the municipal addresses of 99 and 109 Cartwright Avenue and 130 Bentworth Avenue, Toronto, Ontario (the Site).

The Site is located approximately 850 m to the southwest of the underpass of Dufferin Street and Highway 401, in the City of Toronto, Ontario. The Site is bounded by Bentworth Avenue and commercial properties to the south, commercial properties to the west, Cartwright Avenue and commercial properties to the north, and Paul David Street and residential properties to the east. The location of the Site is shown on **Figure 1**.

99 Cartwright Avenue currently consists of an institutional building (The Sterling Hall School), and associated sport facilities, at-grade parking lots and roads. 109 Cartwright Avenue comprises a 1-story commercial building and associated at-grade parking lot. 130 Bentworth Avenue currently consists of a paved area and an at-grade parking lot.

Based on a review of the overall site plan prepared by CS&P Architects dated November 15, 2022, it is proposed to demolish the existing buildings on 109 Cartwright Avenue to facilitate the redevelopment into One 2-Storey addition with a partial basement to the current existing building on 99 Cartwright Avenue. Additionally, an at-grade parking lot is proposed at 130 Bentworth Avenue.

It is understood that the future development will be serviced by municipal water and sanitary sewer system. The study was undertaken to assess the hydrogeological conditions of the Site and to provide general information regarding the hydrogeological impact of the proposed development on the local groundwater function. The report addresses the following areas:

- Identifying the geological and hydrogeological setting of the Site;
- Confirming shallow groundwater level at the Site;
- Assessing groundwater quality in comparison with the City of Toronto Sewer Use By-Law limits;
- Evaluating potential short-term construction dewatering needs for the Site;
- Estimating the long-term foundation drainage flow rate;
- Identifying potential impacts to the nearby groundwater receptors including water supply wells and natural heritage features with respect to the proposed development at the Site;
- Providing mitigation plan on the potential impacts to the groundwater users within the Site and its vicinity, if applicable; and,
- Providing recommendations on any needs for applying for a Permit to Take Water (PTTW) or posting on the Environmental Activity and Sector Registry (EASR) with the Ministry of the Environment, Conservation and Parks (MECP).

The City of Toronto requires that a hydrogeological assessment be completed in order to assess the potential dewatering needs and associated discharge plans. Additionally, associated potential impacts of the Site development to the groundwater system and groundwater receptors/users should be evaluated, if applicable.

1.2 Scope of Work

The scope of work for the hydrogeological assessment consisted of the following:

- Review of Geological and Hydrogeological Setting of the Site: A review of available background geological and hydrogeological information for the Site was completed using Ontario Geological Survey (OGS) maps, MECP, Oak Ridges Moraine Groundwater Program (ORMGP), and Ministry of Natural Resources and Forestry (MNRF) databases.
- Review of the City of Toronto Official Plans and Toronto and Region Conservation Authority (TRCA) Policy Areas: The City of Toronto official plans and TRCA maps were reviewed to understand the location of the Site and the proposed development within the policy areas.
- Site Inspection: A visual inspection of the Site and surrounding areas was conducted to determine local topography and drainage, and an assessment of hydrogeological significant features.
- Groundwater Level Monitoring and Hydraulic Conductivity Testing: Groundwater level in the monitoring wells installed by Terraprobe were monitored to confirm groundwater level beneath the Site and to satisfy the City of Toronto Terms of Reference (ToR) dated August 2018. In-situ hydraulic conductivity testing was conducted in the monitoring wells to confirm the hydraulic conductivity of the sub-soil profile within the screen intervals.
- Groundwater Quality Testing: Groundwater quality was assessed in comparison with the City of Toronto Sanitary and Storm Sewer Use By-Law limits to propose potential short-term and long-term discharge options.
- Review of the Proposed Site Development Concept: The currently proposed site development concept was reviewed with respect to measures being implemented at the Site in order to estimate the potential construction dewatering and long-term foundation drainage needs.
- Construction Dewatering Flow Rate Estimate: Considering the proposed development plans, the construction (short-term) dewatering flow rate for developing the proposed underground structure was estimated using the stable groundwater level and estimated hydraulic conductivity measured at the Site.
- Long-term Foundation Drainage: Considering the proposed slab-on-grade buildings above shallow groundwater table, long-term foundation drainage flow is not anticipated.



- Mitigation Plans for Dewatering: A mitigation plan was recommended to mitigate potential short-term dewatering impacts to the nearby groundwater receptors and structures, if applicable.
- Potential Short-Term Dewatering and Long-Term Foundation Drainage Permits: Considering the estimated short-term construction dewatering flow rate, recommendations were provided on any need for applying for a PTTW or posting on the EASR, if required.

The above scope of work was undertaken in accordance with all of the following: Ontario Water Resources Act, Ontario Regulation 387/04, and Toronto Municipal Code Chapter 681-Sewers.



2.0 APPLICABLE REGULATIONS AND AGENCIES

The environmental regulations and policies relevant to this hydrogeological study are briefly discussed below.

2.1 Toronto and Region Conservation Authority (TRCA) Policies and Regulations (O.Reg. 166/06)

Under Section 28 of the Conservation Authorities Act, local conservation authorities are mandated to protect the health and integrity of the regional greenspace system, and to maintain or improve the hydrological and ecological functions performed by valley and stream corridors. The TRCA, through its regulatory mandate, is responsible for issuing permits under Ontario Regulation (O.Reg.) 166/06, Development, Interference with Wetlands and Alterations to Shorelines and Watercourses for development proposal or Site alteration work to shorelines and watercourses within the regulated areas.

TRCA regulated Area online map was reviewed for the current assessment on December 5, 2022. It is our understanding that the Site is not located within a TRCA Regulated Area. As such, it is anticipated that obtaining a permit from the TRCA under O.Reg. 166/06 will not be required for the proposed development.

2.2 City of Toronto Official Plan

The City of Toronto's Official Plan sets up policies that deal with legislative and administrative concerns, guides physical growth, and addresses social, economic, and environmental concerns. The Official Plan provides land use planning designations and identifies areas of environmental significance where more stringent policies may apply for development applications.

City of Toronto's Official Plans were reviewed for the current study with the results summarized as below:

- The Site is located within the City of Toronto official plan Area E.
- Map 17 (Land Use Plan) - A review of the map dated February 2019 indicates that the Site is located within an area designated as General Employment Areas.
- Map 28 (Site and Area Specific Policies) - A review of the map dated October 2016 shows that the Site is not located within an area affected by the Site and Area Specific Policies.
- Map 35 (Secondary Plan Key Map) - A review of the map dated November 2015 indicates that the Site is not located within an area designated as secondary plan areas.

2.3 Permit to Take Water (PTTW) Section 34 of the Ontario Water Resource Act (1900)

Construction dewatering, water takings of more than 50,000 L/day (combined groundwater and storm water) but less than 400,000 L/day (groundwater only) may be registered on the EASR, while groundwater takings of more than 400,000 L/day require a PTTW issued by the MECP. Applying for PTTW with the MECP is also required if the anticipated long-term foundation drainage flow rate exceeds 50,000 L/day

limits of the MECP. If it is identified that an EASR or PTTW is required for the Site, a hydrogeological assessment report will need to be submitted in support of the application. Construction dewatering and long-term foundation drainage flow rates were estimated as a part of scope of work for the current assessment.

2.4 Clean Water Act

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

The regional-scale source protection mapping (Source Protection Information Atlas Interactive Map) provided by MECP was reviewed on April 19, 2023. Record review indicates that the Site is not located within a WHPA, Intake Protection Zone, Issue Contributing Area, Event Based Area, HVA and SGRA.

2.5 City of Toronto Requirements for Hydrogeological Study (August 2018)

The City of Toronto requires a hydrogeological study report for zoning by-law amendment, plans of subdivision, consent to sever, and site plan control ([Geotechnical Study/Hydrogeological Review](#)).

Based on the guideline, a minimum of five (5) groundwater monitoring wells shall be installed at locations that represent the entire proximity of the Site. If that Site is larger than 30 m x 30 m, additional groundwater monitoring wells shall be installed, and the qualified professional will use professional judgment to determine the number of additional monitoring wells required. It is required that the monitoring wells be installed with a minimum of 3.8 cm diameter and 2 meters below the lowest elevation in the proposed building structure(s). Additionally, one (1) monitoring well is to be drilled to a minimum depth of 10 m below the lowest elevation in the proposed building structure(s), or to bedrock, whichever is shallower.

Static groundwater level should be confirmed, and a monitoring program should be completed considering the guideline. Based on the guideline, static groundwater level measurements shall be monitored at all monitoring wells located within the Site for a minimum of three (3) months with measurements taken every two (2) weeks for a minimum of six (6) measurements. The intent is for the qualified professional to use professional judgment to estimate the seasonally high groundwater level. Water levels can be measured manually or using pressure transducers and data loggers, or similar instrumentation. All water levels shall be presented as geodetic elevations referenced to a City of Toronto, or Canadian Geologic Survey benchmark.



3.0 METHODOLOGY

3.1 Borehole Advancement and Monitoring Well Installation

Drilling boreholes and construction of monitoring wells were conducted in conjunction with geotechnical investigation between December 20th and December 22nd, 2022. The program consisted of the drilling of 12 boreholes (BH) and the installation of 12 monitoring wells (MWs) including one pair of nested shallow and deep monitoring wells (BH4S and BH4D) for completion of geotechnical and hydrogeological investigations and Environmental Site assessment. Six (6) monitoring wells BH1, BH4S, BH4D, BH5, BH6 and BH7 were proposed within the footprint of the proposed building and potential sewer alignment for hydrogeological investigation. The locations of the boreholes/monitoring wells are shown on **Figure 2**.

Borehole drilling and monitoring well construction were completed by a licensed water well contractors, Strong Soil Search Inc., under the full-time supervision of geotechnical technicians from Terraprobe, who also logged the soil strata encountered during borehole advancement and collected representative soil samples for textural classification. Detailed descriptions of the encountered subsoil and groundwater conditions are presented on the borehole and monitoring well logs included in **Appendix A**.

The monitoring wells were constructed using 50-mm diameter PVC riser pipes and screens, which were installed in each of the selected geotechnical boreholes in accordance with Ontario Regulation (O. Reg.) 903. All monitoring wells were provided with steel flush mount protective casings at the ground surface.

The Universal Transverse Mercator (UTM) coordinates and ground surface elevations at the monitoring well locations, as well as the monitoring well construction details, are presented in **Table 3-1**.

Table 3-1- Monitoring Well Installation Details

Well ID	Installation Date	UTM Coordinates (m)		Ground El. (masl)	Soil within the Screen Interval	Screen Interval (mbgs)	Casing Dia. (mm)	Protective Casing
		Easting	Northing					
BH1	December 20, 2022	623636	4842151	183.3	Sandy Silt to Silt and Sand Till	6.7-8.2	50	Flush Mount
BH2	December 20, 2022	623658	4842132	183.4	Sandy Silt to Silt and Sand Till	3.1-6.1	50	Flush Mount
BH3	December 22, 2022	623648	4842097	183.5	Sandy Silt to Silt and Sand Till	4.6-7.6	50	Flush Mount
BH4S	December 20, 2022	623668	4842103	183.7	Sandy Silt to Silt and Sand Till	4.6-7.6	50	Flush Mount
BH4D	December 20, 2022	623667	4842101	183.7	Sandy Silt to Silt and Sand Till	12.5-14.0	50	Monument
BH5	December 21, 2022	623688	4842103	183.5	Sandy Silt to Silt and Sand Till	4.6-7.6	50	Flush Mount
BH6	December 20, 2022	623665	4842083	183.5	Sandy Silt to Silt and Sand Till	4.6-7.6	50	Flush Mount
BH7	December 21, 2022	623688	4842087	182.9	Sandy Silt to Silt and Sand Till	6.1-7.6	50	Flush Mount
BH8	December 22, 2022	623643	4842059	183.7	Sandy Silt to Silt and Sand Till	4.6-7.6	50	Flush Mount



Well ID	Installation Date	UTM Coordinates (m)		Ground EL. (masl)	Soil within the Screen Interval	Screen Interval (mbgs)	Casing Dia. (mm)	Protective Casing
		Easting	Northing					
BH9	December 21, 2022	623679	4842056	183.5	Sandy Silt to Silt and Sand Till	3.1-6.1	50	Flush Mount
BH10	December 22, 2022	623671	4842034	183.3	Sandy Silt to Silt and Sand Till	3.1-6.1	50	Flush Mount
BH11	December 22, 2022	623658	4842023	183.3	Sandy Silt to Silt and Sand Till	3.1-6.1	50	Flush Mount

Notes:

mbgs metres below ground surface
masl metres above sea level

3.2 Groundwater Monitoring

Total of six (6) monitoring wells were proposed for completion of hydrogeological assessment. However, all 12 installed monitoring wells were utilized to measure and monitor the groundwater level. The groundwater monitoring program will confirm the stabilized groundwater level beneath the Site by completion of a monitoring program scheduled every two (2) weeks over six (6) groundwater monitoring events, starting from January 09, 2023. The findings of the groundwater level monitoring program are presented in **Section 6.1**.

3.3 MECP Water Well Records Review

MECP Water Well Records (WWRs) were reviewed for the registered wells located at the Site and within 500 m radius of the Site boundaries (Study Area). The findings of the MECP well records are presented in **Section 4.6** of the current report.

3.4 In-Situ Hydraulic Conductivity Testing

Monitoring wells BH4S, BH4D, BH5, and BH7 installed within the footprint of the proposed building were utilized to conduct falling head in-situ hydraulic conductivity tests. The in-situ hydraulic conductivity tests provide estimated hydraulic conductivity (K) for soil at the depths of the well screens. The monitoring wells were developed in advance of the tests. Well development involves the purging and removal of groundwater from each monitoring well to remove remnants of clay, silt and other debris introduced into the monitoring well during construction so as to improve the flow of formation groundwater through the well screens.

The in-situ falling head hydraulic conductivity test involves the placement of a slug of known volume into the monitoring well, below the water level, to displace the groundwater level upward. The rate at which the water level recovers to static conditions (falling head) is tracked using a data logger/pressure transducer, and/or manually using a water level tape. The rate at which the water table recovers to static conditions is used to estimate the K value for the water-bearing strata formation at the well screen depth. The findings for the hydraulic conductivity testing are presented in **Section 6.3.1** of the current report.

3.5 Hydraulic Conductivity Based on Grain Size Distribution Graphs

The Hazen equation estimation method was also used to estimate the hydraulic conductivity (K) for saturated subsoils at selected depths below the groundwater table beneath the Site. The method provides alternative hydraulic conductivity (K) estimates which are derived from the grain size diameter, whereby 10% by weight of the soil particles are finer and 90% are coarser (Freeze and Cherry, 1979). The soils chosen for Hazen Method estimation were selected primarily within/from above the well screen depths. Findings are presented in **Section 6.3.2**.

3.6 Groundwater Quality Assessment

Based on the City of Toronto Terms of Reference (August 2018), groundwater quality should be assessed in advance of earthwork. As such, one (1) set of groundwater samples was collected from one (1) selected monitoring well to characterize its quality for evaluation against the City of Toronto Storm and Sanitary Sewer Use By-Law parameters. This was performed to assess whether any anticipated dewatering effluent can be disposed of into the City of Toronto sewer system during construction or following site development for any long-term foundation drainage. Based on the results, recommendations for any pre-treatment for any dewatering/drainage effluent can be developed, if required.

Monitoring well BH4S was developed and purged of multiple well casings volumes of groundwater prior to sample collection. The groundwater samples were collected based on a Low Flow Sampling procedure, using a Bladder Pump. In accordance with City of Toronto Storm and Sanitary Sewer use By-Law sampling protocols, one (1) complete set of groundwater samples was not filtered during collection, prior to placement in the laboratory sample bottles. Upon sampling, all of the bottles were placed in ice and packed in a cooler at $8 \pm C^{\circ}$ for shipment to the analytical laboratory. Sample analysis was performed by SGS Canada Inc., which is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA). Results of the analysis are discussed in **Section 6.4**.

3.7 Review of Regional Data and Available Reports for the Site

The maps, data, and documents available from the MECP, OGS, MNRF, ORMGP, and TRCA were reviewed. Additionally, the concurrent geotechnical investigation report was reviewed at the time of preparation of the current hydrogeological assessment report with the findings summarized in **Sections 4** and **5**.



4.0 REGIONAL AND LOCAL SITE SETTING

4.1 Regional Geology

The current understanding of the surface geological setting of the Site is based on scientific work conducted by the OGS (OGS, 2003). The Site and surrounding area are mapped as Till (5b) and comprise stone poor, sandy silt to silty sand-textured till. (OGS, 2003). **Figure 3** illustrates the mapped surficial geology for the Site and surrounding areas.

ORMGP produced a cross-sectional geological map to aid in the characterization of the general area. Considering the regional cross-section, it is understood that the native overburden units prevalent in this area are as follow, with the youngest unit at the top:

- Undifferentiated Upper Sediments
- Halton Till
- Newmarket Till

Undifferentiated Upper Sediments: The undifferentiated upper sediments are expected at the ground surface with an average approximate thickness of 1.7 m.

Halton Till (Upper Till): The Halton till is mainly comprised of sandy silt to clayey silt till interbedded with silt, clay, and a number of discontinuous sand and gravel lenses. It was deposited approximately 12,500 years ago. Based on cross-section, the Halton Till or equivalent is expected beneath undifferentiated upper sediments, with an approximate average thickness of up to 4.0 m.

Newmarket Till: The Newmarket till is a regionally extensive till formation that acts as an aquitard separating the Oak Ridges Aquifer Complex (ORAC) from the underlying Thorncliffe Formation. Based on the ORMGP cross-section, Newmarket till mapped beneath the ORAC. The average thickness of the Newmarket till could reach 23.0 m beneath the Site.

The underlying bedrock at the Site is the Georgian Bay Formation, which consists of shale with limestone interbeds (OGS, 2007). A review of the ORMGP cross-section indicates that the bedrock could be contacted beneath the Site approximately at El. 158.1 metres above sea level (masl).

4.2 Regional Physiography

The Site is located within a regional physiography of Southern Ontario known as Peel Plain. The Peel Plain within the vicinity of the Site comprises of Bevelled Till Plains. The Peel Plain is a level-to-undulating tract of clay rich soils, covering an area of about 780 km² across the central portions of the Regional Municipalities of York, Peel, and Halton. The Peel Plain exhibits a gradual and fairly uniform downward slope, towards the south, towards Lake Ontario. Across this plain the Credit, Humber, Don, and Rouge Rivers have cut deep incised valleys into the overburden soil profile, as have other streams such as the Bronte, Oakville, and Etobicoke Creeks. There are no large un-drained depressions, swamps, or bogs in the



immediate area, and for many of the local inter-stream areas, drainage is still imperfect. The underlying geological material for the Peel Plain is mapped as glacial till mineral soil. The till unit, within much of the Peel Plain has been modified by a veneer of clay (Chapman and Putnam, 1984). **Figure 4** shows the location of the Site within the regional physiography map.

4.3 Regional Topography and Drainage

A review of the regional surface topography map for the Site and surrounding area indicates that the Site is relatively flat and ground surface elevation in the Site varies from 182.9 masl to approximately 183.7 masl based on the ground surface elevation measured at monitoring wells' location on the Site. Based on a review of the regional topography map, a gentle decline in ground surface relief is observed to the west/southwest. **Figure 5** illustrates the regional topography of the Site and surrounding area.

4.4 Watershed Setting

The TRCA's interactive watershed map was reviewed on April 4, 2023. The Site is located within the boundary zone of Humber River and Don River Watersheds, which fall under TRCA jurisdiction. The west portion of the Site is located within Humber River and the east portion is situated within Don River Watersheds.

The Humber River Watershed includes 1,800 km of waterways and 600 bodies of water. It consists of the Main Humber, the East Humber, the West Humber, Black Creek, and the Lower Humber sub-watersheds. The Humber River watershed includes portions within 10 local municipalities, including; the City of Vaughan, the City of Richmond Hill, the Township of King and the Town of Aurora in the Regional Municipality of York; the Cities of Brampton and the City of Mississauga and the Town of Caledon in the Regional Municipality of Peel; the City of Toronto, the Town of Mono in Dufferin County, and the Township of Adjala-Tosorontio in Simcoe County (Toronto and Region Conservation Authority, 2008).

The Don River Watershed is the highest populated watershed in the Greater Toronto Area. It covers an area of approximately 360 km² with the Don River stretching almost 38 km in length, flowing south on the Oak Ridges Moraine to the Keating Channel where it empties into Lake Ontario. The Don River Watershed includes portions of the Regional Municipality of York and the City of Toronto.

4.5 Local Surface Water and Natural Heritage Features

The MNRF database was reviewed for any natural heritage features including, watercourses, bodies of water, wetland features, Area of Natural and Scientific Interest (ANSI) and wooded areas.

Lake Ontario is located approximately 19 km to the south, and Humber River is located approximately 6.2 km to the west of the Site. Records for wooded areas are mapped around the Site with the closest record located approximately 615 m to west of the Site. Record review indicates that there are no records for wetland features and any other natural heritage feature within or in close proximity to the Site.

Figure 6 shows the location of the Site and mapped nearby natural heritage features. A review of the figure indicates that creek, associated wooded area and a wetland (not evaluated as per Ontario Wetland evaluation system) are located approximately 650 m to the west of the Site (North park).

4.6 Groundwater Resources (MECP Well Records)

The MECP water well record database was reviewed for records located within a radius of 500 m from the approximate Site boundary (Study Area). The location of the well records is presented on **Figure 7** with the details for each well summarized in **Appendix B**. A total of 140 well records were located within the Study Area. A summary of data obtained from record review is presented in **Table 4-1**.

Table 4-1- MECP Well Record Summary

Number of the Well Records	140
Water Use (Final Status)	
Abandoned-Other	3 (2.1%)
Monitoring and Test Hole	49 (35.0%)
Test Hole	26 (18.6)
Observation	26 (18.6)
Unknown	36 (25.7%)
Reported Static Water Level	
Unknown	140 (100%)

The Site is situated in a serviced area within the City of Toronto. The above summary indicates that there are no records for water supply wells within the Site and the Study Area. As such, a door to door well survey is not required in advance of, during and after construction.

4.7 Active Permit to Take Water Application Records Review

The MECP website was reviewed for any active PTTW application records within a 1.0 km radius of the Site on April 19, 2023. The records review indicates there are no active PTTW within the study area.

5.0 LOCAL GEOLOGY AND SUBSURFACE INVESTIGATION

Terraprobe conducted a geotechnical field investigation between December 20th and December 22nd, 2022. The fieldwork consisted of drilling a total of twelve (12) boreholes (including one pair of shallow and deep borehole) extending to an approximate termination depth of investigation of 14.5 metres below ground surface (mbgs). All boreholes were equipped with monitoring wells. Information regarding borehole logs and a geological cross-section are presented in **Appendix A**. The approximate locations of boreholes are shown on **Figure 2**.

The stratigraphic boundaries indicated on the Borehole Logs are inferred from non-continuous samples and observations of drilling resistance, which typically represent a transition from one soil type to another. These boundaries should not be interpreted to represent exact planes of geological change. The subsurface conditions have been confirmed in a series of widely spaced boreholes and will vary between and beyond the borehole locations. The discussion has been simplified in terms of the major soil strata for the purposes of geotechnical design. The stratigraphy beneath the investigated areas of the Site generally consists of the followings:

5.1 Pavement Structure

Asphalt and concrete pavement structure were encountered in Boreholes 1, 2, 4S, 4D, 5, 6, 7, 8, 9, 10, and 11 at the ground surface, consisting of 50 to 100 mm thick asphaltic concrete or 90 to 100 mm thick Portland cement concrete underlain by 100 to 275 mm thick granular base course.

Topsoil with a thickness of 100 mm was encountered in Borehole 3 at the ground surface.

The above thicknesses were measured from the borehole drilling and are approximate and not sufficient to estimate quantity and costs. We recommend that a shallow test pit investigation be carried out to determine a precise topsoil thickness present across the site for quantity estimation and costing purposes (if required).

5.2 Earth Fill

Earth fill materials, consisting of clayey silt/ some sand/ trace gravel and organics were encountered beneath the pavement structure in all Boreholes and extended from 0.1 to 2.3 mbgs.

Based on a review of the Geotechnical Investigation report, the cohesive earth fill zone indicates firm to very stiff relative consistency.

The in-situ moisture contents of the earth fill samples ranged from 9 to 26 percent by mass, indicating a moist to locally wet condition.

5.3 Glacial Till

Sandy silt to silt and sand till deposit, with some clay and trace amounts of gravel was encountered beneath the earth fill zone in all the boreholes and extended to the full depth of investigation (i.e., about 6.6 to 14.5 mbgs).

The upper zone of the glacial till layer, extending to a depth ranging from 1.5 to 3.0 mbgs in Boreholes 2, 3, 4, 6 and 11 was weathered/disturbed. The composition of the weathered and disturbed soil is generally similar to that of the underlying undisturbed soil but contains trace amounts of organic inclusions.

Based on the Geotechnical Investigation report the undisturbed glacial till deposit indicates a compact to very dense relative density.

The in-situ moisture contents of the till soil samples ranged from 6 to 16 percent by weight, indicating a generally moist to wet condition.



6.0 LOCAL HYDROGEOLOGICAL STUDY

6.1 Monitoring Well Development and Groundwater Level Monitoring

The groundwater monitoring program started on January 9, 2023. Observations with respect to the depth of water level and casing were made in the open boreholes immediately after completion of drilling, which are reported on the Borehole Logs. Six (6) monitoring wells were installed as a part of hydrogeological study. The measured groundwater levels along with other monitoring well details are presented in **Appendix C**.

Monitoring wells were developed, and the groundwater levels were measured manually using an interface probe (Solinst Interface Meter, Model 122). The following **Table 6-1** provides a summary of groundwater level measurements.

Table 6-1- Summary of Groundwater Monitoring

Well ID	Unit	Ground El.	Screen Interval	January 9, 2023*	January 16, 2023	February 10, 2023	February 27, 2023	March 13, 2023	April 5, 2023
BH1	mbgs	-	6.7-8.2	6.87	6.63	4.44	4.16	4.10	3.80
	masl	183.30	176.6-175.1	176.43	176.67	178.86	179.14	179.20	179.50
BH2	mbgs	-	3.1-6.1	1.82	NA	NA	2.09	1.56	1.44
	masl	183.4	180.3-177.3	181.58	NA	NA	181.31	181.84	181.96
BH3	mbgs	-	4.6-7.6	0.95	1.10	0.95	NA	0.95	0.75
	masl	183.5	178.9-175.9	182.55	182.40	182.55	N/A	182.55	182.75
BH4S	mbgs	-	4.6-7.6	NA	1.30	0.90	1.23	1.06	1.01
	masl	183.70	179.1-176.1	NA	182.40	182.80	182.47	182.64	182.69
B4D	mbgs	-	12.6-14.0	NA	11.46	11.29	11.08	11.04	10.80
	masl	183.70	171.2-169.7	NA	172.24	172.41	172.62	172.66	172.90
BH5	mbgs		4.6-7.6	NA	6.87	5.13	3.55	1.20	1.40
	masl	183.50	178.9-175.9	NA	176.63	178.37	179.95	182.30	182.10
BH6	mbgs	-	4.6-7.6	0.85	1.07	0.65	0.84	0.83	0.42
	masl	183.50	178.9-175.9	182.65	182.43	182.85	182.66	182.67	183.08
BH7	mbgs	-	6.10-7.6	NA	5.37	2.89	2.60	2.53	2.43
	masl	182.90	176.8-175.3	NA	177.53	180.01	180.30	180.37	180.47
BH8	mbgs	-	4.6-7.6	1.78	NA	0.74	0.79	0.89	NA
	masl	183.70	179.1-176.1	181.92	NA	182.96	182.91	182.81	NA
BH9	mbgs	-	3.1-6.1	0.93	NA	0.77	0.80	0.75	0.69
	masl	183.50	180.4-177.4	182.57	NA	182.73	182.70	182.75	182.81
BH10	mbgs	-	3.1-6.1	2.93	NA	NA	NA	0.97	0.22
	masl	183.30	180.2-177.2	180.37	NA	NA	NA	182.33	183.08
BH11	mbgs	-	3.1-6.1	1.33	NA	0.51	NA	0.78	0.49
	masl	183.30	180.2-177.2	181.97	NA	182.79	NA	182.52	182.81

Notes:

mbgs metres below ground surface

masl metres above sea level

NA Monitoring well was not accessible due to snow cover/parked car.

*Groundwater Level Measures in Undeveloped Monitoring Well



As shown in above table, the highest and lowest stabilized shallow groundwater level was measured at El. 183.08 masl in monitoring wells BH6 and BH10 on April 5, 2023.

6.2 Hydraulic Conductivity Testing

6.2.1 In-Situ Hydraulic Conductivity Tests

Monitoring well BH4S, BH4D, BH5 and BH7 underwent single well response tests (SWRTs) to assess the hydraulic conductivity (K) for saturated aquifer subsoils at the depths of the well screens. The monitoring wells were equipped with a digital transducer to record the fluctuation made to complete the SWRT. The results of the SWRT tests are presented in **Appendix D**, with a summary of the findings provided in **Table 6-2**.

Table 6-2- Summary of In-Situ Hydraulic Conductivity Testing

Well ID	Ground El. (masl)	Monitoring Well Depth (mbgs)	Screen Interval (masl)	Screened Soil Strata	Hydraulic Conductivity (K) (m/sec)	Test Method
BH4S	183.70	7.60	179.1-176.1	Sandy Silt to Silt and Sand Till	8.75×10^{-8}	Falling Head Test
BH4D	183.70	14.00	171.2-169.7	Sandy Silt to Silt and Sand Till	3.90×10^{-8}	Falling Head Test
BH5	183.50	7.60	178.9-175.9	Sandy Silt to Silt and Sand Till	7.02×10^{-9}	Falling Head Test
BH7	182.90	7.60	176.8-175.3	Sandy Silt to Silt and Sand Till	1.12×10^{-8}	Falling Head Test

Notes:

mbgs metres below ground surface
masl metres above sea level

The hydraulic conductivity of 8.75×10^{-8} m/sec for sandy silt to silt and sand till measured in BH4S is considered to estimate potential short-term dewatering and long-term foundation drainage flow for the proposed building.

6.2.2 Hydraulic Conductivity Test Using Grain Size Distribution Graphs

The Hazen Equation method was adopted to estimate the hydraulic conductivity (K) for different soil layers which may contain groundwater during the seasonal high-water table (spring) period, or if they are not encountered within the screen intervals.

The Hazen Equation method relies on the interrelationship between hydraulic conductivity and effective grain size, d_{10} , in the soil media. This empirical relation predicts a power-law relation with K, as follow:

$$K = Ad_{10}^2$$

Where:

d_{10} : Value of the soil grain size gradation curve as determined by sieve analysis, whereby 10% by weight of the soil particles are finer and 90% by weight of the soil particles are coarser.



A: Coefficient; it is equal to 1 when K is in cm/sec and d_{10} is in mm

The Hazen Equation estimation provides an indication of the groundwater yield capacity for saturated soil strata at the depths where soil samples were selected for grain size analysis. The grain size distribution graphs were used to estimate the hydraulic conductivity, with the details presented in **Appendix E**. The results of the Hazen equation are provided in **Table 6-3**.

Table 6-3 - Summary of Hydraulic Conductivity Using Hazen Equation

Monitoring Well ID	Soil Sample Depth (mbgs)	Soil Sample Elevation (masl)	Soil Strata	Hydraulic Conductivity (m/sec.)
BH3	1.8 (SS3)	181.7	Glacial Till (Sandy Silt to Sand and Silt)	4.9×10^{-9}
BH6	3.3 (SS5)	180.2	Glacial Till (Sandy Silt to Sand and Silt)	1.6×10^{-9}
BH11	2.5 (SS4)	180.8	Glacial Till (Sandy Silt to Sand and Silt)	1×10^{-8}

Notes:

mbgs metres below ground surface
masl metres above sea level

6.3 Groundwater Quality Assessment

As per the City of Toronto ToR dated August 2018, groundwater quality assessment should be completed for the Site to confirm groundwater quality in comparison with the City of Toronto Sewer Use By-Law Limits. As such, one (1) set of groundwater samples was collected by Terraprobe on January 30, 2023, and submitted to characterize groundwater quality for evaluation against the City of Toronto Sewer Use By-Law limits. The groundwater samples were collected from monitoring well BH4S.

One (1) set of unfiltered groundwater samples was collected in accordance with City of Toronto Sewer Use By-Law sampling protocols. Upon sampling, all of the bottles were placed in ice and packed in a cooler for shipment to the analytical laboratory. Sample analysis was performed by SGS Canada Inc., a laboratory accredited by CALA.

The chain of custody form and the certificate of analysis are presented in **Appendix F**. The exceedances along with the storm and sanitary criteria are presented in **Table 6-4**. The results were compared to the following:

- City of Toronto Municipal Code Chapter 681 Table 1 – Limits for Sanitary and Combined Sewers Discharge
- City of Toronto Municipal Code Chapter 681 Table 2 – Limits for Storm Sewer Discharge



Table 6-4 - Groundwater Quality Results and Exceedances

Parameter	Groundwater Quality Results (mg/L)	City of Toronto Sanitary Sewer Use Limits (mg/L)	City of Toronto Storm Sewer Use Limits (mg/L)	Reporting Detection Limit (mg/L)
Total Suspended Solids	71	350	15	2
Total Manganese	0.311	5	0.05	0.00001

As shown above, exceedances were recorded for groundwater samples in comparison with the City of Toronto Sewer Use By-Law limits. A review of the results shows that groundwater quality at monitoring well BH4S exceeded for Total Suspended Solids (TSS) and total manganese in comparison to the City of Toronto Storm Sewer Use By-Law limits. The results review also indicates no exceedances in comparison to the City of Toronto Sanitary and Combined Sewer Use By-Law limits at BH4S.



7.0 DEWATERING FLOW RATE ESTIMATION

7.1 Site Plan Review

The Site consists of a parcel of land with an approximate area of 32,160 m² based on a review of overall site plan provided by CS&P Architects dated November 15, 2022. It is understood the redevelopment at the Site will include demolishing the existing building at 109 Cartwright Avenue to facilitate the construction of a 2-storey institution building with a partial basement, (**Appendix G**). The Finished Floor Elevation (FFE) for the proposed building is 184.00 masl.

7.2 Review of the Geotechnical Investigation Report

A review of the geotechnical investigation report prepared by Terraprobe, an Englobe Company, dated May 3, 2023 indicates:

- The existing earth fill consisting of clayey silt with some sand and weathered/disturbed soil materials are unsuitable to support the proposed addition foundations. Based on the borehole information within or in close proximity to the proposed addition footprints, the foundations may be supported on the undisturbed sandy silt to silt and sand till of compact to very dense relative density.
- Based on the borehole information of Boreholes 3 to 7, which are in close proximity to the addition building, the foundation may be supported on the undisturbed sandy silt to silt and sand till of compact to very dense relative density.
- The minimum width of the continuous strip footings must be 500 mm and the minimum size of isolated footings must be 900 mm × 900 mm regardless of loading considerations.

7.3 Summary of Hydrogeological Conditions of Site Development

The results of the study completed by Terraprobe indicate the following hydrogeological conditions for the Site:

- Underlying the earth fill and weathered soil, a sandy silt to silt and sand till (Glacial Till) unit was encountered across the Site.
- The existing ground surface elevation according to boreholes drilled at the Site was estimated to range between approximately 182.9 and 183.7 masl.
- The highest stabilized groundwater level was measured at El. 183.08 masl in monitoring wells BH6 and BH10 on April 5, 2023 during the groundwater monitoring program.



- The hydraulic conductivity of 8.75×10^{-8} m/s for sandy silt to sand and silt till measured in BH4S is considered to estimate potential short-term dewatering and long-term foundation drainage flow for the proposed building.

7.4 Short-Term Groundwater Control Requirements (Construction Dewatering)

The short-term steady state dewatering flow rate was estimated reviewing the proposed development plan, considering subsoil profile, groundwater conditions, and estimated hydraulic conductivity for the geological units in which the excavation and construction of the underground structure will be completed.

Based on a review of the overall site plan prepared by CS&P Architects dated November 15, 2022 it is understood a 2-storey building will be added to the existing 1-storey building at 99 Cartwright Avenue. The Finished Floor Elevation (FFE) of the building is proposed at El. 184.0 masl. It is also understood that a partial basement with dimensions of 23.05 x 9.52 m is proposed as a part of the future development (email received from CS&P60, on May 8, 2023). Based on a review of the geotechnical investigation report dated May 3, 2023 it is our understanding that FFE of the proposed partial basement would be set at El. 181.75 masl. The dewatering requirements for construction of the footings proposed for the buildings are summarized in **Table 7-1**.

Table 7-1- Proposed Dewatering Details

Proposed Building	Proposed Lowest FFE El.	Ground Elevation (masl)	Excavation Dimensions (m)	Base of Excavation (masl)	Base of Footing El. (masl)	Base of Elevator Pit (masl)	Maximum Required Dewatering Target (masl)	Highest Groundwater Level (masl)
2-Storey Building	181.75	183.7	23.05 x 9.52	181.25*	180.75**	180.25***	179.25	183.08

Notes:

masl metres above sea level

*Assuming 0.5 m below the basement FFE

**As recommended by geotechnical engineer

***Assuming 1.5 below basement FFE

The estimated construction dewatering flow rate for the partial basement considering permeable shoring/open cut is summarized below and calculations are presented in **Appendix H**:

- 4,333.3 L/day without safety factor included, and it could reach 6,500 L/day of groundwater seepage into the excavation considering a safety factor of 1.5.
- The above estimate does not take into account storm water management from rainfall events. The collection system should also account for a typical 2-year design storm event which will generate approximately 5,500 L/day. The dewatering system should be designed to take into account removal of rainfall from the excavation. As such, a total short-term anticipated dewatering flow reaches up to 12,000 L/day.



- According to O. Reg. 63/16, a plan for discharge must consider the conveyance of storm water from a 100-year storm event, which translates to approximately 21,000 L/day.
- Details for installation of underground utilities are not available for review at the time of preparation of the current report and are not included in the current assessment.

7.5 Long-Term Groundwater Control Requirements (Post-Construction)

Anticipated long-term foundation drainage flow rate from groundwater source reaches 5,500 L/day considering a safety factor of 1.5. It reaches to total flow rate of 6,500 L/day considering infiltration.

Any localized protrusions extending below the base of the excavation, including elevator pits should be waterproofed in the long-term.

7.6 Foundation Drainage Policy

Thy City of Toronto released a foundation drainage policy on November 1, 2021. The objective of this policy is to preserve sewer capacity in the City of Toronto's sewer systems for the conveyance of sanitary sewage and sustain future development growth through an approach that requires that *foundation drainage* be managed on-site rather than being discharged to the City's sewer system.

The provision of a subfloor drainage system is recommended in the geotechnical investigation report. As such, the policy will be applicable to the proposed addition.

Based on the City of Toronto Foundation Drainage Guideline, dated November 1, 2021, since the monitoring program is completed between January and April, a maximum fluctuation allowance of 2.1 m should be considered to estimate maximum anticipated groundwater fluctuation (Foundation Drainage Guideline, dated November 1, 2021, Table 1). Applying the fluctuation allowance suggests that the maximum anticipated groundwater level could reach up to ground surface. However, a review of the borehole logs for the boreholes drilled within the footprint of the proposed building and soil color change zone, indicates that it turns from brown to grey between 177.4 and 178.9 masl.

MECP brownfields website was reviewed for any Record of Site Condition (RSC) filed for the Site on May 10, 2023. Record review indicates that there is no record for RSC for the Site.

7.7 Regulatory Requirements

Short-Term Dewatering: The estimated short-term construction dewatering flow rate for construction of the proposed building is below the MECP Environmental Activity and Sector Registry (EASR) threshold limit of 50,000 L/day. As such, filing an EASR with the MECP is not required. However, obtaining a discharge permit is required from the City of Toronto for directing the short-term dewatering discharge if it is proposed to be conveyed to the City's sewer system. Alternatively, discharge water can be hauled off-site.

Long-Term Foundation Drainage: The estimated long-term foundation drainage flow rate is below the MECP Permit to Take Water (PTTW) threshold limit of 50,000 L/day. As such, applying for PTTW with the MECP is not required. However, obtaining a discharge permit is required from the City of Toronto for directing the foundation drainage flow if it is proposed to be conveyed to the City's sewer system.

7.8 Zone of Influence (ZOI)

The conceptual Zone of Influence (ZOI) for dewatering, also known as Radius of Influence (R_0), is calculated based on the anticipated maximum drawdown required and the estimated hydraulic conductivity recorded at the Site using Sichardt's relationship as below.

Equation: $R_0 = 3000 * dH * K^{0.5}$

Where dH is the drawdown (m)
 K is the hydraulic conductivity (m/s)

The conceptual ZOI for dewatering reaches 3.4 m away from the dewatering area.

7.9 Potential Dewatering Impacts and Mitigation Plan

7.9.1 Short-Term Discharge of Pumped Groundwater (Construction Dewatering)

The dewatering system must be appropriately filtered to prevent the pumping of fines and loss of ground during the dewatering activities.

A review of the groundwater quality results suggests that potential short-term dewatering discharge could be directed to the City of Toronto Sanitary sewer system. Furthermore, pre-treatment should be considered to treat the elevated TSS and total manganese, if discharged groundwater is proposed to be directed to the City of Toronto Storm Sewer System. This report does not deal with the sewer capacities. The sewer capacity analysis is provided under a separate cover by the civil consultant.

7.9.2 Ground Settlement

Anticipated conceptual zone of influence can reach 3.4 m away from dewatering area for construction of the proposed building. There is a nearby building to the east side of the proposed building that may be located within the conceptual ZOI for dewatering. The potential for impacts from the short-term dewatering on ground settlement should be assessed by a Professional Geotechnical Engineer.

7.9.3 Surface Water, Wetlands and Areas of Natural Significance

There are no records for any natural heritage feature within or in close proximity to the Site. As such, no concern to the nearby natural heritage features is anticipated with respect to the proposed construction.



7.9.4 Water Supply Wells and Zone of Influence

The Site is located in a serviced area of Toronto. A review of the MECP well records confirmed that there are no records for any water supply wells or municipal wells on the Site and within a radius of 500 m from the Site boundary. As such, no concerns are anticipated to groundwater users with respect to the proposed development.

7.9.5 Contamination Sources

Terraprobe is undertaking a Phase One Environmental Site Assessment (ESA) for the Site. Further details can be reviewed in the above-mentioned report once available.



8.0 CONCLUSIONS AND RECOMMENDATIONS

- The Site is located within a regional physiography of Southern Ontario known as South Slope. The South Slope within the vicinity of the Site comprises of drumlinized Till Plains.
- The Site and surrounding area are mapped within the glacial till (5b) and comprise stone poor, sandy silt to silty sand-textured till.
- The Site is located within the Humber River and Don River Watersheds, which fall under TRCA jurisdiction. Lake Ontario and Humber River are located approximately 19 km and 6.2 km to the south and west of the Site, respectively. Record review indicates that there are no records for any natural heritage feature within or in close proximity to the Site.
- The subsoil profile beneath the Site consists of earth fill, weathered soil, underlain by a glacial till (Sandy Silt to Silt and Sand till) to termination depth of investigation at 14.5 mbgs.
- The highest stabilized groundwater level was measured at El. 183.08 masl at monitoring wells BH6 and BH10 on April 5, 2023 during the monitoring program.
- The hydraulic conductivity of 8.75×10^{-8} m/s for sandy silt to sand and silt till measured in BH4S is considered to estimate potential short-term dewatering and long-term foundation drainage flow for the proposed building.
- Groundwater quality for a set of samples collected from monitoring well BH4S exceeds for TSS and total manganese in comparison to the City of Toronto Storm Sewer By-Law Use Limits. The results review indicates that there are no exceedances for all parameters in comparison to the City of Toronto Sanitary Sewer Use By-Law Limits.
- Total short-term construction dewatering flow rates for construction of the building reach up to 12,000 L/day considering a safety factor of 1.5 and storm event.
- Long-term foundation drainage flow anticipated for the proposed building reaches 6,500 L/day considering safety factor of 1.5 and infiltration.
- Posting EASR or applying for PTTW with MECP is not required for short-term construction dewatering control.
- Applying for PTTW with MECP is not required for long-term foundation drainage control.
- Applying for discharge agreement with the City of Toronto is required for discharging short-term dewatering effluent if it is proposed to be conveyed to the City's sewer system. Alternatively, discharge water can be hauled off-site.
- Obtaining a discharge permit is required from the City of Toronto for directing the foundation drainage flow if it is proposed to be conveyed to the City's sewer system.



- There are no concerns with respect to the impact of the proposed development to the nearby natural heritage features.
- A review of the MECP well records indicates that there are no water supply wells within the Site and its vicinity. Therefore, no concerns with respect to the Site development is anticipated for groundwater users.
- Considering the nearby structure, which may be located within the conceptual ZOI for dewatering, potential risk of ground settlement is expected with respect to the proposed excavation and construction. As such, it is recommended a professional geotechnical engineer is consulted in advance of earthwork.

9.0 CLOSURE

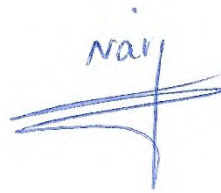
We trust that the above-noted information is suitable for your review. If you have any questions regarding this information, please do not hesitate to contact the undersigned.

Yours truly,

Terraprobe an Englobe Company



Alaa Alborn, B.Eng., EIT.
Project Manager



Narjes Alijani, M.Sc., P.Geo.
Team Lead/Senior Hydrogeologist



10.0 REFERENCES

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11.0 LIMITATIONS OF LIABILITY

This report was prepared at the request of, and for the exclusive use of CS&P Architects and its affiliates (“the Intended User”) is intended to provide an assessment of the hydrogeological conditions of the property with the municipal address of 1100-1130 Caledonia Road, in the City of Toronto, Ontario (the Site). No one other than the Intended User has the right to use and rely on the work without first obtaining the written authorization of Terraprobe, an Englobe Company, and CS&P Architects.

Terraprobe, an Englobe Company, expressly excludes liability to any party except the Intended User for any use of, and/or reliance upon, the work. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Terraprobe, an Englobe Company, accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report, including consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.

The assessment should not be considered a comprehensive audit that eliminates all risks of encountering hydrogeological problems. The information presented in this report is based on information collected during the completion of the hydrogeological study by Terraprobe, an Englobe Company. It was based on the conditions on the Site at the time of the hydrogeological study by a review of historical information and field investigation to assess the hydrogeological conditions of the Site, as reported herein.

There is no warranty expressed or implied by this report regarding the hydrogeological conditions for the Site. Professional judgement was exercised in gathering and analysing information collected by reviewing previous reports, data provided by government and are open to public and field work investigation. The conclusions presented are the product of professional care and competence and cannot be construed as an absolute guarantee.

In the event that during future work new information regarding the hydrogeological conditions of the Site is encountered, or in the event that the outstanding responses from the regulatory agencies indicate outstanding issues on file with respect to the Site, Terraprobe, an Englobe Company, should be notified in order that we may re-evaluate the findings of this assessment and provide amendments, as required.

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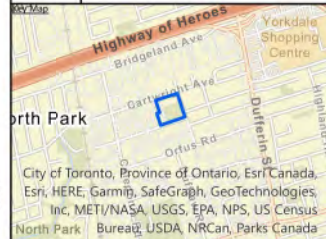


FIGURES

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References:
ESRI, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community BaseMaps



Notes:

Legend:

 Approximate Site Location

Project Title:

Hydrogeological Assessment

Site Location:

99 Cartwright Avenue
North York, Ontario

Figure Title:

Site Location Plan

Designed By:

AA

File No.:

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Reviewed By:

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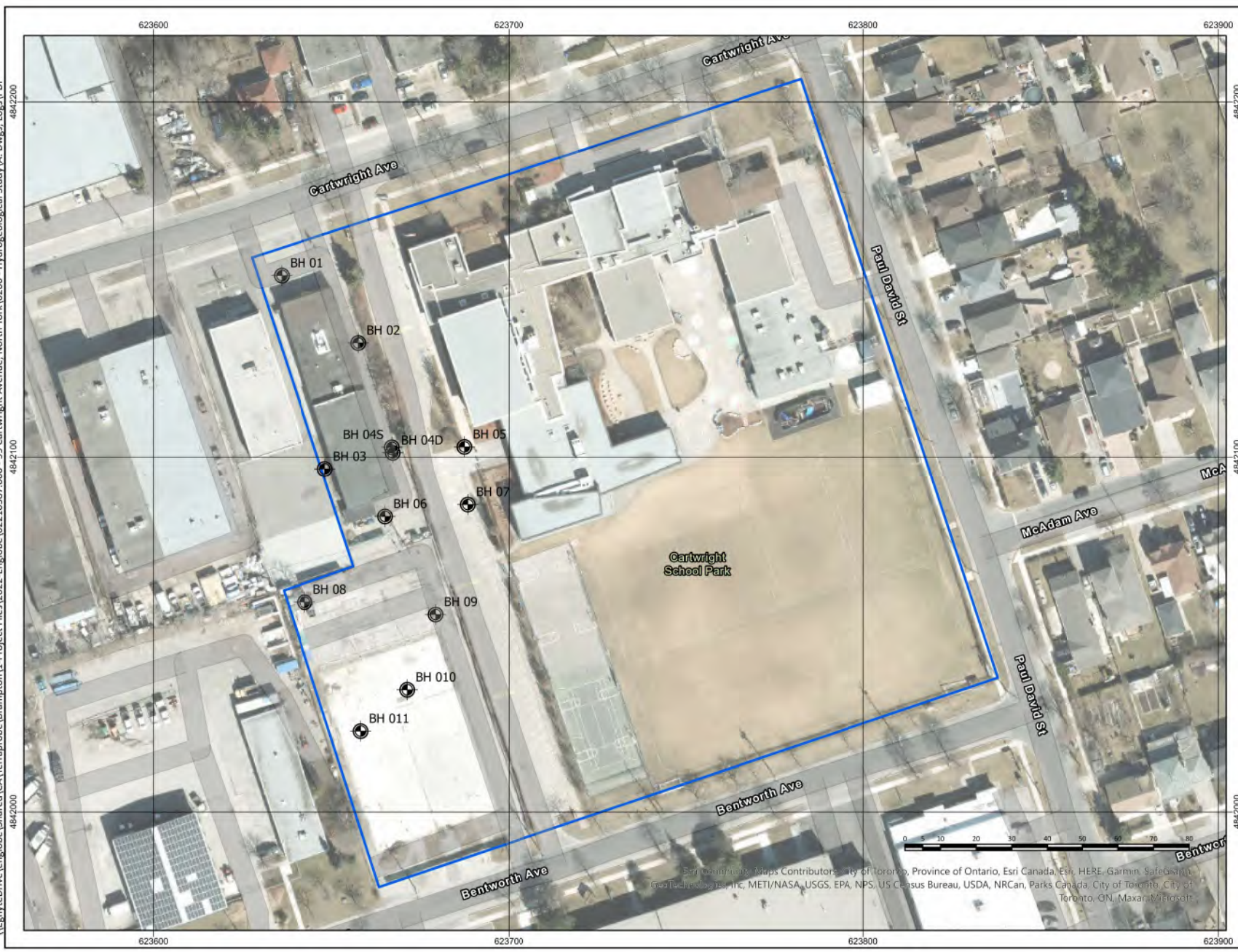
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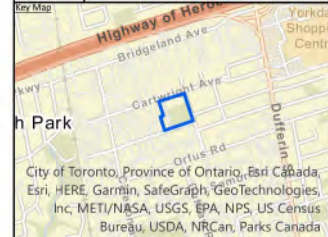
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References:

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Key Map



City of Toronto, Province of Ontario, Esri Canada, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, NRCan, Parks Canada

Notes:

Legend:

- Approximate Site Boundary
- Monitoring Well Locations

Project Title:
Hydrogeological Investigation

Site Location:
99 Cartwright Avenue
North York, Ontario

Figure Title:
Borehole and Monitoring Well Plan

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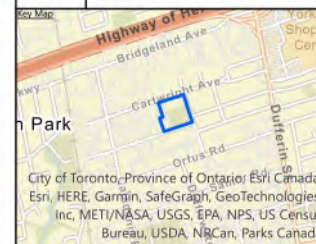
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Date: Mar 2023	2
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References:
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Notes:

Legend:

- Approximate Site Boundary
- Ss: Stone-poor, carbonate-derived silt to sandy till
- Se: Undifferentiated older till and stratified sediment
- Qc: Foreshire-basinal deposits
- Water Body
- Roads
 - Collector
 - Local / Street
 - Ramp
 - Watercourse

Project Title:

Hydrogeological Assessment

Site Location:

99 Cartwright Avenue
North York, Ontario

Figure Title:

Surficial Geology Map

Designed By:

AA

File No.:

02210387.000.0200

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Date:

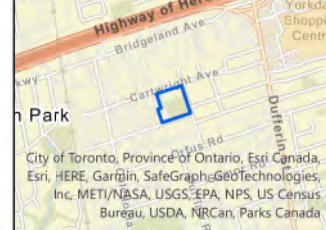
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Key Map



Notes:

Legend:

- Approximate Site Boundary
- 32, South Slope
- 33, Peel Plain
- Roads
 - Collector
 - Freeway
 - Local / Street
 - Ramp
 - Watercourse

Project Title:

Hydrogeological Assessment

Site Location:

99 Cartwright Avenue
North York, Ontario

Figure Title:

Physiography Map

Designed By:

AA
File No.:
02210387.000.200

Drawn By:

HK
Scale:
As Shown

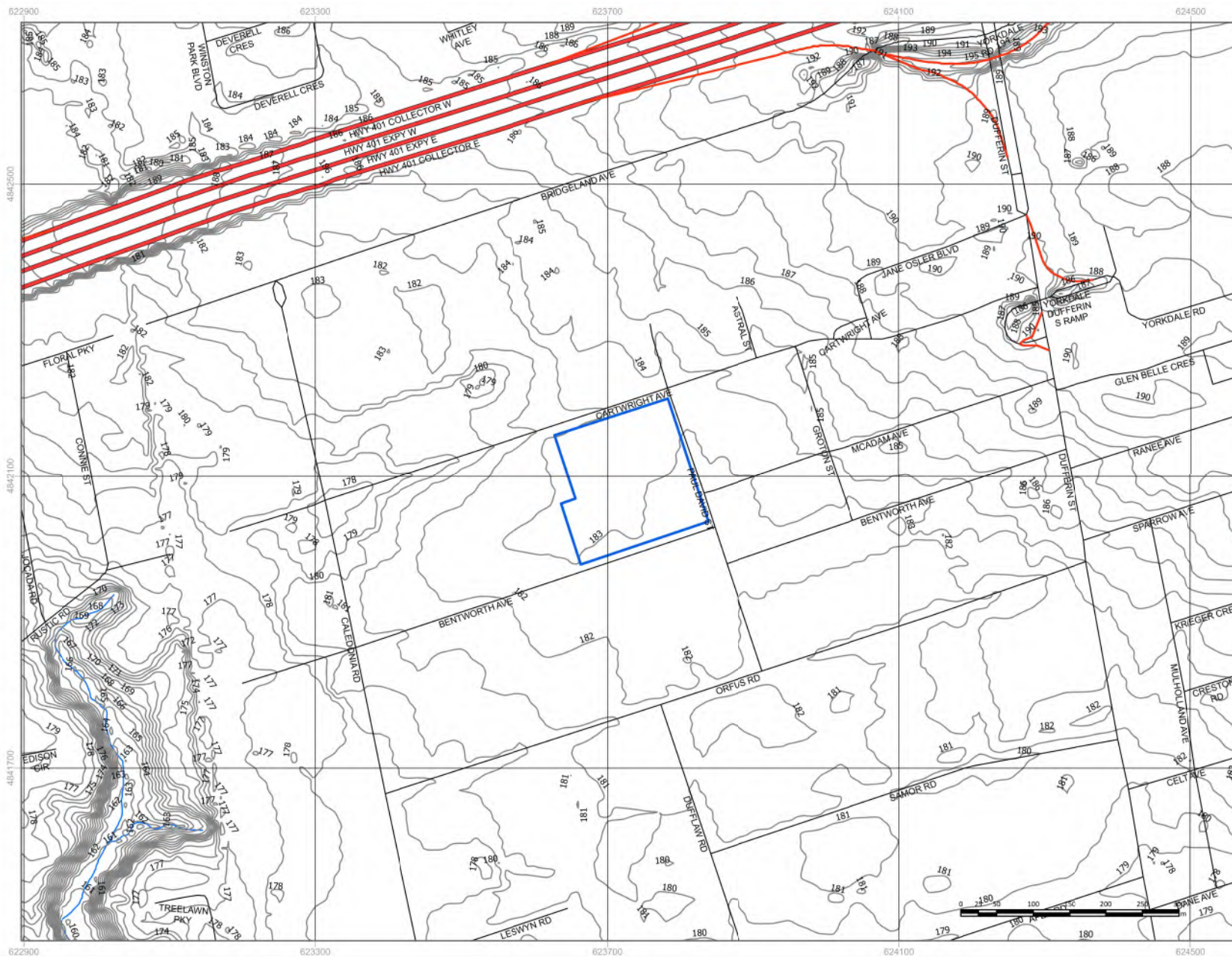
Reviewed By:

NA
Figure No.:

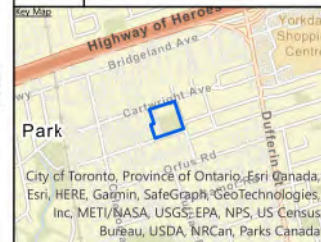
Date:
Mar 2023

4

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References:
Service Layer Credits: © Topography, Water Body and Watercourse Map was Produced by Englobe Corp. under license from the Ministry of Natural Resources and Forestry (MNR). Copyright (c) is held by the Queen's Printer for Ontario 2015.



Notes:

Legend:

Approximate Site Boundary

Layer

ROADS TYPE

Collector

Freeway

Local / Street

Ramp

City of Toronto, Topographic Contours

Watercourse

Project Title:

Hydrogeological Assessment

Site Location:

99 Cartwright Avenue
North York, Ontario

Figure Title:

Topography Map

Designed By:

AA

File No.:

02210387.000.0200

Drawn By:

HK

Scale:

As Shown

Reviewed By:

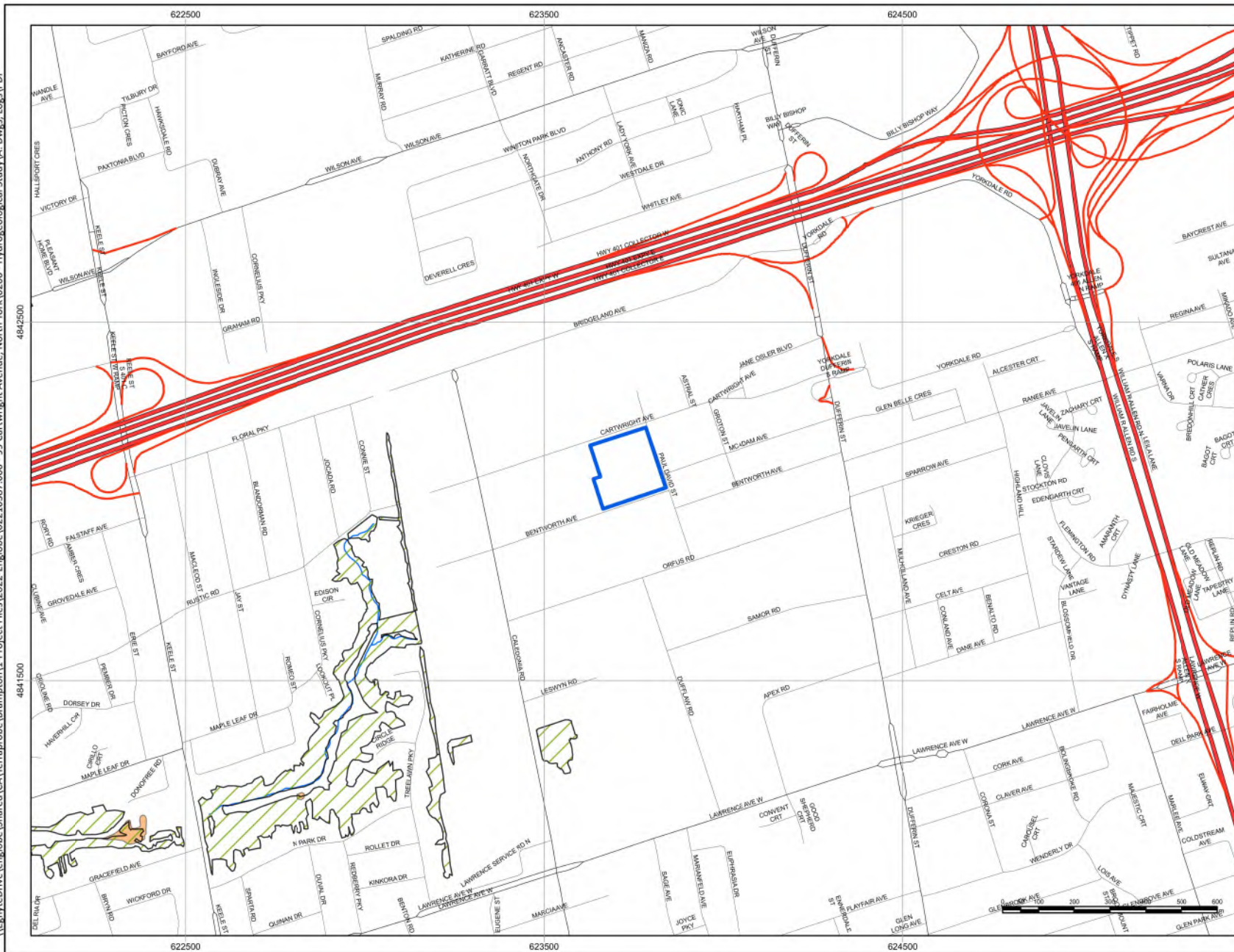
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Figure No.:

5

Date:

Mar 2023

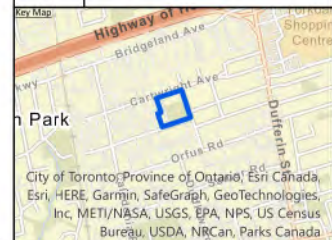


References:

Service Layer Credits: © Natural Heritage Map was Produced by Englobe Corp under license from the Ministry of North Development and Mines (MINDM). Copyright (c) is held by the Queen's Printer for Ontario.



Key Map



Notes:

Legend:

- Approximate Site Boundary
- Water Body
- Wooded Area

Wetland Significance

- Wetland Features-Not evaluated per OWES

Watercourse

- Watercourse

Roads

- Collector
- Local / Street
- Ramp

Project Title:

Hydrogeological Assessment

Site Location:

99 Cartwright Avenue
North York, Ontario

Figure Title:

Natural Heritage Feature Map

Designed By:

AA

File No.:

02210387.000.200

Drawn By:

HK

Scale:

As Shown

Reviewed By:

NA

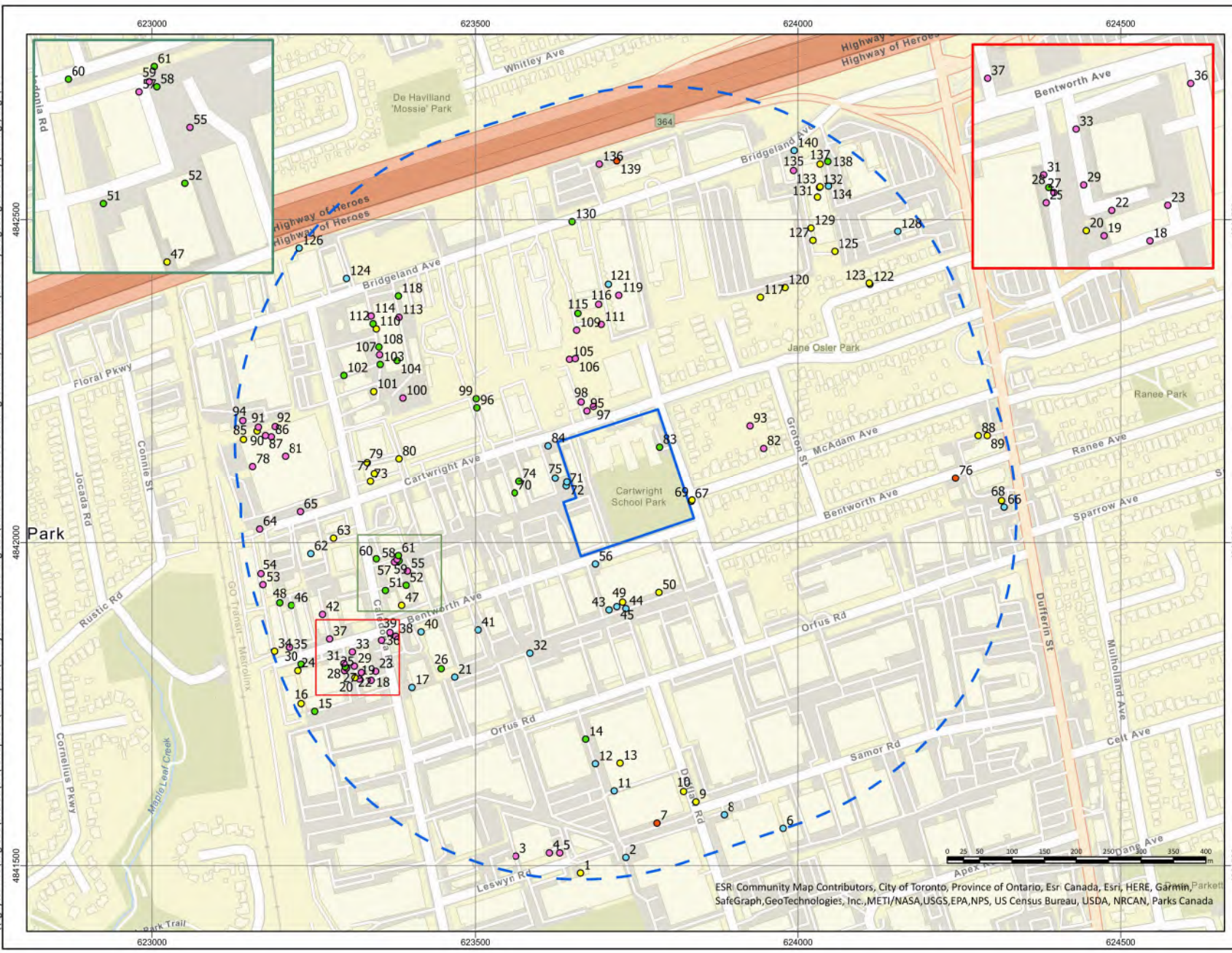
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Date:

Mar 2023

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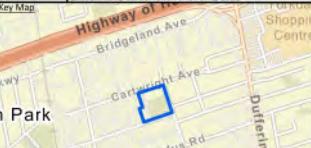




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References:
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Well Information System Ministry of the
Environment, Conservation and Parks, 2021



Key Map

ESRI Community Map Contributors, City of
Toronto, Province of Ontario, Esri Canada, Esri,
HERE, Garmin, SafeGraph, GeoTechnologies, Inc.,
METI/NASA, USGS/EPA/NPS, US Census Bureau,
USDA, NRCAN, Parks Canada

Notes:

Legend:

- Approximate Site Boundary
- 500 m Study Area

MECP Wells-Final Status

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

Project Title:

Hydrogeological Assessment

Site Location:

99 Cartwright Avenue
North York, Ontario

Figure Title:

MECP Well Records Map

Designed By:	AA	File No.:	02210387.000.200
Drawn By:	HK	Scale:	As Shown
Reviewed By:	NA	Figure No.:	7
Date:	Mar 2023		

APPENDIX A

Boreholes and Monitoring Well Logs and Cross-Section



SAMPLING METHODS	PENETRATION RESISTANCE
AS auger sample CORE cored sample DP direct push FV field vane GS grab sample SS split spoon ST shelby tube WS wash sample	Standard Penetration Test (SPT) resistance ('N' values) is defined as the number of blows by a hammer weighing 63.6 kg (140 lb.) falling freely for a distance of 0.76 m (30 in.) required to advance a standard 50 mm (2 in.) diameter split spoon sampler for a distance of 0.3 m (12 in.). Dynamic Cone Test (DCT) resistance is defined as the number of blows by a hammer weighing 63.6 kg (140 lb.) falling freely for a distance of 0.76 m (30 in.) required to advance a conical steel point of 50 mm (2 in.) diameter and with 60° sides on 'A' size drill rods for a distance of 0.3 m (12 in.)."

COHESIONLESS SOILS	COHESIVE SOILS	COMPOSITION
Compactness 'N' value	Consistency 'N' value Undrained Shear Strength (kPa)	Term (e.g) % by weight
very loose < 4	very soft < 2 < 12	<i>trace</i> silt < 10
loose 4 – 10	soft 2 – 4 12 – 25	<i>some</i> silt 10 – 20
compact 10 – 30	firm 4 – 8 25 – 50	silty 20 – 35
dense 30 – 50	stiff 8 – 15 50 – 100	sand <i>and</i> silt > 35
very dense > 50	very stiff 15 – 30 100 – 200	
	hard > 30 > 200	

TESTS AND SYMBOLS

MH mechanical sieve and hydrometer analysis		Unstabilized water level
w, w _c water content		1 st water level measurement
w _L , LL liquid limit		2 nd water level measurement
w _P , PL plastic limit		Most recent water level measurement
I _P , PI plasticity index		Undrained shear strength from field vane (with sensitivity)
k coefficient of permeability	3.0 +	
γ soil unit weight, bulk	C _c compression index	
G _s specific gravity	c _v coefficient of consolidation	
φ' internal friction angle	m _v coefficient of compressibility	
c' effective cohesion	e void ratio	
c _u undrained shear strength		

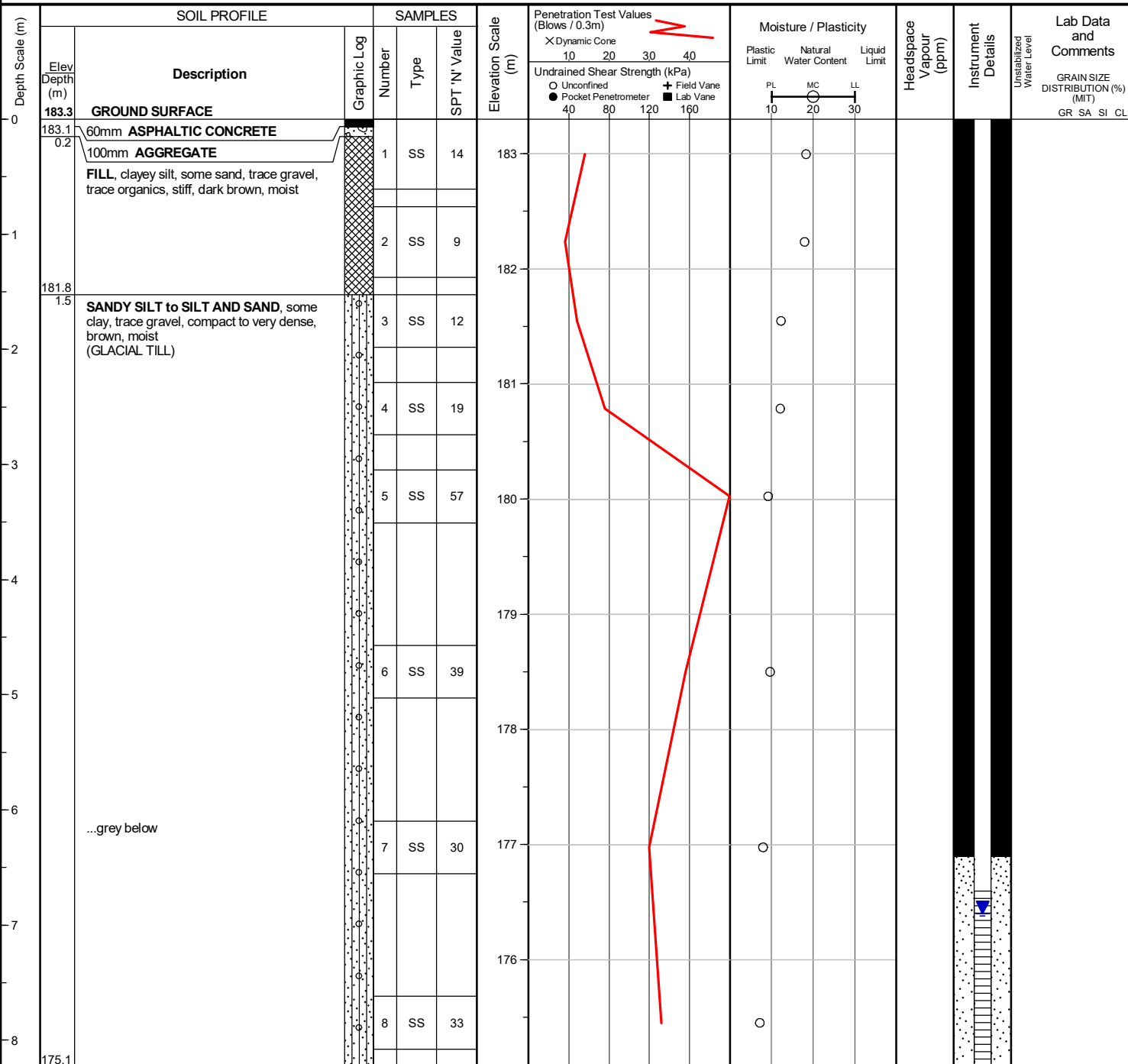
FIELD MOISTURE DESCRIPTIONS

Damp	refers to a soil sample that does not exhibit any observable pore water from field/hand inspection.
Moist	refers to a soil sample that exhibits evidence of existing pore water (e.g. sample feels cool, cohesive soil is at or close to plastic limit) but does not have visible pore water
Wet	refers to a soil sample that has visible pore water



Project No. : 02210387.000 Client : The Sterling Hall School Originated by : RS
Date started : December 20, 2022 Project : 99 Cartwright Avenue Compiled by : OH
Sheet No. : 1 of 1 Location : Toronto, Ontario Checked by : RS

Position : E: 623636, N: 4842151 (UTM 17T) Elevation Datum : Geodetic
Rig type : Track-mounted Drilling Method : Solid stem augers



END OF BOREHOLE

Borehole was dry and open upon completion of drilling.

50 mm dia. monitoring well installed.

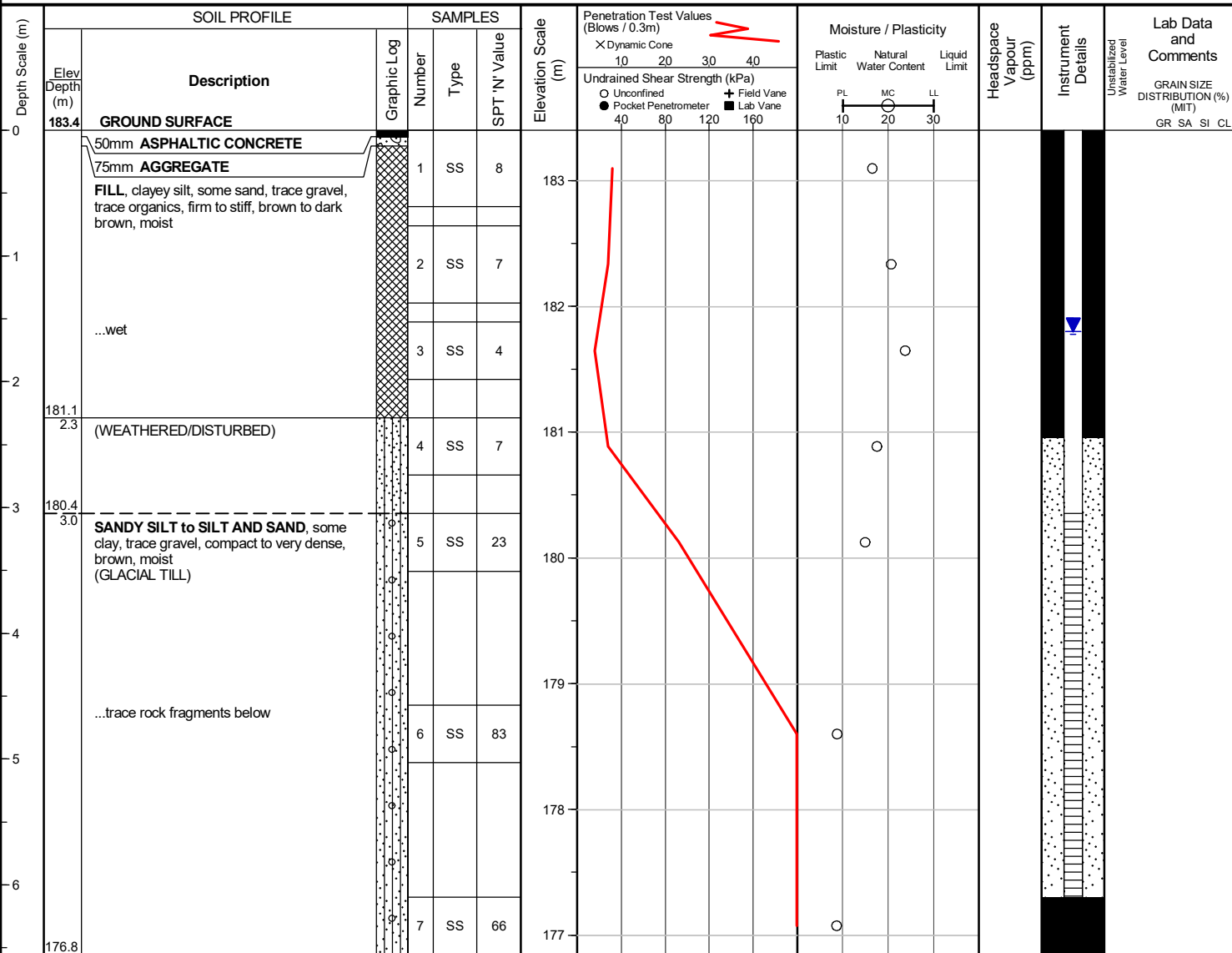
WATER LEVEL READINGS

Date Jan 6, 2023 Water Depth (m) 6.9 Elevation (m) 176.4



Project No. : 02210387.000 Client : The Sterling Hall School Originated by : RS
Date started : December 20, 2022 Project : 99 Cartwright Avenue Compiled by : OH
Sheet No. : 1 of 1 Location : Toronto, Ontario Checked by : RS

Position : E: 623658, N: 4842132 (UTM 17T) Elevation Datum : Geodetic
Rig type : Track-mounted Drilling Method : Solid stem augers



END OF BOREHOLE

Borehole was dry and open upon completion of drilling.

50 mm dia. monitoring well installed.

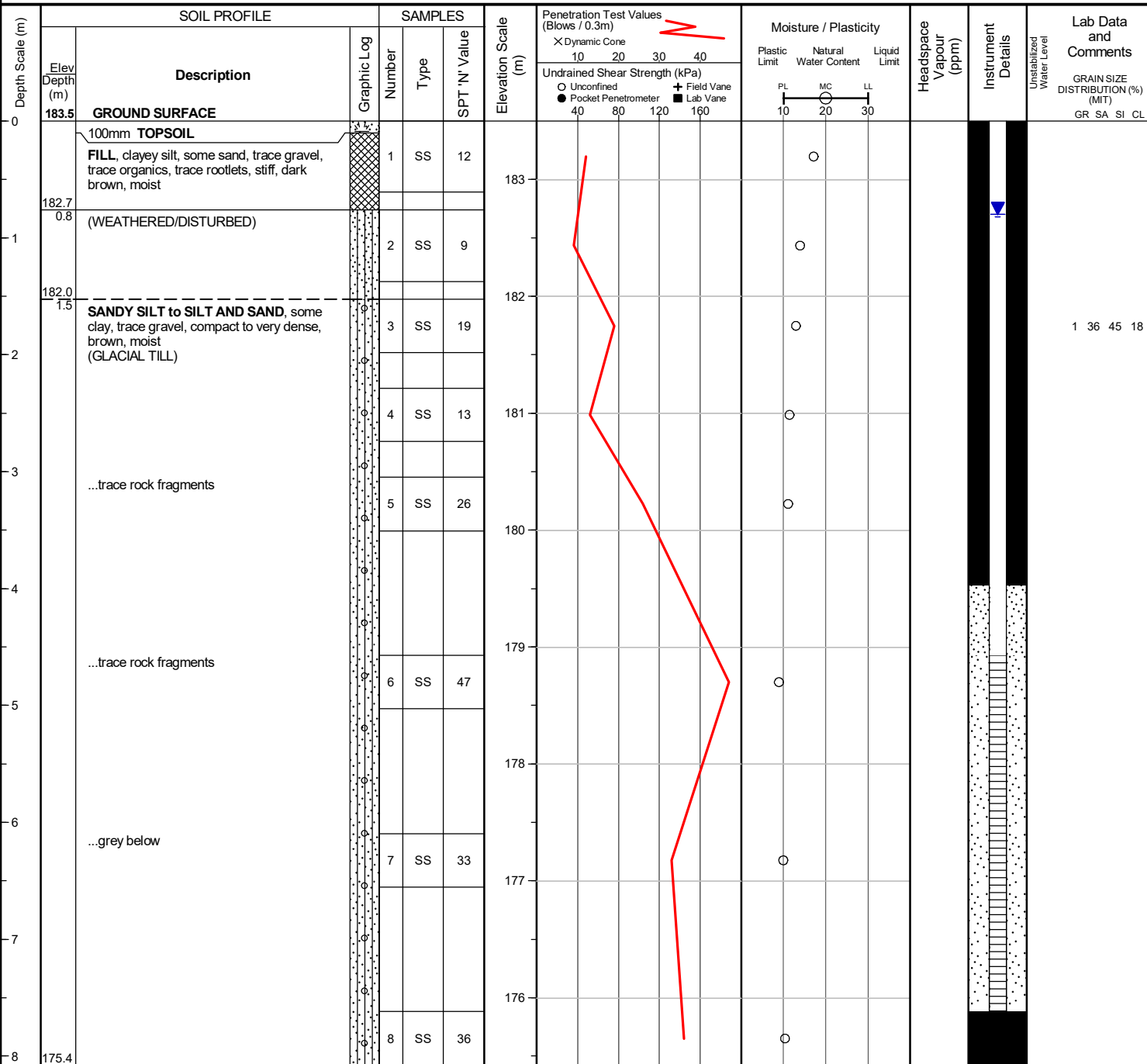
WATER LEVEL READINGS

Date Jan 6, 2023 Water Depth (m) 1.6 Elevation (m) 181.8



Project No. : 02210387.000 Client : The Sterling Hall School Originated by : RS
Date started : December 22, 2022 Project : 99 Cartwright Avenue Compiled by : OH
Sheet No. : 1 of 1 Location : Toronto, Ontario Checked by : RS

Position : E: 623648, N: 4842097 (UTM 17T) Elevation Datum : Geodetic
Rig type : Track-mounted Drilling Method : Solid stem augers



END OF BOREHOLE

Borehole was dry and open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date Jan 6, 2023 Water Depth (m) 0.8 Elevation (m) 182.7



Project No. : 02210387.000

Client : The Sterling Hall School

Originated by : RS

Date started : December 20, 2022

Project : 99 Cartwright Avenue

Compiled by : OH

Sheet No. : 1 of 2

Location : Toronto, Ontario

Checked by : RS

Position : E: 623667, N: 4842101 (UTM 17T)

Elevation Datum : Geodetic

Rig type : Track-mounted

Drilling Method : Solid stem augers

Depth Scale (m)	SOIL PROFILE			SAMPLES			Elevation Scale (m)	Penetration Test Values (Blows / 0.3m) X Dynamic Cone Undrained Shear Strength (kPa) ○ Unconfined ● Pocket Penetrometer + Field Vane ■ Lab Vane	Moisture / Plasticity			Headspace Vapour (ppm)	Instrument Details	Lab Data and Comments GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL
	Elev Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value			Plastic Limit	Natural Water Content	Liquid Limit			
0	183.7	GROUND SURFACE												
	183.4	50mm ASPHALTIC CONCRETE		1	SS	20								
	183.3	275mm AGGREGATE												
	182.9	FILL, clayey silt, some sand, trace gravel, trace organics, very stiff, dark brown, moist (WEATHERED/DISTURBED)		2	SS	14								
1	182.2													
	182.2	SANDY SILT to SILT AND SAND, some clay, trace gravel, compact to very dense, dark brown, moist (GLACIAL TILL)		3	SS	20								
2				4	SS	16								
3		...trace rock fragments		5	SS	30								
4														
5		...grey below		6	SS	23								
6														
7		...trace rock fragments		7	SS	23								
8				8	SS	21								
9		...trace rock fragments		9	SS	28								
10														

(continued next page)



Project No. : 02210387.000 Client : The Sterling Hall School Originated by : RS
 Date started : December 20, 2022 Project : 99 Cartwright Avenue Compiled by : OH
 Sheet No. : 2 of 2 Location : Toronto, Ontario Checked by : RS

Position : E: 623667, N: 4842101 (UTM 17T) Elevation Datum : Geodetic
 Rig type : Track-mounted Drilling Method : Solid stem augers

Depth Scale (m)	SOIL PROFILE			SAMPLES			Elevation Scale (m)	Penetration Test Values (Blows / 0.3m)		Moisture / Plasticity			Headspace Vapour (ppm)	Instrument Details	Lab Data and Comments
	Elev Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value		Dynamic Cone	Unconfined	Plastic Limit	Natural Water Content	Liquid Limit			
		(continued)						10 20 30 40	40 80 120 160	PL MC LL	10 20 30				
11		SANDY SILT to SILT AND SAND, some clay, trace gravel, compact to very dense, dark brown, moist (GLACIAL TILL) (continued) ...wet below		10	SS	30	173								
12							172								
13				11	SS	61 / 275mm	171								
14		...silt, some sand		12	SS	50 / 125mm	170								
169.2	14.5														

END OF BOREHOLE

Unstabilized water level measured at 13.9 m below ground surface; borehole caved to 14.0 m below ground surface upon completion of drilling.

50 mm dia. monitoring well installed.

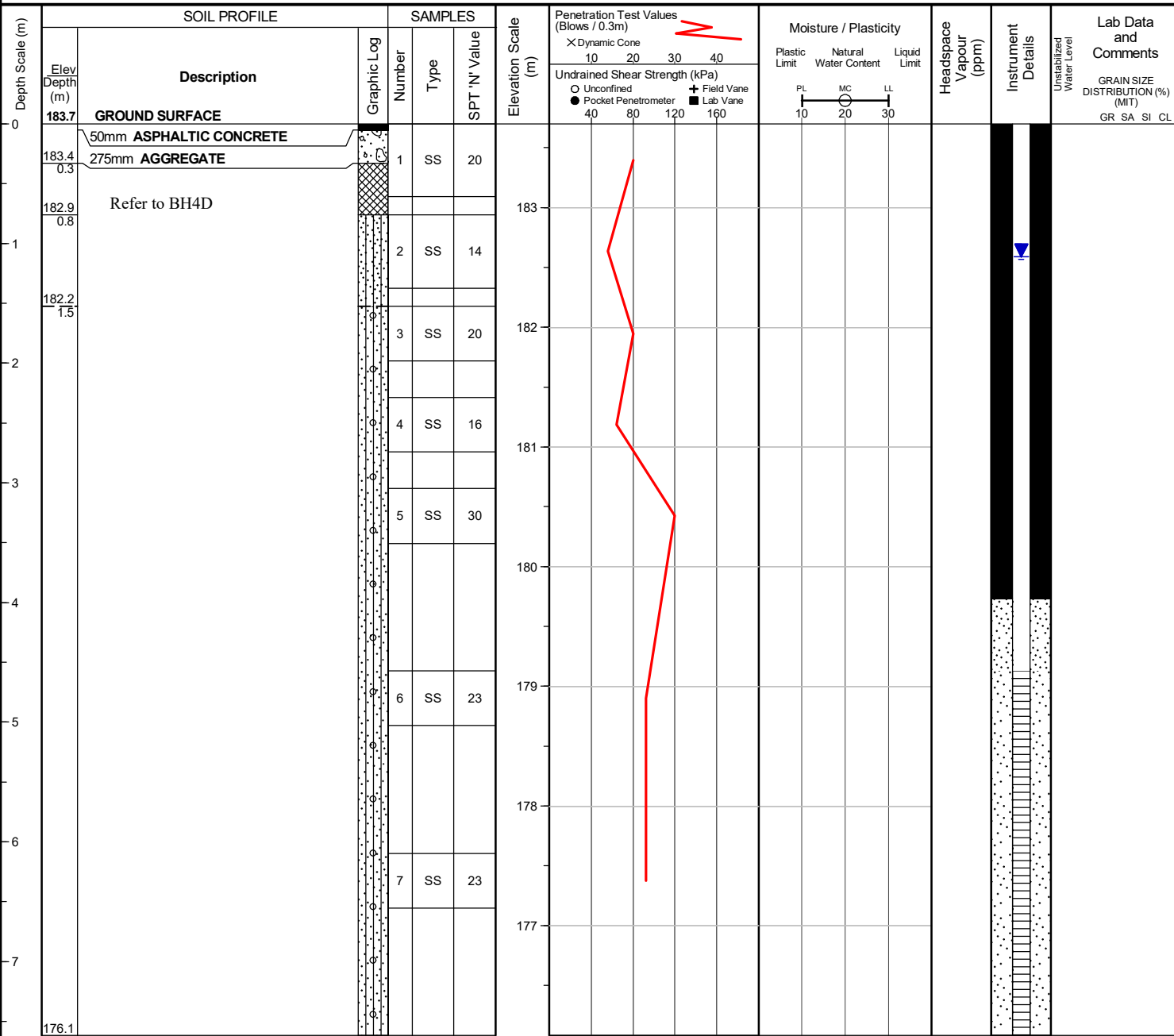
WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Jan 6, 2023	11.6	172.1



Project No. : 02210387.000 Client : The Sterling Hall School Originated by : RS
 Date started : December 20, 2022 Project : 99 Cartwright Avenue Compiled by : OH
 Sheet No. : 1 of 1 Location : Toronto, Ontario Checked by : RS

Position : E: 623668, N: 4842103 (UTM 17T) Elevation Datum : Geodetic
 Rig type : Track-mounted Drilling Method : Solid stem augers



END OF BOREHOLE

Borehole was dry and open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date : Jan 6, 2023
 Water Depth (m) : 1.1
 Elevation (m) : 182.6



Project No. : 02210387.000

Client : The Sterling Hall School

Originated by : RS

Date started : December 21, 2022

Project : 99 Cartwright Avenue

Compiled by : OH

Sheet No. : 1 of 1

Location : Toronto, Ontario

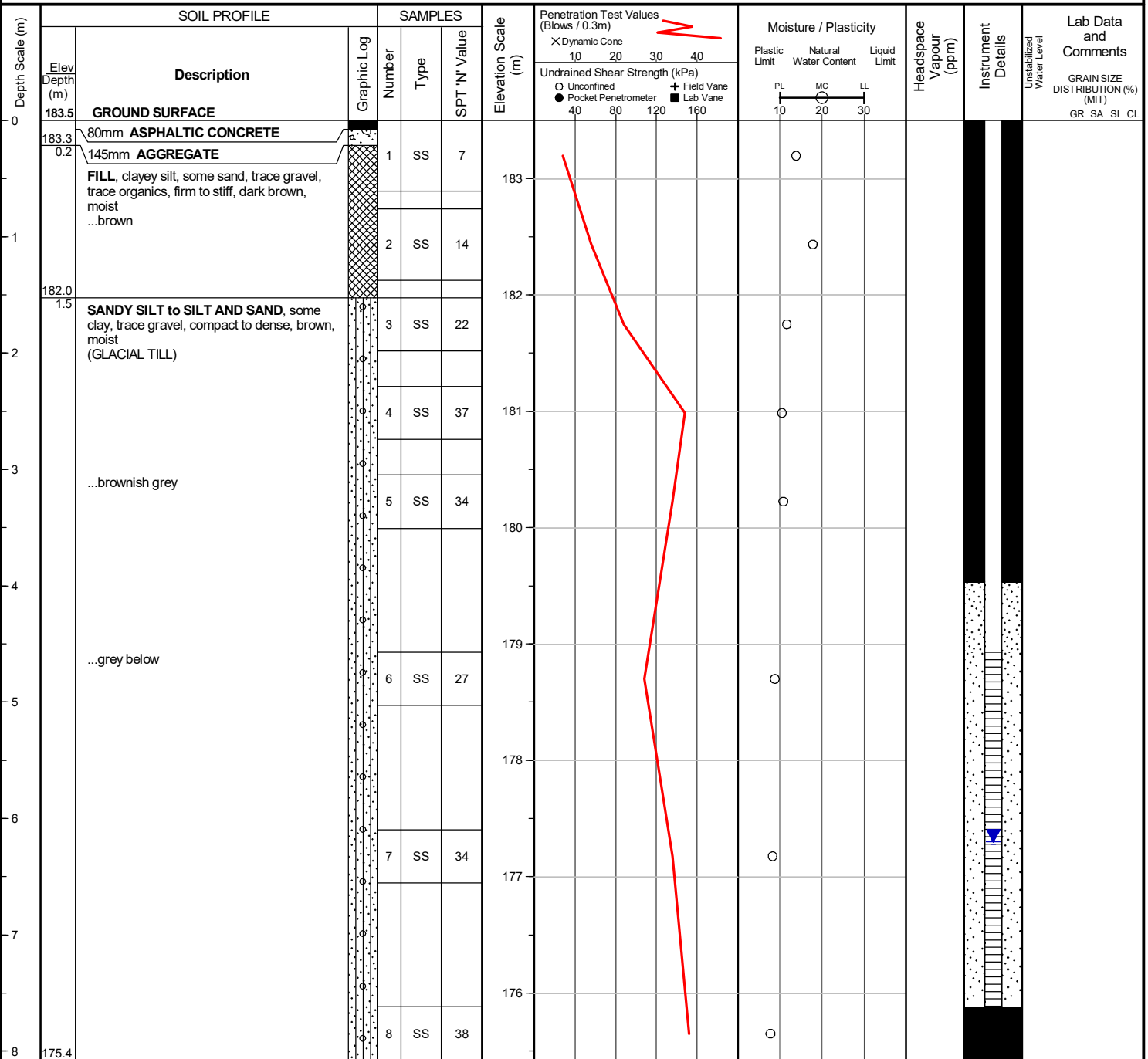
Checked by : RS

Position : E: 623688, N: 4842103 (UTM 17T)

Elevation Datum : Geodetic

Rig type : Track-mounted

Drilling Method : Solid stem augers



END OF BOREHOLE

Borehole was dry and open upon completion of drilling.

50 mm dia. monitoring well installed.

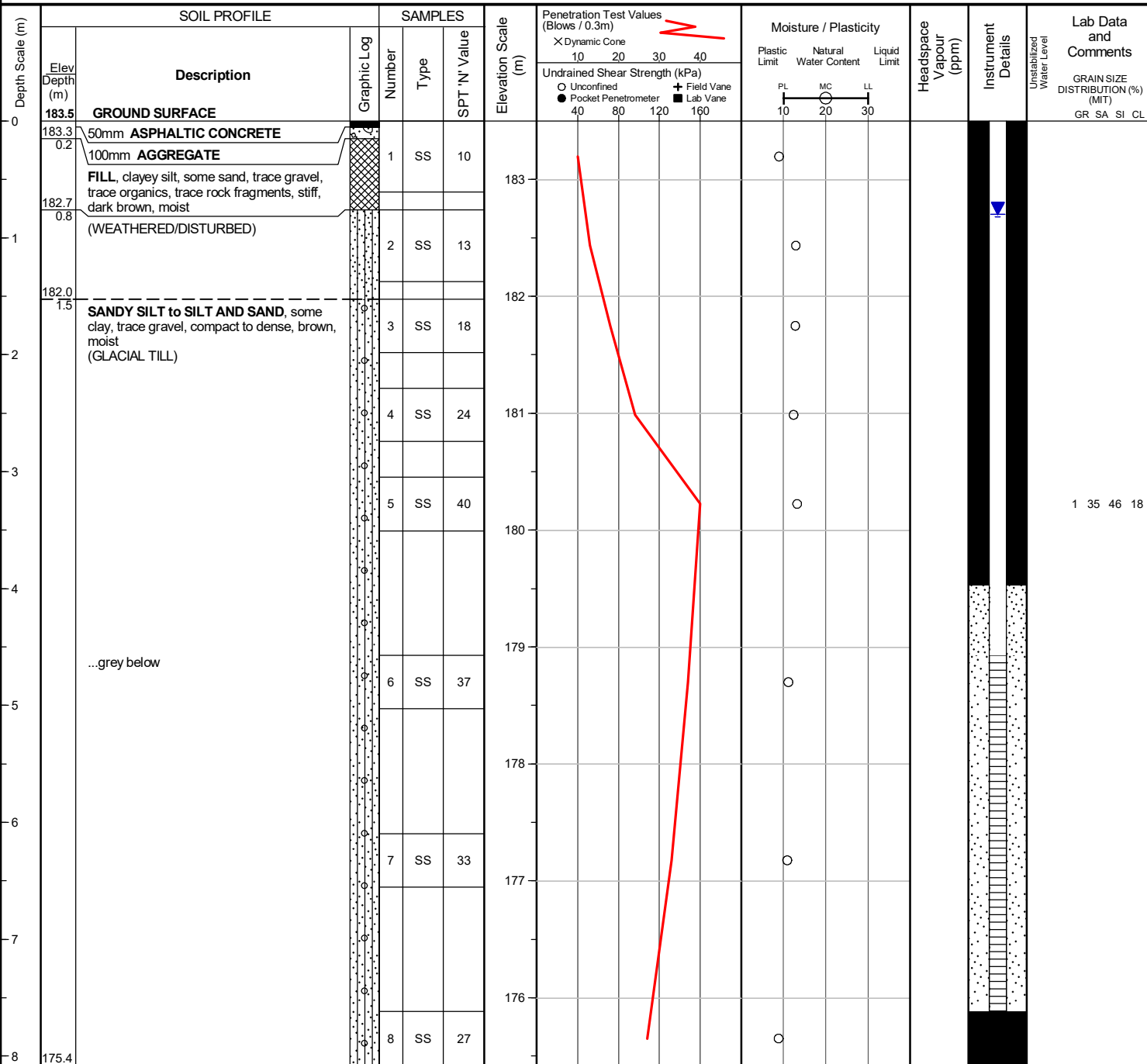
WATER LEVEL READINGS

Date Jan 6, 2023 Water Depth (m) 6.2 Elevation (m) 177.3



Project No. : 02210387.000 Client : The Sterling Hall School Originated by : RS
Date started : December 20, 2022 Project : 99 Cartwright Avenue Compiled by : OH
Sheet No. : 1 of 1 Location : Toronto, Ontario Checked by : RS

Position : E: 623665, N: 4842083 (UTM 17T) Elevation Datum : Geodetic
Rig type : Track-mounted Drilling Method : Solid stem augers



END OF BOREHOLE

Borehole was dry and open upon completion of drilling.

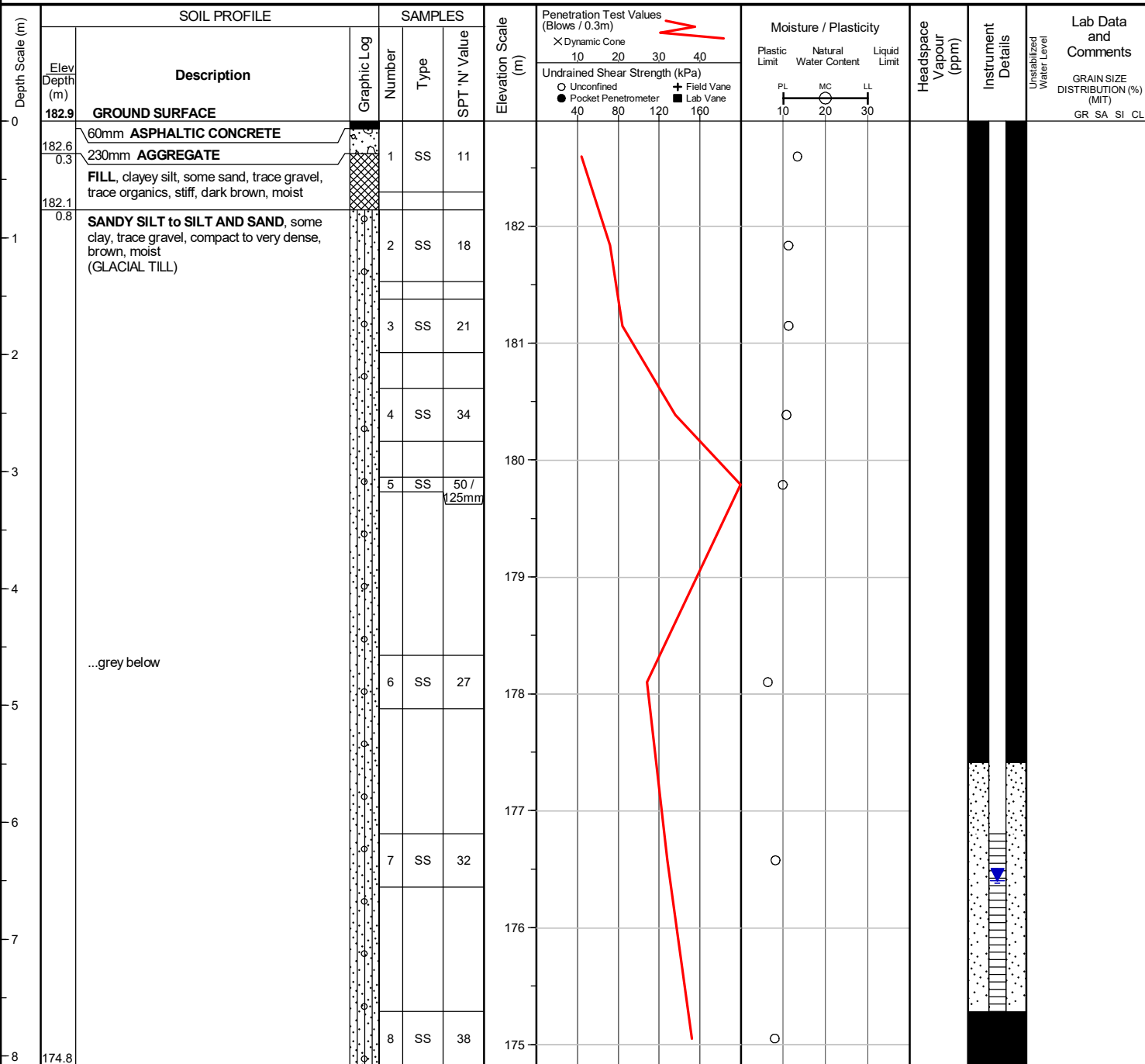
50 mm dia. monitoring well installed.

WATER LEVEL READINGS
Date Jan 6, 2023
Water Depth (m) 0.8
Elevation (m) 182.7



Project No. : 02210387.000 Client : The Sterling Hall School Originated by : RS
Date started : December 21, 2022 Project : 99 Cartwright Avenue Compiled by : OH
Sheet No. : 1 of 1 Location : Toronto, Ontario Checked by : RS

Position : E: 623688, N: 4842087 (UTM 17T) Elevation Datum : Geodetic
Rig type : Track-mounted Drilling Method : Solid stem augers



END OF BOREHOLE

Borehole was dry and open upon completion of drilling.

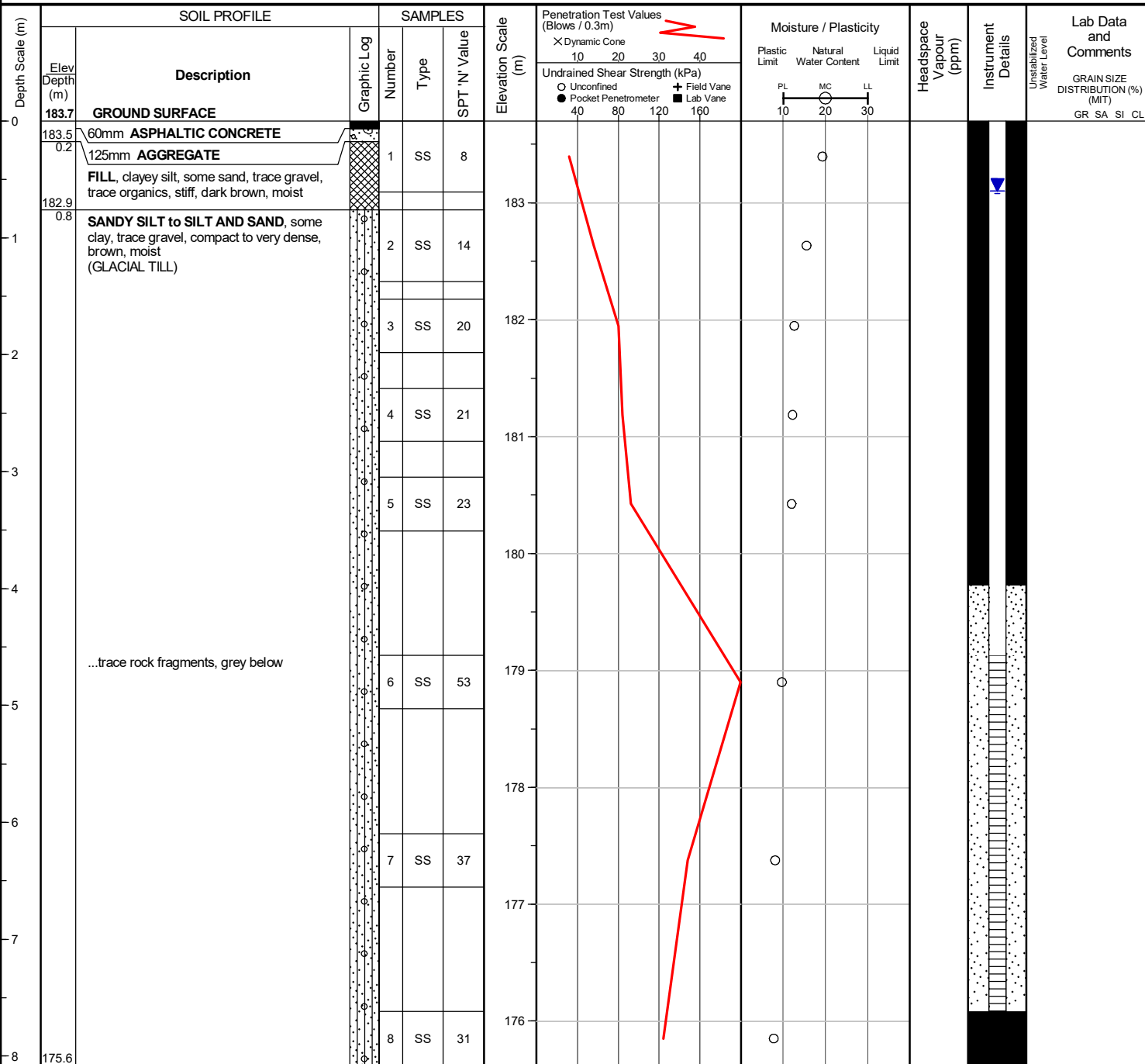
50 mm dia. monitoring well installed.

WATER LEVEL READINGS
Date Jan 6, 2023 Water Depth (m) 6.5 Elevation (m) 176.4



Project No. : 02210387.000 Client : The Sterling Hall School Originated by : RS
Date started : December 22, 2022 Project : 99 Cartwright Avenue Compiled by : OH
Sheet No. : 1 of 1 Location : Toronto, Ontario Checked by : RS

Position : E: 623643, N: 4842059 (UTM 17T) Elevation Datum : Geodetic
Rig type : Track-mounted Drilling Method : Solid stem augers



END OF BOREHOLE

Borehole was dry and open upon completion of drilling.

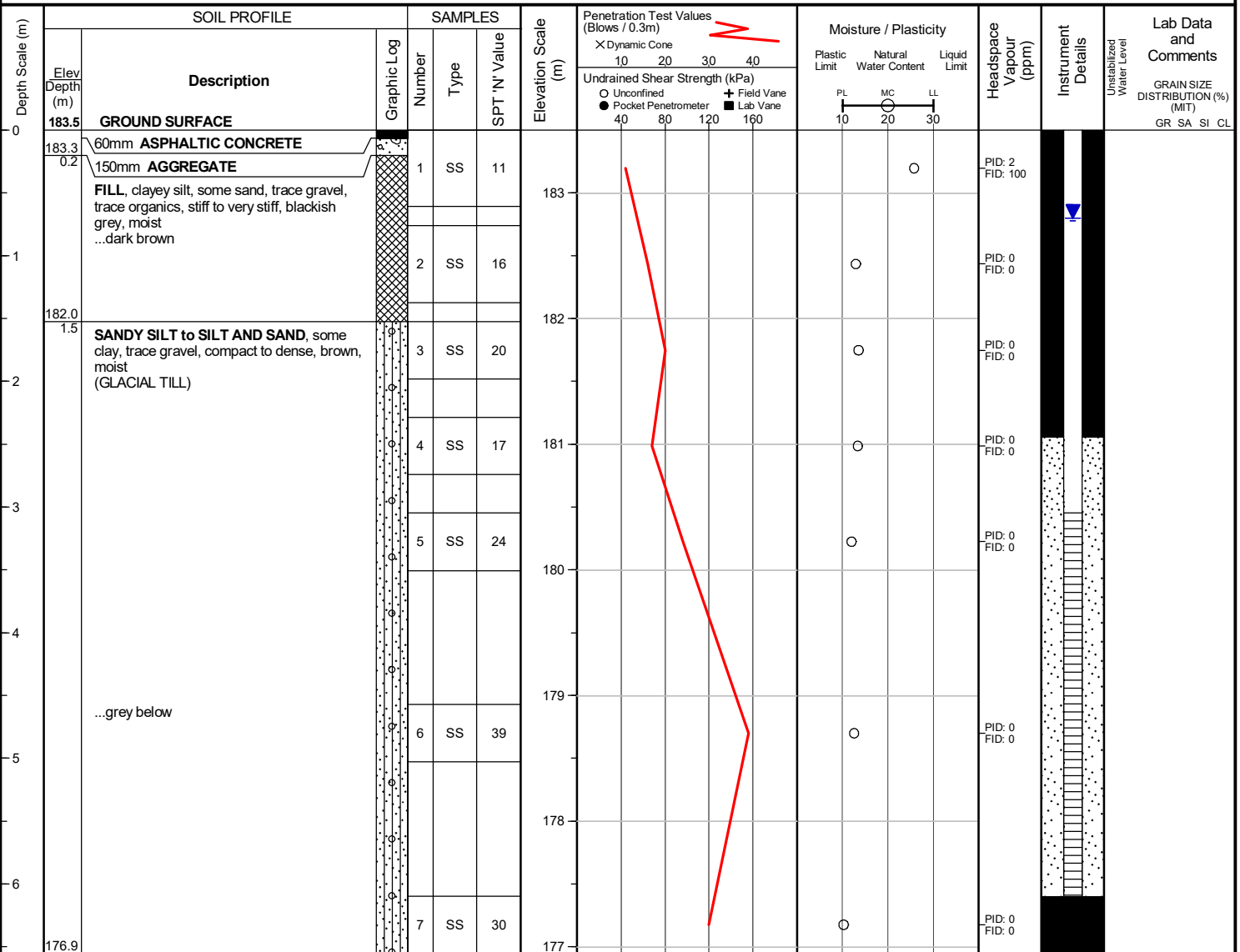
50 mm dia. monitoring well installed.

WATER LEVEL READINGS
Date Jan 6, 2023 Water Depth (m) 0.6 Elevation (m) 183.1



Project No. : 02210387.000 Client : The Sterling Hall School Originated by : RS
 Date started : December 21, 2022 Project : 99 Cartwright Avenue Compiled by : OH
 Sheet No. : 1 of 1 Location : Toronto, Ontario Checked by : RS

Position : E: 623679, N: 4842056 (UTM 17T) Elevation Datum : Geodetic
 Rig type : Track-mounted Drilling Method : Solid stem augers



END OF BOREHOLE

Borehole was dry and open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS
 Date Jan 6, 2023 Water Depth (m) 0.7 Elevation (m) 182.8



Project No. : 02210387.000

Client : The Sterling Hall School

Originated by : RS

Date started : December 22, 2022

Project : 99 Cartwright Avenue

Compiled by : OH

Sheet No. : 1 of 1

Location : Toronto, Ontario

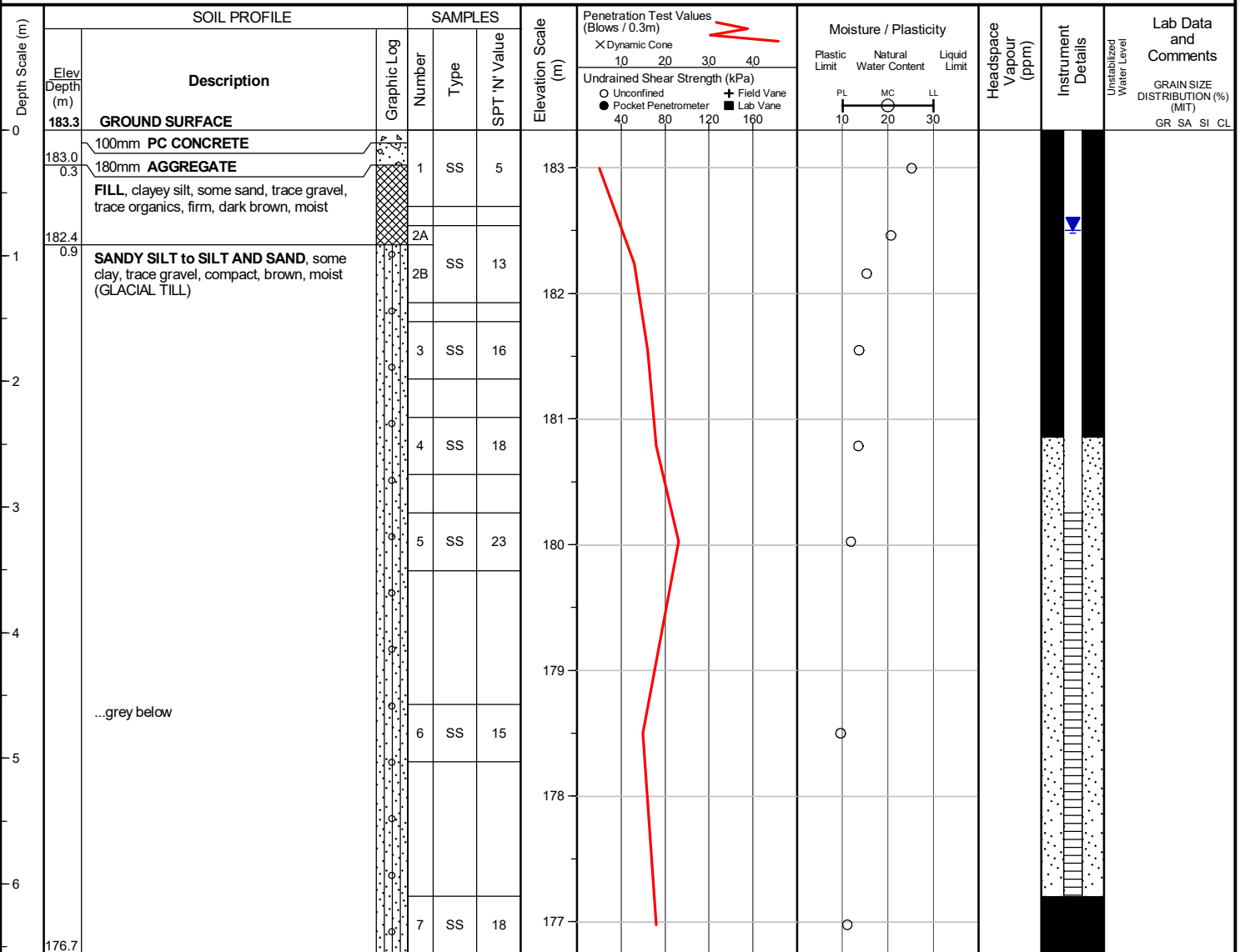
Checked by : RS

Position : E: 623671, N: 4842034 (UTM 17T)

Elevation Datum : Geodetic

Rig type : Track-mounted

Drilling Method : Solid stem augers



END OF BOREHOLE

Borehole was dry and open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Jan 6, 2023	0.8	182.5



Project No. : 02210387.000

Client : The Sterling Hall School

Originated by : RS

Date started : December 22, 2022

Project : 99 Cartwright Avenue

Compiled by : OH

Sheet No. : 1 of 1

Location : Toronto, Ontario

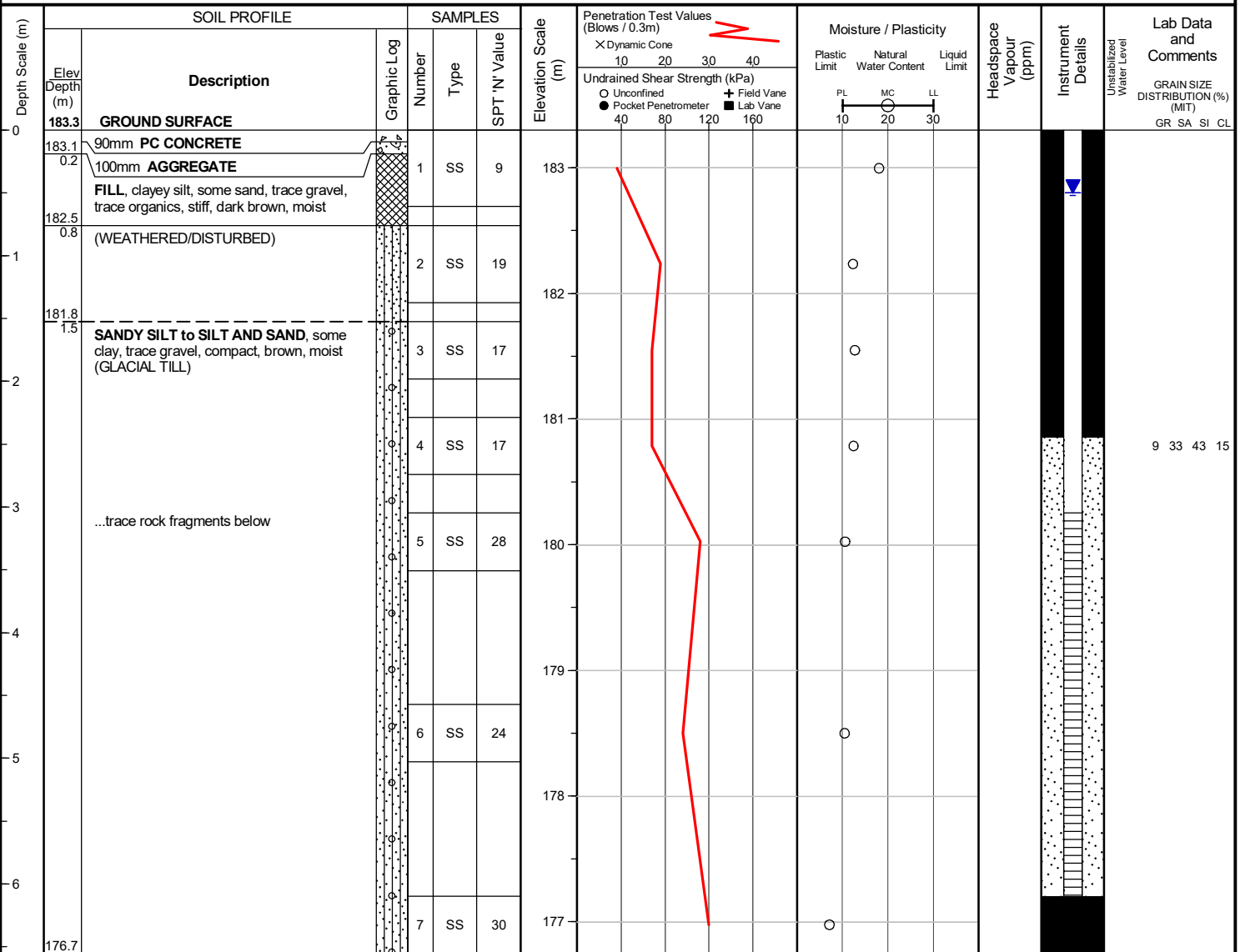
Checked by : RS

Position : E: 623658, N: 4842023 (UTM 17T)

Elevation Datum : Geodetic

Rig type : Track-mounted

Drilling Method : Solid stem augers



END OF BOREHOLE

Borehole was dry and open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

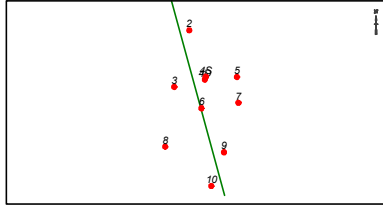
Date	Water Depth (m)	Elevation (m)
Jan 6, 2023	0.5	182.8

Alignment: From E:623880
N:4842023,
to E:623646, N:4842154

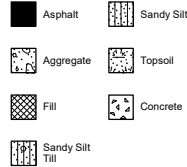
Elevation (m)

Distance Along Baseline (m)

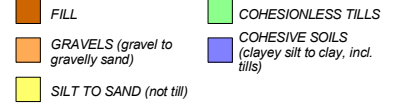
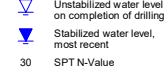
SITE MAP



LITHOLOGY GRAPHIC LEGEND



INTERPRETIVE LEGEND

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

Title:

SUBSURFACE PROFILE

File No.:

02210387.000

APPENDIX B

MECP Well Records

MECP Well Records Summary

WELL ID	MECP* WWR ID	Construction Method	Well Depth (m)**	Well Usage		Static Water Level (m)**	Water Found Depth	Top of Screen Depth (m)**	Bottom of Screen Depth (m)**	Date Completed
				First Status	Final Use					
1	7124441	Other Method	6.1	Monitoring and Test Hole	-	-	-	1.525	6.1	Tuesday, June 2, 2009
2	6929660	Boring	5.9	-	Observation Wells	-	-	2.9	5.9	Thursday, November 3, 2005
3	7284889	Other Method	5.49	Test Hole	Monitoring and Test Hole	-	-	2.44	5.49	Thursday, March 23, 2017
4	7284887	Other Method	5.49	Test Hole	Monitoring and Test Hole	-	-	2.44	5.49	Thursday, March 23, 2017
5	7284888	Other Method	5.49	Test Hole	Monitoring and Test Hole	-	-	2.44	5.49	Thursday, March 23, 2017
6	7138200	Other Method	-	Not Used	Observation Wells	-	2.9	-	-	Wednesday, January 13, 2010
7	6929758	Other Method	7.6	-	Abandoned-Other	-	-	6	7.6	Friday, December 9, 2005
8	7138199	Other Method	-	Not Used	Observation Wells	-	2.9	-	-	Wednesday, January 13, 2010
9	7171611	-	-	-	-	-	-	-	-	Sunday, August 21, 2011
10	7035388	Other Method	7.62	-	-	-	-	4.57	7.62	Wednesday, June 7, 2006
11	6930425	Boring	12.1	-	Observation Wells	-	6.0	9.1	12.1	Monday, June 5, 2006
12	6929338	Boring	5.8	-	Observation Wells	-	-	4.2	5.8	Friday, August 12, 2005
13	7358456	-	-	-	-	-	-	-	-	Wednesday, February 26, 2020
14	7173825	Rotary (Convent.)	1.83	Test Hole	Test Hole	-	-	4.88	1.83	Thursday, October 13, 2011
15	7231576	Direct Push	6.1	Monitoring and Test Hole	Test Hole	-	-	3.05	6.1	Friday, October 24, 2014
16	7228117	Rotary (Convent.)	3.05	Monitoring	-	-	-	6.1	3.05	Monday, June 23, 2014
17	6929657	Boring	4.5	-	Observation Wells	-	3.0	1.5	4.5	Friday, November 4, 2005
18	7212016	Direct Push	9.76	Monitoring and Test Hole	Monitoring and Test Hole	-	-	-	9.76	Friday, November 1, 2013
19	7212015	Direct Push	9.76	Monitoring and Test Hole	Monitoring and Test Hole	-	-	-	9.76	Friday, November 1, 2013
20	7327459	Other Method	6.1	Monitoring and Test Hole	-	-	-	3.05	6.1	Friday, November 30, 2018
21	6929662	Boring	5.9	-	Observation Wells	-	5.6	2.9	5.9	Thursday, November 3, 2005
22	7212014	Direct Push	6.71	Monitoring and Test Hole	Monitoring and Test Hole	-	-	-	6.71	Friday, November 1, 2013
23	7212013	Direct Push	13.725	Monitoring and Test Hole	Monitoring and Test Hole	-	-	-	13.725	Friday, November 1, 2013
24	7247599	-	-	-	-	-	-	-	-	Wednesday, June 18, 2014
25	7329402	Rotary (Convent.)	6.1	Test Hole	Monitoring and Test Hole	-	-	3	6.1	Saturday, February 24, 2018
26	7316356	Rotary (Convent.)	15	Test Hole	Test Hole	-	-	5	15	Thursday, June 21, 2018
27	7327460	Other Method	6.1	Monitoring and Test Hole	Monitoring and Test Hole	-	-	3.05	6.1	Friday, November 30, 2018
28	7231575	Direct Push	6.1	Monitoring and Test Hole	Test Hole	-	-	3.05	6.1	Friday, October 24, 2014
29	7327461	Other Method	6.1	Monitoring and Test Hole	Monitoring and Test Hole	-	-	3.05	6.1	Friday, November 30, 2018
30	7231574	Direct Push	4.88	Monitoring and Test Hole	Test Hole	-	-	1.83	4.88	Friday, October 24, 2014
31	7329403	Rotary (Convent.)	6.1	Test Hole	Monitoring and Test Hole	-	-	3	6.1	Saturday, February 24, 2018
32	6929661	Boring	4.5	-	Observation Wells	-	3.9	1.5	4.5	Friday, November 4, 2005
33	7327462	Direct Push	6.1	Monitoring and Test Hole	Monitoring and Test Hole	-	-	3.05	6.1	Friday, November 30, 2018
34	7342311	Rotary (Convent.)	6.1	Monitoring and Test Hole	-	-	-	3.05	6.1	Wednesday, June 12, 2019
35	7281579	Boring	4.575	Test Hole	Monitoring and Test Hole	-	1.5	1.525	4.575	Thursday, August 18, 2016
36	7209003	Direct Push	12.2	Monitoring and Test Hole	Monitoring and Test Hole	-	-	9.15	12.2	Friday, September 6, 2013
37	7208717	Direct Push	7.4725	Monitoring and Test Hole	Monitoring and Test Hole	-	-	4.4225	7.4725	Friday, August 23, 2013
38	7209000	Direct Push	9.76	Monitoring and Test Hole	Monitoring and Test Hole	-	-	6.71	9.76	Friday, September 6, 2013
39	7209002	Direct Push	9.5	Monitoring and Test Hole	Monitoring and Test Hole	-	-	6.5	9.5	Friday, September 6, 2013
40	7316357	Rotary (Convent.)	25	Test Hole	Observation Wells	-	-	15	25	Thursday, June 21, 2018

WELL ID	MECP* WWR ID	Construction Method	Well Depth (m)**	Well Usage		Static Water Level (m)**	Water Found Depth	Top of Screen Depth (m)**	Bottom of Screen Depth (m)**	Date Completed
				First Status	Final Use					
41	7048137	Other Method	6.1	-	Observation Wells	-	-	3.1	6.1	Tuesday, July 10, 2007
42	7208722	-	7.625	-	Monitoring and Test Hole	-	-	4.575	7.625	Thursday, August 22, 2013
43	7191975	Boring	6.1	Monitoring	Observation Wells	-	-	3.1	6.1	Tuesday, September 18, 2012
44	7191976	Boring	6.1	Monitoring	Observation Wells	-	-	3.1	6.1	Tuesday, September 18, 2012
45	7191977	Boring	6.1	Monitoring	Observation Wells	-	-	3.1	6.1	Tuesday, September 18, 2012
46	7281578	Boring	7.625	Test Hole	Test Hole	-	6.1	4.575	7.625	Monday, August 29, 2016
47	7343059	-	-	-	-	-	-	-	-	Tuesday, August 6, 2019
48	7281580	Boring	7.32	Test Hole	Test Hole	-	6.1	4.27	7.32	Sunday, August 28, 2016
49	7161397	-	-	-	-	-	-	-	-	Friday, November 19, 2010
50	7161057	-	-	-	-	-	-	-	-	Tuesday, March 8, 2011
51	7180724	Direct Push	6.1	Monitoring and Test Hole	Test Hole	-	-	3.05	6.1	Thursday, March 8, 2012
52	7180725	Direct Push	7.625	Monitoring and Test Hole	Test Hole	-	-	4.575	7.625	Thursday, March 8, 2012
53	7342313	Other Method	7.625	Monitoring and Test Hole	Monitoring and Test Hole	-	-	4.575	7.625	Friday, June 14, 2019
54	7342312	Other Method	7.625	Monitoring and Test Hole	Monitoring and Test Hole	-	-	4.575	7.625	Friday, June 14, 2019
55	7181106	Direct Push	7.32	Monitoring and Test Hole	Monitoring and Test Hole	-	-	4.27	7.32	Friday, April 13, 2012
56	6929659	Boring	6.1	-	Observation Wells	-	-	3	6.1	Monday, November 7, 2005
57	7181105	Direct Push	7.625	Monitoring and Test Hole	Monitoring and Test Hole	-	-	4.575	7.625	Friday, April 13, 2012
58	7181269	Direct Push	11.743	Monitoring and Test Hole	Test Hole	-	-	8.6925	11.7425	Friday, April 13, 2012
59	7181104	Direct Push	7.625	Monitoring and Test Hole	Monitoring and Test Hole	-	-	4.575	7.625	Friday, April 13, 2012
60	7180723	Direct Push	6.1	Monitoring and Test Hole	Test Hole	-	-	3.05	6.1	Thursday, March 8, 2012
61	7180722	Direct Push	7.625	Monitoring and Test Hole	Test Hole	-	-	4.575	7.625	Thursday, March 8, 2012
62	7162643	Boring	-	Monitoring	Observation Wells	-	3.1	-	-	<Null>
63	7206105	-	-	-	-	-	-	-	-	Wednesday, September 19, 2012
64	7342314	Other Method	7.625	Monitoring and Test Hole	Monitoring and Test Hole	-	-	4.575	7.625	Friday, June 14, 2019
65	7208718	Direct Push	8.235	Monitoring and Test Hole	Monitoring and Test Hole	-	-	5.185	8.235	Friday, August 23, 2013
66	7331388	Other Method	13.725	Monitoring	Observation Wells	-	7.6	9.15	13.725	Monday, March 4, 2019
67	7232232	-	-	-	-	-	-	-	-	Thursday, September 11, 2014
68	7337045	-	-	-	-	-	-	-	-	Wednesday, July 25, 2018
69	7218673	-	-	-	-	-	-	-	-	Thursday, July 4, 2013
70	7159339	Direct Push	6.1	Monitoring and Test Hole	Test Hole	-	-	3.05	6.1	Tuesday, January 18, 2011
71	7048099	Other Method	5.79	-	Observation Wells	-	-	2.74	5.79	Thursday, July 26, 2007
72	7332346	Boring	6.1	Test Hole	Observation Wells	-	-	3.05	6.1	Wednesday, April 3, 2019
73	7365302	-	-	-	-	-	-	-	-	Thursday, June 11, 2020
74	7159338	Direct Push	6.1	Monitoring and Test Hole	Test Hole	-	-	3.05	6.1	Tuesday, January 18, 2011
75	7332344	Boring	6.1	Test Hole	Observation Wells	-	-	3.05	6.1	Wednesday, April 3, 2019
76	6929936	Other Method	7.3	-	Abandoned-Other	-	-	4.3	7.3	Friday, January 20, 2006
77	7365301	-	-	-	-	-	-	-	-	Thursday, June 11, 2020
78	7235338	Direct Push	9.15	Monitoring and Test Hole	Monitoring and Test Hole	-	-	6.1	9.15	Wednesday, November 19, 2014
79	7365303	-	-	-	-	-	-	-	-	Thursday, June 11, 2020
80	7365139	-	-	-	-	-	-	-	-	Thursday, June 11, 2020
81	7235339	Direct Push	9.15	Monitoring and Test Hole	Monitoring and Test Hole	-	-	6.1	9.15	Wednesday, November 19, 2014

WELL ID	MECP* WWR ID	Construction Method	Well Depth (m)**	Well Usage		Static Water Level (m)**	Water Found Depth	Top of Screen Depth (m)**	Bottom of Screen Depth (m)**	Date Completed
				First Status	Final Use					
82	7149493	Rotary (Convent.)	2.0435	-	Monitoring and Test Hole	-	-	1.1285	2.0435	Monday, July 19, 2010
83	7222994	Rotary (Convent.)	4.575	Monitoring and Test Hole	Test Hole	-	-	3.05	4.575	Saturday, May 3, 2014
84	7332345	Boring	6.1	Test Hole	Observation Wells	-	-	3.05	6.1	Wednesday, April 3, 2019
85	7236640	-	-	-	-	-	-	-	-	Thursday, September 18, 2014
86	7235340	Direct Push	7.625	Monitoring and Test Hole	Monitoring and Test Hole	-	-	4.575	7.625	Wednesday, November 19, 2014
87	7249436	-	7.625	Monitoring and Test Hole	Monitoring and Test Hole	-	-	4.575	7.625	Sunday, August 9, 2015
88	7219316	-	-	-	-	-	-	-	-	Thursday, July 4, 2013
89	7242241	-	-	-	-	-	-	-	-	Tuesday, May 12, 2015
90	7258927	-	-	-	-	-	-	-	-	Saturday, October 10, 2015
91	7210774	Direct Push	7.625	Monitoring and Test Hole	Monitoring and Test Hole	-	-	4.575	7.625	Thursday, October 10, 2013
92	7235334	Rotary (Convent.)	5.185	Monitoring and Test Hole	Monitoring and Test Hole	-	-	2.135	5.185	Tuesday, November 18, 2014
93	7149492	Rotary (Convent.)	1.8605	Monitoring and Test Hole	Monitoring and Test Hole	-	-	0.9455	1.8605	Monday, July 19, 2010
94	7210773	Direct Push	6.1	Test Hole	Monitoring and Test Hole	-	-	3.05	6.1	Thursday, October 10, 2013
95	7281892	Other Method	4.575	Test Hole	Monitoring and Test Hole	-	-	1.525	4.575	Wednesday, February 1, 2017
96	7159337	Direct Push	7.625	Monitoring and Test Hole	Test Hole	-	-	4.575	7.625	Tuesday, January 18, 2011
97	7281891	Other Method	6.1	Test Hole	Monitoring and Test Hole	-	-	3.05	6.1	Wednesday, February 1, 2017
98	7281833	Other Method	4.27	Test Hole	Monitoring and Test Hole	-	-	1.22	4.27	Wednesday, February 1, 2017
99	7159336	Direct Push	8.235	Monitoring and Test Hole	Test Hole	-	-	5.185	8.235	Tuesday, January 18, 2011
100	7286369	Direct Push	6.1	Test Hole	Monitoring and Test Hole	-	-	3.05	6.1	Thursday, April 27, 2017
101	7191352	Boring	6.1	Test Hole	-	-	3.3	3	6.1	Thursday, October 11, 2012
102	7167691	Direct Push	8.53	Monitoring and Test Hole	Test Hole	-	-	5.49	8.53	Wednesday, August 10, 2011
103	7167692	Direct Push	8.53	Monitoring and Test Hole	Test Hole	-	-	5.49	8.53	Wednesday, August 10, 2011
104	7167693	Direct Push	7.93	Monitoring and Test Hole	Test Hole	-	-	4.88	7.93	Wednesday, August 10, 2011
105	7281890	Other Method	6.1	Test Hole	Monitoring and Test Hole	-	-	3.05	6.1	Wednesday, February 1, 2017
106	7281889	Other Method	6.1	Test Hole	Monitoring and Test Hole	-	-	3.05	6.1	Wednesday, February 1, 2017
107	7286370	Direct Push	6.405	Test Hole	Monitoring and Test Hole	-	-	3.355	6.405	Thursday, April 27, 2017
108	7191351	Boring	6.1	Test Hole	Test Hole	-	3.6	3	6.1	Thursday, October 11, 2012
109	7154036	Other Method	3.66	Monitoring and Test Hole	Monitoring and Test Hole	-	-	2.135	3.66	Monday, September 27, 2010
110	7356340	-	-	-	-	-	-	-	-	Wednesday, October 30, 2019
111	7154035	Other Method	6.1	Monitoring and Test Hole	Monitoring and Test Hole	-	-	3.05	6.1	Monday, September 27, 2010
112	7191353	Boring	6.1	Test Hole	Test Hole	-	3.6	3	6.1	Thursday, October 11, 2012
113	7286368	Direct Push	6.71	Test Hole	Monitoring and Test Hole	-	-	3.66	6.71	Thursday, April 27, 2017
114	7286367	Direct Push	6.71	Test Hole	Monitoring and Test Hole	-	-	3.66	6.71	Thursday, April 27, 2017
115	7154054	Other Method	5.49	Monitoring and Test Hole	Test Hole	-	-	2.44	5.49	Monday, September 27, 2010
116	7154034	Other Method	5.795	Monitoring and Test Hole	Monitoring and Test Hole	-	-	2.745	5.795	Monday, September 27, 2010
117	7343116	-	-	-	-	-	-	-	-	Wednesday, June 5, 2019
118	7191350	Boring	4.6	Test Hole	Test Hole	-	1.5	1.5	4.6	Thursday, October 11, 2012
119	7179517	Direct Push	6.1	Monitoring and Test Hole	Monitoring and Test Hole	-	-	9.15	6.1	Thursday, January 26, 2012
120	7331247	-	-	-	-	-	-	-	-	Tuesday, October 2, 2018
121	6930320	Other Method	5.2	Not Used	Observation Wells	-	-	2.1	5.2	Tuesday, May 23, 2006
122	7232217	-	-	-	-	-	-	-	-	Thursday, September 11, 2014

WELL ID	MECP* WWR ID	Construction Method	Well Depth (m)**	Well Usage		Static Water Level (m)**	Water Found Depth	Top of Screen Depth (m)**	Bottom of Screen Depth (m)**	Date Completed
				First Status	Final Use					
123	7218681	-	-	-	-	-	-	-	-	Friday, July 5, 2013
124	7048085	Other Method	5.49	-	Observation Wells	-	-	2.44	5.49	Tuesday, July 17, 2007
125	7203970	-	-	-	-	-	-	-	-	Tuesday, June 18, 2013
126	6930401	Other Method	4.6	Not Used	Observation Wells	-	-	1.5	4.6	Tuesday, July 4, 2006
127	7367621	-	-	-	-	-	-	-	-	Tuesday, August 4, 2020
128	7143592	Boring	10.5	Monitoring	Observation Wells	-	2.8	7.5	10.5	Friday, March 26, 2010
129	7205401	-	-	-	-	-	-	-	-	Friday, July 5, 2013
130	7154055	Other Method	4.27	Monitoring and Test Hole	Test Hole	-	-	1.22	4.27	Tuesday, September 28, 2010
131	7291951	-	-	-	-	-	-	-	-	Friday, June 30, 2017
132	7363563	-	-	-	-	-	-	-	-	Monday, November 11, 2019
133	7363564	-	-	-	-	-	-	-	-	Wednesday, September 11, 2019
134	7198077	Direct Push	7.32	Dewatering	Observation Wells	-	-	4.27	7.32	Tuesday, February 19, 2013
135	7297815	Rotary (Convent.)	6.1	Test Hole	Monitoring and Test Hole	-	5.5	3.05	6.1	Tuesday, February 7, 2017
136	7179561	Direct Push	7.93	Monitoring and Test Hole	Monitoring and Test Hole	-	-	4.88	7.93	Thursday, January 19, 2012
137	7286239	-	-	-	-	-	-	-	-	-
138	7198079	Direct Push	7.32	Monitoring and Test Hole	Test Hole	-	-	4.27	7.32	Tuesday, February 19, 2013
139	7177743	Other Method	-	Monitoring and Test Hole	Abandoned-Other	-	-	-	-	Friday, February 24, 2012
140	7322827	Boring	5.6	Monitoring	Observation Wells	-	1.6	2.6	5.6	-

*MECP WWID: Ministry of the Environment , Conservation and Parks Water Well Records Identification

**metres below ground surface

APPENDIX C

Groundwater Monitoring Details

Groundwater Depths (m below ground surface)

Monitoring Well ID	Ground Surface Elevation (masl)	Well Depth (mbgs)	Top of the Well Screen Depth (mbgs)	1st GW Monitoring Event	2nd GW Monitoring Event	3rd GW Monitoring Event	4th GW Monitoring Event	5th GW Monitoring Event	6th GW Monitoring Event
				Water Depth (mbgs)	Water Depth (mbgs)	Water Depth (mbgs)	Water Depth (mbgs)	Water Depth (mbgs)	Water Depth (mbgs)
				Monday, January 9, 2023	Monday, January 16, 2023	Friday, February 10, 2023	Monday, February 27, 2023	Monday, March 13, 2023	Wednesday, April 5, 2023
BH1	183.30	8.20	6.70	6.87	6.63	4.44	4.16	4.10	3.80
BH2	183.40	6.10	3.10	1.82	NA	NA	2.09	1.56	1.44
BH3	183.50	7.60	4.60	0.95	1.10	0.95	NA	0.95	0.75
BH4S	183.70	7.60	4.60	NA	1.30	0.90	1.23	1.06	1.01
BH4D	183.70	14.00	12.50	NA	11.46	11.29	11.08	11.04	10.80
BH5	183.50	7.60	4.60	NA	6.87	5.13	3.55	1.20	1.40
BH6	183.50	7.60	4.60	0.85	1.07	0.65	0.84	0.83	0.42
BH7	182.90	7.60	6.10	NA	5.37	2.89	2.60	2.53	2.43
BH8	183.70	7.60	4.60	1.78	NA	0.74	0.79	0.89	NA
BH9	183.50	6.10	3.10	0.93	NA	0.77	0.80	0.75	0.69
BH10	183.30	6.10	3.10	2.93	NA	NA	NA	0.97	0.22
BH11	183.30	6.10	3.10	1.33	NA	0.51	NA	0.78	0.49

Groundwater Elevations (m above sea level)

Monitoring Well ID	Ground Surface Elevation (masl)	Well Screen Bottom Elevation (masl)	Top of the Well Screen Depth (masl)	1st GW Monitoring Event	2nd GW Monitoring Event	3rd GW Monitoring Event	4th GW Monitoring Event	5th GW Monitoring Event	6th GW Monitoring Event
				Groundwater Elevation (masl)	Groundwater Elevation (masl)	Groundwater Elevation (masl)	Groundwater Elevation (masl)	Groundwater Elevation (masl)	Groundwater Elevation (masl)
				Monday, January 9, 2023	Monday, January 16, 2023	Friday, February 10, 2023	Monday, February 27, 2023	Monday, March 13, 2023	Wednesday, April 5, 2023
BH1	183.30	175.10	176.60	176.43	176.67	178.86	179.14	179.20	179.50
BH2	183.40	177.30	180.30	181.58	N/A	N/A	181.31	181.84	FALSE
BH3	183.50	175.90	178.90	182.55	182.40	182.55	N/A	182.55	182.75
BH4S	183.70	176.10	179.10	N/A	182.40	182.80	182.47	182.64	182.69
BH4D	183.70	169.70	171.20	N/A	172.24	172.41	172.62	172.66	172.90
BH5	183.50	175.90	178.90	N/A	176.63	178.37	179.95	182.30	182.10
BH6	183.50	175.90	178.90	182.65	182.43	182.85	182.66	182.67	183.08
BH7	182.90	175.30	176.80	N/A	177.53	180.01	180.30	180.37	180.47
BH8	183.70	176.10	179.10	181.92	N/A	182.96	182.91	182.81	NA
BH9	183.50	177.40	180.40	182.57	N/A	182.73	182.70	182.75	182.81
BH10	183.30	177.20	180.20	180.37	N/A	N/A	N/A	182.33	183.08
BH11	183.30	177.20	180.20	181.97	N/A	182.79	N/A	182.52	182.81

Note

mbgs - metres below ground surface

masl - metres above sea level

NA - Monitoring well was not found due to snow cover/ parked car

APPENDIX D

In-situ Hydraulic Conductivity Test Results



Terraprobe
an Englobe Company

Slug Test Analysis Report

Project: 99 Cartwright Avenue

Number: 02201387

Client:

Location: North York

Slug Test: BH4S

Test Well: BH4S

Test Conducted by: Omar Hamad

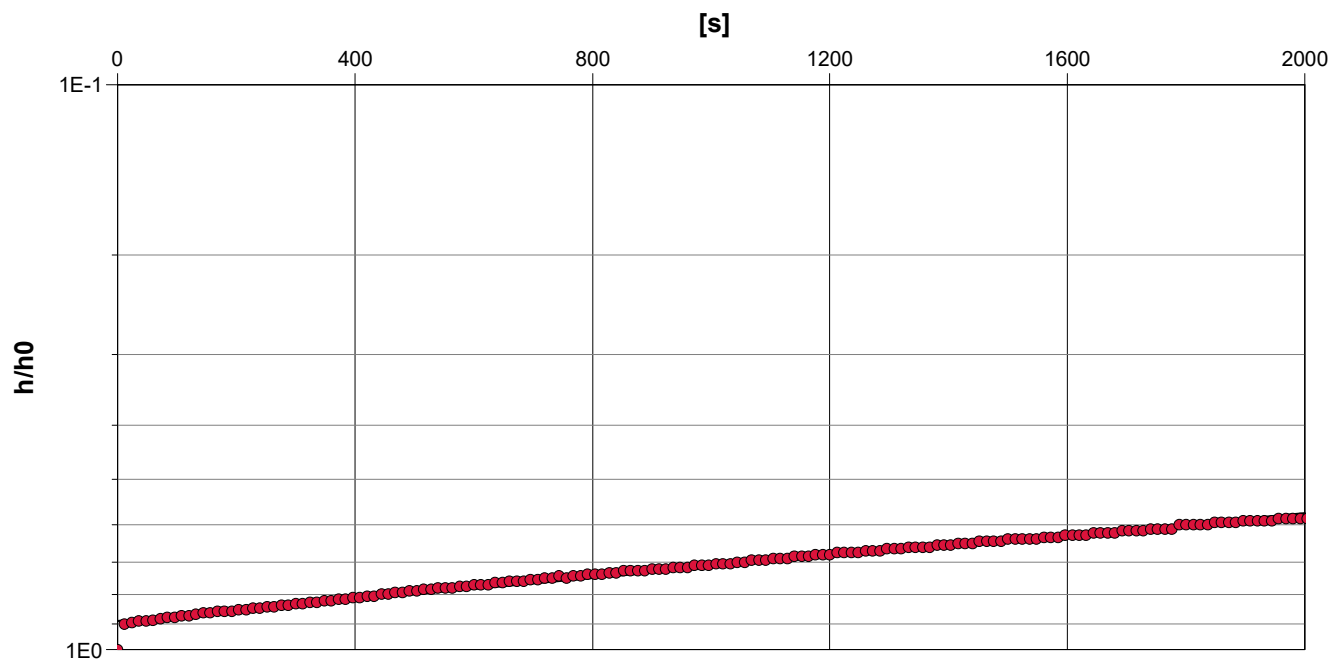
Test Date: 1/30/2023

Analysis Performed by: Alaa

BH4S

Analysis Date: 3/28/2023

Aquifer Thickness: 6.50 m



Calculation using Bouwer & Rice

Observation Well

Hydraulic Conductivity
[m/s]

BH4S

8.75×10^{-8}



Terraprobe
an Englobe Company

Slug Test Analysis Report

Project: 99 Cartwright Avenue

Number: 02201387

Client:

Location: North York

Slug Test: BH4D

Test Well: BH4D

Test Conducted by:

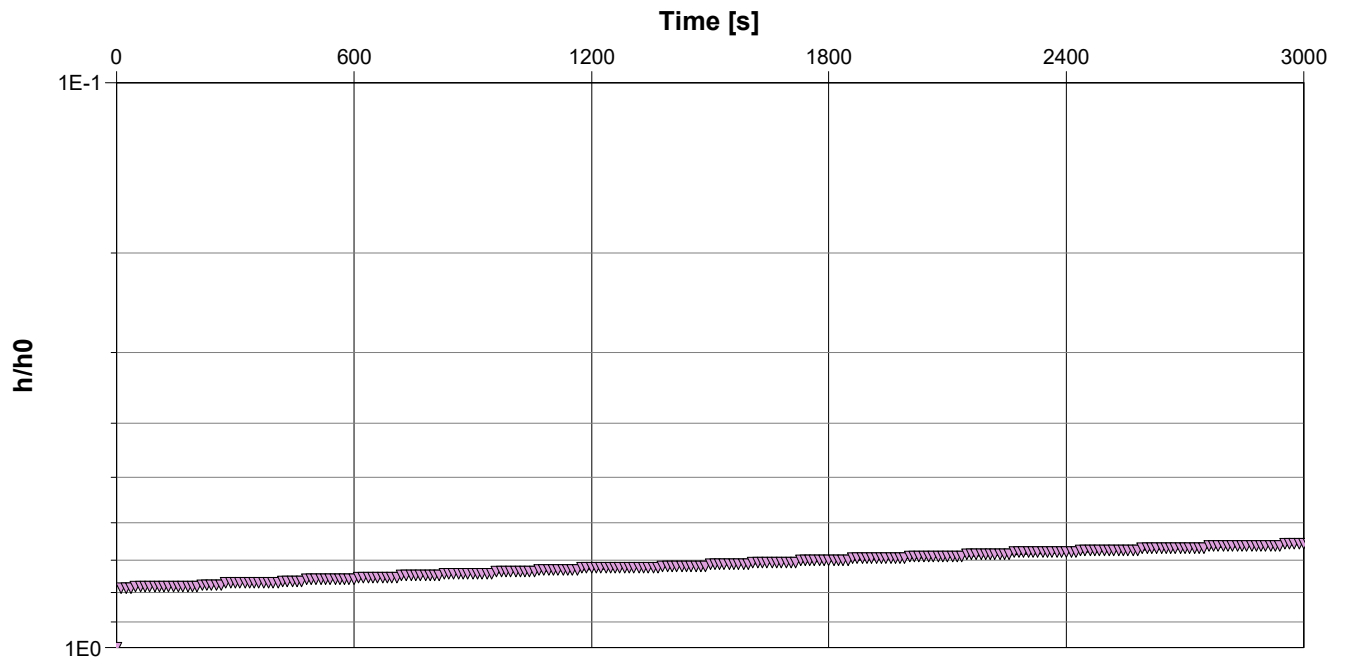
Test Date: 3/28/2023

Analysis Performed by: Alaa

BH4D

Analysis Date: 3/28/2023

Aquifer Thickness: 2.50 m



Calculation using Bouwer & Rice

Observation Well

Hydraulic Conductivity
[m/s]

BH4D

3.90×10^{-8}



Terraprobe
an Englobe Company

Slug Test Analysis Report

Project: 99 Cartwright Avenue

Number: 02201387

Client:

Location: North York

Slug Test: BH5

Test Well: BH5

Test Conducted by: Omar Hamad

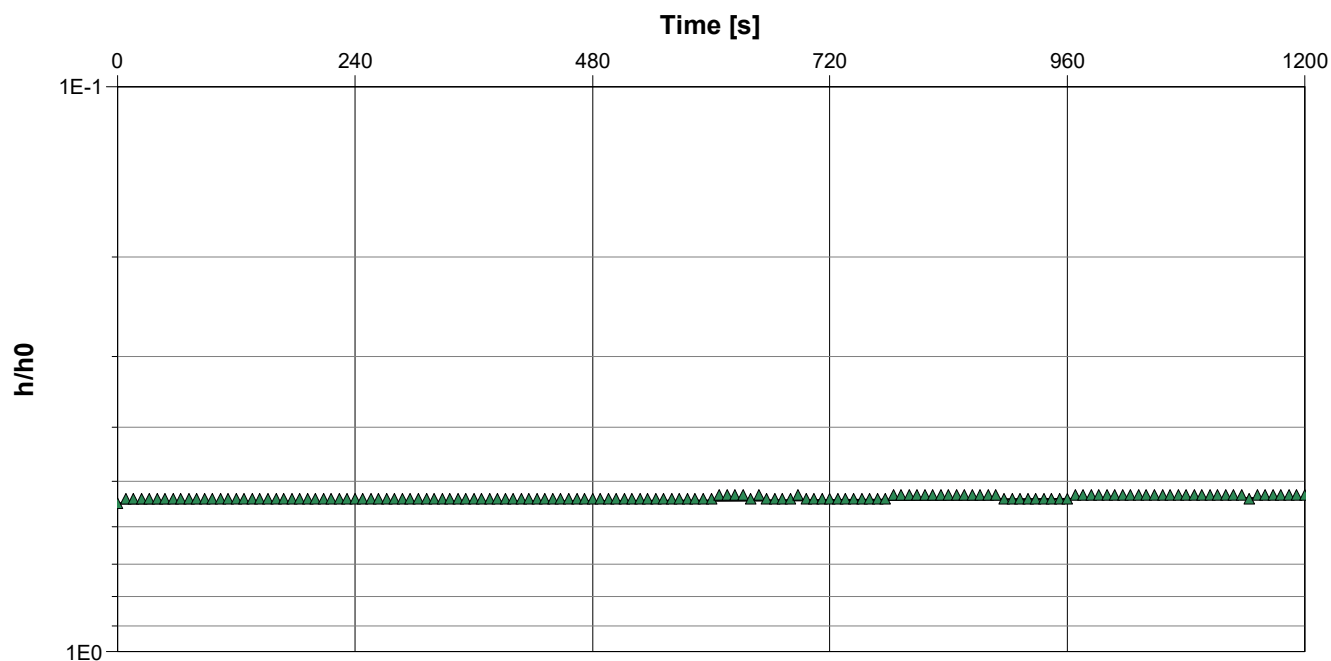
Test Date: 5/30/2023

Analysis Performed by: Alaa

BH5

Analysis Date: 3/28/2023

Aquifer Thickness: 2.00 m



Calculation using Bouwer & Rice

Observation Well

Hydraulic Conductivity
[m/s]

BH5

7.02×10^{-9}



Terraprobe

an Englobe Company

Slug Test Analysis Report

Project: 99 Cartwright Avenue

Number: 02201387

Client:

Location: North York

Slug Test: BH7

Test Well: BH7

Test Conducted by: Omar Hamad

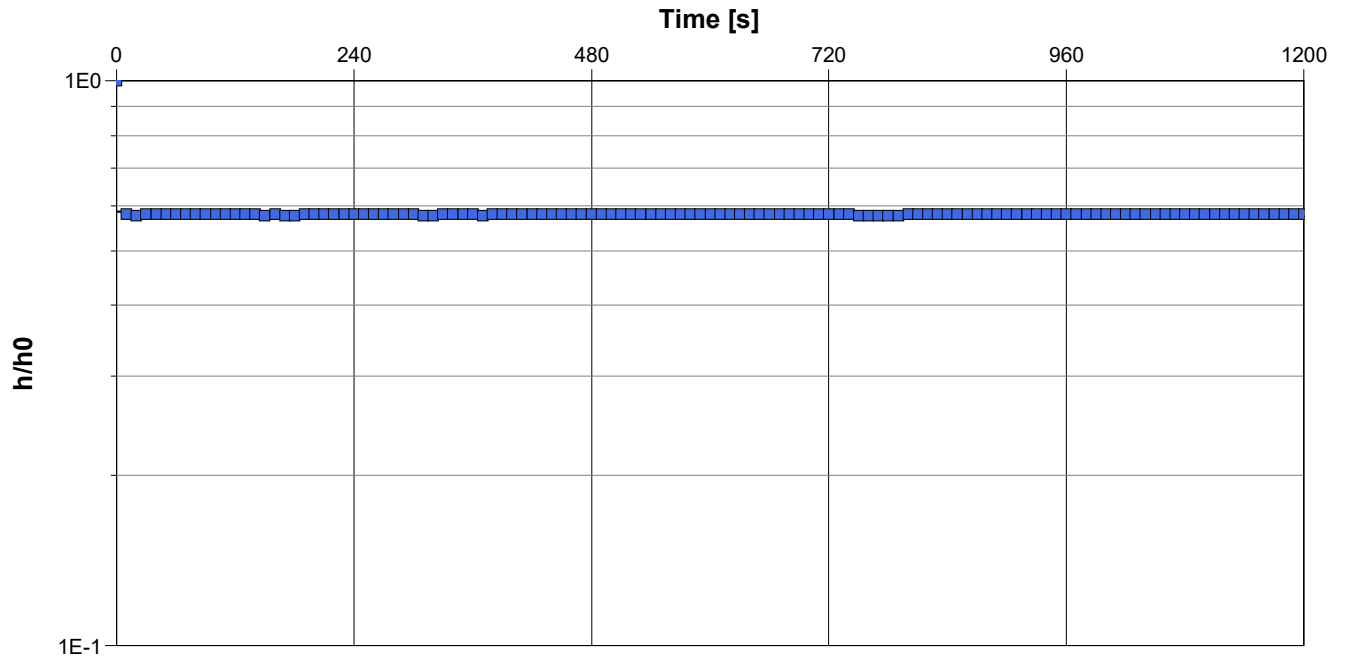
Test Date: 1/30/2023

Analysis Performed by: Alaa

BH7 Slug Test

Analysis Date: 3/28/2023

Aquifer Thickness: 5.00 m



Calculation using Bouwer & Rice

Observation Well

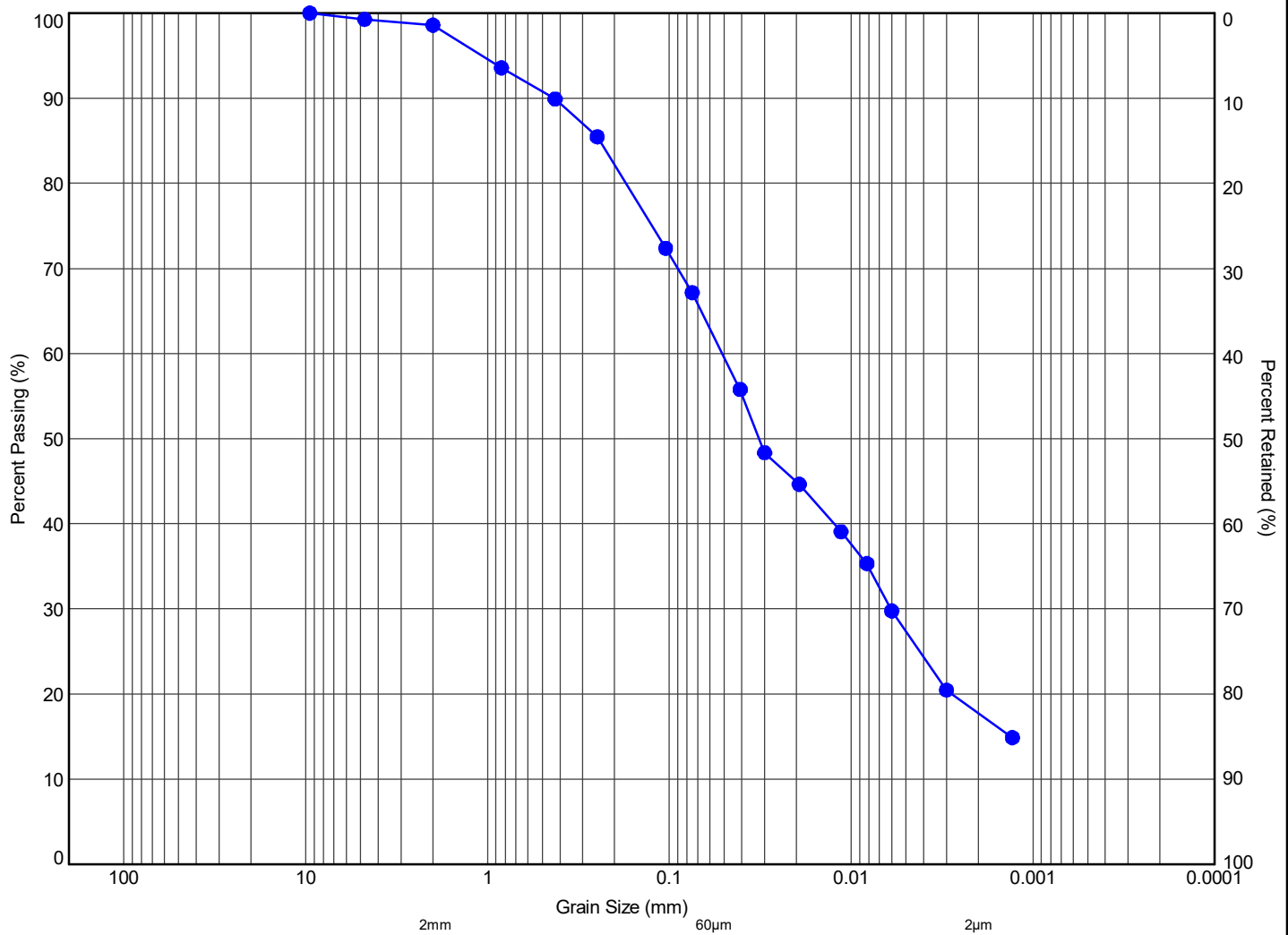
Hydraulic Conductivity
[m/s]

BH7

1.12×10^{-8}

APPENDIX E

Grain Size Distribution Graphs



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

MIT SYSTEM									
Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	(Fines, %)	
● 3	SS3	1.8	181.7	1	36	45	18		



Terraprobe

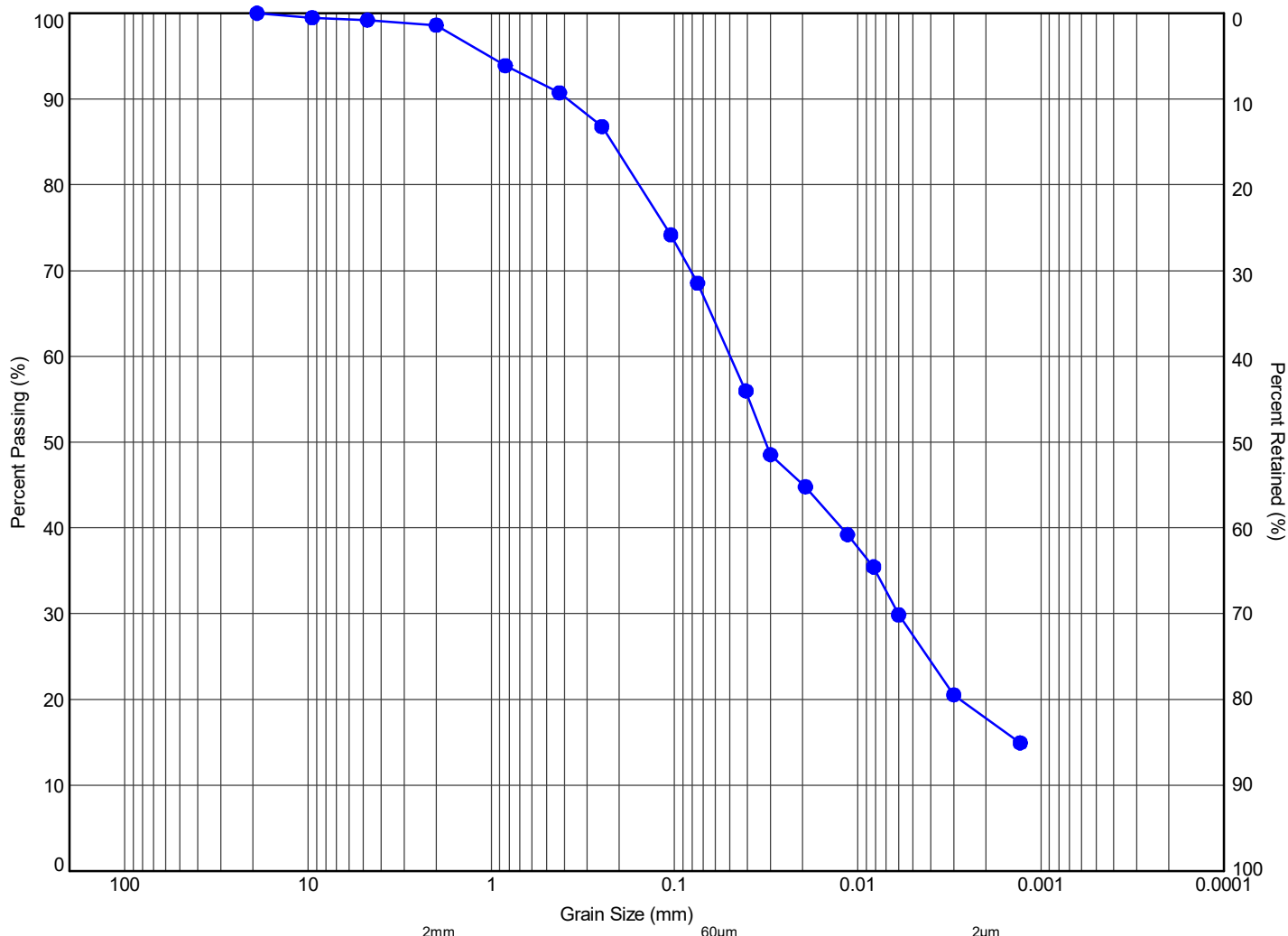
11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title:

**GRAIN SIZE DISTRIBUTION
SANDY SILT, SOME CLAY, TRACE GRAVEL**

File No.:

02210387.000



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

MIT SYSTEM									
Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	(Fines, %)	
● 6	SS5	3.3	180.2	1	35	46	18		



Terraprobe

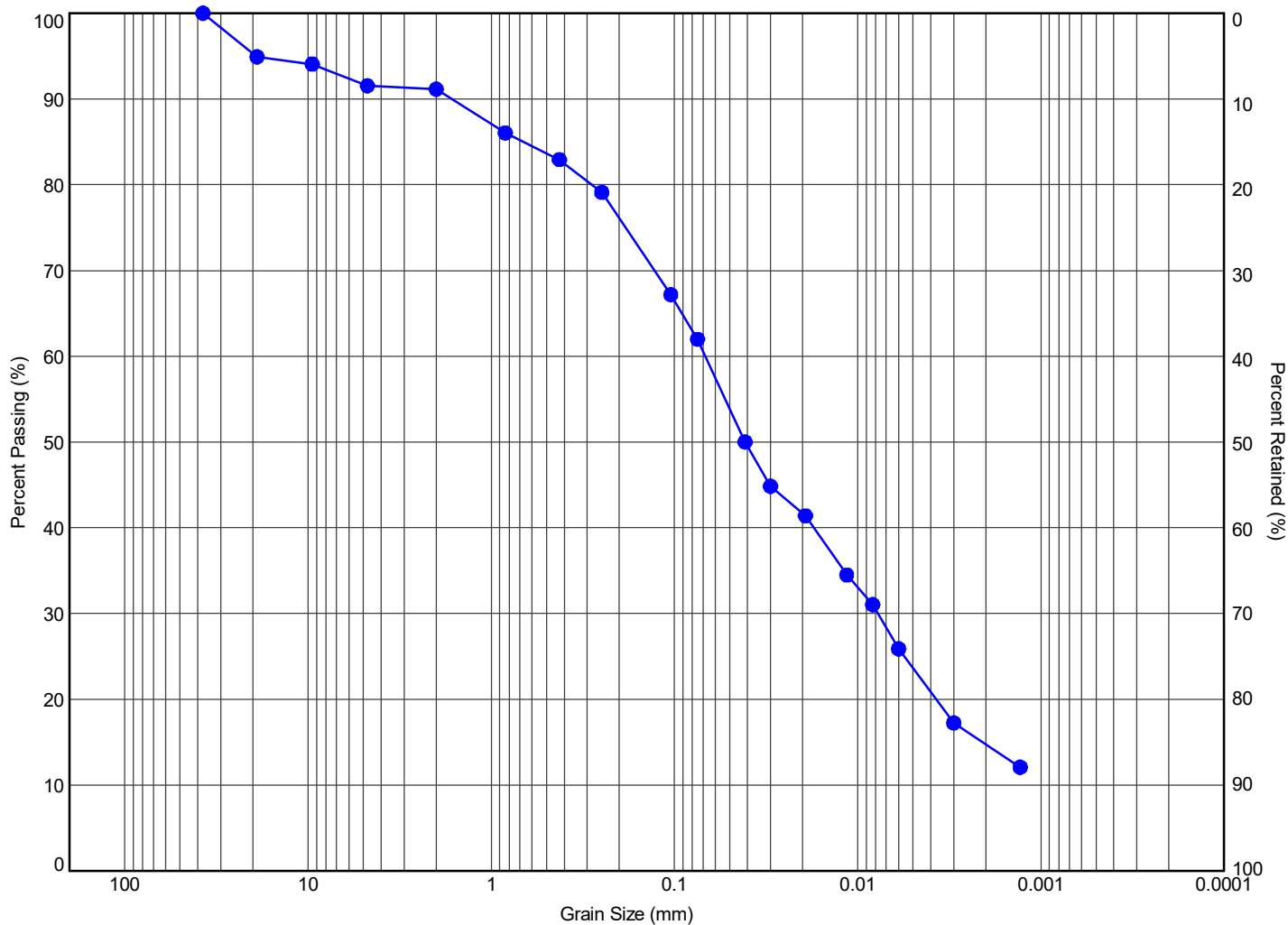
11 Indell Lane, Brampton Ontario L6T 3Y3
(905) 796-2650

Title:

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

File No.:

02210387.000



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

MIT SYSTEM									
Hole ID	Sample	Depth (m)	Elev. (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	(Fines, %)	
● 11	SS4	2.5	180.8	9	33	43	15		



Terraprobe

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

Title:

**GRAIN SIZE DISTRIBUTION
SANDY SILT, SOME CLAY, TRACE GRAVEL**

File No.:

02210387.000

APPENDIX F

Groundwater Quality Test Results



FINAL REPORT

CA40308-JAN23 R1

02210387.0200

Prepared for

Terraprobe Inc

First Page

CLIENT DETAILS

Client Terraprobe Inc

Address 11 Indell Lane
Brampton, ON
L6T 3Y3, Canada

Contact Rachel Geddam

Telephone (905) 796-2650

Facsimile (905) 796-2250

Email rgeddam@terraprobe.ca

Project 02210387.0200

Order Number

Samples Ground Water (1)

LABORATORY DETAILS

Project Specialist Maarit Wolfe, Hon.B.Sc

Laboratory SGS Canada Inc.

Address 185 Concession St., Lakefield ON, K0L 2H0

Telephone 705-652-2000

Facsimile 705-652-6365

Email Maarit.Wolfe@sgs.com

SGS Reference CA40308-JAN23

Received 01/31/2023

Approved 02/08/2023

Report Number CA40308-JAN23 R1

Date Reported 02/08/2023

COMMENTS

RL - SGS Reporting Limit

Nonylphenol Ethoxylates is the sum of nonylphenol monoethoxylate and nonylphenol diethoxylate.

Temperature of Sample upon Receipt: 8 degrees C

Cooling Agent Present: Yes

Custody Seal Present: Yes

Chain of Custody Number: 028777

SVOCs; 7H-Dibenzo(c,g)carbazole & Dibenzo(a,i)pyrene; Increased RLs. The PAH TOT RL remains unchanged.

SIGNATORIES

Maarit Wolfe, Hon.B.Sc

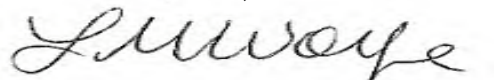




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FINAL REPORT

CA40308-JAN23 R1

Client: Terraprobe Inc
Project: 02210387.0200
Project Manager: Rachel Geddam
Samplers: Omar Hamad

MATRIX: WATER

Sample Number 8
Sample Name BH4S
Sample Matrix Ground Water
Sample Date 30/01/2023

L1 = SANSEW / WATER / - - Toronto Sewer Use By Law - Sanitary and Combined Sewer Discharge - BL_100_2016

L2 = SANSEW / WATER / - - Toronto Sewer Use By Law - Storm Sewer Discharge - BL_100_2016

Parameter	Units	RL	L1	L2	Result
General Chemistry					
Biochemical Oxygen Demand (BOD5)	mg/L	2	300	15	4
Total Kjeldahl Nitrogen	as N mg/L	0.5	100		< 0.5
Total Suspended Solids	mg/L	2	350	15	71

Metals and Inorganics

Fluoride	mg/L	0.06	10		0.20
Cyanide (total)	mg/L	0.01	2	0.02	< 0.01
Aluminum (total)	mg/L	0.001	50		1.48
Antimony (total)	mg/L	0.0009	5		< 0.0009
Arsenic (total)	mg/L	0.0002	1	0.02	0.0008
Cadmium (total)	mg/L	0.000003	0.7	0.008	0.000036
Chromium (total)	mg/L	0.00008	4	0.08	0.00314
Cobalt (total)	mg/L	0.000004	5		0.00217
Copper (total)	mg/L	0.0002	2	0.04	0.0031
Lead (total)	mg/L	0.00009	1	0.12	0.00115
Manganese (total)	mg/L	0.00001	5	0.05	0.311
Molybdenum (total)	mg/L	0.00004	5		0.00284
Nickel (total)	mg/L	0.0001	2	0.08	0.0060
Phosphorus (total)	mg/L	0.003	10	0.4	0.083
Selenium (total)	mg/L	0.00004	1	0.02	0.00039
Silver (total)	mg/L	0.00005	5	0.12	< 0.00005
Tin (total)	mg/L	0.00006	5		0.00477



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Parameter	Units	RL	L1	L2	Result
Metals and Inorganics (continued)					
Titanium (total)	mg/L	0.00005	5		0.0607
Zinc (total)	mg/L	0.002	2	0.04	0.016
Microbiology					
E. Coli	cfu/100mL	0		200	< 2 †
Nonylphenol and Ethoxylates					
Nonylphenol	mg/L	0.001	0.02	0.001	< 0.001
Nonylphenol Ethoxylates	mg/L	0.01	0.2	0.01	< 0.01
Nonylphenol diethoxylate	mg/L	0.01			< 0.01
Nonylphenol monoethoxylate	mg/L	0.01			< 0.01
Oil and Grease					
Oil & Grease (total)	mg/L	2			< 2
Oil & Grease (animal/vegetable)	mg/L	4	150		< 4
Oil & Grease (mineral/synthetic)	mg/L	4	15		< 4



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Parameter	Units	RL	L1	L2	Result
Other (ORP)					
pH	No unit	0.05	11.5	9.5	7.26
Chromium VI	mg/L	0.0002	2	0.04	0.0004
Mercury (total)	mg/L	0.00001	0.01	0.0004	< 0.00001
PAHs					
Benzo(b+j)fluoranthene	mg/L	0.0001			< 0.0001
PCBs					
Polychlorinated Biphenyls (PCBs) - Total	mg/L	0.0001	0.001	0.0004	< 0.0001
Phenols					
4AAP-Phenolics	mg/L	0.002	1	0.008	< 0.002
SVOCs					
3,3-Dichlorobenzidine	mg/L	0.0005	0.002	0.0008	< 0.0005
di-n-Butyl Phthalate	mg/L	0.002	0.08	0.015	< 0.002
Bis(2-ethylhexyl)phthalate	mg/L	0.002	0.012	0.0088	< 0.002
Pentachlorophenol	mg/L	0.0005	0.005	0.002	< 0.0005
PAHs (Total)	mg/L		0.005	0.002	< 0.001
Perylene	mg/L	0.0005			< 0.0005



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Parameter	Units	RL	L1	L2	Result
SVOCs - PAHs					
7Hdibenzo(c,g)carbazole	mg/L	0.0001			< 0.0002 †
Anthracene	mg/L	0.0001			< 0.0001
Benzo(a)anthracene	mg/L	0.0001			< 0.0001
Benzo(a)pyrene	mg/L	0.0001			< 0.0001
Benzo[e]pyrene	mg/L	0.0001			< 0.0001
Benzo(ghi)perylene	mg/L	0.0002			< 0.0002
Benzo(k)fluoranthene	mg/L	0.0001			< 0.0001
Chrysene	mg/L	0.0001			< 0.0001
Dibenzo(a,h)anthracene	mg/L	0.0001			< 0.0001
Dibenzo(a,i)pyrene	mg/L	0.0001			< 0.0003 †
Dibenzo(a,j)acridine	mg/L	0.0001			< 0.0001
Fluoranthene	mg/L	0.0001			< 0.0001
Indeno(1,2,3-cd)pyrene	mg/L	0.0002			< 0.0002
Phenanthrene	mg/L	0.0001			< 0.0001
Pyrene	mg/L	0.0001			< 0.0001



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L2 = SANSEW / WATER / - - Toronto Sewer Use By Law - Storm Sewer Discharge - BL_100_2016

Parameter	Units	RL	L1	L2	Result
VOCs					
Chloroform	mg/L	0.0005	0.04	0.002	< 0.0005
1,2-Dichlorobenzene	mg/L	0.0005	0.05	0.0056	< 0.0005
1,4-Dichlorobenzene	mg/L	0.0005	0.08	0.0068	< 0.0005
cis-1,2-Dichloroethene	mg/L	0.0005	4	0.0056	< 0.0005
trans-1,3-Dichloropropene	mg/L	0.0005	0.14	0.0056	< 0.0005
Methylene Chloride	mg/L	0.0005	2	0.0052	< 0.0005
1,1,2,2-Tetrachloroethane	mg/L	0.0005	1.4	0.017	< 0.0005
Tetrachloroethylene (perchloroethylene)	mg/L	0.0005	1	0.0044	< 0.0005
Trichloroethylene	mg/L	0.0005	0.4	0.0076	< 0.0005

VOCs - BTEX					
Benzene	mg/L	0.0005	0.01	0.002	< 0.0005
Ethylbenzene	mg/L	0.0005	0.16	0.002	< 0.0005
Toluene	mg/L	0.0005	0.016	0.002	< 0.0005
Xylene (total)	mg/L	0.0005	1.4	0.0044	< 0.0005
m-p-xylene	mg/L	0.0005			< 0.0005
o-xylene	mg/L	0.0005			< 0.0005



FINAL REPORT

CA40308-JAN23 R1

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	SANSEW / WATER / - - Toronto Sewer Use By Law - Sanitary and Combined Sewer Discharge - BL_100_2016	SANSEW / WATER / - - Toronto Sewer Use By Law - Storm Sewer Discharge - BL_100_2016
				L1	L2

BH4S

Total Suspended Solids	SM 2540D	mg/L	71
Manganese	SM 3030/EPA 200.8	mg/L	0.311

15
0.05



FINAL REPORT

CA40308-JAN23 R1

QC SUMMARY

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0001-FEB23	mg/L	2	< 2	11	30	108	70	130	NV	70	130

Cyanide by SFA

Method: SM 4500 | Internal ref.: ME-CA-IENVISFA-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Cyanide (total)	SKA0019-FEB23	mg/L	0.01	<0.01	ND	10	102	90	110	99	75	125

Fluoride by Specific Ion Electrode

Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-014

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Fluoride	EWL0003-FEB23	mg/L	0.06	<0.06	ND	10	99	90	110	98	75	125



FINAL REPORT

CA40308-JAN23 R1

QC SUMMARY

Hexavalent Chromium by SFA

Method: EPA218.6/EPA3060A | Internal ref.: ME-CA-IENVISKA-LAK-AN-012

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chromium VI	SKA0020-FEB23	mg/L	0.0002	<0.0002	0	20	97	80	120	NV	75	125

Mercury by CVAAS

Method: EPA 7471A/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0001-FEB23	mg/L	0.00001	< 0.00001	ND	20	NV	80	120	123	70	130



FINAL REPORT

CA40308-JAN23 R1

QC SUMMARY

Metals in aqueous samples - ICP-MS
Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0021-FEB23	mg/L	0.00005	<0.00005	17	20	106	90	110	84	70	130
Aluminum (total)	EMS0021-FEB23	mg/L	0.001	<0.001	5	20	100	90	110	101	70	130
Arsenic (total)	EMS0021-FEB23	mg/L	0.0002	<0.0002	2	20	107	90	110	106	70	130
Cadmium (total)	EMS0021-FEB23	mg/L	0.000003	<0.000003	7	20	106	90	110	99	70	130
Cobalt (total)	EMS0021-FEB23	mg/L	0.000004	<0.000004	2	20	108	90	110	99	70	130
Chromium (total)	EMS0021-FEB23	mg/L	0.00008	<0.00008	2	20	108	90	110	97	70	130
Copper (total)	EMS0021-FEB23	mg/L	0.0002	<0.0002	1	20	107	90	110	92	70	130
Manganese (total)	EMS0021-FEB23	mg/L	0.00001	<0.00001	3	20	109	90	110	106	70	130
Molybdenum (total)	EMS0021-FEB23	mg/L	0.00004	<0.00004	2	20	103	90	110	102	70	130
Nickel (total)	EMS0021-FEB23	mg/L	0.0001	<0.0001	3	20	105	90	110	98	70	130
Lead (total)	EMS0021-FEB23	mg/L	0.00009	<0.00001	9	20	107	90	110	99	70	130
Phosphorus (total)	EMS0021-FEB23	mg/L	0.003	<0.003	1	20	103	90	110	NV	70	130
Antimony (total)	EMS0021-FEB23	mg/L	0.0009	<0.0009	ND	20	93	90	110	101	70	130
Selenium (total)	EMS0021-FEB23	mg/L	0.00004	<0.00004	3	20	107	90	110	101	70	130
Tin (total)	EMS0021-FEB23	mg/L	0.00006	<0.00006	6	20	106	90	110	NV	70	130
Titanium (total)	EMS0021-FEB23	mg/L	0.00005	<0.00005	2	20	108	90	110	NV	70	130
Zinc (total)	EMS0021-FEB23	mg/L	0.002	<0.002	1	20	109	90	110	98	70	130



FINAL REPORT

CA40308-JAN23 R1

QC SUMMARY

Microbiology

Method: SM 9222D | Internal ref.: ME-CA-IENVIMIC-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
E. Coli	BAC9425-JAN23	cfu/100mL	-	ACCEPTED	ACCEPTED D							

Nonylphenol and Ethoxylates

Method: ASTM D7065-06 | Internal ref.: ME-CA-IENVIGC-LAK-AN-015

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nonylphenol diethoxylate	GCM0067-FEB23	mg/L	0.01	<0.01			90	55	120			
Nonylphenol Ethoxylates	GCM0067-FEB23	mg/L	0.01	0								
Nonylphenol monoethoxylate	GCM0067-FEB23	mg/L	0.01	<0.01			92	55	120			
Nonylphenol	GCM0067-FEB23	mg/L	0.001	<0.001			89	55	120			



FINAL REPORT

CA40308-JAN23 R1

QC SUMMARY

Oil & Grease

Method: MOE E3401 | Internal ref.: ME-CA-IENVIGC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (total)	GCM0080-FEB23	mg/L	2	<2	NSS	20	99	75	125			

Oil & Grease-AV/MS

Method: MOE E3401/SM 5520F | Internal ref.: ME-CA-IENVIGC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (animal/vegetable)	GCM0080-FEB23	mg/L	4	< 4	NSS	20	NA	70	130			
Oil & Grease (mineral/synthetic)	GCM0080-FEB23	mg/L	4	< 4	NSS	20	NA	70	130			

pH

Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0004-FEB23	No unit	0.05	NA	0		100			NA		



FINAL REPORT

CA40308-JAN23 R1

QC SUMMARY

Phenols by SFA
Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0009-FEB23	mg/L	0.002	<0.002	ND	10	107	80	120	102	75	125

Polychlorinated Biphenyls
Method: MOE E3400/EPA 8082A | Internal ref.: ME-CA-IENVIGC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Polychlorinated Biphenyls (PCBs) - Total	GCM0065-FEB23	mg/L	0.0001	<0.0001	NSS	30	93	60	140	NSS	60	140



FINAL REPORT

CA40308-JAN23 R1

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-IENV/IGC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
7Hdibenzo(c,g)carbazole	GCM0041-FEB23	mg/L	0.0001	< 0.0001	NSS	30	105	50	140	NSS	50	140
Anthracene	GCM0041-FEB23	mg/L	0.0001	< 0.0001	NSS	30	91	50	140	NSS	50	140
Benzo(a)anthracene	GCM0041-FEB23	mg/L	0.0001	< 0.0001	NSS	30	96	50	140	NSS	50	140
Benzo(a)pyrene	GCM0041-FEB23	mg/L	0.0001	< 0.0001	NSS	30	98	50	140	NSS	50	140
Benzo(b+j)fluoranthene	GCM0041-FEB23	mg/L	0.0001	< 0.0001	NSS	30	101	50	140	NSS	50	140
Benzo[e]pyrene	GCM0041-FEB23	mg/L	0.0001	< 0.0001	NSS	30	91	50	140	NSS	50	140
Benzo(ghi)perylene	GCM0041-FEB23	mg/L	0.0002	< 0.0002	NSS	30	96	50	140	NSS	50	140
Benzo(k)fluoranthene	GCM0041-FEB23	mg/L	0.0001	< 0.0001	NSS	30	97	50	140	NSS	50	140
Bis(2-ethylhexyl)phthalate	GCM0041-FEB23	mg/L	0.002	< 0.002	NSS	30	102	50	140	NSS	50	140
Chrysene	GCM0041-FEB23	mg/L	0.0001	< 0.0001	NSS	30	95	50	140	NSS	50	140
di-n-Butyl Phthalate	GCM0041-FEB23	mg/L	0.002	< 0.002	NSS	30	103	50	140	NSS	50	140
Dibenzo(a,h)anthracene	GCM0041-FEB23	mg/L	0.0001	< 0.0001	NSS	30	94	50	140	NSS	50	140
Dibenzo(a,i)pyrene	GCM0041-FEB23	mg/L	0.0001	< 0.0001	NSS	30	95	50	140	NSS	50	140
Dibenzo(a,j)acridine	GCM0041-FEB23	mg/L	0.0001	< 0.0001	NSS	30	93	50	140	NSS	50	140
Fluoranthene	GCM0041-FEB23	mg/L	0.0001	< 0.0001	NSS	30	96	50	140	NSS	50	140
Indeno(1,2,3-cd)pyrene	GCM0041-FEB23	mg/L	0.0002	< 0.0002	NSS	30	92	50	140	NSS	50	140
Pentachlorophenol	GCM0041-FEB23	mg/L	0.0005	< 0.0005	NSS	30	82	50	140	NSS	50	140
Perylene	GCM0041-FEB23	mg/L	0.0005	< 0.0005	NSS	30	99	50	140	NSS	50	140
Phenanthrene	GCM0041-FEB23	mg/L	0.0001	< 0.0001	NSS	30	91	50	140	NSS	50	140
Pyrene	GCM0041-FEB23	mg/L	0.0001	< 0.0001	NSS	30	95	50	140	NSS	50	140



FINAL REPORT

CA40308-JAN23 R1

QC SUMMARY

Semi-Volatile Organics (continued)

Method: EPA 3510C/8270D | Internal ref.: ME-CA-IENVIGC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
3,3-Dichlorobenzidine	GCM0056-FEB23	mg/L	0.0005	< 0.0005	NSS	30	108	30	130	NSS	30	130

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-IENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0005-FEB23	mg/L	2	< 2	0	10	92	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0036-FEB23	as N mg/L	0.5	<0.5	0	10	100	90	110	101	75	125



FINAL REPORT

CA40308-JAN23 R1

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-IENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,2,2-Tetrachloroethane	GCM0036-FEB23	mg/L	0.0005	<0.0005	ND	30	94	60	130	96	50	140
1,2-Dichlorobenzene	GCM0036-FEB23	mg/L	0.0005	<0.0005	ND	30	93	60	130	99	50	140
1,4-Dichlorobenzene	GCM0036-FEB23	mg/L	0.0005	<0.0005	ND	30	92	60	130	98	50	140
Benzene	GCM0036-FEB23	mg/L	0.0005	<0.0005	ND	30	91	60	130	103	50	140
Chloroform	GCM0036-FEB23	mg/L	0.0005	<0.0005	ND	30	91	60	130	101	50	140
cis-1,2-Dichloroethene	GCM0036-FEB23	mg/L	0.0005	<0.0005	ND	30	91	60	130	102	50	140
Ethylbenzene	GCM0036-FEB23	mg/L	0.0005	<0.0005	ND	30	92	60	130	102	50	140
m-p-xylene	GCM0036-FEB23	mg/L	0.0005	<0.0005	ND	30	91	60	130	102	50	140
Methylene Chloride	GCM0036-FEB23	mg/L	0.0005	<0.0005	ND	30	92	60	130	101	50	140
o-xylene	GCM0036-FEB23	mg/L	0.0005	<0.0005	ND	30	92	60	130	102	50	140
Tetrachloroethylene (perchloroethylene)	GCM0036-FEB23	mg/L	0.0005	<0.0005	ND	30	91	60	130	102	50	140
Toluene	GCM0036-FEB23	mg/L	0.0005	<0.0005	ND	30	92	60	130	102	50	140
trans-1,3-Dichloropropene	GCM0036-FEB23	mg/L	0.0005	<0.0005	ND	30	94	60	130	100	50	140
Trichloroethylene	GCM0036-FEB23	mg/L	0.0005	<0.0005	ND	30	90	60	130	101	50	140



FINAL REPORT

CA40308-JAN23 R1

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

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

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.

RL Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

NA The sample was not analysed for this analyte

ND Non Detect

Results relate only to the sample tested.

Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.

"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

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This report supersedes all previous versions.

-- End of Analytical Report --



Request for Laboratory Services and CHAIN OF CUSTODY

Industries & Environment - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 028777

Page of

Laboratory Information Section - Lab use only

Received By: Leah Kern
Received Date: 01/31/23 (mm/dd/yy)
Received Time: 0830 (hr:min)

Received By (signature): [Signature]
Custody Seal Present: Yes ☐ No ☒
Custody Seal Intact: Yes ☒ No ☐

Cooling Agent Present: Yes ☒ No ☐ Type: ice packs
Temperature Upon Receipt (°C): 8.0

CA-40308-Jan 23
LAB LIMS #: Ba

REPORT INFORMATION
Company: Temp 187
Contact: Rachel Geddam
Address: 11 Indelby, Brampton,
ON, L6T 3Y3
Phone: 905 796 2650
Fax:
Email: rgeddam@temp187.ca

INVOICE INFORMATION
☒ (same as Report Information)
Company:
Contact:
Address:
Phone:

Quotation #: P.O. #:
Project #: 02210387.0200 Site Location/ID:

TURNAROUND TIME (TAT) REQUIRED

☒ Regular TAT (5-7 days)

TAT's are quoted in business days (exclude statutory holidays & weekends).
Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days

PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:

*NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

☐ O.Reg 153/04 ☐ O.Reg 406/19

Other Regulations:
☐ Table 1 ☐ Res/Park ☐ Soil Texture:
☐ Table 2 ☐ Ind/Com ☐ Coarse
☐ Table 3 ☐ Agri/Other ☐ Medium/Fine
☐ Table Appx.
Soil Volume ☐ <350m3 ☐ >350m3

Other Regulations:
☐ Reg 347/558 (3 Day min TAT)
☐ PWQO ☐ MMR
☐ CCME ☐ Other:
☐ MISA
☐ ODWS Not Reportable *See note

Sewer By-Law:

☐ Sanitary
☐ Storm

Municipality:
Toronto region

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX
1 BH45	30/01/2023		19	GW
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

ANALYSIS REQUESTED															
M & I		SVOC	PCB	PHC	VOC	Pest	Other (please specify)			SPLP	TCLP	COMMENTS:			
Field Filtered (Y/N)	Metals & Inorganics (incl CrVI, Cu, Hg, pH, B(HWS), EC, SAR-soil) (Cl-, Na-water)	Full Metals Suite (ICP metals plus B(HWS-soil only), Hg, CrVI)	ICP Metals only Sb, As, Ba, Be, B, Cd, Cr, Co, Cu, Pb, Mo, Ni, Se, Ag, Tl, U, V, Zn	PAHs only	SVOCs (all incl PAHs, ABNs, CPs)	PCBs Total ☐ Aroclor ☐	F1-F4 + BTEX	F1-F4 only (no BTEX)	VOCs (all incl BTEX)	BTEX only	Pesticides Organochlorine or specify other				

Observations/Comments/Special Instructions

Sampled By (NAME): OMAR HAMAD
Relinquished by (NAME): OMAR HAMAD

Signature: [Signature]
Signature: [Signature]

Date: 01/30/23 (mm/dd/yy)
Date: 01/30/23 (mm/dd/yy)

Pink Copy - Client

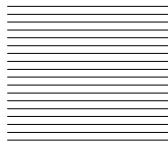
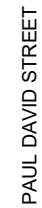
Yellow & White Copy - SGS

Revision #: 1.6
Date of Issue: 02 May 2022

Note: Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. (2) Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). (3) Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request. This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. (Printed copies are available upon request.) Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

APPENDIX G

Reviewed Proposed Development Plans

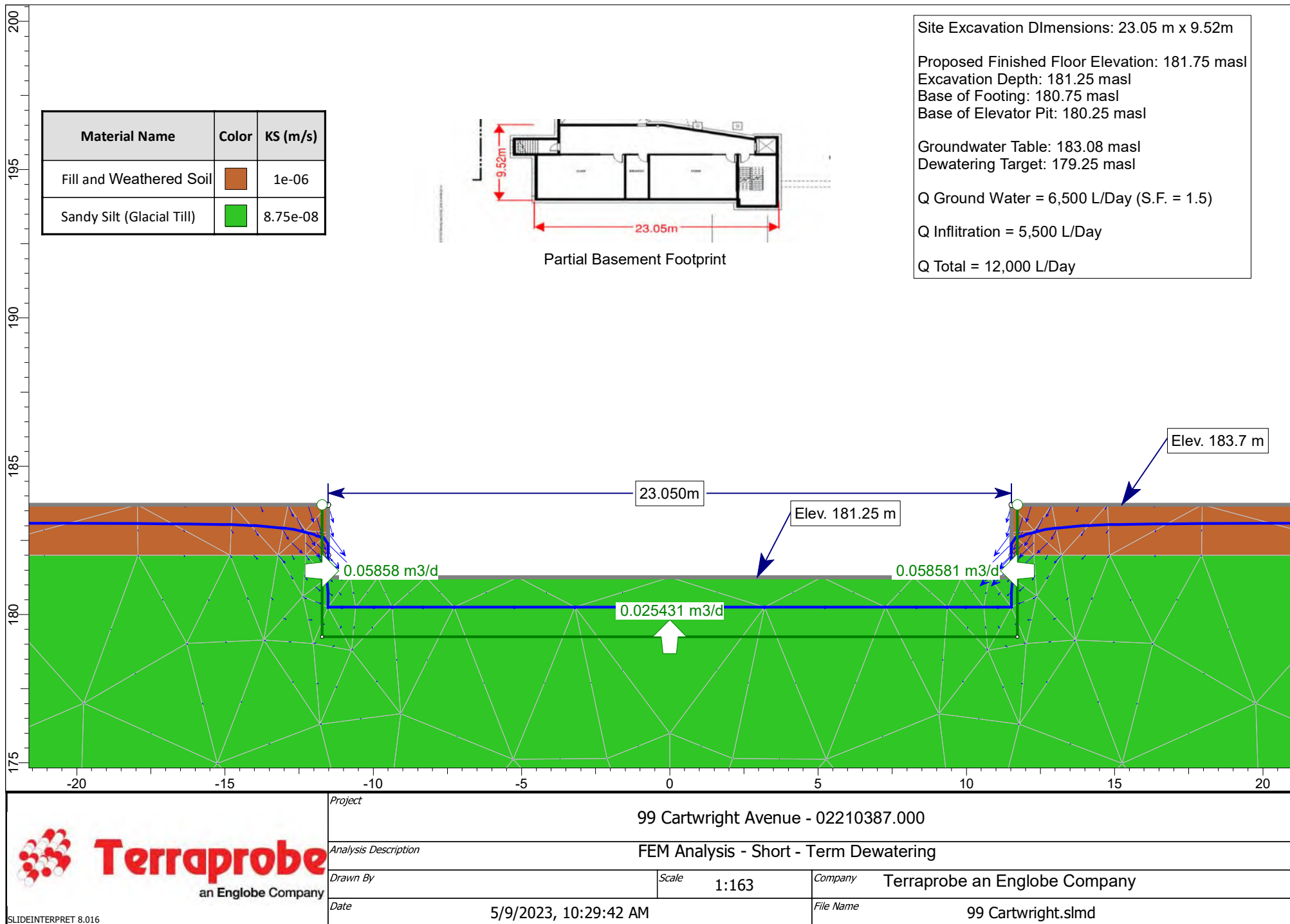


A compass rose diagram with a circle divided into four quadrants by a vertical and a horizontal line. The top quadrant is labeled "PROJECT NORTH" and contains a thick black arrow pointing towards the top-right. The letter "N" is written above the arrow.

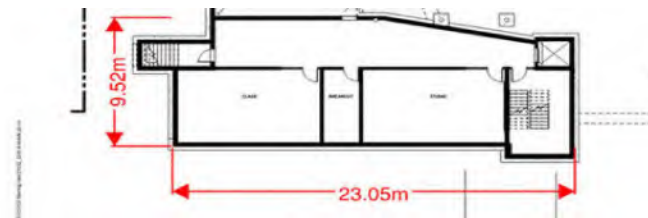
scale: 1 : 300
date:
drawn: CS&P
checked by: CS&P
project number: 21032
drawing number: A1.10

APPENDIX H

Dewatering Flow Rate Calculations



Material Name	Color	KS (m/s)
Fill and Weathered Soil		1e-06
Sandy Silt (Glacial Till)		8.75e-08



Partial Basement Footprint

Site Excavation Dimensions: 23.05 m x 9.52m

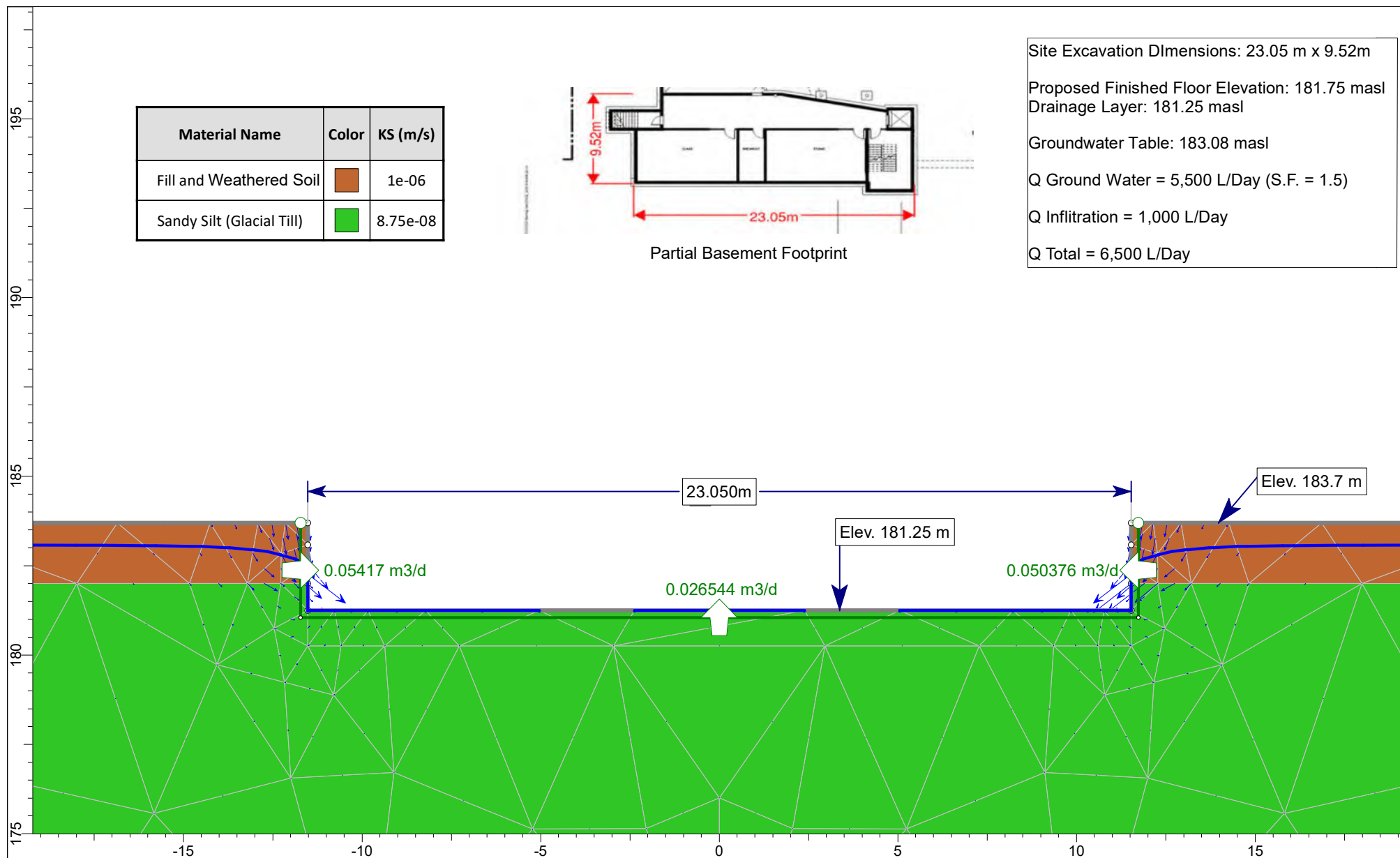
Proposed Finished Floor Elevation: 181.75 masl
Drainage Layer: 181.25 masl

Groundwater Table: 183.08 masl

Q Ground Water = 5,500 L/Day (S.F. = 1.5)

Q Infiltration = 1,000 L/Day

Q Total = 6,500 L/Day



Project

99 Cartwright Avenue - 02210387.000

Analysis Description

FEM Analysis - Long - Term Drainage

Drawn By

Scale

1:147

Company

Terraprobe an Englobe Company

Date

5/9/2023, 10:29:42 AM

File Name

99 Cartwright.slmd