

REVISION 2



HYDROGEOLOGICAL ASSESSMENT

1310 South Service Road, Stoney Creek, Ontario

Project No. 0138-001.02

February 2, 2023

Prepared for:

Jennum Properties Inc.
3027 Harvester Road
Burlington, Ontario L7N 3G7

Prepared by:



BlueFrog
Environmental Consulting Inc.
Suite 100 - 208 Wyecroft Road
Oakville, ON L6K 3T8
bluefrogconsulting.ca

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1.0 Introduction and Objectives

Jennum Properties Inc. retained BlueFrog Environmental Consulting Inc. (BlueFrog) to complete a Hydrogeological Assessment of the subject property located at 1310 South Service Road, Stoney Creek, Ontario (hereinafter referred to as the Site). A site map is provided as **Figure 1**.

The purpose of this hydrogeological assessment is to support the proposed redevelopment at the Site.

The subject work was performed in accordance with the agreement between BlueFrog Environmental Consulting Inc. and Jennum Properties. This report has been prepared based on fieldwork and/or review of information conducted by BlueFrog and others, for the sole benefit and use by Jennum Properties. In performing the work, BlueFrog has relied in good faith on information provided by others and has assumed that the information provided is both complete and accurate. The work was performed to current industry practice for similar geotechnical work, within the same regulatory jurisdiction. The findings presented herein should be considered in the context of the scope of work; further, the findings are considered valid only at the time the report was produced. The information presented herein shall not be construed as legal advice.

The conclusions, recommendations, and/or opinions presented in this report are based upon engineering and/or geoscience judgement and experience within the context of Jennum Properties's objectives and the applicable guidelines, regulations, and legislation existing at the time the report was produced.

1.1 Background and Site Description

The Site plan showing the current Site configuration is presented as **Figure 2**. The Site is currently undeveloped with an asphalt pavement cover across the central portion of the Site. We understand that a former motel and restaurant structure were present at the southern portion of the Site, with a former retail fuel outlet located on the central and eastern portion of the property.

The following two environmental reports were made available during this investigation:

- Phase II Environmental Site Assessment, West Portion of 1310 South Service Road, Stoney Creek. By LRJ, File No. 200786, dated April 5, 2021.
- Phase Two Environmental Site Assessment, 1310 South Service Road, Stoney Creek, Ontario. By Terraprobe Inc., File No. 73-14-4006, dated May 23, 2014.

1.2 Proposed Redevelopment

We understand that the Site will be redeveloped to four mixed use commercial/residential apartment buildings ranging from 3 to 12 storeys high. Underground parking will consist of one level of underground parking in the southern portion of the Site, with floor slab about 3m below ground surface (bgs), and two levels of underground parking in the northern portion of the Site, with floor slab about 6mbgs. The proposed building layouts are included in **Appendix E**.

2.0 Scope of Work

The scope of the hydrogeological work was to perform the following main activities:

- Obtain underground utility clearances prior to completing subsurface work.
- Advance fourteen boreholes on-Site to depths of 5.2 to 11.3mbgs.
 - Sample the soils at regular depth intervals in the boreholes. Samples were collected with a split spoon sampler used to obtain N-values.
 - Collect soil samples for geotechnical laboratory testing consisting of moisture contents and Atterberg Limits determinations.

- Install monitoring wells in seven boreholes.
- Measure the groundwater levels in the wells and conduct hydraulic conductivity testing.
- Obtain one groundwater sample for City of Hamilton Sewer Use-Bylaw testing.
- Obtain elevations of all boreholes and monitoring wells.

3.0 Methodology

3.1 Drilling

Public and private utility locates were completed prior to the initiation of the drilling program.

BlueFrog staff supervised the drilling of the boreholes. The assessment locations are presented on **Figure 2** and a summary of the 2022 drilling is provided in **Table i**.

Table i **Drilling Details**

Item	Comments
Drilling Dates	March 30 to April 5, 2022
Drilling Contractor	Profile Drilling
Drill Rig	Track mount drill rig equipped with hollow-stem augers and split spoon samplers
Assessment locations completed as boreholes	BH101, BH102, BH104, BH108 to BH111, and MW103, MW105 to MW107 and MW112 to MW114
Assessment locations completed as monitoring wells	MW103, MW105 to MW107 and MW112 to MW114
Assessment depth	5.2 to 11.3 mbgs

Soil samples were obtained by employing the Standard Penetration Test, in accordance with ASTM D1586. The Standard Penetration Test consists of freely dropping a 63.5 kilogram hammer a vertical distance of 0.76m to drive a 51 mm outside diameter split-barrel (split spoon) sampler into the ground. The number of blows of the hammer required to drive the sampler into the relatively undisturbed ground by a vertical distance of 0.30 m was recorded and is denoted as 'N'-values. These recorded 'N'-values give an indication of the consistency of cohesive soils or compactness of non-cohesive soils and are recorded on the Record of Borehole sheets in **Appendix A**.

Pocket penetrometer readings were carried out on representative cohesive soil samples to provide an indication of the undrained shear strength of the soil. The results are recorded on the Record of Borehole sheets in **Appendix A**.

Monitoring wells, consisting of a 51 mm diameter polyvinyl chloride (PVC) 10 slot screen, measuring 3.0 m in length, and an un-slotted riser, were installed in seven of the boreholes. Sand pack was placed in the annulus between the slotted PVC pipe and borehole walls to a maximum of 0.30 m above the well screen. Hydrated bentonite chips were placed in the annulus between the solid PVC pipe and borehole walls on top of the sand pack to approximately 0.2 to 0.3 m below ground surface. The monitoring wells were completed with a J-plug and above grade casing set in concrete grout to protect the well from damage. Details are presented on the Record of Borehole sheets in **Appendix A**.

3.2 Monitoring Well Development

The existing monitoring wells were developed to remove particulates or fluids that may have collected within the screen or sand pack during well installation. The monitoring wells were developed by purging at least ten

casing volumes of water or until the well went dry three times using a dedicated inertial pump and a non-dedicated surge block. The surge block was cleaned with a solution of phosphate-free detergent and water, then rinsed with distilled water, between monitoring wells.

3.3 Water Level Measurements

The depth to the water table in the monitoring wells were determined with a Solinst interface meter that was cleaned with a solution of phosphate-free detergent and water, then rinsed with distilled water, between monitoring wells. The water levels in the monitoring wells were measured every 2 weeks for a period of up to three months. The measurements are included in **Table 1**.

3.4 Hydraulic Conductivity Testing

Hydraulic conductivity testing (rising head slug tests) was completed on May 19, 2022 in two monitoring wells. Initial water levels were measured using a Solinst interface meter. A slug of water was removed from the wells using a clean disposable bailer and the volume removed was recorded for each well. Water levels were measured throughout the rising head testing using a dedicated (one per monitoring well) Solinst Levellogger and manual measurements were also collected using the interface meter. Water level measurements were collected until the water level in the monitoring well recovered to at least 90% of its initial water level (as determined by manual measurements). The Levelloggers were set to measure water levels every 30 seconds and these measurements were supplemented by manual measurements every minute for the first 5 minutes, then every two minutes for the next 5 minutes and so on.

3.5 Groundwater Sampling

A groundwater sample was collected from monitoring well MW107 using a dedicated bailer on April 11, 2022. The groundwater sample was collected into laboratory supplied bottles and stored in coolers on ice immediately after they were collected. The sample was transported to BV for analysis of the parameters listed under the *City of Hamilton Storm and Sanitary/Combined Sewer Discharge Bylaw 14-090*.

3.6 Survey

All boreholes and wells were surveyed by BlueFrog staff. Each location was geo-referenced vertically to a local benchmark. The top of the fire hydrant at the southwest corner of South Service Road and Vince Mazza Way was used as a local benchmark, assigned an elevation of 100.00m. The well elevations are included in **Table1**, attached.

4.0 Results

4.1 Regional Geology and Hydrogeology

Table i below summarizes the information obtained from regional topographic, geological, and soil maps.

Table ii *Regional Geology and Hydrogeology*

Feature	Comments
Nearest surface water body	Lake Ontario is located 700m northwest of the Site.
Interpreted Groundwater Flow Direction	Regional groundwater flow is inferred to flow north towards Lake Ontario, however at the Site based on Figure 3 the groundwater flow direction is to the east. The flow direction is likely influenced by the presence of underground utilities in the immediate area.
Bedrock	The bedrock in the area is described as the Queenston Formation: shale, limestone, dolostone, siltstone, (Ontario Geological Survey, Bedrock Geology of Ontario).
Surficial soils	Surficial soils in the area are described as Lacustrine deposits: sand, gravelly sand and gravel nearshore and beach deposits. (Ontario Geological Survey, Quaternary Geology).

4.2 Site Geology

The Site Stratigraphy is summarized in the **Table iii** below and is described in detail in the following sections. A subsurface cross-section is presented in **Figure 5**.

Table iii *Site Stratigraphy*

Soil Type	Depth of Bottom of Soil Type (mbgs)
Fill	0.3 to 5.4
Silty Fine Sand to Fine Sandy Silt	1.2 (where present)
Silty Clay Till	7.0 to >11.1
Shale Bedrock	-

4.2.1 Ground Cover and Fill

Topsoil was encountered at surface of BH104, MW105, MW106 and MW113. The topsoil ranges in thickness from 0.1 to 0.9m. One measured 'N'-value of 4 blows per 0.3m was obtained within the topsoil. A measured moisture content of 17% was obtained within the topsoil.

Concrete was encountered at surface of BH110, about 0.1m thick.

Asphalt was encountered at surface of BH102, MW103, BH111, MW112 and MW114, with a buried asphalt layer found in BH108. The asphalt thickness ranges from about 5 to 10cm.

Sand and gravel fills were encountered in the remaining boreholes at surface and below the asphalt and concrete to depths of about 0.3to 0.9mbgs, except at MW112 where the gravelly sand fill was encountered to a depth of about 5.4mbgs. Measured 'N'-values range from 4 to 52 blows per 0.3m indicating a loose to very dense compactness. Measured moisture contents range from 5 to 21%.

4.2.2 Silty Fine Sand to Fine Sandy Silt

Underlying the topsoil in BH104 the native silty sand was encountered to a depth of about 1.2mbgs.

4.2.3 Silty Clay Glacial Till

Below the fill and silty fine sand to fine sandy silt soils a mottled brown to grey silty clay glacial till was encountered. The boreholes were either terminated within the glacial till at depth of 5.2 to 11.1mbgs, or the base of the glacial till was encountered at the bedrock surface at depths of 7.0 to 10.5mbgs.

The glacial till is a heterogeneous mixture of a silty clay matrix with varying amounts of sand and gravel. Cobbles and boulders are anticipated within the glacial till.

Measured 'N'-values range from 6 to greater than 50 blows per 0.3m within the glacial till, but typically ranging from 15 to 37 blows per 0.3m. Pocket penetrometer measurements indicate an undrained shear strength of 100 to greater than 225kPa (limit of penetrometer), but typically greater than 200kPa. These results indicate a firm to hard consistency, but typically very stiff to hard.

Measured moisture contents range from 8 to 22%. Two Atterberg Limits determinations were carried out on representative samples of the glacial till. The results are presented in Appendix A and Appendix B and summarized as follows: plastic limit of 15%, liquid limit of 27 and 28% and plasticity index of 12 and 13%.

From the Terraprobe report referenced in Section 1.1, three grain size distributions were presented of the glacial till deposit. The results are summarized below.

Table iv *Glacial Till Gradation*

Gravel	5 to 8%
Sand	17 to 20%
Silt	45 to 46%
Clay	26 to 31%

4.2.4 Bedrock

Reddish-brown, weathered shale bedrock as encountered in eight of the boreholes at depths of 7.0 to 10.5mbgs. The following table summarizes the approximate depth and elevation of the bedrock.

Table v *Depth to Bedrock*

Borehole No.	Approximate Depth to Bedrock	Approximate Elevation of Bedrock Surface
BH101	9.5mbgs	90.4m
MW103	10.0mbgs	89.7m
BH104	10.5mbgs	89.2m
BH105	10.5mbgs	88.8m
MW106	8.5mbgs	90.7m
MW107	7.0mbgs	93.4m
BH108	7.0mbgs	93.3m
BH109	8.5mbgs	92.0m

These boreholes were terminated within the shale bedrock at depths of 10.8 to 11.3mbgs.

Measured 'N'-values were greater than 50 blows per 0.3m indicating a hard consistency. Measured moisture contents range from 4 to 16%, but typically 8 to 9%.

The shale bedrock is part of the Queenston Formation and is known to contain layers of limestone and sandstone. The rock has swelling properties and degrades quickly when exposed to wetting and drying conditions.

4.3 Site Hydrogeology

Seven (7) monitoring wells were installed at the Site during this investigation and four (4) monitoring wells were found at the Site that were installed by others (see Section 1.1). These eleven (11) monitoring wells have been monitored every two weeks for a period of two months. The monitoring results are presented in **Table 1** for the newly installed monitoring wells. Groundwater elevations for one of the monitoring events is presented in **Figure 3**. Groundwater levels from all eleven (11) monitoring wells at the Site are summarized in the table below.

Table vi Summary of Groundwater Levels (April 11 to June 17, 2022)

	Monitoring Well	Depth to Groundwater Level	Potentiometric Elevation	Well Screen Stratigraphy
BlueFrog 2022	MW103	2.9 to 7.2mbgs	92.5 to 96.8m	Silty Clay Glacial Till
	MW105	Dry to 2.4mbgs	Dry to 97.0m	Silty Clay Glacial Till
	MW106	Dry to 4.8mbgs	Dry to 94.5m	Silty Clay Glacial Till
	MW107	0.6 to 0.7mbgs	99.6 to 99.8m	Silty Clay Glacial Till to Weathered Shale Bedrock
	MW112	0 to 0.2mbgs	99.1 to 99.3m	Gravelly Sand FILL
	MW113	0.4 to 2.9mbgs	96.5 to 99.1m	Silty Clay Glacial Till
	MW114	0 to 1.2mbgs	98.2 to 99.4m	Silty Clay Glacial Till
Existing Wells by others	MW21-8	1.6mbgs	-	Silty Clay Glacial Till
	BH201	1.4 to 2.0mbgs	-	-
	BH303	1.6 to 3.1mbgs	-	-
	BH401	1.2 to 1.8mbgs	97.5 to 98.1m	-

4.3.1 Hydraulic Conductivity Testing

Hydraulic conductivity testing (rising head slug tests) was completed on May 19, 2022, in two monitoring wells. The tests are presented below and the calculations are presented in **Appendix C**.

Table vii Hydraulic Conductivity Testing Results

Monitoring Well Location	Hydraulic Conductivity	Stratigraphic Unit
MW106	3.83×10^{-8} m/s	Silty Clay Glacial Till
MW107	6.54×10^{-8} m/s	Silty Clay Glacial Till

4.3.2 Groundwater Quality

One groundwater sample was collected from MW107. The groundwater analytical laboratory certificates of analyses are presented in **Appendix D**. The analytical results were compared to the *City of Hamilton Storm and Sanitary/Combined Sewer Discharge Bylaw 14-090*. The following exceedances were measured within the sample:

- Combined/Sanitary Sewer-Use-Bylaw criteria: none
- Storm Sewer Use-By-Law criteria: none

It should be noted that volatile organic compounds (VOCs) and petroleum hydrocarbons compounds (PHCs) were measured in the monitoring wells in the area of the former underground fuel tanks on the north side of the site above MECP standards for PHC F1 to F4, benzene, ethylbenzene and hexane.

5.0 Groundwater Control

5.1 Short-Term Groundwater Control Requirements

We understand that the Site will be redeveloped to four mixed use commercial/residential apartment buildings ranging from 3 to 12 storeys high. Underground parking will consist of one to two levels of underground parking at 3 to 6mbgs. A sketch of the proposed building layout is included in **Appendix E**. The building is assumed to be about 130m wide and 130m long.

Construction dewatering will be dependent on the type of shoring support installed for the basement excavation. We assume permeable soldier pile and lagging will be used.

Soldier pile and lagging shoring is permeable and dewatering will be required during excavation below the groundwater table using temporary sumps and pumps. The short-term design groundwater table at the site ranges from 0.5 to 2mbgs.

The groundwater quantity was calculated using the following equation:

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

where q = groundwater quantity

K = design hydraulic conductivity (3.83×10^{-8} m/s)

H = head at constant-head boundary (9m)

h = head in the excavation (2.4 to 5.6m)

R = dewatering zone of influence

R_0 = equivalent diameter of excavation

The anticipated short term groundwater pumping rates, zone of influence of the dewatering and the anticipated stormwater (1 in 2 year storm – 25mm rainfall event) discharge for one level of underground parking is noted in **Table viii**. A factor of safety of 2 has been applied to the groundwater quantities.

Table viii Short Term Dewatering Quantities

Location	Groundwater Quantity(factored)	Stormwater Quantity (unfactored)	Total Discharge Quantity	Dewatering Zone of Influence
South Building	73,600	422,500	496,100	4m from edge of excavation

The groundwater will need to be filtered and treated prior to discharge to the municipal sewer due to the presence of PHCs and VOCs.

Based on the pumping rates noted above, a MECP Permit To Take Water (PTTW), as per Ontario Regulation 387/04 Water Taking and Transfer, would not be required for the short-term construction dewatering. The dewatering will need to be registered on the Environmental Activity and Sector Registry. A discharge permit from the City of Hamilton to discharge to the municipal sewer would be required.

Once the development details are confirmed this report will need to be revised and an additional groundwater sample taken to update the groundwater quality results.

5.2 Long-Term Groundwater Control

We understand that the buildings will be constructed as water tight structures and no long term groundwater control will be required.

6.0 Assessment of Potential Impacts of Groundwater Taking and Discharge

6.1 Nearby Water Well Users and Surface Water Bodies

A water well record search was completed for all registered MECP water wells located within a 500 m radius of the Site. The location of the well records is provided on **Figure 4**. About 27 water wells installed in the area were listed as test holes and monitoring wells, except for one drinking water well located about 400 m to the northeast from the Site. The short term dewatering is not expected to have an adverse effect on water well users in the area.

There are no surface water bodies within 250 m of the Site. The short term construction dewatering is not anticipated to affect surface water bodies as the zone of influence for the Site dewatering is no more than 4m from the edge of the excavation.

6.2 Sewage Works

The groundwater sample tested at the Site met the *City of Hamilton Storm and Sanitary/Combined Sewer Discharge Bylaw 14-090*. As noted previously, the environmental investigation carried out at the Site measured VOCs and PHCs on the north side of the site above MECP standards. Therefore, any groundwater must also be treated for the possibility of VOCs and PHCs prior to discharge to the municipal sewers.

6.3 Ground Settlements

The proposed dewatering noted above will induce negligible settlements to the surrounding ground and structures.

6.4 Negative Environmental Impacts

There are no negative impacts to the surrounding environment associated with the proposed short term dewatering.

6.5 Proposed Monitoring Plan

Discharge effluent water quality must be monitored to ensure that the dewatering quality is in compliance to the *City of Hamilton Storm and Sanitary/Combined Sewer Discharge Bylaw 14-090*, specified in the Discharge Permit to be obtained from the City of Hamilton. The following monitoring must be carried out during short term dewatering:

- Discharge volumes to the sewer system must be monitored and recorded daily with use of a flow meter. Flow meter must be calibrated on an annual basis.
- Discharge quality must be sampled weekly for the first month and then monthly to ensure *City of Hamilton Storm and Sanitary/Combined Sewer Discharge Bylaw 14-090* criteria are met.

7.0 Closure

We trust that the above information meets your present needs. Statement of qualifications for the undersigned are available on request. Please do not hesitate to contact us if you have any questions or comments.

Sincerely,

BlueFrog Environmental Consulting Inc.

Report prepared by:
Downunder Geotechnical Limited



Andrew Drevininkas, P.Eng.
Geotechnical Engineer

Report reviewed by:
Downunder Geotechnical Limited

A handwritten signature in black ink, appearing to read "D. Olshansky".

Dmitry Olshansky, P.Eng., M.Sc., M.Eng.
Geotechnical Engineer

Report reviewed by:

A handwritten signature in black ink, appearing to read "O. Gharabegian".

Oshin Gharabegian, P.Geo.
Senior Project Manager

STATEMENT OF LIMITATIONS

The conclusions and recommendations given in this report are based on information determined at the testhole locations. The information herein in no way reflects on the environmental aspects of the project. Subsurface and groundwater conditions beyond the testholes may differ from those encountered at the testhole locations, and conditions may become apparent during construction, which could not be detected or anticipated at the time of the site investigation. It is recommended practice that the Geotechnical Engineer be retained during the construction to confirm that the subsurface conditions across the site do not deviate materially from those encountered in the testholes.

The design recommendations in this report are applicable only to the project described in the text, and then only if constructed substantially in accordance with the details stated in this report. Since all details of the design may not be known, we recommend that we be retained during the final design stage to verify that the design is consistent with our recommendations, and that assumptions made in our analysis are valid.

The comments made in this report relating to potential construction problems and possible methods of construction are intended only for the guidance of the designer. The number of testholes may not be sufficient to determine all the factors that may affect construction methods and costs. For example, the thickness of fill may vary markedly and unpredictably. The contractors bidding on this project or undertaking the construction should, therefore, make their own interpretation of the factual information presented and draw their own conclusions as to how the subsurface conditions may affect their work. This work has been undertaken in accordance with normally accepted geotechnical engineering practices. No other warranty is expressed or implied.

This report was prepared for Jennum Properties. 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. BlueFrog Environmental Consulting Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

TABLES

Table 1: Groundwater Monitoring Well Details and Results

Assessment Location	Top of Pipe Elevation (m)	Ground Surface Elevation (m)	Screen Interval (mbgs)	Date (yyyy/mm/dd)	Potentiometric Depth (mbgs)	Potentiometric Elevation (m)	
MW103	100.60	99.67	4.6 - 7.6	4/11/2022	7.21	92.47	
				4/22/2022	6.57	93.10	
				5/6/2022	5.64	94.03	
				5/19/2022	4.95	94.73	
				6/2/2022	3.89	95.79	*
				6/17/2022	2.88	96.80	*
MW105	100.34	99.40	1.5 - 4.6	4/11/2022	DRY	DRY	
				4/22/2022	4.29	95.11	
				5/6/2022	3.55	95.84	
				5/19/2022	3.74	95.66	
				6/2/2022	3.00	96.40	
				6/17/2022	2.41	96.99	
MW106	100.10	99.23	4.6 - 7.6	4/11/2022	DRY	DRY	
				4/22/2022	7.60	91.63	
				5/6/2022	7.00	92.23	
				5/19/2022	6.14	93.09	
				6/2/2022	5.51	93.71	
				6/17/2022	4.75	94.47	
MW107	101.20	100.37	4.6 - 7.6	4/11/2022	0.69	99.68	*
				4/22/2022	0.69	99.68	*
				5/6/2022	0.74	99.63	*
				5/19/2022	0.60	99.77	*
				6/2/2022	0.71	99.66	*
				6/17/2022	0.70	99.67	*
MW112	100.21	99.31	1.5 - 4.6	4/11/2022	0.05	99.26	*
				4/22/2022	0.07	99.24	*
				5/6/2022	0.00	99.31	*
				5/19/2022	0.11	99.20	*
				6/2/2022	0.18	99.13	*
				6/17/2022	0.09	99.22	*
MW113	100.41	99.48	1.5 - 4.6	4/11/2022	2.94	96.54	*
				4/22/2022	1.13	98.36	*
				5/6/2022	0.39	99.09	*
				5/19/2022	0.46	99.02	*
				6/2/2022	0.55	98.93	*
				6/17/2022	0.42	99.06	*
MW114	100.25	99.35	1.5 - 4.6	4/11/2022	0.10	99.25	*
				4/22/2022	0.08	99.27	*
				5/6/2022	-0.04	99.39	*
				5/19/2022	0.02	99.33	*
				6/2/2022	0.05	99.31	*
				6/17/2022	1.19	98.16	*
MW21-8			1.5 - 4.5	4/11/2022	1.58		*
				4/22/2022	1.63		
				5/6/2022	1.56		*
				5/19/2022	1.65		
				6/2/2022	1.63		*
				6/17/2022	1.60		*

Assessment Location	Top of Pipe Elevation (m)	Ground Surface Elevation (m)	Screen Interval (mbgs)	Date (yyyy/mm/dd)	Potentiometric Depth (mbgs)	Potentiometric Elevation (m)
BH201				4/11/2022	1.35	
				4/22/2022	1.98	
				5/6/2022	1.50	
				5/19/2022	1.39	
				6/2/2022	1.42	
				6/17/2022	1.36	
BH401	100.149	99.27		4/11/2022	1.20	98.07
				4/22/2022	1.82	97.45
				5/6/2022	1.19	98.07
				5/19/2022	1.22	98.05
				6/2/2022	1.32	97.94
				6/17/2022	1.43	97.84
BH303				4/11/2022	1.56	
				4/22/2022	3.05	
				5/6/2022	2.49	
				5/19/2022	2.15	
				6/2/2022	1.88	
				6/17/2022	1.70	

NOTES:

* - Water level above top of screen

Table 2:Groundwater Analytical Results - City of Hamilton Sanitary and Combined Sewer Discharge Bylaw

SANITARY/COMBINED Sample Location: MW107

Parameters	City of Hamilton Sanitary/Combined Sewer Use Standards	Units	Sample Result	RDL
Inorganics				
BOD	300	mg/L	<2	2
Fluoride	10	mg/L	0.51	0.10
TKN	100	mg/L	2.6	0.1
Phenolics Compounds	1	mg/L	<0.0010	0.0010
TSS	350	mg/L	58	10
Chlorides	1500	mg/L	1100	10
Sulphates	1500	mg/L	970	5.0
Total Cyanide	2	mg/L	<0.0050	0.0050
Metals				
Mercury	0.01	mg/L	<0.00010	0.00010
Total Aluminum	50	mg/L	1.2	0.1
Total Antimony	5	mg/L	<0.02	0.02
Total Arsenic	1	mg/L	<0.01	0.01
Total Bismuth	5	mg/L	<0.05	0.05
Total Cadmium	0.7	mg/L	<0.002	0.002
Total Chromium	5	mg/L	<0.01	0.01
Total Cobalt	5	mg/L	<0.002	0.002
Total Copper	2	mg/L	<0.01	0.01
Total Iron	50	mg/L	1.8	0.02
Total Lead	2	mg/L	<0.01	0.01
Total Manganese	5	mg/L	0.53	0.001
Total Molybdenum	1	mg/L	0.013	0.005
Total Nickel	2	mg/L	<0.005	0.005
Total Phosphorus	10	mg/L	<0.05	0.05
Total Selenium	1	mg/L	<0.02	0.02
Total Silver	5	mg/L	<0.01	0.01
Total Tin	5	mg/L	<0.02	0.02
Total Titanium	5	mg/L	0.023	0.005
Total Vanadium	5	mg/L	<0.005	0.005
Total Zinc	3	mg/L	0.05	0.005
Petroleum Hydrocarbons				
Animal/Vegetable Oil & Grease	150	mg/L	<0.50	0.50
Mineral/Synthetic Oil & Grease	15	mg/L	<0.50	0.50
Volatile Organics				
Benzene	0.01	mg/L	<0.0040	0.0040
Chloroform	0.04	mg/L	<0.0040	0.0040
1,2-Dichlorobenzene	0.05	mg/L	<0.0080	0.0080
1,4-Dichlorobenzene	0.08	mg/L	<0.0080	0.0080
Cis-1,2-Dichloroethylene	4	mg/L	<0.010	0.010
Trans-1,3-Dichloropropylene	0.14	mg/L	<0.0080	0.0080
Ethyl Benzene	0.16	mg/L	<0.0040	0.0040
Methylene Chloride	2	mg/L	<0.040	0.0040
1,1,2,2-Tetrachloroethane	1.4	mg/L	<0.0080	0.008
Tetrachloroethylene	1	mg/L	<0.0040	0.0040
Toluene	0.016	mg/L	<0.0040	0.0040
Trichloroethylene	0.4	mg/L	<0.0040	0.0040
Total Xylenes	1.4	mg/L	<0.0040	0.0040
Semi-Volatile Organics				
Di-n-butyl Phthalate	0.08	mg/L	<0.02	0.02
Bis (2-ethylhexyl) Phthalate	0.012	mg/L	<0.02	0.02
3,3'-Dichlorobenzidine	0.002	mg/L	<0.008	0.008
Pentachlorophenol	0.005	mg/L	<0.01	0.01
Total PAHs	0.005	mg/L	<0.0096	0.0096
Misc Parameters				
Aldrin/Dieldrin	0.0002	mg/L	<0.00005	0.00005
Chlordane	0.04	mg/L	<0.00005	0.00005
DDT	0.0001	mg/L	<0.00005	0.00005
Hexachlorobenzene	0.0001	mg/L	0.000032	0.00005
Mirex	0.1	mg/L	<0.00005	0.00005
PCBs	0.001	mg/L	<0.005	0.005

Legend	
Bold Text	Exceeds Applicable Criteria

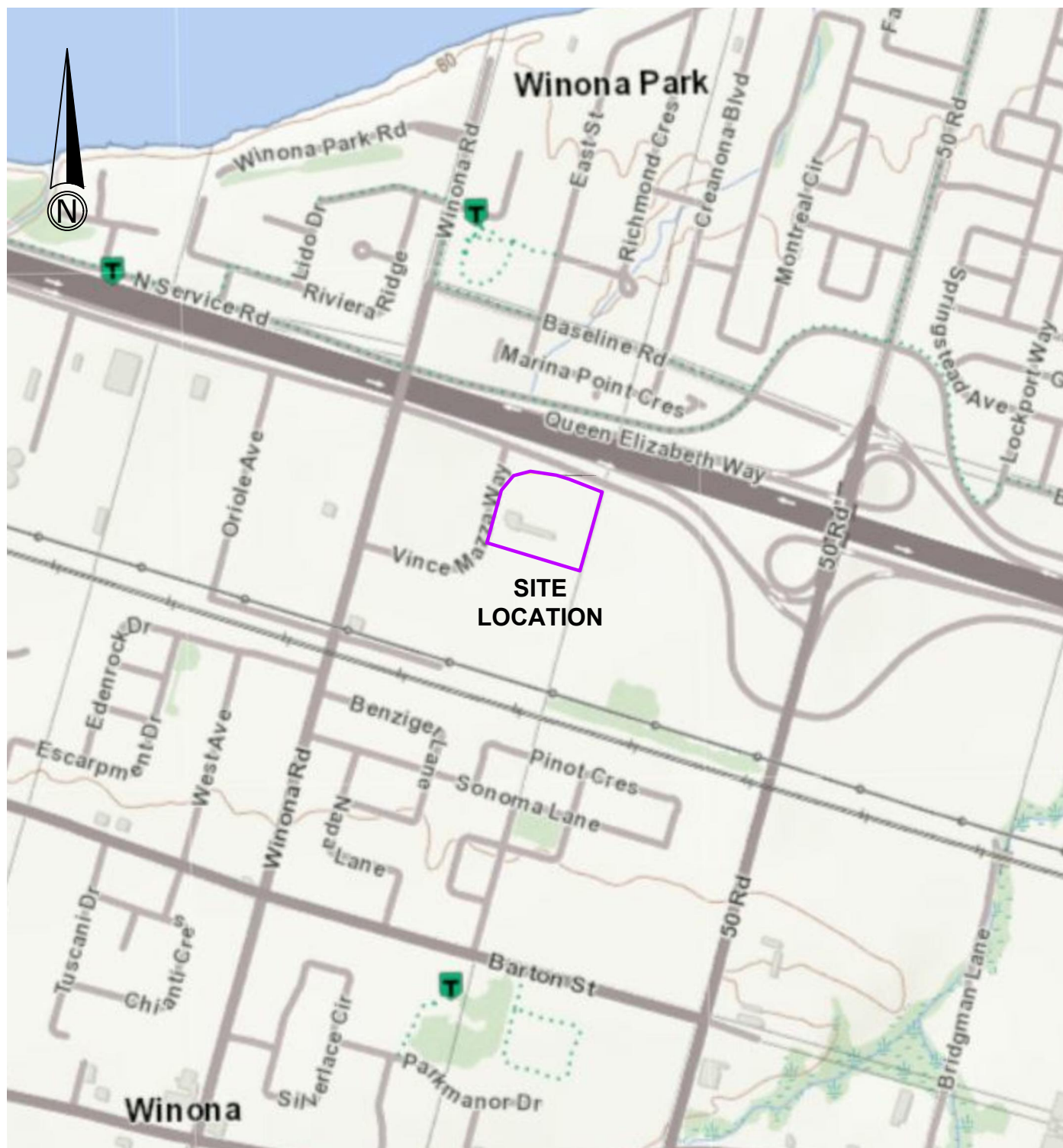
Table 2: Groundwater Analytical Results - City of Hamilton Storm Sewer Discharge Bylaw

STORM Sample Location: MW107

Parameters	City of Hamilton Sanitary/Combined Sewer Use Standards	Units	Sample Result	RDL
TSS	15	mg/L	58	10
Oil and Grease (animal/vegetable)	10	mg/L	<0.50	0.50
Total Zinc	3	mg/L	0.05	0.005
Total Chromium	1	mg/L	<0.01	0.01
Total Lead	1	mg/L	<0.01	0.01
Total Nickel	1	mg/L	<0.005	0.005
Total Copper	1	mg/L	<0.01	0.01
Total Cadmium	1	mg/L	<0.002	0.002
Phenolic Compounds	0.02	mg/L	<0.0010	0.0010

Legend	
Bold Text	Exceeds Applicable Criteria

FIGURES



MAP REFERENCE: Ontario Ministry of Natural Resources and Forestry

0 100 200 400m
Scale 1 : 10 000



BlueFrog
Environmental Consulting Inc.

SITE LOCATION MAP

1310 SOUTH SERVICE ROAD,
STONEY CREEK, ONTARIO

0138-001.02

JUNE 2022

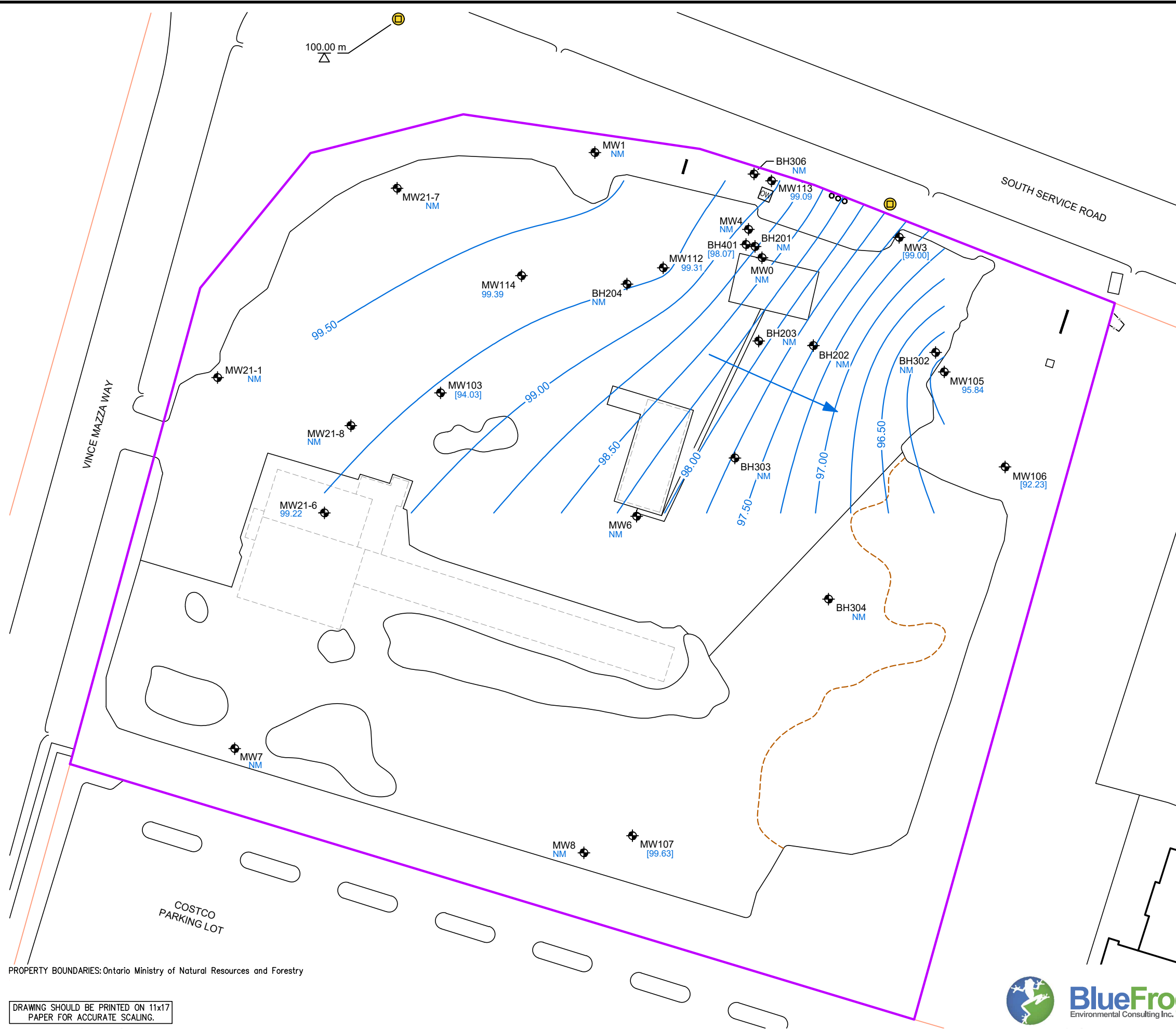
FIGURE 1



- LEGEND**
- SITE BOUNDARY
 - PROPERTY BOUNDARY
 - BUILDING FOOTPRINT
 - FORMER BUILDING FOOTPRINT
 - BOREHOLE
 - BH101, BH102, BH104 AND BH108 TO BH111 ADVANCED BY BLUEFROG (2022)
 - BH21-2 TO BH21-5 ADVANCED BY IRL (2021)
 - BH5 AND BH9 ADVANCED BY TERRAPROBE (2014)
 - MONITORING WELL
 - MW103, MW105 TO MW107 AND MW112 TO MW114 INSTALLED BY BLUEFROG (2022)
 - MW21-1 AND MW21-6 TO MW21-8 INSTALLED BY IRL (2021)
 - MW0, MW1, MW3, MW4 AND MW6 TO MW8 INSTALLED BY TERRAPROBE (2014)
 - BH201 TO BH204, BH302 TO BH304, BH306 AND BH401 INSTALLED BY OTHERS
 - STOCKPILE SAMPLE
 - SP1 TO SP6 BY BLUEFROG (2022)
 - OIL WATER SEPARATOR
 - FIRE HYDRANT
 - ASPHALT
 - CONCRETE
 - DIRT / GRAVEL
 - GRASS / BUSH

NOTES:
LOCATIONS ARE APPROXIMATE.

SITE PLAN
1310 SOUTH SERVICE ROAD,
STONEY CREEK, ONTARIO



LEGEND

- SITE BOUNDARY
- PROPERTY BOUNDARY
- BUILDING FOOTPRINT
- FORMER BUILDING FOOTPRINT
- MONITORING WELL
 - MW103, MW105 TO MW107 AND MW112 TO MW114 INSTALLED BY BLUEFROG (2022)
 - MW21-1 AND MW21-6 TO MW21-8 INSTALLED BY IRL (2021)
 - MW0, MW1, MW3, MW4 AND MW6 TO MW8 INSTALLED BY TERRAPROBE (2014)
 - BH201 TO BH204, BH302 TO BH304, BH306 AND BH401 INSTALLED BY OTHERS
- OIL WATER SEPARATOR
- FIRE HYDRANT
- 100.00 m BENCHMARK
- GROUNDWATER ELEVATION (m) RELATIVE TO LOCAL BENCHMARK
- NOT USED IN CONTOURING
- NOT MONITORED
- GROUNDWATER ELEVATION CONTOUR (m) RELATIVE TO LOCAL BENCHMARK
- INTERPRETED GROUNDWATER FLOW DIRECTION

NOTES:

LOCATIONS ARE APPROXIMATE.

BENCHMARK IS THE FIRE HYDRANT LOCATED NORTHEAST OF THE SITE ALONG SOUTH SERVICE ROAD WITH AN ASSIGNED ELEVATION OF 100.00 m.

**ELEVATION OF POTENTIOMETRIC SURFACE -
MAY 06, 2022
1310 SOUTH SERVICE ROAD,
STONEY CREEK, ONTARIO**

0138-001.02

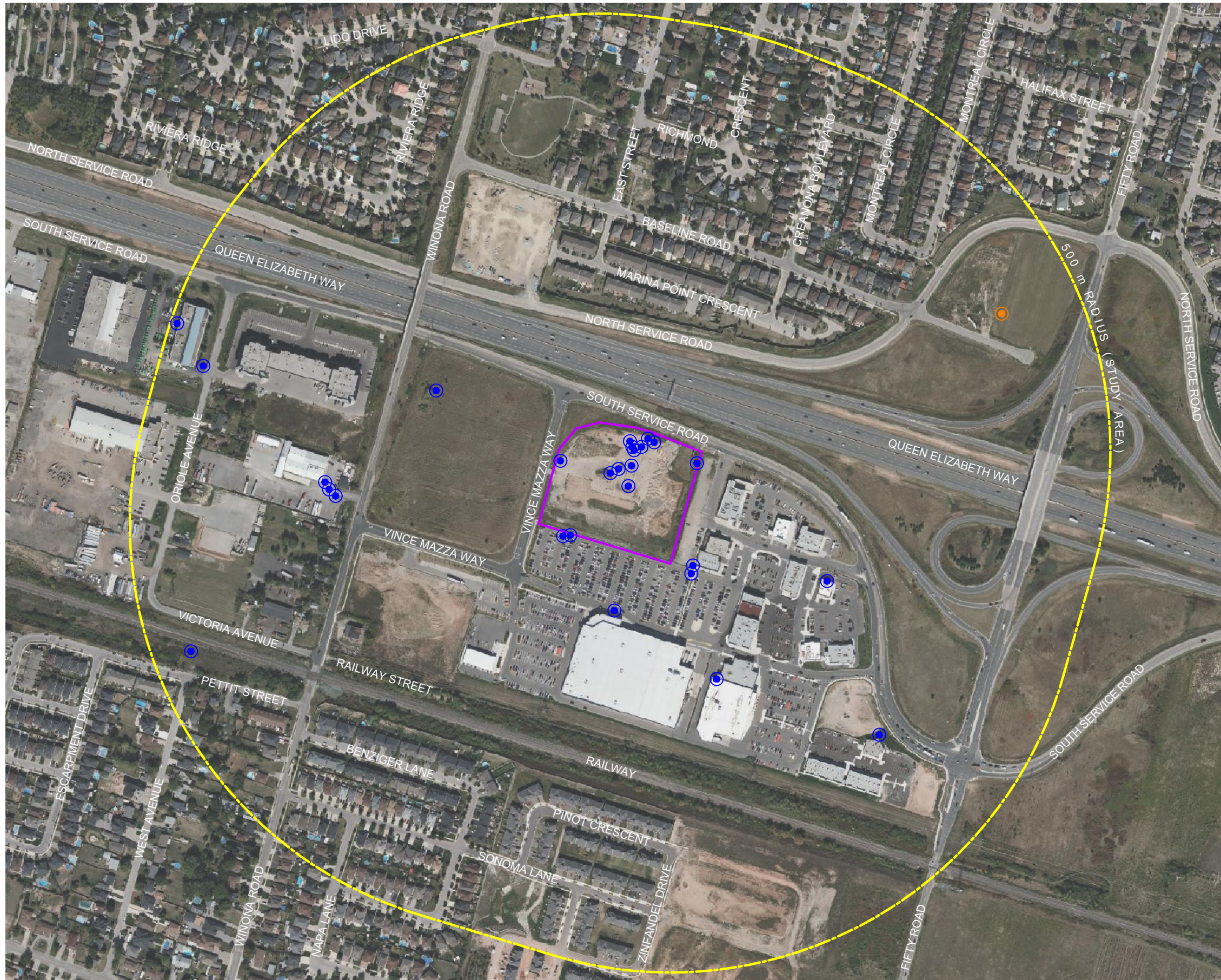
JUNE 2022

FIGURE 3

PROPERTY BOUNDARIES: Ontario Ministry of Natural Resources and Forestry

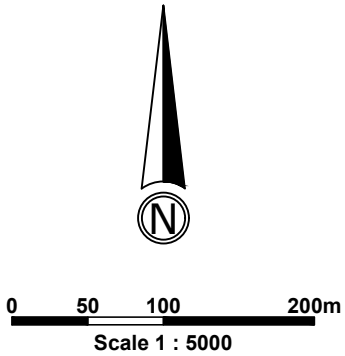
DRAWING SHOULD BE PRINTED ON 11x17
PAPER FOR ACCURATE SCALING.





PROPERTY BOUNDARIES: Ontario Ministry of Natural Resources and Forestry

DRAWING SHOULD BE PRINTED ON 11x17 PAPER FOR ACCURATE SCALING.

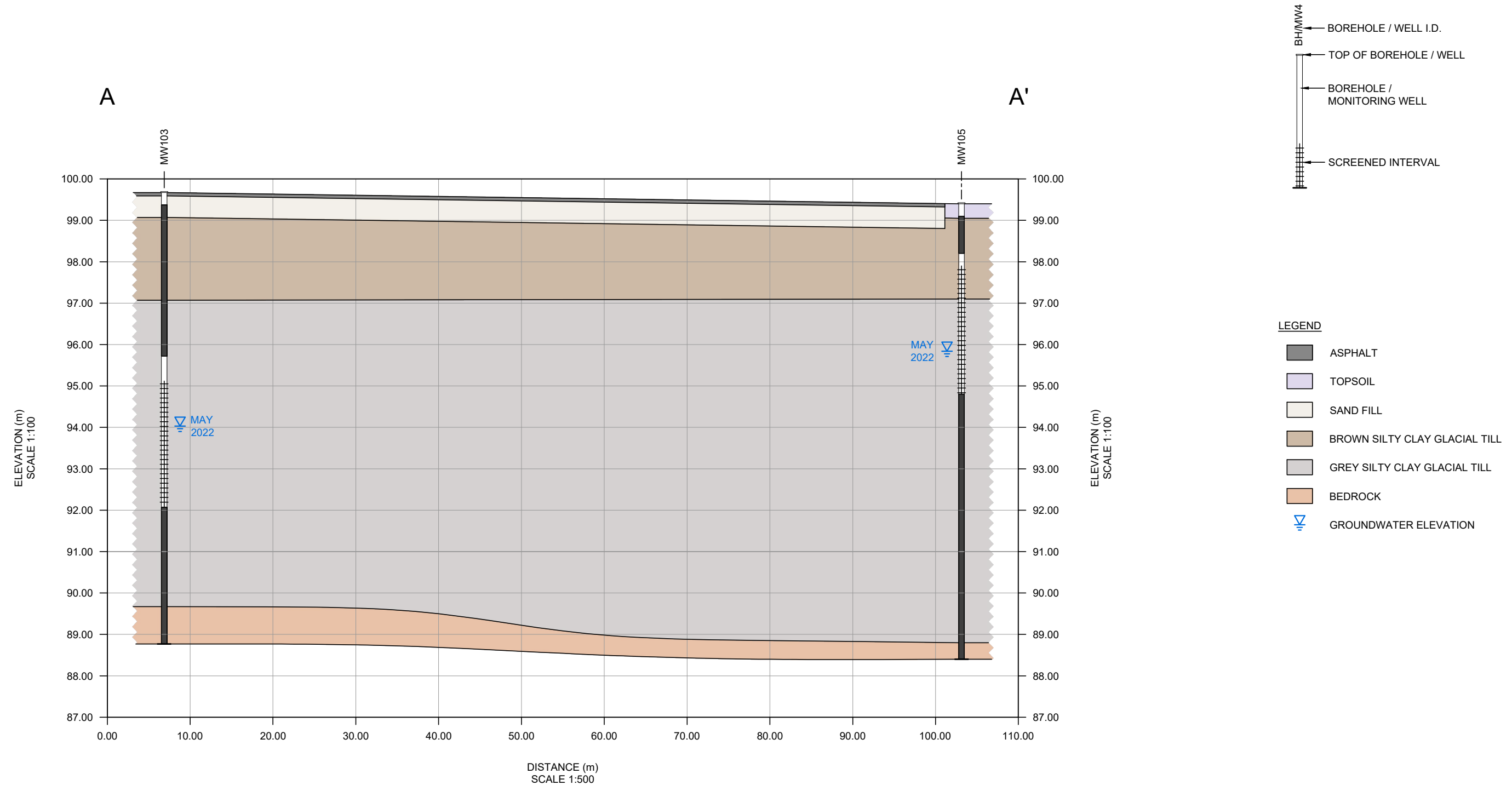


- LEGEND
- SITE BOUNDARY
 - WATER WELL LOCATION
 - DRINKING WATER WELL LOCATION

NOTES:
LOCATIONS ARE APPROXIMATE.

WATER WELL LOCATION MAP		
1310 SOUTH SERVICE ROAD, STONEY CREEK, ONTARIO		
0138-001.02	JUNE 2022	FIGURE 4

File: 0138-001.02_22PH2.dwg Date: June 23, 2022 12:59:54 PM By: Chris



DRAWING SHOULD BE PRINTED ON 11x17
PAPER FOR ACCURATE SCALING.



CROSS-SECTION A-A'
1310 SOUTH SERVICE ROAD,
STONEY CREEK, ONTARIO

0138-001.02

JUNE 2022

FIGURE 5

APPENDIX A
Record of Borehole Sheets

Explanation of Terms Used in the Record of Borehole Sheets

Classification of Soils

As per Unified Soil Classification System ASTM D2487

Consistency (Cohesive Soils)

Consistency	Undrained Shear Strength (kPa)	N-value
Very soft	<12	0-2
Soft	12-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very stiff	100-200	15-30
hard	>200	>30

Compactness (Cohesionless Soils)

Compactness	N-value
Very loose	<4
Loose	4-10
Compact	10-30
Dense	30-50
Very dense	>50

Sample Types

GS	Grab Sample
DP	Direct Push soil core sample
RC	Rock core
SS	Split Spoon sample
TW	Thin walled sample

Recovery

- ☒ Sample recovery
- ☐ No sample recovery

Soil Boundaries

The boundaries of the soil strata encountered are presented on the borehole logs as dashed and solid lines. Dashed lines represent an assumed boundary between soil strata, while a solid line represents an observed transition between soil strata within the recovered soil samples.

Cobbles and Boulders

Cobbles and boulders may be encountered within the soil deposits, which cannot be sampled in their boreholes. Glacial till is known to contain cobbles and boulders due to the nature of their formation/deposition and should be expected in any excavations within the soil.

Fill

It should be noted that fill is heterogeneous in nature and has a variable compactness, consistency, or degree of compaction. The fill description is based solely on the soil sample retrieved and may not be representative of the entire layer. All fills should be expected to contain variable materials, including possible obstructions, such as wood, concrete, etc. which may not have been encountered within the boreholes. The depth of fill may also be variable and cannot be detected solely on the results of the boreholes. Testpits are recommended to confirm the variability of the material and depth of the fill.

Project No.:0138-001.02

Drilling Date:3/30/2022

Project: Geotechnical Assessment

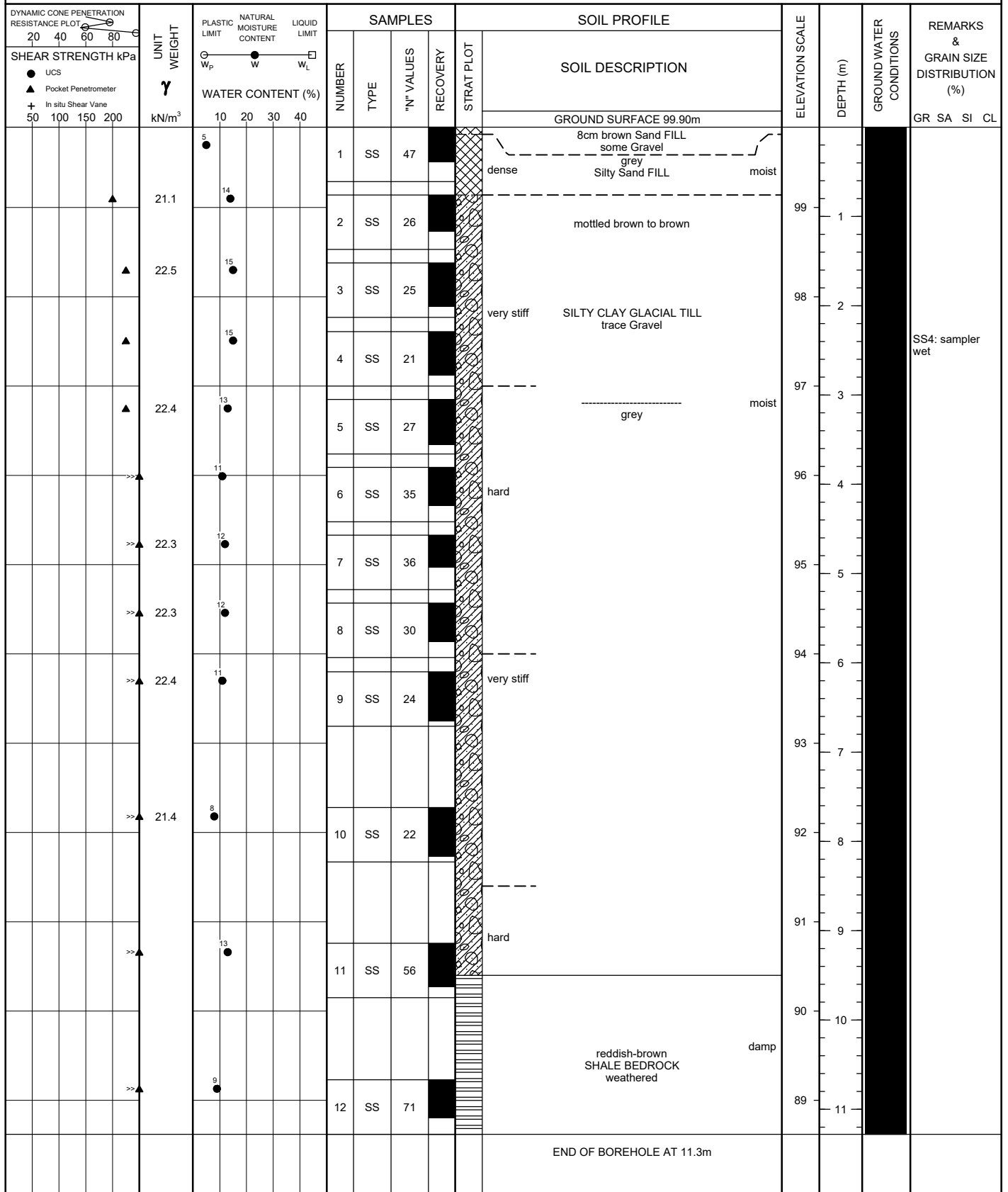
Drilling Method: Hollow Stem Augering

Location: 1310 South Service Road, Stoney Creek, Ontario

Hole Diameter: 225mm

Client: Jennum Properties Inc.

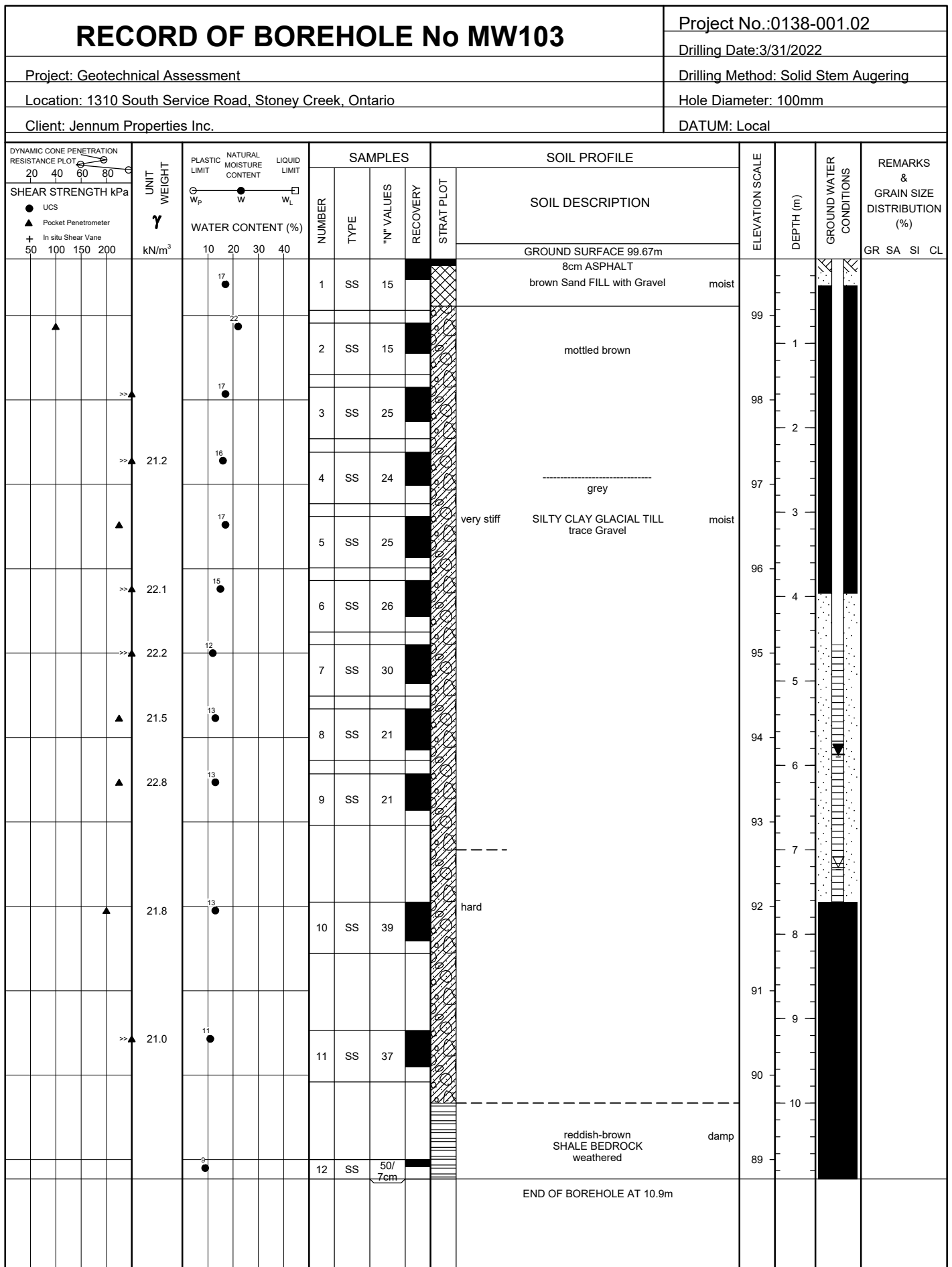
DATUM: Local



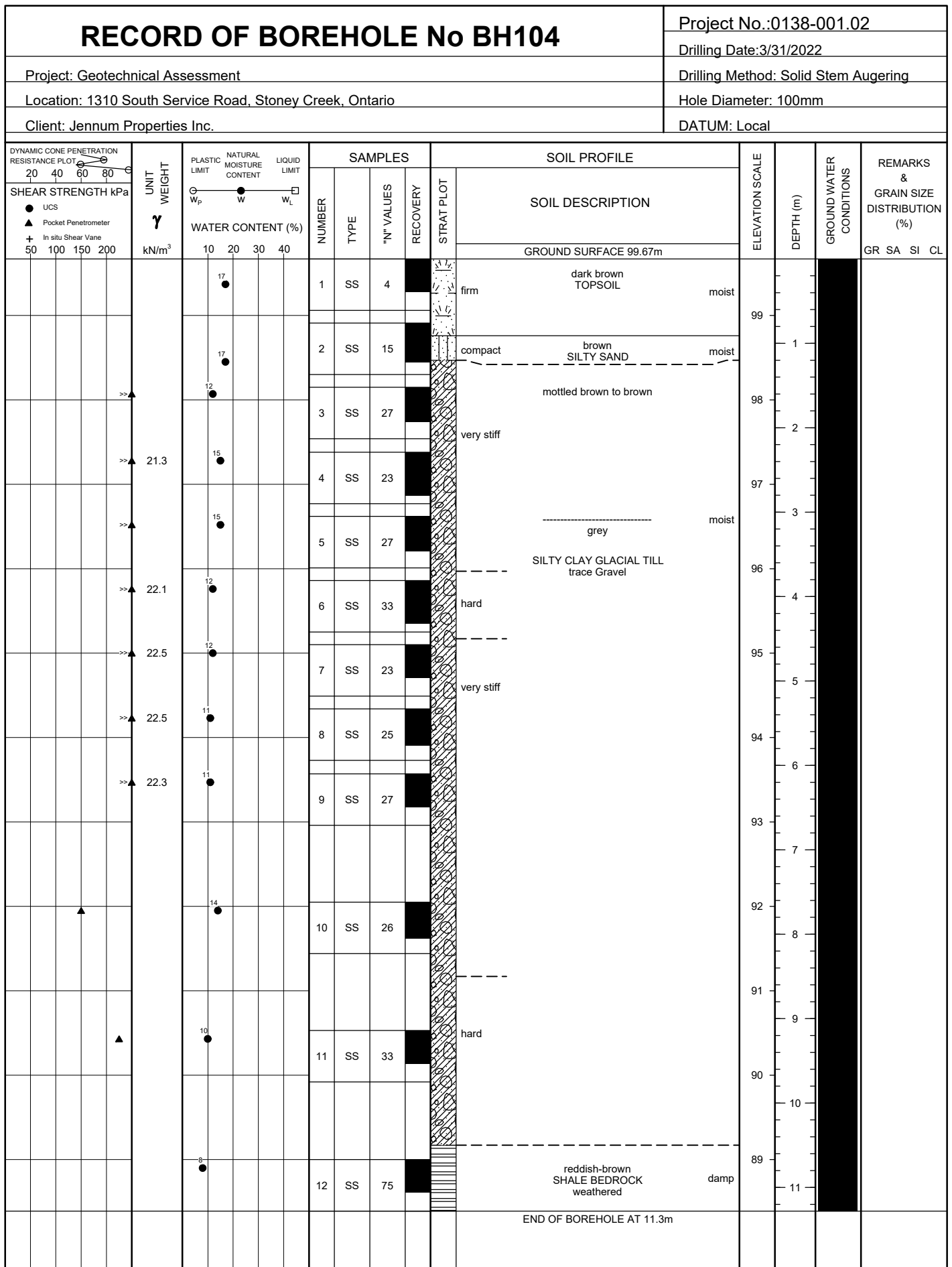
LOGGED BY CFM

RECORD OF BOREHOLE No BH102														Project No.:0138-001.02			
Project: Geotechnical Assessment Location: 1310 South Service Road, Stoney Creek, Ontario Client: Jennum Properties Inc.														Drilling Date:3/30/2022			
														Drilling Method: Hollow Stem Augering			
														Hole Diameter: 225mm			
														DATUM: Local			
<div>DYNAMIC CONE PENETRATION RESISTANCE PLOT</div> <div><div>20 40 60 80</div><div>● UCS ▲ Pocket Penetrometer + In situ Shear Vane</div><div>50 100 150 200</div></div> <div><div>UNIT WEIGHT</div><div>γ</div><div>kN/m³</div></div> <div><div>PLASTIC LIMIT W_P</div><div>NATURAL MOISTURE CONTENT W</div><div>LIQUID LIMIT W_L</div></div> <div><div>WATER CONTENT (%)</div><div>10 20 30 40</div></div> <div><div>SAMPLES</div><div><div>NUMBER</div><div>TYPE</div><div>"N" VALUES</div><div>RECOVERY</div></div></div> <div><div>SOIL PROFILE</div><div><div>SOIL DESCRIPTION</div><div>GROUND SURFACE 99.40m</div></div></div> <div><div>ELEVATION SCALE</div></div> <div><div>DEPTH (m)</div></div> <div><div>GROUND WATER CONDITIONS</div></div> <div><div>REMARKS & GRAIN SIZE DISTRIBUTION (%)</div><div>GR SA SI CL</div></div>																	
<div>loose</div> <div>8cm ASPHALT grey Gravel FILL with Sand</div> <div>wet</div>																	
<div>mottled brown to brown</div>																	
<div>grey</div>																	
<div>very stiff</div> <div>SILTY CLAY GLACIAL TILL trace Gravel</div> <div>moist</div>																	
<div>hard</div>																	
<div>END OF BOREHOLE AT 11.1m</div>																	

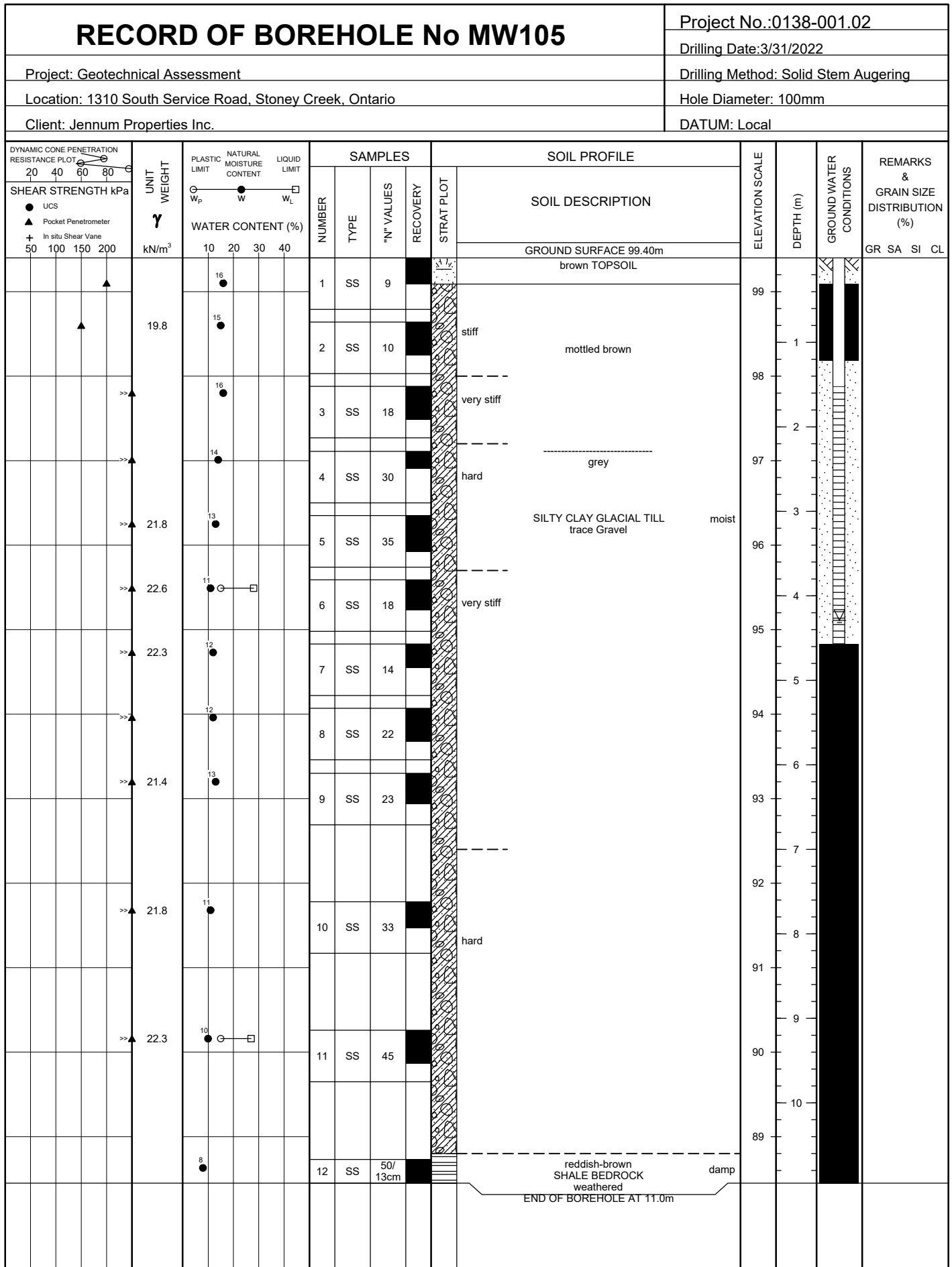
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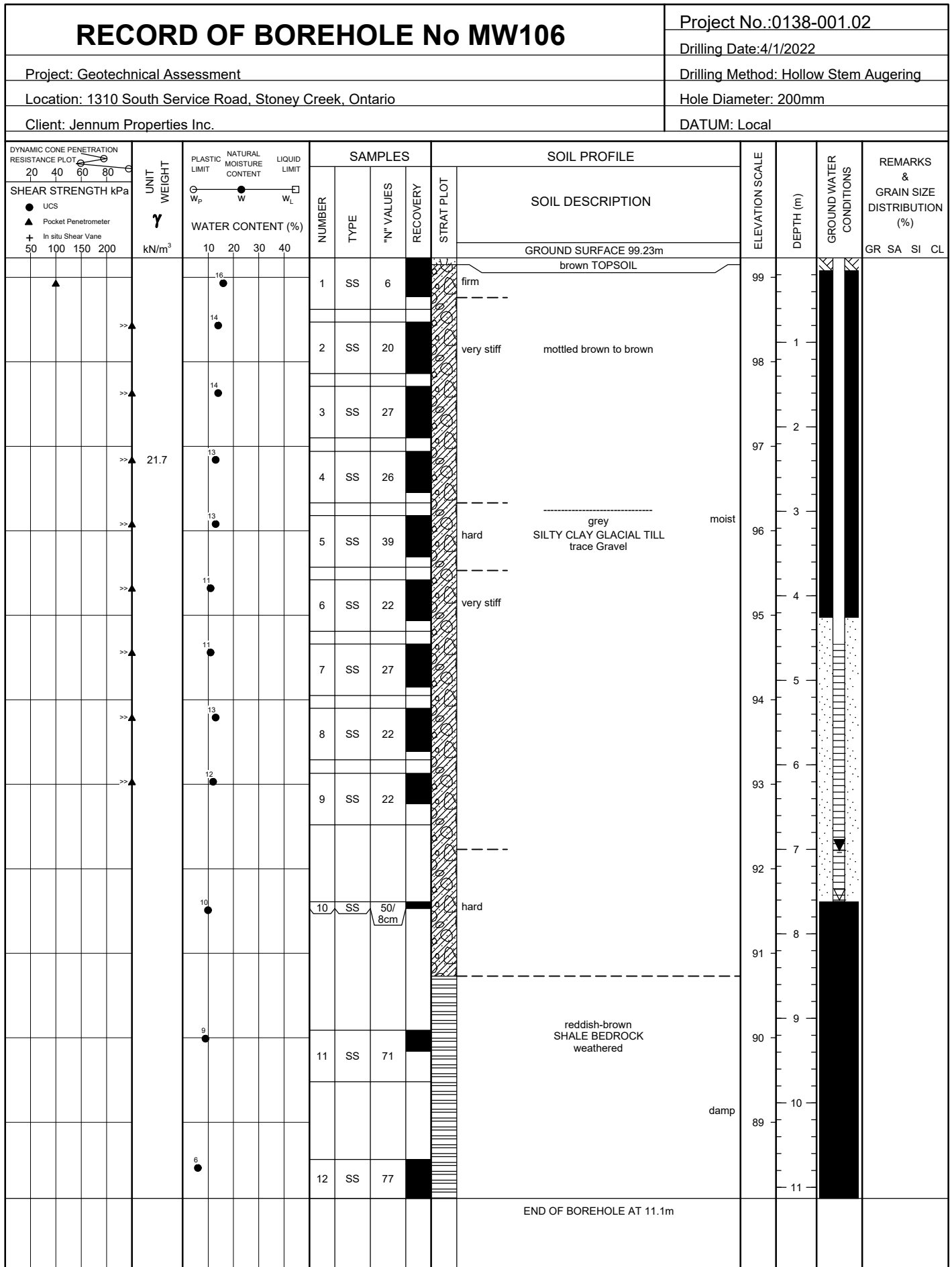
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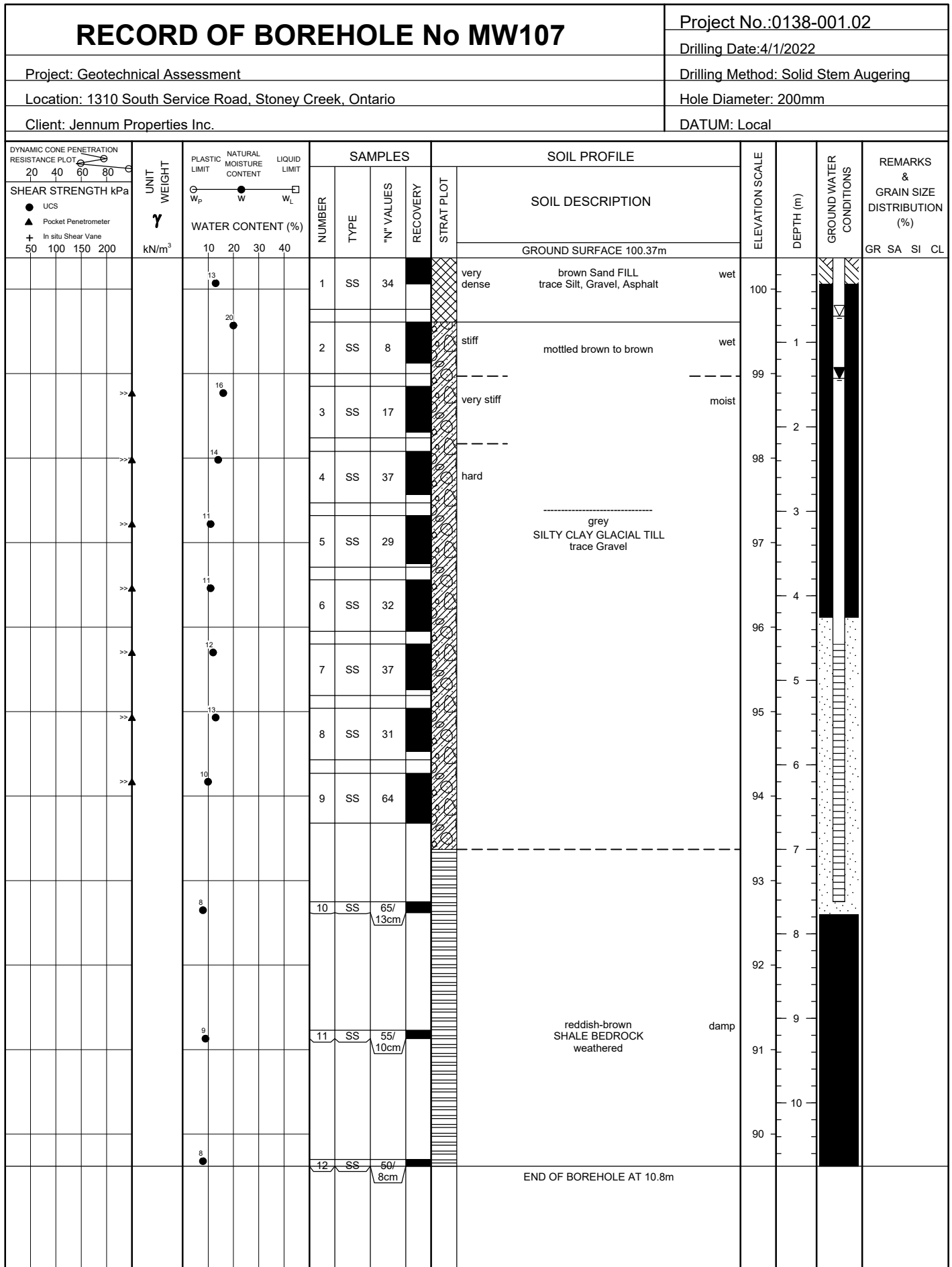
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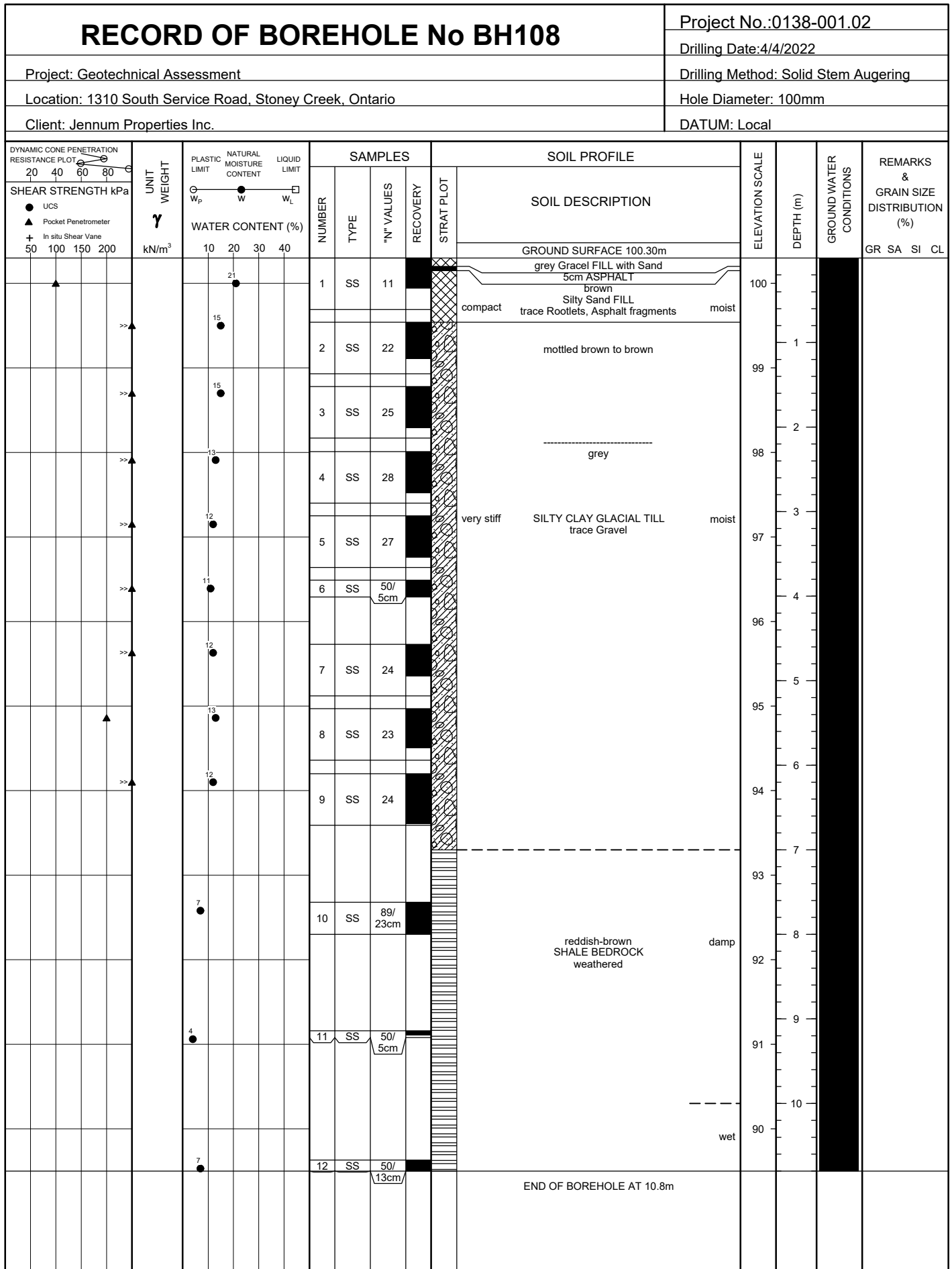
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RECORD OF BOREHOLE No BH109										Project No.:0138-001.02								
										Drilling Date:4/4/2022								
Project: Geotechnical Assessment										Drilling Method: Solid Stem Augering								
Location: 1310 South Service Road, Stoney Creek, Ontario										Hole Diameter: 100mm								
Client: Jennum Properties Inc.										DATUM: Local								
DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 ● UCS ▲ Pocket Penetrometer + In situ Shear Vane 50 100 150 200		UNIT WEIGHT WEIGHT γ kN/m ³	PLASTIC LIMIT W _p		NATURAL MOISTURE CONTENT W		LIQUID LIMIT W _L		SAMPLES		SOIL PROFILE		ELEVATION SCALE	DEPTH (m)	GROUND WATER CONDITIONS	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
WATER CONTENT (%) 10 20 30 40			NUMBER	TYPE	"N" VALUES	RECOVERY	STRAT PLOT	SOIL DESCRIPTION										
GROUND SURFACE 100.46m																		

LOGGED BY CFM

PAGE 1 OF 1



RECORD OF BOREHOLE No BH111														Project No.:0138-001.02			
														Drilling Date:4/5/2022			
Project: Geotechnical Assessment														Drilling Method: Solid Stem Augering			
Location: 1310 South Service Road, Stoney Creek, Ontario														Hole Diameter: 100mm			
Client: Jennum Properties Inc.														DATUM: Local			

DYNAMIC CONE PENETRATION RESISTANCE PLOT				UNIT WEIGHT γ kN/m ³	PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT LIMIT				SAMPLES				SOIL PROFILE		ELEVATION SCALE	DEPTH (m)	GROUND WATER CONDITIONS	REMARKS & GRAIN SIZE DISTRIBUTION (%)	
SHEAR STRENGTH kPa					W _p W W _L				NUMBER	TYPE	"N" VALUES	RECOVERY	STRAT PLOT	SOIL DESCRIPTION					
● UCS ▲ Pocket Penetrometer + In situ Shear Vane														GROUND SURFACE 99.57m 10cm ASPHALT brown Sand FILL with Gravel black staining at 0.33m brown Sand FILL trace Silt black staining at 0.51m brown Sandy Silt FILL					
50 100 150 200				10 20 30 40										compact moist hard black staining from 1.8 to 2.3m SILTY CLAY GLACIAL TILL trace Gravel grey very stiff mosit hard very stiff					
								1	SS	18									
								2	SS	22									
								3	SS	36									
								4	SS	29									
								5	SS	25									
								6	SS	27									
								7	SS	26									
								8	SS	32									
								9	SS	26									
END OF BOREHOLE AT 6.7m																			

LOGGED BY CFM

RECORD OF BOREHOLE No MW112														Project No.:0138-001.02			
														Drilling Date:4/5/2022			
Project: Geotechnical Assessment														Drilling Method: Hollow Stem Augering			
Location: 1310 South Service Road, Stoney Creek, Ontario														Hole Diameter: 225mm			
Client: Jennum Properties Inc.														DATUM: Local			

DYNAMIC CONE PENETRATION RESISTANCE PLOT				UNIT WEIGHT γ kN/m ³	PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT LIMIT				SAMPLES				SOIL PROFILE		ELEVATION SCALE	DEPTH (m)	GROUND WATER CONDITIONS	REMARKS & GRAIN SIZE DISTRIBUTION (%)		
SHEAR STRENGTH kPa					WATER CONTENT (%)				NUMBER	TYPE	"N" VALUES	RECOVERY	STRAT PLOT	SOIL DESCRIPTION						
● UCS ▲ Pocket Penetrometer + In situ Shear Vane					W _p W W _L									GROUND SURFACE 99.31m 8cm ASPHALT						
50 100 150 200				10 20 30 40										moist						
								1	SS	18				compact		99				
								2	SS	32				dense	---	1				
								3	SS	52				very dense	---	2				
								4	SS	35				dense	---	3				
								5	SS	18				compact	---	4				
								6	SS	24						4				
								7	SS	12						5				
▲								8	SS	22				very stiff	moist	5				
END OF BOREHOLE AT 5.9m																				

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RECORD OF BOREHOLE No MW113												Project No.:0138-001.02			
												Drilling Date:4/5/2022			
Project: Geotechnical Assessment												Drilling Method: Hollow Stem Augering			
Location: 1310 South Service Road, Stoney Creek, Ontario												Hole Diameter: 225mm			
Client: Jennum Properties Inc.												DATUM: Local			

DYNAMIC CONE PENETRATION RESISTANCE PLOT				UNIT WEIGHT γ kN/m ³	PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT LIMIT				SAMPLES				SOIL PROFILE		ELEVATION SCALE	DEPTH (m)	GROUND WATER CONDITIONS	REMARKS & GRAIN SIZE DISTRIBUTION (%)	
SHEAR STRENGTH kPa					WATER CONTENT (%)				NUMBER	TYPE	"N" VALUES	RECOVERY	STRAT PLOT	SOIL DESCRIPTION					
● UCS ▲ Pocket Penetrometer + In situ Shear Vane				W _p W W _L												GROUND SURFACE 99.48m			
50 100 150 200				10 20 30 40										brown TOPSOIL					
								1		SS		4		loose		brown Sand FILL with Gravel		moist	
								2		SS		10		loose		brown Silt FILL with Gravel, trace Clay		wet	
								3		SS		26		stiff		grey Gravel FILL trace Sand		brown to mottled brown	
								4		SS		17		very stiff		grey SILTY CLAY GLACIAL TILL trace Gravel			
								5		SS		17							
								6		SS		17							
								7		SS		18							
END OF BOREHOLE AT 5.2m																			

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Project No.:0138-001.02

Drilling Date:4/5/2022

Project: Geotechnical Assessment

Drilling Method: Hollow Stem Augering

Location: 1310 South Service Road, Stoney Creek, Ontario

Hole Diameter: 225mm

Client: Jennum Properties Inc.

DATUM: Local

DYNAMIC CONE PENETRATION RESISTANCE PLOT				UNIT WEIGHT				SAMPLES				SOIL PROFILE		ELEVATION SCALE	DEPTH (m)	GROUND WATER CONDITIONS	REMARKS & GRAIN SIZE DISTRIBUTION (%)
SHEAR STRENGTH kPa				WATER CONTENT (%)				NUMBER	TYPE	"N" VALUES	RECOVERY	STRAT PLOT	SOIL DESCRIPTION				
● UCS ▲ Pocket Penetrometer + In situ Shear Vane				PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT W _p W W _L													
20 40 60 80 50 100 150 200				10 20 30 40													
								1	SS	24			compact	8cm ASPHALT brown Gravel FILL with Sand	moist	99	
▲								2	SS	24				black staining at 0.8m brown to mottled brown		1	
>>>▲								3	SS	22						2	
>>>▲								4	SS	23				grey SILTY CLAY GLACIAL TILL trace Gravel		3	
>>>▲								5	SS	21			very stiff		moist	4	
>>>▲								6	SS	15						5	
>>>▲								7	SS	23							
END OF BOREHOLE AT 5.2m																	

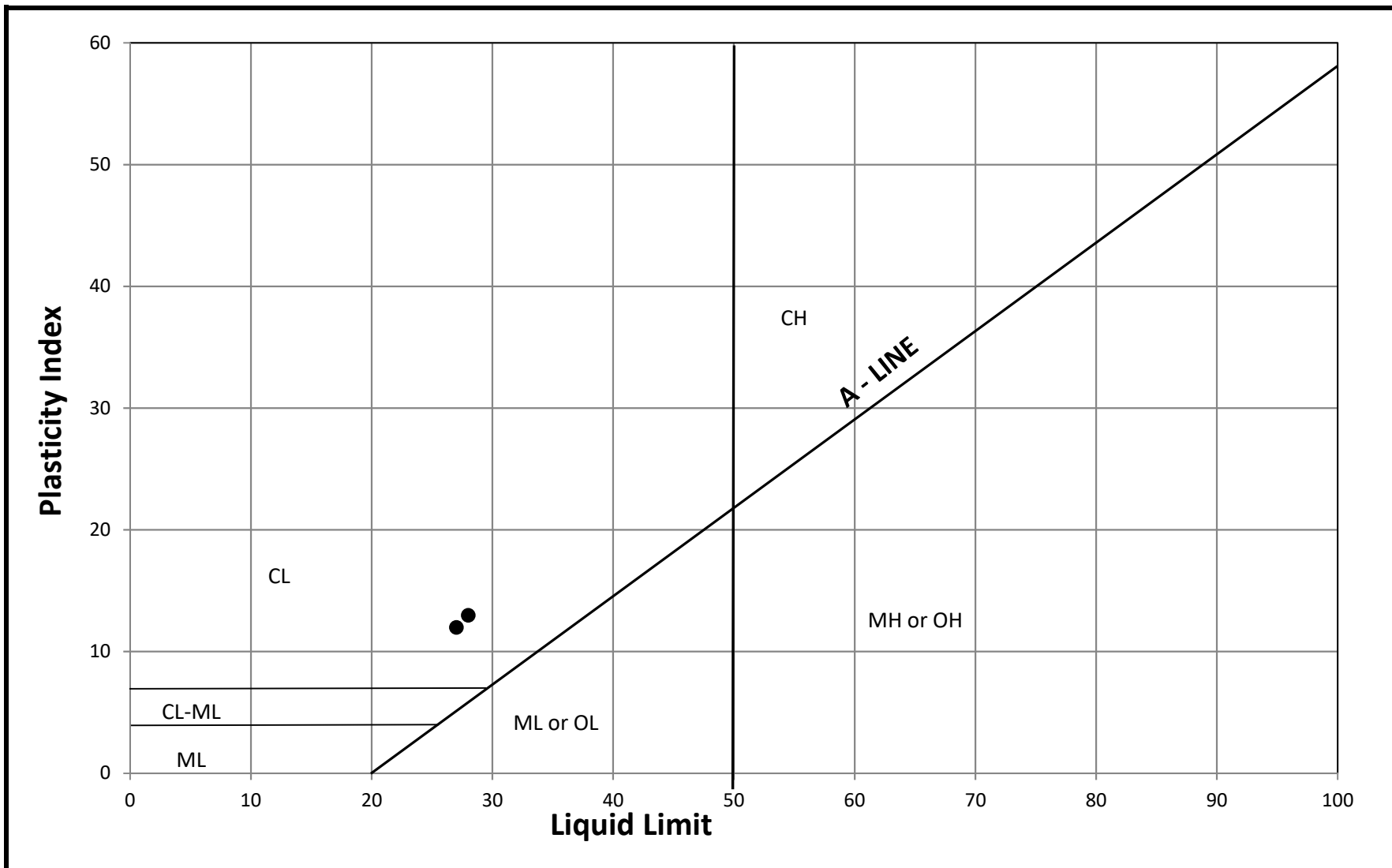
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PAGE 1 OF 1



APPENDIX B

Geotechnical Laboratory Results



	PLASTICITY CHART	Project No: D22115
		Project:
Date: April 2022	SILTY CLAY GLACIAL TILL	1301 South Service Road Hamilton, Ontario
Checked: AD		

APPENDIX C

Hydraulic Conductivity Test Results

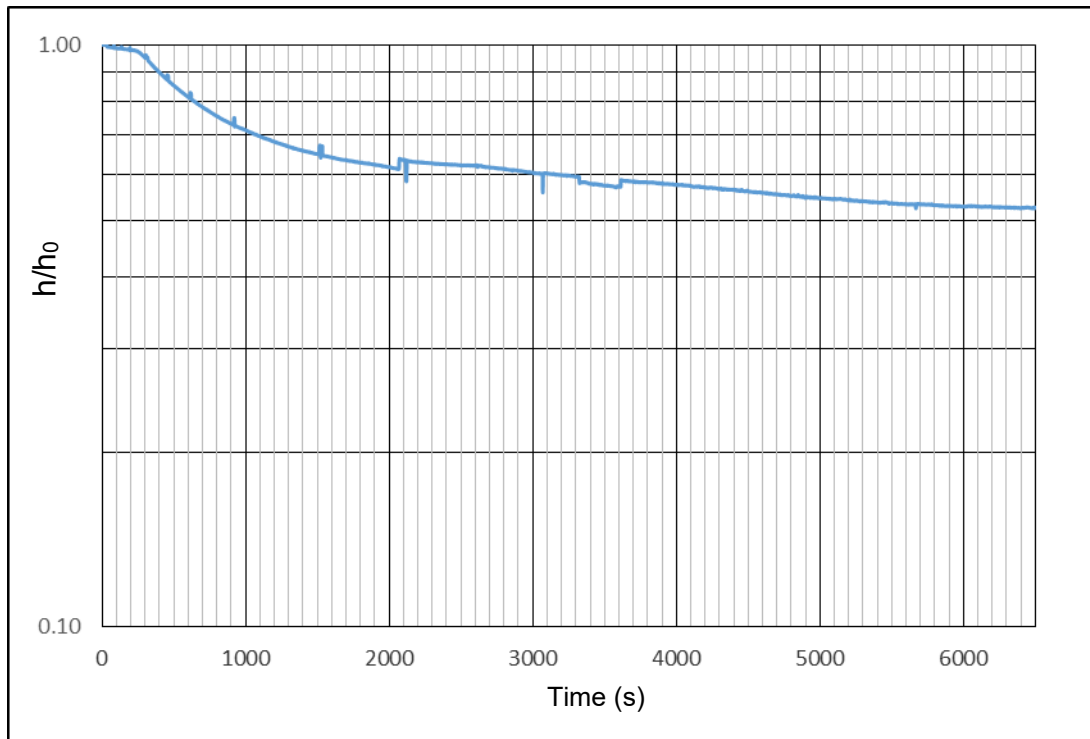
RIISING HEAD TEST RESULTS

Monitoring Well No. MW106

Date: May 19, 2022

Solinst Levelogger

Initial Displacement: 0.26m



The hydraulic conductivity, k (m/s), was evaluated using the following expression (Hvorslev's Method).

$$k = \frac{R^2}{2LT_0} \ln \frac{L}{r}$$

Where

- k = hydraulic conductivity (cm/s) = **3.83×10^{-8} m/s**
- L = saturated length of well screen = 0.61m
- R = well radius = 0.025m
- r = bore radius = 0.100m
- T_0 = basic time lag (37% recovery) = 24,200 s

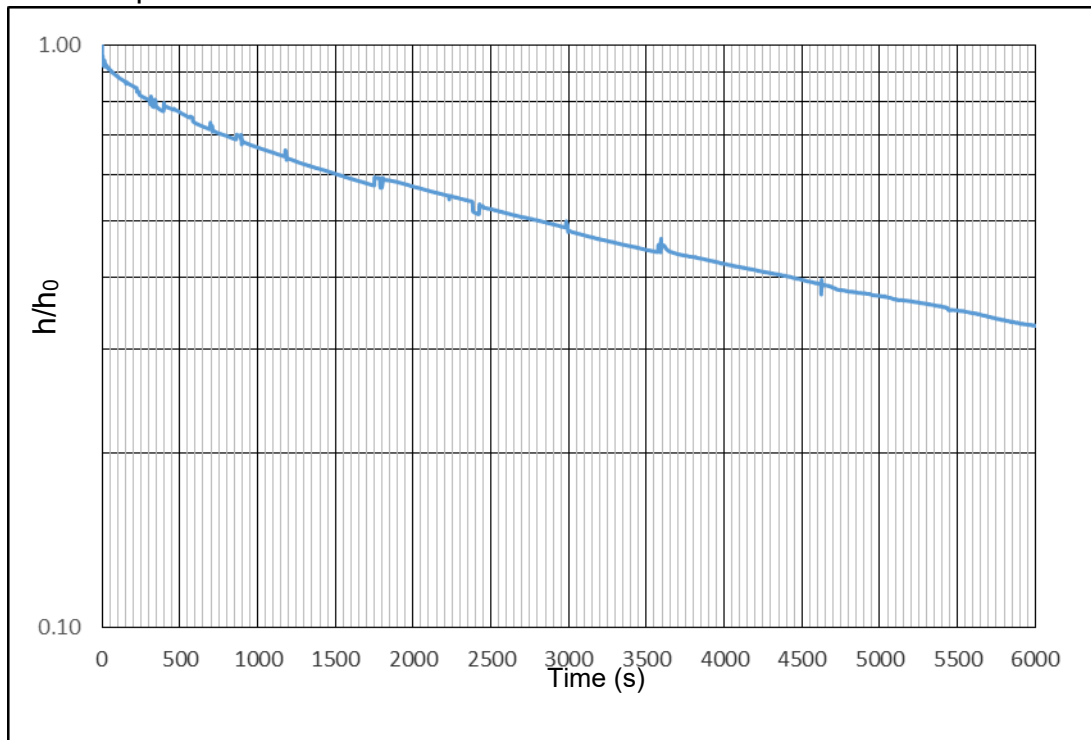
RIISING HEAD TEST RESULTS

Monitoring Well No. MW107

Date: May 19, 2022

Solinst Levellogger

Initial Displacement: 0.43m



The hydraulic conductivity, k (m/s), was evaluated using the following expression (Hvorslev's Method).

$$k = \frac{R^2}{2LT_0} \ln \frac{L}{r}$$

Where

- k = hydraulic conductivity (cm/s) = **6.54×10^{-8} m/s**
- L = saturated length of well screen = 3.05m
- R = well radius = 0.025m
- r = bore radius = 0.025m
- T_0 = basic time lag (37% recovery) = 7530 s

APPENDIX D
Laboratory Certificates of Analysis



Your P.O. #: 0138-001.02
Your Project #: 0138-001.02
Site Location: 1310 SOUTH SERVICE ROAD
Your C.O.C. #: 871757-02-01

Attention: Oshin Gharabegian

BLUEFROG ENVIRONMENTAL CONSULTING INC.
SUITE 100-208 WYECROFT ROAD
OAKVILLE, ON
CANADA L6K 3T8

Report Date: 2022/04/19

Report #: R7090918

Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C295746

Received: 2022/04/11, 19:01

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Sewer Use By-Law Semivolatile Organics	1	2022/04/12	2022/04/13	CAM SOP 00301	EPA 8270 m
Carbonaceous BOD	1	2022/04/12	2022/04/17	CAM SOP-00427	SM 23 5210B m
Chloride by Automated Colourimetry	1	N/A	2022/04/13	CAM SOP-00463	SM 23 4500-Cl E m
Total Cyanide	1	2022/04/12	2022/04/12	CAM SOP-00457	OMOE E3015 5 m
Fluoride	1	2022/04/12	2022/04/13	CAM SOP-00449	SM 23 4500-F C m
Mercury in Water by CVAA	1	2022/04/13	2022/04/13	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by Axial ICP	1	2022/04/13	2022/04/13	CAM SOP-00408	EPA 6010D m
E.coli, (CFU/100mL)	1	N/A	2022/04/11	CAM SOP-00552	MOE LSB E3371
Animal and Vegetable Oil and Grease	1	N/A	2022/04/18	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2022/04/17	2022/04/17	CAM SOP-00326	EPA1664B m,SM5520B m
OC Pesticides (Selected) & PCB (1)	1	2022/04/13	2022/04/14	CAM SOP-00307	EPA 8081A/8082B m
OC Pesticides Summed Parameters	1	N/A	2022/04/12	CAM SOP-00307	EPA 8081A/8082B m
pH	1	2022/04/12	2022/04/13	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2022/04/12	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	1	N/A	2022/04/13	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	1	2022/04/13	2022/04/18	CAM SOP-00938	OMOE E3516 m
Total PAHs (Hamilton, Ottawa S.U.B.) (2)	1	N/A	2022/04/13	CAM SOP - 00301	
Mineral/Synthetic O & G (TPH Heavy Oil) (3)	1	2022/04/17	2022/04/17	CAM SOP-00326	EPA1664B m,SM5520F m
Total Suspended Solids	1	2022/04/14	2022/04/18	CAM SOP-00428	SM 23 2540D m
Volatile Organic Compounds in Water	1	N/A	2022/04/13	CAM SOP-00228	EPA 8260C m

Remarks:

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

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

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or



Your P.O. #: 0138-001.02
Your Project #: 0138-001.02
Site Location: 1310 SOUTH SERVICE ROAD
Your C.O.C. #: 871757-02-01

Attention: Oshin Gharabegian

BLUEFROG ENVIRONMENTAL CONSULTING INC.
SUITE 100-208 WYECROFT ROAD
OAKVILLE, ON
CANADA L6K 3T8

Report Date: 2022/04/19
Report #: R7090918
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C295746

Received: 2022/04/11, 19:01

implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

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

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane

(2) Total PAHs include only those PAHs specified in the sewer use by-law.

(3) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Deepthi Shaji, Project Manager

Email: Deepthi.Shaji@bureauveritas.com

Phone# (905)817-5700 Ext:7065843

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This report has been generated and distributed using a secure automated process.

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.

For Service Group specific validation please refer to the Validation Signature Page.



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VERITAS

Bureau Veritas Job #: C295746

Report Date: 2022/04/19

BLUEFROG ENVIRONMENTAL CONSULTING INC.

Client Project #: 0138-001.02

Site Location: 1310 SOUTH SERVICE ROAD

Your P.O. #: 0138-001.02

Sampler Initials: CFM

HAMILTON SANITARY & STORM BYLAW (14-090)

Bureau Veritas ID		SIJ096			SIJ096		
Sampling Date		2022/04/11 11:28			2022/04/11 11:28		
COC Number		871757-02-01			871757-02-01		
	UNITS	MW107	RDL	QC Batch	MW107 Lab-Dup	RDL	QC Batch

Calculated Parameters							
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	7934160			
Inorganics							
Total Carbonaceous BOD	mg/L	<2	2	7935409			
Fluoride (F-)	mg/L	0.51	0.10	7936005	0.51	0.10	7936005
Total Kjeldahl Nitrogen (TKN)	mg/L	2.6	0.10	7939275			
pH	pH	7.58		7936008	7.77		7936008
Phenols-4AAP	mg/L	<0.0010	0.0010	7935690			
Total Suspended Solids	mg/L	58	10	7935437			
Dissolved Sulphate (SO4)	mg/L	970	5.0	7934808			
Total Cyanide (CN)	mg/L	<0.0050	0.0050	7935857			
Dissolved Chloride (Cl-)	mg/L	1100	10	7934806			
Petroleum Hydrocarbons							
Total Oil & Grease	mg/L	<0.50	0.50	7943662			
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	7943663			
Metals							
Total Aluminum (Al)	mg/L	1.2	0.1	7937727			
Total Antimony (Sb)	mg/L	<0.02	0.02	7937727			
Total Arsenic (As)	mg/L	<0.01	0.01	7937727			
Total Bismuth (Bi)	mg/L	<0.05	0.05	7937727			
Total Cadmium (Cd)	mg/L	<0.002	0.002	7937727			
Total Chromium (Cr)	mg/L	<0.01	0.01	7937727			
Total Cobalt (Co)	mg/L	<0.002	0.002	7937727			
Total Copper (Cu)	mg/L	<0.01	0.01	7937727			
Total Iron (Fe)	mg/L	1.8	0.02	7937727			
Total Lead (Pb)	mg/L	<0.01	0.01	7937727			
Total Manganese (Mn)	mg/L	0.53	0.001	7937727			
Mercury (Hg)	mg/L	<0.00010	0.00010	7937652	<0.00010	0.00010	7937652
Total Molybdenum (Mo)	mg/L	0.013	0.005	7937727			
Total Nickel (Ni)	mg/L	<0.005	0.005	7937727			
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
Lab-Dup = Laboratory Initiated Duplicate							



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Bureau Veritas Job #: C295746

Report Date: 2022/04/19

BLUEFROG ENVIRONMENTAL CONSULTING INC.

Client Project #: 0138-001.02

Site Location: 1310 SOUTH SERVICE ROAD

Your P.O. #: 0138-001.02

Sampler Initials: CFM

HAMILTON SANITARY & STORM BYLAW (14-090)

Bureau Veritas ID		SIJ096			SIJ096		
Sampling Date		2022/04/11 11:28			2022/04/11 11:28		
COC Number		871757-02-01			871757-02-01		
	UNITS	MW107	RDL	QC Batch	MW107 Lab-Dup	RDL	QC Batch
Total Phosphorus (P)	mg/L	<0.05	0.05	7937727			
Total Selenium (Se)	mg/L	<0.02	0.02	7937727			
Total Silver (Ag)	mg/L	<0.01	0.01	7937727			
Total Tin (Sn)	mg/L	<0.02	0.02	7937727			
Total Titanium (Ti)	mg/L	0.023	0.005	7937727			
Total Vanadium (V)	mg/L	<0.005	0.005	7937727			
Total Zinc (Zn)	mg/L	0.005	0.005	7937727			
Semivolatile Organics							
Di-N-butyl phthalate	ug/L	<2	2	7935189			
Bis(2-ethylhexyl)phthalate	ug/L	<2	2	7935189			
3,3'-Dichlorobenzidine	ug/L	<0.8	0.8	7935189			
Pentachlorophenol	ug/L	<1	1	7935189			
Phenanthrene	ug/L	<0.2	0.2	7935189			
Anthracene	ug/L	<0.2	0.2	7935189			
Fluoranthene	ug/L	<0.2	0.2	7935189			
Pyrene	ug/L	<0.2	0.2	7935189			
Benzo(a)anthracene	ug/L	<0.2	0.2	7935189			
Chrysene	ug/L	<0.2	0.2	7935189			
Benzo(b,j)fluoranthene	ug/L	<0.2	0.2	7935189			
Benzo(k)fluoranthene	ug/L	<0.2	0.2	7935189			
Benzo(a)pyrene	ug/L	<0.2	0.2	7935189			
Indeno(1,2,3-cd)pyrene	ug/L	<0.2	0.2	7935189			
Dibenzo(a,h)anthracene	ug/L	<0.2	0.2	7935189			
Benzo(g,h,i)perylene	ug/L	<0.2	0.2	7935189			
Dibenzo(a,i)pyrene	ug/L	<0.2	0.2	7935189			
Benzo(e)pyrene	ug/L	<0.2	0.2	7935189			
Perylene	ug/L	<0.2	0.2	7935189			
Dibenzo(a,j) acridine	ug/L	<0.4	0.4	7935189			
7H-Dibenzo(c,g) Carbazole	ug/L	<0.4	0.4	7935189			
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
Lab-Dup = Laboratory Initiated Duplicate							



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Bureau Veritas Job #: C295746

Report Date: 2022/04/19

BLUEFROG ENVIRONMENTAL CONSULTING INC.

Client Project #: 0138-001.02

Site Location: 1310 SOUTH SERVICE ROAD

Your P.O. #: 0138-001.02

Sampler Initials: CFM

HAMILTON SANITARY & STORM BYLAW (14-090)

Bureau Veritas ID		SIJ096			SIJ096		
Sampling Date		2022/04/11 11:28			2022/04/11 11:28		
COC Number		871757-02-01			871757-02-01		
	UNITS	MW107	RDL	QC Batch	MW107 Lab-Dup	RDL	QC Batch
Calculated Parameters							
Total PAHs (18 PAHs)	ug/L	<0.96	0.96	7934841			
Volatile Organics							
Benzene	ug/L	<0.40	0.40	7935761			
Chloroform	ug/L	<0.40	0.40	7935761			
1,2-Dichlorobenzene	ug/L	<0.80	0.80	7935761			
1,4-Dichlorobenzene	ug/L	<0.80	0.80	7935761			
cis-1,2-Dichloroethylene	ug/L	<1.0	1.0	7935761			
trans-1,3-Dichloropropene	ug/L	<0.80	0.80	7935761			
Ethylbenzene	ug/L	<0.40	0.40	7935761			
Methylene Chloride(Dichloromethane)	ug/L	<4.0	4.0	7935761			
1,1,2,2-Tetrachloroethane	ug/L	<0.80	0.80	7935761			
Tetrachloroethylene	ug/L	<0.40	0.40	7935761			
Toluene	ug/L	<0.40	0.40	7935761			
Trichloroethylene	ug/L	<0.40	0.40	7935761			
p+m-Xylene	ug/L	<0.40	0.40	7935761			
o-Xylene	ug/L	<0.40	0.40	7935761			
Total Xylenes	ug/L	<0.40	0.40	7935761			
Pesticides & Herbicides							
Aldrin	ug/L	<0.005	0.005	7937536	<0.005	0.005	7937536
Dieldrin	ug/L	<0.005	0.005	7937536	<0.005	0.005	7937536
a-Chlordane	ug/L	<0.005	0.005	7937536	<0.005	0.005	7937536
g-Chlordane	ug/L	<0.005	0.005	7937536	<0.005	0.005	7937536
o,p-DDT	ug/L	<0.005	0.005	7937536	<0.005	0.005	7937536
p,p-DDT	ug/L	<0.005	0.005	7937536	<0.005	0.005	7937536
Lindane	ug/L	<0.003	0.003	7937536	<0.003	0.003	7937536
Hexachlorobenzene	ug/L	0.032	0.005	7937536	0.030	0.005	7937536
Mirex	ug/L	<0.005	0.005	7937536	<0.005	0.005	7937536
Microbiological							
Escherichia coli	CFU/100mL	<10	10	7934920			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate							



BUREAU
VERITAS

Bureau Veritas Job #: C295746

Report Date: 2022/04/19

BLUEFROG ENVIRONMENTAL CONSULTING INC.

Client Project #: 0138-001.02

Site Location: 1310 SOUTH SERVICE ROAD

Your P.O. #: 0138-001.02

Sampler Initials: CFM

HAMILTON SANITARY & STORM BYLAW (14-090)

Bureau Veritas ID		SIJ096			SIJ096		
Sampling Date		2022/04/11 11:28			2022/04/11 11:28		
COC Number		871757-02-01			871757-02-01		
	UNITS	MW107	RDL	QC Batch	MW107 Lab-Dup	RDL	QC Batch
Surrogate Recovery (%)							
2,4,6-Tribromophenol	%	77		7935189			
2-Fluorobiphenyl	%	35		7935189			
D14-Terphenyl (FS)	%	87		7935189			
D5-Nitrobenzene	%	41		7935189			
D8-Acenaphthylene	%	43		7935189			
2,4,5,6-Tetrachloro-m-xylene	%	84		7937536	92		7937536
Decachlorobiphenyl	%	113		7937536	114		7937536
4-Bromofluorobenzene	%	96		7935761			
D4-1,2-Dichloroethane	%	111		7935761			
D8-Toluene	%	89		7935761			
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
Lab-Dup = Laboratory Initiated Duplicate							



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Bureau Veritas Job #: C295746

Report Date: 2022/04/19

BLUEFROG ENVIRONMENTAL CONSULTING INC.

Client Project #: 0138-001.02

Site Location: 1310 SOUTH SERVICE ROAD

Your P.O. #: 0138-001.02

Sampler Initials: CFM

ORGANOCHLORINATED PESTICIDES BY GC-ECD (WATER)

Bureau Veritas ID		SIJ096		
Sampling Date		2022/04/11 11:28		
COC Number		871757-02-01		
	UNITS	MW107	RDL	QC Batch
Calculated Parameters				
Aldrin + Dieldrin	ug/L	<0.005	0.005	7934842
Chlordane (Total)	ug/L	<0.005	0.005	7934842
DDT+ Metabolites	ug/L	<0.005	0.005	7934842
Heptachlor + Heptachlor epoxide	ug/L	<0.005	0.005	7934842
o,p-DDD + p,p-DDD	ug/L	<0.005	0.005	7934842
o,p-DDE + p,p-DDE	ug/L	<0.005	0.005	7934842
o,p-DDT + p,p-DDT	ug/L	<0.005	0.005	7934842
Total Endosulfan	ug/L	<0.005	0.005	7934842
Total PCB	ug/L	<0.05	0.05	7934842
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



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Bureau Veritas Job #: C295746
Report Date: 2022/04/19

BLUEFROG ENVIRONMENTAL CONSULTING INC.
Client Project #: 0138-001.02
Site Location: 1310 SOUTH SERVICE ROAD
Your P.O. #: 0138-001.02
Sampler Initials: CFM

TEST SUMMARY

Bureau Veritas ID: SIJ096
Sample ID: MW107
Matrix: Water

Collected: 2022/04/11
Shipped:
Received: 2022/04/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sewer Use By-Law Semivolatile Organics	GC/MS	7935189	2022/04/12	2022/04/13	Adriana Zurita
Carbonaceous BOD	DO	7935409	2022/04/12	2022/04/17	Frank Zhang
Chloride by Automated Colourimetry	KONE	7934806	N/A	2022/04/13	Raiq Kashif
Total Cyanide	SKAL/CN	7935857	2022/04/12	2022/04/12	Aditiben Patel
Fluoride	ISE	7936005	2022/04/12	2022/04/13	Surinder Rai
Mercury in Water by CVAA	CV/AA	7937652	2022/04/13	2022/04/13	Indira HarryPaul
Total Metals Analysis by Axial ICP	ICPX	7937727	2022/04/13	2022/04/13	Gagandeep Rai
E.coli, (CFU/100mL)	PL	7934920	N/A	2022/04/11	Sonja Elavinamannil
Animal and Vegetable Oil and Grease	BAL	7934160	N/A	2022/04/18	Automated Statchk
Total Oil and Grease	BAL	7943662	2022/04/17	2022/04/17	Himanshu Patel
OC Pesticides (Selected) & PCB	GC/ECD	7937536	2022/04/13	2022/04/14	Li Peng
OC Pesticides Summed Parameters	CALC	7934842	N/A	2022/04/12	Automated Statchk
pH	AT	7936008	2022/04/12	2022/04/13	Surinder Rai
Phenols (4AAP)	TECH/PHEN	7935690	N/A	2022/04/12	Louise Harding
Sulphate by Automated Colourimetry	KONE	7934808	N/A	2022/04/13	Chandra Nandlal
Total Kjeldahl Nitrogen in Water	SKAL	7939275	2022/04/13	2022/04/18	Massarat Jan
Total PAHs (Hamilton, Ottawa S.U.B.)	CALC	7934841	N/A	2022/04/13	Automated Statchk
Mineral/Synthetic O & G (TPH Heavy Oil)	BAL	7943663	2022/04/17	2022/04/17	Himanshu Patel
Total Suspended Solids	BAL	7935437	2022/04/14	2022/04/18	Shaneil Hall
Volatile Organic Compounds in Water	GC/MS	7935761	N/A	2022/04/13	Gladys Guerrero

Bureau Veritas ID: SIJ096 Dup
Sample ID: MW107
Matrix: Water

Collected: 2022/04/11
Shipped:
Received: 2022/04/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Fluoride	ISE	7936005	2022/04/12	2022/04/13	Surinder Rai
Mercury in Water by CVAA	CV/AA	7937652	2022/04/13	2022/04/13	Indira HarryPaul
OC Pesticides (Selected) & PCB	GC/ECD	7937536	2022/04/13	2022/04/14	Li Peng
pH	AT	7936008	2022/04/12	2022/04/13	Surinder Rai



GENERAL COMMENTS

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

Package 1	6.0°C
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Sample SIJ096 [MW107] : VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.



**BUREAU
VERITAS**

Bureau Veritas Job #: C295746

Report Date: 2022/04/19

BLUEFROG ENVIRONMENTAL CONSULTING INC.

Client Project #: 0138-001.02

Site Location: 1310 SOUTH SERVICE ROAD

Your P.O. #: 0138-001.02

Sampler Initials: CFM

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7934806	RKF	Matrix Spike	Dissolved Chloride (Cl-)	2022/04/13		NC	%	80 - 120
7934806	RKF	Spiked Blank	Dissolved Chloride (Cl-)	2022/04/13		102	%	80 - 120
7934806	RKF	Method Blank	Dissolved Chloride (Cl-)	2022/04/13	<1.0		mg/L	
7934806	RKF	RPD	Dissolved Chloride (Cl-)	2022/04/13	0.37		%	20
7934808	C_N	Matrix Spike	Dissolved Sulphate (SO4)	2022/04/13		NC	%	75 - 125
7934808	C_N	Spiked Blank	Dissolved Sulphate (SO4)	2022/04/13		105	%	80 - 120
7934808	C_N	Method Blank	Dissolved Sulphate (SO4)	2022/04/13	<1.0		mg/L	
7934808	C_N	RPD	Dissolved Sulphate (SO4)	2022/04/13	0.87		%	20
7935189	AZ	Matrix Spike	2,4,6-Tribromophenol	2022/04/12		99	%	10 - 130
			2-Fluorobiphenyl	2022/04/12		80	%	30 - 130
			D14-Terphenyl (FS)	2022/04/12		97	%	30 - 130
			D5-Nitrobenzene	2022/04/12		76	%	30 - 130
			D8-Acenaphthylene	2022/04/12		82	%	30 - 130
			Di-N-butyl phthalate	2022/04/12		99	%	30 - 130
			Bis(2-ethylhexyl)phthalate	2022/04/12		90	%	30 - 130
			3,3'-Dichlorobenzidine	2022/04/12		26 (1)	%	30 - 130
			Pentachlorophenol	2022/04/12		77	%	30 - 130
			Phenanthrene	2022/04/12		104	%	30 - 130
			Anthracene	2022/04/12		102	%	30 - 130
			Fluoranthene	2022/04/12		107	%	30 - 130
			Pyrene	2022/04/12		108	%	30 - 130
			Benzo(a)anthracene	2022/04/12		106	%	30 - 130
			Chrysene	2022/04/12		103	%	30 - 130
			Benzo(b/j)fluoranthene	2022/04/12		96	%	30 - 130
			Benzo(k)fluoranthene	2022/04/12		95	%	30 - 130
			Benzo(a)pyrene	2022/04/12		97	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2022/04/12		99	%	30 - 130
			Dibenzo(a,h)anthracene	2022/04/12		105	%	30 - 130
			Benzo(g,h,i)perylene	2022/04/12		100	%	30 - 130
			Dibenzo(a,i)pyrene	2022/04/12		91	%	30 - 130
			Benzo(e)pyrene	2022/04/12		95	%	30 - 130
			Perylene	2022/04/12		102	%	30 - 130
			Dibenzo(a,j) acridine	2022/04/12		127	%	30 - 130
			7H-Dibenzo(c,g) Carbazole	2022/04/12		115	%	30 - 130
7935189	AZ	Spiked Blank	2,4,6-Tribromophenol	2022/04/12		99	%	10 - 130
			2-Fluorobiphenyl	2022/04/12		69	%	30 - 130
			D14-Terphenyl (FS)	2022/04/12		94	%	30 - 130
			D5-Nitrobenzene	2022/04/12		81	%	30 - 130
			D8-Acenaphthylene	2022/04/12		79	%	30 - 130
			Di-N-butyl phthalate	2022/04/12		100	%	30 - 130
			Bis(2-ethylhexyl)phthalate	2022/04/12		94	%	30 - 130
			3,3'-Dichlorobenzidine	2022/04/12		123	%	30 - 130
			Pentachlorophenol	2022/04/12		51	%	30 - 130
			Phenanthrene	2022/04/12		99	%	30 - 130
			Anthracene	2022/04/12		98	%	30 - 130
			Fluoranthene	2022/04/12		102	%	30 - 130
			Pyrene	2022/04/12		102	%	30 - 130
			Benzo(a)anthracene	2022/04/12		103	%	30 - 130
			Chrysene	2022/04/12		101	%	30 - 130
			Benzo(b/j)fluoranthene	2022/04/12		97	%	30 - 130



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BLUEFROG ENVIRONMENTAL CONSULTING INC.
Client Project #: 0138-001.02
Site Location: 1310 SOUTH SERVICE ROAD
Your P.O. #: 0138-001.02
Sampler Initials: CFM

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7935189	AZ	Method Blank	Benzo(k)fluoranthene	2022/04/12		91	%	30 - 130
			Benzo(a)pyrene	2022/04/12		100	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2022/04/12		103	%	30 - 130
			Dibenzo(a,h)anthracene	2022/04/12		101	%	30 - 130
			Benzo(g,h,i)perylene	2022/04/12		96	%	30 - 130
			Dibenzo(a,i)pyrene	2022/04/12		120	%	30 - 130
			Benzo(e)pyrene	2022/04/12		97	%	30 - 130
			Perylene	2022/04/12		97	%	30 - 130
			Dibenzo(a,j) acridine	2022/04/12		99	%	30 - 130
			7H-Dibenzo(c,g) Carbazole	2022/04/12		85	%	30 - 130
			2,4,6-Tribromophenol	2022/04/12		76	%	10 - 130
			2-Fluorobiphenyl	2022/04/12		69	%	30 - 130
			D14-Terphenyl (FS)	2022/04/12		97	%	30 - 130
			D5-Nitrobenzene	2022/04/12		73	%	30 - 130
			D8-Acenaphthylene	2022/04/12		77	%	30 - 130
			Di-N-butyl phthalate	2022/04/12	<2		ug/L	
			Bis(2-ethylhexyl)phthalate	2022/04/12	<2		ug/L	
			3,3'-Dichlorobenzidine	2022/04/12	<0.8		ug/L	
			Pentachlorophenol	2022/04/12	<1		ug/L	
			Phenanthrene	2022/04/12	<0.2		ug/L	
			Anthracene	2022/04/12	<0.2		ug/L	
			Fluoranthene	2022/04/12	<0.2		ug/L	
			Pyrene	2022/04/12	<0.2		ug/L	
			Benzo(a)anthracene	2022/04/12	<0.2		ug/L	
			Chrysene	2022/04/12	<0.2		ug/L	
			Benzo(b/j)fluoranthene	2022/04/12	<0.2		ug/L	
			Benzo(k)fluoranthene	2022/04/12	<0.2		ug/L	
			Benzo(a)pyrene	2022/04/12	<0.2		ug/L	
			Indeno(1,2,3-cd)pyrene	2022/04/12	<0.2		ug/L	
			Dibenzo(a,h)anthracene	2022/04/12	<0.2		ug/L	
			Benzo(g,h,i)perylene	2022/04/12	<0.2		ug/L	
			Dibenzo(a,i)pyrene	2022/04/12	<0.2		ug/L	
			Benzo(e)pyrene	2022/04/12	<0.2		ug/L	
			Perylene	2022/04/12	<0.2		ug/L	
			Dibenzo(a,j) acridine	2022/04/12	<0.4		ug/L	
			7H-Dibenzo(c,g) Carbazole	2022/04/12	<0.4		ug/L	
7935189	AZ	RPD	Di-N-butyl phthalate	2022/04/12	NC		%	40
			Bis(2-ethylhexyl)phthalate	2022/04/12	NC		%	40
			3,3'-Dichlorobenzidine	2022/04/12	NC		%	40
			Pentachlorophenol	2022/04/12	NC		%	40
			Phenanthrene	2022/04/12	NC		%	40
			Anthracene	2022/04/12	NC		%	40
			Fluoranthene	2022/04/12	NC		%	40
			Pyrene	2022/04/12	NC		%	40
			Benzo(a)anthracene	2022/04/12	NC		%	40
			Chrysene	2022/04/12	NC		%	40
			Benzo(b/j)fluoranthene	2022/04/12	NC		%	40
			Benzo(k)fluoranthene	2022/04/12	NC		%	40
			Benzo(a)pyrene	2022/04/12	NC		%	40
			Indeno(1,2,3-cd)pyrene	2022/04/12	NC		%	40



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BLUEFROG ENVIRONMENTAL CONSULTING INC.
Client Project #: 0138-001.02
Site Location: 1310 SOUTH SERVICE ROAD
Your P.O. #: 0138-001.02
Sampler Initials: CFM

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dibenzo(a,h)anthracene	2022/04/12	NC		%	40
			Benzo(g,h,i)perylene	2022/04/12	NC		%	40
			Dibenzo(a,i)pyrene	2022/04/12	NC		%	40
			Benzo(e)pyrene	2022/04/12	NC		%	40
			Perylene	2022/04/12	NC		%	40
			Dibenzo(a,j) acridine	2022/04/12	NC		%	40
			7H-Dibenzo(c,g) Carbazole	2022/04/12	NC		%	40
7935409	FZH	QC Standard	Total Carbonaceous BOD	2022/04/17		103	%	85 - 115
7935409	FZH	Method Blank	Total Carbonaceous BOD	2022/04/17	<2		mg/L	
7935409	FZH	RPD	Total Carbonaceous BOD	2022/04/17	9.8		%	30
7935437	SHD	QC Standard	Total Suspended Solids	2022/04/18		96	%	85 - 115
7935437	SHD	Method Blank	Total Suspended Solids	2022/04/18	<10		mg/L	
7935437	SHD	RPD	Total Suspended Solids	2022/04/18	4.7		%	25
7935690	LHA	Matrix Spike	Phenols-4AAP	2022/04/12		101	%	80 - 120
7935690	LHA	Spiked Blank	Phenols-4AAP	2022/04/12		103	%	80 - 120
7935690	LHA	Method Blank	Phenols-4AAP	2022/04/12	<0.0010		mg/L	
7935690	LHA	RPD	Phenols-4AAP	2022/04/12	0		%	20
7935761	GGU	Matrix Spike	4-Bromofluorobenzene	2022/04/13		107	%	70 - 130
			D4-1,2-Dichloroethane	2022/04/13		106	%	70 - 130
			D8-Toluene	2022/04/13		96	%	70 - 130
			Benzene	2022/04/13		93	%	70 - 130
			Chloroform	2022/04/13		98	%	70 - 130
			1,2-Dichlorobenzene	2022/04/13		97	%	70 - 130
			1,4-Dichlorobenzene	2022/04/13		110	%	70 - 130
			cis-1,2-Dichloroethylene	2022/04/13		100	%	70 - 130
			trans-1,3-Dichloropropene	2022/04/13		105	%	70 - 130
			Ethylbenzene	2022/04/13		89	%	70 - 130
			Methylene Chloride(Dichloromethane)	2022/04/13		110	%	70 - 130
			1,1,2,2-Tetrachloroethane	2022/04/13		102	%	70 - 130
			Tetrachloroethylene	2022/04/13		92	%	70 - 130
			Toluene	2022/04/13		93	%	70 - 130
			Trichloroethylene	2022/04/13		107	%	70 - 130
			p+m-Xylene	2022/04/13		95	%	70 - 130
			o-Xylene	2022/04/13		91	%	70 - 130
7935761	GGU	Spiked Blank	4-Bromofluorobenzene	2022/04/13		106	%	70 - 130
			D4-1,2-Dichloroethane	2022/04/13		104	%	70 - 130
			D8-Toluene	2022/04/13		97	%	70 - 130
			Benzene	2022/04/13		91	%	70 - 130
			Chloroform	2022/04/13		96	%	70 - 130
			1,2-Dichlorobenzene	2022/04/13		96	%	70 - 130
			1,4-Dichlorobenzene	2022/04/13		108	%	70 - 130
			cis-1,2-Dichloroethylene	2022/04/13		98	%	70 - 130
			trans-1,3-Dichloropropene	2022/04/13		104	%	70 - 130
			Ethylbenzene	2022/04/13		88	%	70 - 130
			Methylene Chloride(Dichloromethane)	2022/04/13		107	%	70 - 130
			1,1,2,2-Tetrachloroethane	2022/04/13		102	%	70 - 130
			Tetrachloroethylene	2022/04/13		90	%	70 - 130
			Toluene	2022/04/13		92	%	70 - 130
			Trichloroethylene	2022/04/13		104	%	70 - 130
			p+m-Xylene	2022/04/13		94	%	70 - 130



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Site Location: 1310 SOUTH SERVICE ROAD
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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7935761	GGU	Method Blank	o-Xylene	2022/04/13		92	%	70 - 130
			4-Bromofluorobenzene	2022/04/13		100	%	70 - 130
			D4-1,2-Dichloroethane	2022/04/13		108	%	70 - 130
			D8-Toluene	2022/04/13		89	%	70 - 130
			Benzene	2022/04/13	<0.20		ug/L	
			Chloroform	2022/04/13	<0.20		ug/L	
			1,2-Dichlorobenzene	2022/04/13	<0.40		ug/L	
			1,4-Dichlorobenzene	2022/04/13	<0.40		ug/L	
			cis-1,2-Dichloroethylene	2022/04/13	<0.50		ug/L	
			trans-1,3-Dichloropropene	2022/04/13	<0.40		ug/L	
			Ethylbenzene	2022/04/13	<0.20		ug/L	
			Methylene Chloride(Dichloromethane)	2022/04/13	<2.0		ug/L	
			1,1,2,2-Tetrachloroethane	2022/04/13	<0.40		ug/L	
			Tetrachloroethylene	2022/04/13	<0.20		ug/L	
			Toluene	2022/04/13	<0.20		ug/L	
			Trichloroethylene	2022/04/13	<0.20		ug/L	
			p+m-Xylene	2022/04/13	<0.20		ug/L	
			o-Xylene	2022/04/13	<0.20		ug/L	
			Total Xylenes	2022/04/13	<0.20		ug/L	
7935761	GGU	RPD	Benzene	2022/04/13	NC		%	30
			1,2-Dichlorobenzene	2022/04/13	NC		%	30
			1,4-Dichlorobenzene	2022/04/13	NC		%	30
			cis-1,2-Dichloroethylene	2022/04/13	NC		%	30
			trans-1,3-Dichloropropene	2022/04/13	NC		%	30
			Ethylbenzene	2022/04/13	NC		%	30
			Methylene Chloride(Dichloromethane)	2022/04/13	NC		%	30
			1,1,2,2-Tetrachloroethane	2022/04/13	NC		%	30
			Tetrachloroethylene	2022/04/13	NC		%	30
			Toluene	2022/04/13	NC		%	30
			Trichloroethylene	2022/04/13	NC		%	30
			p+m-Xylene	2022/04/13	NC		%	30
			o-Xylene	2022/04/13	NC		%	30
			Total Cyanide (CN)	2022/04/12		66 (1)	%	80 - 120
7935857	ABP	Matrix Spike	Total Cyanide (CN)	2022/04/12		99	%	80 - 120
7935857	ABP	Spiked Blank	Total Cyanide (CN)	2022/04/12	<0.0050		mg/L	
7935857	ABP	Method Blank	Total Cyanide (CN)	2022/04/12	NC		%	20
7935857	ABP	RPD	Total Cyanide (CN)	2022/04/12			%	20
7936005	SAU	Matrix Spike [SIJ096-05]	Fluoride (F-)	2022/04/13		98	%	80 - 120
7936005	SAU	Spiked Blank	Fluoride (F-)	2022/04/13		101	%	80 - 120
7936005	SAU	Method Blank	Fluoride (F-)	2022/04/13	<0.10		mg/L	
7936005	SAU	RPD [SIJ096-05]	Fluoride (F-)	2022/04/13	0		%	20
7936008	SAU	Spiked Blank	pH	2022/04/13		102	%	98 - 103
7936008	SAU	RPD [SIJ096-05]	pH	2022/04/13	2.4		%	N/A
7937536	LPG	Matrix Spike	2,4,5,6-Tetrachloro-m-xylene	2022/04/14		77	%	50 - 130
			Decachlorobiphenyl	2022/04/14		108	%	50 - 130
			Aldrin	2022/04/14		116	%	50 - 130
			Dieldrin	2022/04/14		102	%	50 - 130
			a-Chlordane	2022/04/14		90	%	50 - 130
			g-Chlordane	2022/04/14		90	%	50 - 130
			o,p-DDT	2022/04/14		88	%	50 - 130
			p,p-DDT	2022/04/14		90	%	50 - 130



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7937536	LPG	Spiked Blank	Lindane	2022/04/14		82	%	50 - 130
			Hexachlorobenzene	2022/04/14		82	%	50 - 130
			Mirex	2022/04/14		97	%	30 - 130
			2,4,5,6-Tetrachloro-m-xylene	2022/04/14		73	%	50 - 130
			Decachlorobiphenyl	2022/04/14		120	%	50 - 130
			Aldrin	2022/04/14		100	%	50 - 130
			Dieldrin	2022/04/14		109	%	50 - 130
			a-Chlordane	2022/04/14		95	%	50 - 130
			g-Chlordane	2022/04/14		92	%	50 - 130
			o,p-DDT	2022/04/14		89	%	50 - 130
			p,p-DDT	2022/04/14		92	%	50 - 130
			Lindane	2022/04/14		85	%	50 - 130
			Hexachlorobenzene	2022/04/14		79	%	50 - 130
			Mirex	2022/04/14		95	%	30 - 130
7937536	LPG	RPD	Aldrin	2022/04/14	15		%	30
			Dieldrin	2022/04/14	4.7		%	30
			a-Chlordane	2022/04/14	6.1		%	30
			g-Chlordane	2022/04/14	11		%	30
			o,p-DDT	2022/04/14	5.1		%	30
			p,p-DDT	2022/04/14	3.0		%	30
			Lindane	2022/04/14	11		%	30
			Hexachlorobenzene	2022/04/14	12		%	30
			Mirex	2022/04/14	6.6		%	40
		Method Blank	2,4,5,6-Tetrachloro-m-xylene	2022/04/14		73	%	50 - 130
			Decachlorobiphenyl	2022/04/14		99	%	50 - 130
			Aldrin	2022/04/14	<0.005		ug/L	
			Dieldrin	2022/04/14	<0.005		ug/L	
			a-Chlordane	2022/04/14	<0.005		ug/L	
			g-Chlordane	2022/04/14	<0.005		ug/L	
			o,p-DDT	2022/04/14	<0.005		ug/L	
			p,p-DDT	2022/04/14	<0.005		ug/L	
			Lindane	2022/04/14	<0.003		ug/L	
			Hexachlorobenzene	2022/04/14	<0.005		ug/L	
		RPD [SIJ096-03]	Mirex	2022/04/14	<0.005		ug/L	
			Aldrin	2022/04/14	NC		%	30
			Dieldrin	2022/04/14	NC		%	30
			a-Chlordane	2022/04/14	NC		%	30
			g-Chlordane	2022/04/14	NC		%	30
			o,p-DDT	2022/04/14	NC		%	30
			p,p-DDT	2022/04/14	NC		%	30
			Lindane	2022/04/14	NC		%	30
			Hexachlorobenzene	2022/04/14	5.6		%	30
			Mirex	2022/04/14	NC		%	40
7937652	IHP	Matrix Spike [SIJ096-10]	Mercury (Hg)	2022/04/13		94	%	75 - 125
7937652	IHP	Spiked Blank	Mercury (Hg)	2022/04/13		96	%	80 - 120
7937652	IHP	Method Blank	Mercury (Hg)	2022/04/13	<0.00010		mg/L	
7937652	IHP	RPD	Mercury (Hg)	2022/04/13	NC		%	20
			Mercury (Hg)	2022/04/13	NC		%	20
			Mercury (Hg)	2022/04/13	NC		%	20
			Mercury (Hg)	2022/04/13	NC		%	20



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BLUEFROG ENVIRONMENTAL CONSULTING INC.
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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7937652	IHP	RPD [SIJ096-10]	Mercury (Hg)	2022/04/13	NC		%	20
			Mercury (Hg)	2022/04/13	NC		%	20
			Mercury (Hg)	2022/04/13	NC		%	20
			Mercury (Hg)	2022/04/13	NC		%	20
			Mercury (Hg)	2022/04/13	NC		%	20
			Mercury (Hg)	2022/04/13	NC		%	20
7937727	GR1	Matrix Spike	Mercury (Hg)	2022/04/13	NC		%	20
7937727	GR1	Spiked Blank	Total Aluminum (Al)	2022/04/13		104	%	80 - 120
			Total Antimony (Sb)	2022/04/13		109	%	80 - 120
			Total Arsenic (As)	2022/04/13		106	%	80 - 120
			Total Bismuth (Bi)	2022/04/13		103	%	80 - 120
			Total Cadmium (Cd)	2022/04/13		107	%	80 - 120
			Total Chromium (Cr)	2022/04/13		104	%	80 - 120
			Total Cobalt (Co)	2022/04/13		101	%	80 - 120
			Total Copper (Cu)	2022/04/13		101	%	80 - 120
			Total Iron (Fe)	2022/04/13		102	%	80 - 120
			Total Lead (Pb)	2022/04/13		101	%	80 - 120
			Total Manganese (Mn)	2022/04/13		102	%	80 - 120
			Total Molybdenum (Mo)	2022/04/13		107	%	80 - 120
			Total Nickel (Ni)	2022/04/13		103	%	80 - 120
			Total Phosphorus (P)	2022/04/13		104	%	80 - 120
			Total Selenium (Se)	2022/04/13		107	%	80 - 120
			Total Silver (Ag)	2022/04/13		100	%	80 - 120
			Total Tin (Sn)	2022/04/13		105	%	80 - 120
			Total Titanium (Ti)	2022/04/13		104	%	80 - 120
			Total Vanadium (V)	2022/04/13		104	%	80 - 120
			Total Zinc (Zn)	2022/04/13		102	%	80 - 120
			Total Aluminum (Al)	2022/04/13		108	%	80 - 120
			Total Antimony (Sb)	2022/04/13		112	%	80 - 120
			Total Arsenic (As)	2022/04/13		107	%	80 - 120
			Total Bismuth (Bi)	2022/04/13		106	%	80 - 120
			Total Cadmium (Cd)	2022/04/13		108	%	80 - 120
			Total Chromium (Cr)	2022/04/13		105	%	80 - 120
			Total Cobalt (Co)	2022/04/13		104	%	80 - 120
			Total Copper (Cu)	2022/04/13		104	%	80 - 120
			Total Iron (Fe)	2022/04/13		103	%	80 - 120
			Total Lead (Pb)	2022/04/13		105	%	80 - 120
			Total Manganese (Mn)	2022/04/13		105	%	80 - 120
			Total Molybdenum (Mo)	2022/04/13		108	%	80 - 120
			Total Nickel (Ni)	2022/04/13		106	%	80 - 120
			Total Phosphorus (P)	2022/04/13		105	%	80 - 120
			Total Selenium (Se)	2022/04/13		107	%	80 - 120
			Total Silver (Ag)	2022/04/13		103	%	80 - 120
			Total Tin (Sn)	2022/04/13		108	%	80 - 120
			Total Titanium (Ti)	2022/04/13		106	%	80 - 120
			Total Vanadium (V)	2022/04/13		104	%	80 - 120
			Total Zinc (Zn)	2022/04/13		105	%	80 - 120
7937727	GR1	Method Blank	Total Aluminum (Al)	2022/04/13	<0.1		mg/L	
			Total Antimony (Sb)	2022/04/13	<0.02		mg/L	
			Total Arsenic (As)	2022/04/13	<0.01		mg/L	



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Your P.O. #: 0138-001.02
Sampler Initials: CFM

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7937727	GR1	RPD	Total Bismuth (Bi)	2022/04/13	<0.05		mg/L	
			Total Cadmium (Cd)	2022/04/13	<0.002		mg/L	
			Total Chromium (Cr)	2022/04/13	<0.01		mg/L	
			Total Cobalt (Co)	2022/04/13	<0.002		mg/L	
			Total Copper (Cu)	2022/04/13	<0.01		mg/L	
			Total Iron (Fe)	2022/04/13	<0.02		mg/L	
			Total Lead (Pb)	2022/04/13	<0.01		mg/L	
			Total Manganese (Mn)	2022/04/13	<0.001		mg/L	
			Total Molybdenum (Mo)	2022/04/13	<0.005		mg/L	
			Total Nickel (Ni)	2022/04/13	<0.005		mg/L	
			Total Phosphorus (P)	2022/04/13	<0.05		mg/L	
			Total Selenium (Se)	2022/04/13	<0.02		mg/L	
			Total Silver (Ag)	2022/04/13	<0.01		mg/L	
			Total Tin (Sn)	2022/04/13	<0.02		mg/L	
			Total Titanium (Ti)	2022/04/13	<0.005		mg/L	
			Total Vanadium (V)	2022/04/13	<0.005		mg/L	
			Total Zinc (Zn)	2022/04/13	<0.005		mg/L	
			Total Aluminum (Al)	2022/04/13	3.8		%	20
			Total Antimony (Sb)	2022/04/13	NC		%	20
			Total Arsenic (As)	2022/04/13	NC		%	20
			Total Cadmium (Cd)	2022/04/13	NC		%	20
			Total Chromium (Cr)	2022/04/13	NC		%	20
			Total Cobalt (Co)	2022/04/13	NC		%	20
			Total Copper (Cu)	2022/04/13	4.1		%	20
			Total Iron (Fe)	2022/04/13	NC		%	20
			Total Lead (Pb)	2022/04/13	2.1		%	20
			Total Manganese (Mn)	2022/04/13	15		%	20
			Total Molybdenum (Mo)	2022/04/13	NC		%	20
			Total Nickel (Ni)	2022/04/13	0.37		%	20
			Total Phosphorus (P)	2022/04/13	NC		%	20
			Total Selenium (Se)	2022/04/13	NC		%	20
			Total Silver (Ag)	2022/04/13	NC		%	20
			Total Tin (Sn)	2022/04/13	NC		%	20
			Total Titanium (Ti)	2022/04/13	NC		%	20
			Total Zinc (Zn)	2022/04/13	NC		%	20
7939275	MJ1	Matrix Spike	Total Kjeldahl Nitrogen (TKN)	2022/04/18		102	%	80 - 120
7939275	MJ1	QC Standard	Total Kjeldahl Nitrogen (TKN)	2022/04/18		100	%	80 - 120
7939275	MJ1	Spiked Blank	Total Kjeldahl Nitrogen (TKN)	2022/04/18		102	%	80 - 120
7939275	MJ1	Method Blank	Total Kjeldahl Nitrogen (TKN)	2022/04/18	<0.10		mg/L	
7939275	MJ1	RPD	Total Kjeldahl Nitrogen (TKN)	2022/04/18	4.8		%	20
7943662	HPL	Spiked Blank	Total Oil & Grease	2022/04/17		99	%	85 - 115
7943662	HPL	RPD	Total Oil & Grease	2022/04/17	0.25		%	25
7943662	HPL	Method Blank	Total Oil & Grease	2022/04/17	<0.50		mg/L	
7943663	HPL	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2022/04/17		99	%	85 - 115
7943663	HPL	RPD	Total Oil & Grease Mineral/Synthetic	2022/04/17	0.51		%	25



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC									
Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits	
7943663	HPL	Method Blank	Total Oil & Grease Mineral/Synthetic	2022/04/17	<0.50		mg/L		
N/A = Not Applicable									
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.									
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.									
QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.									
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.									
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.									
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.									
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)									
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).									
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.									



BUREAU
VERITAS

Bureau Veritas Job #: C295746

Report Date: 2022/04/19

BLUEFROG ENVIRONMENTAL CONSULTING INC.

Client Project #: 0138-001.02

Site Location: 1310 SOUTH SERVICE ROAD

Your P.O. #: 0138-001.02

Sampler Initials: CFM

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Anastassia Hamanov, Scientific Specialist

Cristina Carriere, Senior Scientific Specialist

Sonja Elavinamannil, Master of Biochemistry, Team Lead

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Bureau Veritas
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel: (905) 817-5700 Toll-free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name: #34874 BLUEFROG ENVIRONMENTAL CONSULTING		Company Name: Oshin Gharabegian		Quotation #: C20119		Bureau Veritas Job #:	
Attention: Oshin Gharabegian		Attention: Oshin Gharabegian		P.O. #: 0138-001.02		Bottle Order #:	
Address: SUITE 100-208 WYECROFT ROAD		Address:		Project: 0138-001.02		COC #:	
OAKVILLE ON L6K 3T8				Project Name: 1910 South Service Rd		Project Manager:	
Tel: Fax:		Tel: Fax:		Site #: CFM		C#871757-02-01	
Email: ogharabegian@bluefrogconsulting.ca		Email: ogharabegian@bluefrogconsulting.ca		Sampled By:		Deepthi Shaji	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BUREAU VERITAS DRINKING WATER CHAIN OF CUSTODY				ANALYSIS REQUESTED (PLEASE BE SPECIFIC)										Turnaround Time (TAT) Required:							
Regulation 153 (2011)				Other Regulations				Special Instructions				Regular (Standard) TAT:									
☐ Table 1	☐ Res/Park	☐ Medium/Fine	☐ CCME	☒ Sanitary Sewer Bylaw					☒ Regular (Standard) TAT: (will be applied if Rush TAT is not specified): Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.												
☐ Table 2	☐ Ind/Comm	☐ Coarse	☐ Reg 558	☒ Storm Sewer Bylaw					☐ Job Specific Rush TAT (if applies to entire submission): Date Required: Time Required: ☐												
☐ Table 3	☐ Agri/Other	☐ For RSC	☐ MISA	☐ Municipality	Hamilton				Rush Confirmation Number: (call lab for #)												
☐ Table				☐ PWQO	☐ Reg 406 Table																
				☐ Other																	
Include Criteria on Certificate of Analysis (Y/N)? <u>N</u>																					
Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O Reg 153 VOCs by HS & F-F4	O Reg 153 Metals Package (Incl Hg and Cr6)	Conductivity	Sodium Adsorption Ratio	pH Calc EXTRACT	Sieve, 75um	Handwritten: Hamilton Sanitary & Storm Sewer (14-06)	# of Bottles	Comments							
1	MW107	10 th Apr 11	1128	G/W								X	17								
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					

* RELINQUISHED BY: (Signature/Print)		Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)		Date: (YY/MM/DD)	Time	# jars used and not submitted.	Laboratory Use Only				
Caroline MacIsaac		12/11/11	1945	Kavitha Selvan		2022/04/11	19:01		Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
										71516	Present		
											Intact		

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

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

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVNA.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

White: Bureau Veritas Yellow: Client

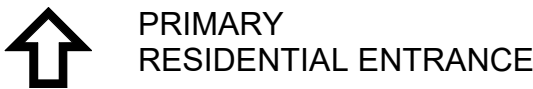
SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

APPENDIX E

Building Layout

This drawing, as an instrument of service, is provided by and is the property of Turner Fleischer Architects Inc. The contractor must verify and accept responsibility for all dimensions and conditions on site and must notify Turner Fleischer Architects Inc. of any variations from the supplied information. This drawing is not to be scaled. The architect is not responsible for the accuracy of survey, structural, mechanical, electrical, etc. information shown on this drawing. Refer to the appropriate consultant drawings before proceeding with the work. Contractor must conform to all applicable codes and requirements of authorities having jurisdiction. The contractor working from drawings not specifically marked "For Contractor" must assume full responsibility and bear costs for any corrections or damages resulting from his work.

LEGEND



PRIMARY
RESIDENTIAL ENTRANCE



SECONDARY
RESIDENTIAL ENTRANCE



RETAIL ENTRANCE



EXIT



FIRE HYDRANT



SIAMESE CONNECTION



CONVEX MIRROR



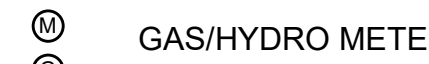
TRANSFORMER WITH
CLEARANCES



FIRE ROUTE SIGN



0.000.00 SPOT ELEVATION



GAS/HYDRO METER



EXISTING DRAINAGE
DITCH TO REMAIN

LEGEND

EV EVSE PARKING

△ CONVEX MIRROR

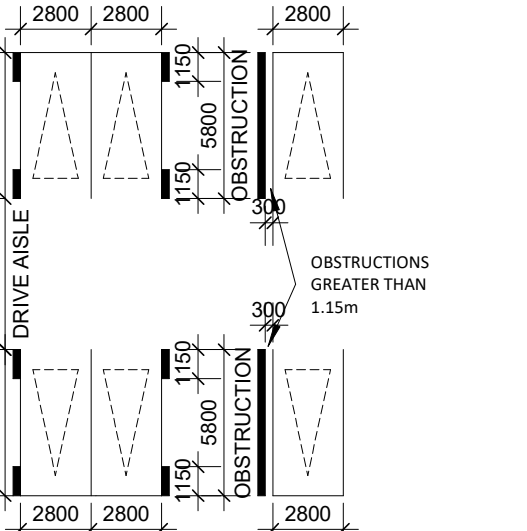
▽ VISITOR PARKING SPACE

STANDARD PARKING DIMENSIONS:

aisle width: MIN 6m

TYPICAL PARKING SIZE:

MIN 2.8 x 5.8 x 2.0m HIGH

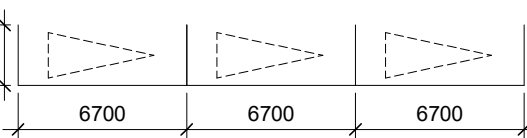


PARALLEL PARKING DIMENSIONS:

aisle width: MIN 6m

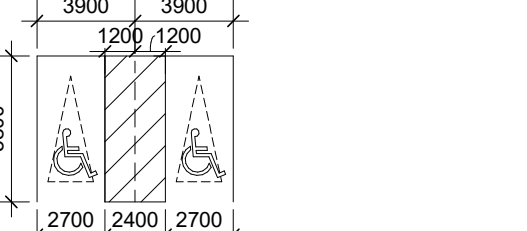
TYPICAL PARKING SIZE:

MIN 2.4 x 6.7



STANDARD BARRIER-FREE SPACE:

MIN 5.1 x 5.8



CITY OF HAMILTON ZONING BY-LAW 21-189, AS
AMENDED - REGULATIONS BY-LAW 17-240 APPLYING
TO ACCESSIBLE PARKING SPACES

#	DATE	ISSUED FOR	DESCRIPTION	BY
---	------	------------	-------------	----

1	2022-08-29	Issued for OPA/ZBA		
---	------------	--------------------	--	--

PROJECT
1310 South Service Road

Hamilton, ON

DRAWING

SITE PLAN / ROOF PLAN

PROJECT NO.

22.060SPA

PROJECT DATE

2023-01-24

DRAWN BY

RYT

CHECKED BY

LLE

SCALE

As indicated

DRAWING NO.

SPA005

REV.

1

SOUTH SERVICE ROAD

VINCE MAZZA WAY

PROPOSED BUILDING A
(8 STOREYS)

PROPOSED BUILDING B
(12 STOREYS)

PROPOSED TOWNHOUSE
(3 STOREYS)

PROPOSED TOWNHOUSE
(3 STOREYS)

PROPOSED TOWNHOUSE
(3 STOREYS)

PROPOSED TOWNHOUSE
(3 STOREYS)

PROPOSED BUILDING C
(10 STOREYS)

SOUTH SERVICE ROAD

TURNER
FLEISCHER

Turner Fleischer Architects Inc.
67 Leslie Road
Toronto, ON M5B 2T8
T 416 425 2222
turnerfleischer.com

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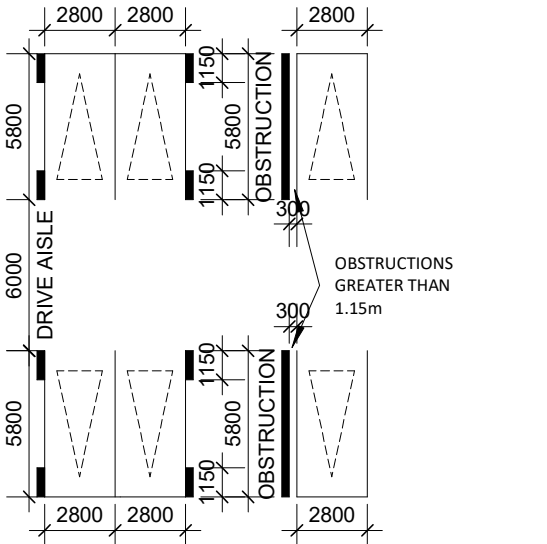
LEGEND

- EV EVSE PARKING
△ CONVEX MIRROR
V VISITOR PARKING SPACE

STANDARD PARKING DIMENSIONS:

aisle width: min 6m

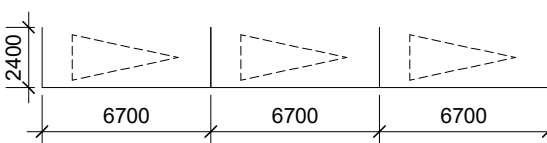
typical parking size:
min 2.8 x 5.8 x 2.0m high



PARALLEL PARKING DIMENSIONS:

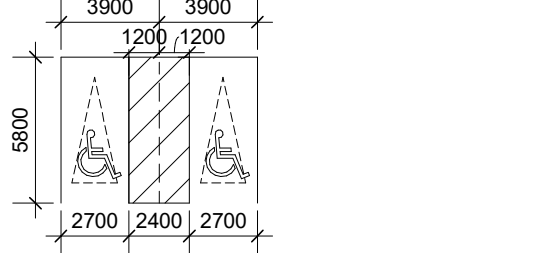
aisle width: min 6m

typical parking size:
min 2.4 x 6.7



STANDARD BARRIER-FREE SPACE:

min 5.1 x 5.8



CITY OF HAMILTON ZONING BY-LAW 21-189, AS
AMENDED - REGULATIONS BY-LAW 17-240 APPLYING
TO ACCESSIBLE PARKING SPACES

#	DATE	DESCRIPTION	BY
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PROJECT
1310 South Service Road

Hamilton, ON

DRAWING
UNDERGROUND LEVEL 02

PROJECT NO.

22.060SPA

PROJECT DATE

2023-01-24

DRAWN BY

RYT

CHECKED BY

LLE

SCALE

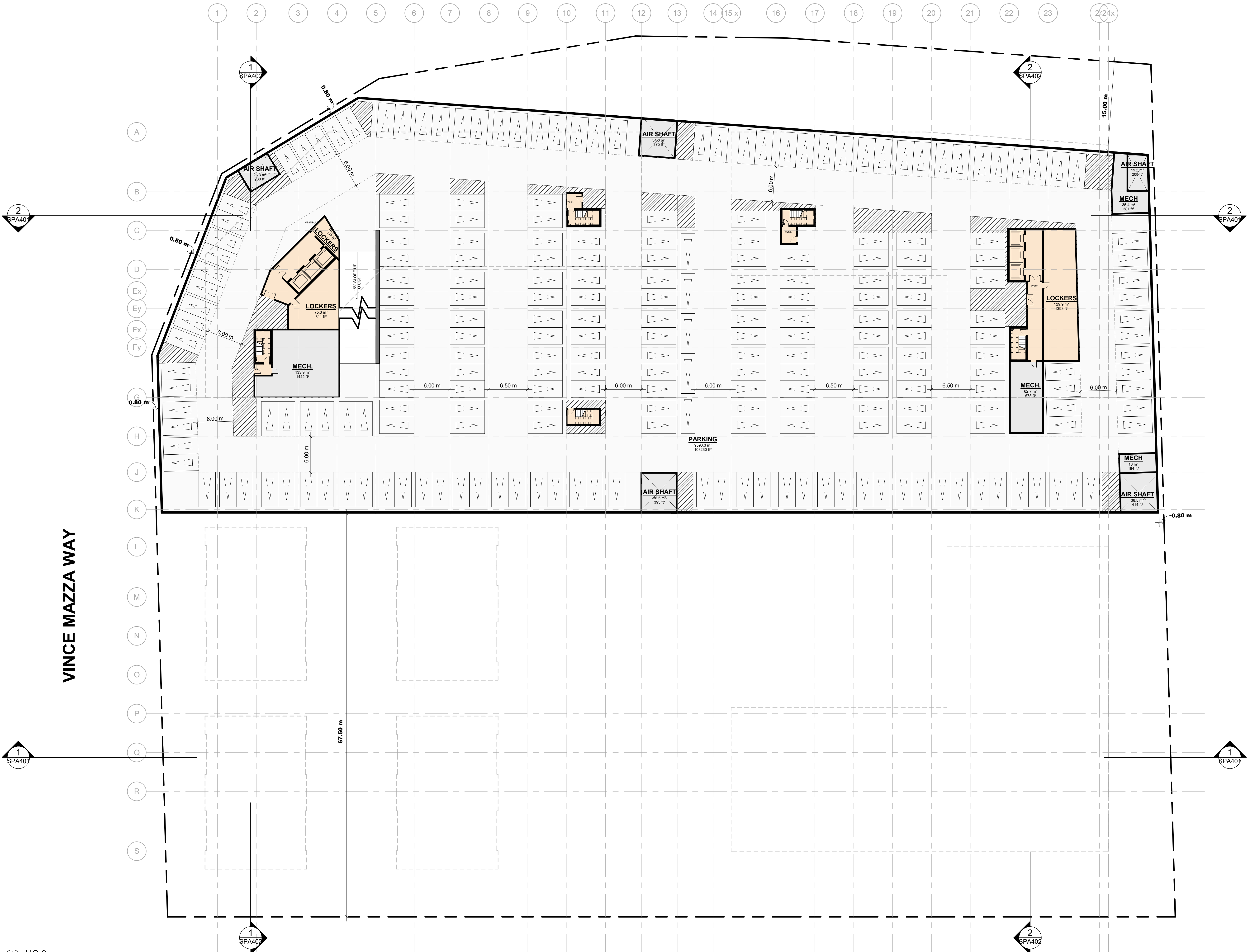
1 : 300

DRAWING NO.

SPA101

REV.

VINCE MAZZA WAY



1 UG 2
SPA101 1 : 300

2023-01-24 3:32:27 PM

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LEGEND

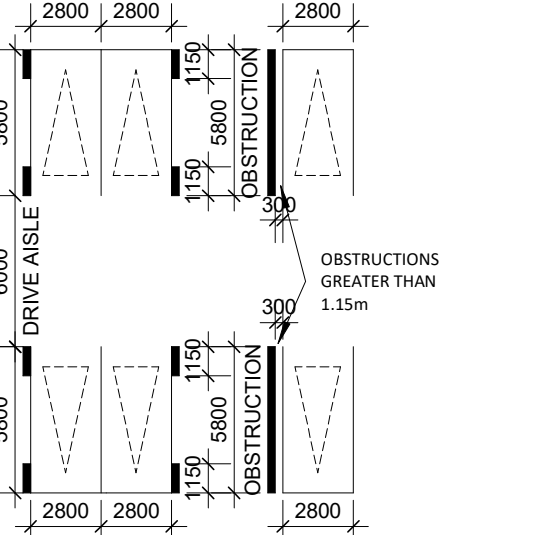
- EV EVSE PARKING
△ CONVEX MIRROR
V VISITOR PARKING SPACE

STANDARD PARKING DIMENSIONS:

aisle width: min 6m

typical parking size:

min 2.8 x 5.8 x 2.0m high

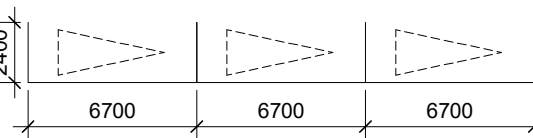


PARALLEL PARKING DIMENSIONS:

aisle width: min 6m

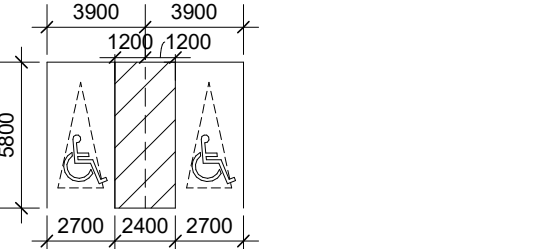
typical parking size:

min 2.4 x 6.7



STANDARD BARRIER-FREE SPACE:

min 5.1 x 5.8



CITY OF HAMILTON ZONING BY-LAW 21-189, AS AMENDED - REGULATIONS BY-LAW 17-240 APPLYING TO ACCESSIBLE PARKING SPACES

#	DATE	DESCRIPTION	BY
---	------	-------------	----

PROJECT 1310 South Service Road

Hamilton, ON

DRAWING

UNDERGROUND LEVEL 01

PROJECT NO.

22.060SPA

PROJECT DATE

2023-01-24

DRAWN BY

RYT

CHECKED BY

LLE

SCALE

1 : 300

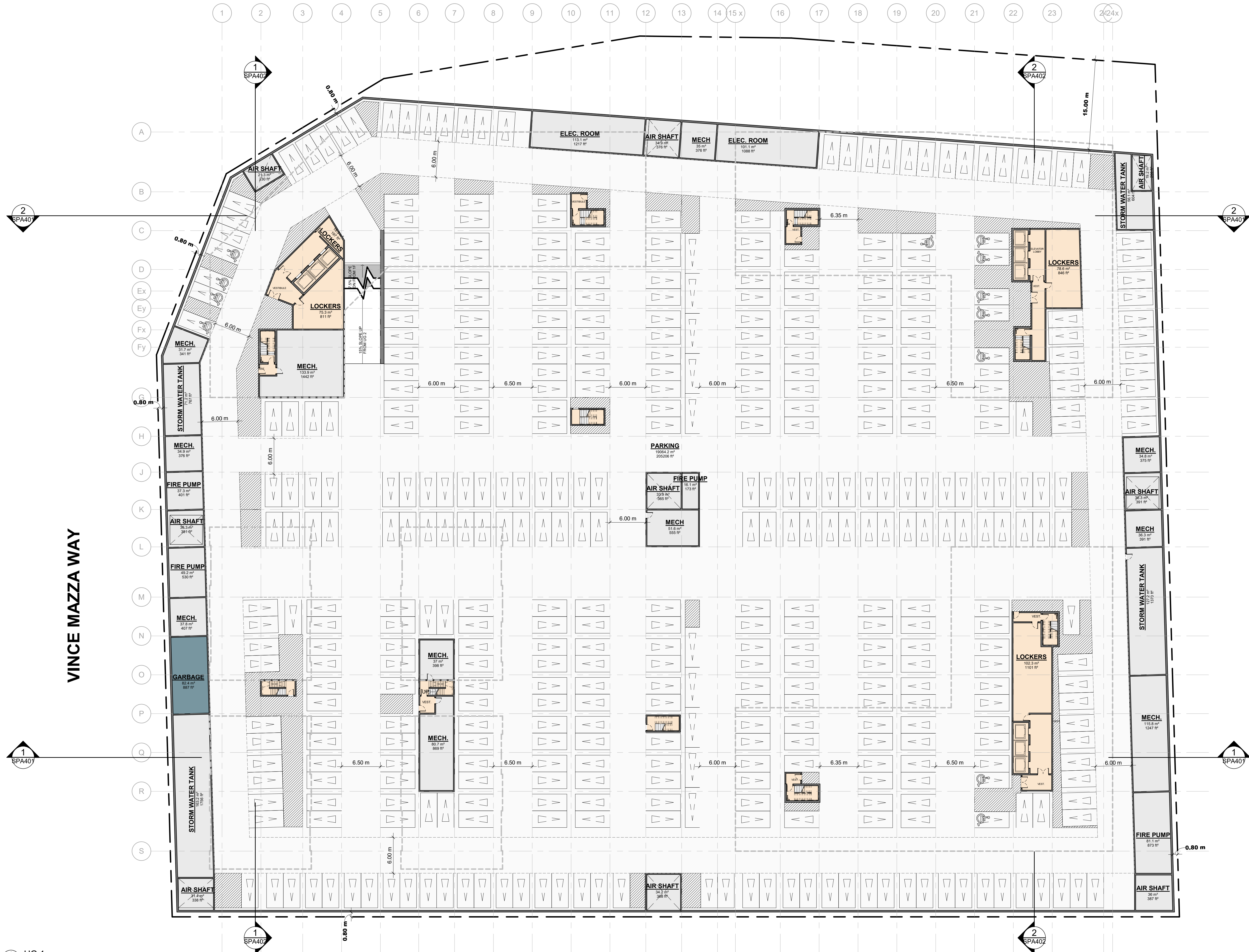
REV.

SPA102

1

SOUTH SERVICE ROAD

VINCE MAZZA WAY



1 UG 1

SPA102 1 : 300