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G5822 **AUGUST 2023**

GEOTECHNICAL REPORT
PROPOSED DEVELOPMENT
3085 – 3105 HURONTARIO STREET
MISSISSAUGA, ONTARIO

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PREPARED FOR:

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TORONTO, ONTARIO
M8X 2X2

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1.0 INTRODUCTION

MCR was retained by Mattamy Homes Canada (the Client), to carry out a geotechnical investigation for the proposed residential and commercial development located at the 3081 – 3095 Hurontario Street, in the City of Mississauga, Ontario (hereafter referred to as 'the Site').

The objective of the report was to determine design data required for foundations, dewatering, shoring/excavation, backfill, slab on grade and pavement. The above design and construction issues are addressed in the following report.

2.0 SITE CONDITIONS

The site is located on the east side of Hurontario Street, between Kirwin Avenue and Dundas Street East, in the City of Mississauga.

The Site is presently occupied by two [2] storey commercial building, in the southwestern portion and a two [2] storey above grade parking structure on the eastern portion of the Site. The Site is bounded by Kirwin Avenue to the north, residential building to the east, commercial buildings to the south and Hurontario Street to the west.

3.0 PROPOSED DEVELOPMENT

The Site is proposed for a residential and commercial development consisting of a forty [40] storey building with four [4] storey podium (Building 1), a forty-four [44] storey building with four [4] storey podium (Building 2), a twenty-eight [28] storey building with six [6] storey podium (Building 3) and a twenty-four [24] storey building with six [6] storey podium (Buidling 4) over four [4] levels of combined underground parking (Appendix B).

It is understood that the ground floor finished elevation (FFE) ranges from 117.96 to 116.00 m and P4 FFE will be at 100.95 m.

4.0 SITE INVESTIGATION

Three [3] boreholes, BH 1, BH 2 and BH 101, were drilled at the subject site by Soil-Mat on April 8, 2019, and March 12, 2020 to depths of 7.90, 4.65 and 13.85 m.

Two [2] boreholes, BH 19-3 and BH 19-4, were drilled at the subject site by WSP on July 3, 2019, to depths of 4.40 m.

Two [2] supplementary boreholes, BH 101 and BH 102, were drilled at the subject site by MCR on March 15 and 16, 2023, to depths of 5.05 and 5.35 m.

Monitoring wells were installed in all the boreholes, except BH 1, for long term groundwater monitoring and sampling.

The borehole locations are shown on Drawing No. 1 and borehole logs by MCR and others are enclosed in Appendices B and C.

Soil samples were taken using the Standard Penetration Test (SPT) method and were placed in clean, sealed plastic bags in the field and transported back to our laboratory where they were further examined for soil characterization.

Selected samples were transported to Bureau Veritas to be tested for common corrosion parameters, including pH, resistivity, oxygen reduction potential (redox), chlorides and sulphate content. The laboratory test results are presented in Appendix D.

The elevation of the borehole by Soil-Mat was determined relative to a geodetic benchmark, described as the door sill located on the north face of the existing building located at 3085 Hurontario Street West, with the reported geodetic elevation of 116.40 metres, all as per the Site Servicing and Grading Plan drawing by McConnell Maughan Limited Plan 313E-2., dated July 1986.

MCR borehole elevations referred to in this report are geodetic and metric and are interpolated from the survey plans by R-PE Surveying Ltd., dated February 24, 2021.

5.0 SOIL AND GROUNDWATER CONDITIONS

Subsurface conditions encountered at the borehole locations are shown on Borehole Log Sheets, attached in Appendices Band C, and summarized on a Soil Profile/Drawing No. 2&3, as follows:

Pavement: A layer of asphalt, 100 to 200 mm in thickness, was present at the surface of BH 1, BH 2, and BH 101 (by Soil-Mat) and BH 101 (by MCR) and was followed by 150 to 250 mm of granular fill. A layer of concrete, 165 to 200 mm in thickness, was present at the surface of BH 19-3 (by WSP) and BH 102 (by MCR) and was followed by 150 to mm of granular fill in BH 102.

Possible topsoil with approximate 100 mm thickness was observed at the surface of BH 19-4 (by WSP).

For the purpose of offsite disposal, the type/quality and extent of the existing fill should be explored by further test pit/borehole investigation prior to contract award.

Sand/Silty Sand Till: Loose to very dense layer sand/silty sand till was detected below the pavement/possible topsoil in all boreholes and extended to depths of 1.75 to 3.65 m. The brown/light brown/dark brown sand/silty sand till deposit was in moist to wet condition and contained trace gravel and boulder, some silt and occasional organics in upper level.

Clayey Silt (Till): Very stiff to hard clayey stilt (till) was encountered below the sand/silty sand (till) in BH 1, BH 2 and BH 101 (by Soil-Mat), BH 19-3 and BH19-4 (by WSP) and BH 102 (by MCR) and extended to the underlying weathered shale at depths of 2.45 to 4.30 m. The grey clayey silt (till) deposit was in a moist to wet condition and contained trace of sand and gravel.

Silty Sand Till/Weathered Shale Complex: Very dense silty sand till/weathered shale complex was found below the silty sand till in BH 101 (by MCR) and extended to the underlying weathered shale at a depth of 4.60 m. The brown silty sand till/weathered shale complex was in a wet condition and contained trace gravel.

It should be noted that the till/sand soil is an unsorted sediment; therefore, boulders and cobbles are anticipated.

Shale Bedrock: Weathered shale bedrock was spotted below the clayey silt (till)/silty sand till/weathered shale complex in all boreholes at about depth of 2.45 to 4.60 m, i.e., at about Elevations of 114.00 to 111.25 m, and extended to the maximum depth of the borehole.

The surface of the shale bedrock will vary across the site; therefore, it should be confirmed by further borehole investigation and during foundation installations.

Groundwater: Upon competition of drilling, BH 101 (by Soil-Mat) remained dry. Groundwater level was not measured in BH 101 and BH 102 (by MCR) upon competition of drilling. The results of groundwater level monitoring are summarized in Table 1.

Table 1 – Groundwater Level Monitoring Results

Monitoring Well Id	Ground Surface Elevation (masl)	Water Level (mbgs)	Groundwater Elevation (masl)	Date of Measurement (mm/dd/yyyy)	Depth of Well (mbgs)	Depth of Bentonite (mbgs)	Length of Screen (m)	Inside Diameter of Pipe (mm)	Top of Monitoring Well
Boreholes by Soil-Mat									
BH 2	116.15	3.10	113.05	04/24/2019	4.40	2.80	1.52	50	Flush Mount
		3.00	113.15	05/07/2019					
		3.10	113.05	04/17/202					
BH 101	116.23	4.60	111.63	03/27/2020	13.63	4.30	9.20	50	Flush Mount
		4.50	111.73	04/17/2020					
Boreholes by WSP									
BH 19-3	115.51	2.51	113.00	8/9/2019	3.55	1.85	3.05	50	Flush Mount
BH 19-4	118.26	3.13	115.13	8/9/2019	3.55	1.85	3.05	50	Flush Mount
Boreholes by MCR									
BH 101	116.95	1.83	115.12	04/11/2023	4.57	0.91	3.05	50	Flush Mount
BH 102	116.47	3.71	112.76	04/11/2023	5.33	1.68	3.05	50	Flush Mount
Min	115.51	1.83	111.63	-	3.55	-	-	-	-
Max	118.26	4.60	115.13	-	13.63	-	-	-	-
Average	116.60	3.28	113.18	-	5.84	-	-	-	-

Please note that the groundwater levels are subject to seasonal fluctuations. Consequently, definitive information on the long-term groundwater levels could not be obtained at the present time.

The sedimentary bedrock may contain waterbearing bedding planes. When these bedding planes are intercepted in rock excavation, caissons or elevator pistons etc., a substantial amount of water, often under a hydrostatic head may be encountered.

A Geohydrology assessment study is completed by MCR and the results are presented in a separate report.

6.0 FOUNDATION

The Site is proposed for a residential and commercial development consisting of a forty [40] storey building with four [4] storey podium (Building 1), a forty-four [44] storey building with four [4] storey podium (Building 2), a twenty-eight [28] storey building with six [6] storey podium (Building 3) and a twenty-four [24] storey building with six [6] storey podium (Buidling 4) over four [4] levels of combined underground parking (Appendix B).

It is understood that the ground floor finished elevation (FFE) ranges from 117.96 to 116.00 m and P4 FFE will be at 100.95 m.

Based on the encountered soil/rock foundation conditions, the proposed development, with four U/G parking levels, can be supported on a spread/strip footings founded in sound shale bedrock.

The recommendations are based on the current information and design. Should changes are made during the design phase or construction, this office must be informed and retained to modify recommendations accordingly or propose additional field work.

6.1 SPREAD/STRIP FOOTINGS

The proposed footings could be proportioned using the following bearing resistance:

Factored Bearing Resistance at ULS = 7000 kPa
Bearing Resistance at SLS = 5000 kPa

When founded in sound shale bedrock at or below Elevations of 100.45 m, and at least 1.50 m below the surface of the shale bedrock, subject to design grades and the depth of shale bedrock across the site.

Coefficient of Subgrade Reaction k (for sound shale) = 100 MN/m^3 is considered applicable.

6.2 GENERAL FOUNDATION NOTES

It is recommended that your excavation and construction contract provisions include unit prices for excavation into wet soils which may contain cobbles, boulders and erratic rock to minimize potential unexpected extra costs during excavation and foundation installations.

Adjacent footings, founded at different elevations, preferably are to be stepped at 10 horizontal to 7 vertical, subject to rock condition during excavations.

For frost protection requirements, the exterior footings and footings in unheated areas in unheated P4 areas must have a minimum shale bedrock cover of 0.5 m.

Any water or loose materials must be removed from the footing bases prior to placing concrete.

The recommended resistance at SLS allows for up to 25 mm of total settlement. Potential differential settlements are to be evaluated after completion of the foundation drawings.

Furthermore, the recommended bearing resistance and foundation elevations

have been calculated from the limited borehole information and are intended for design purposes only.

More specific information with respect to rock/foundation conditions will be available when the proposed shoring/foundation construction is underway. Therefore, the encountered rock/foundation conditions must be verified in the field, and footings must be inspected and approved by our office prior to placement of concrete.

7.0 EARTHQUAKE CONSIDERATION

The building must be designed to resist a minimum earthquake force. The National Building Code specifies that the building be designed to withstand a minimum lateral seismic force, V, which is assumed to act non-currently in any direction on the building as per the following expression:

$$V = S(T_a)\, M_v I_E W / R_d R_o$$

It should be noted that V shall not be less than:

$$S(2.0)\, M_v I_E W / R_d R_o$$

In addition, the SFRS (Seismic Force Resisting System (s)) with R_d equal to or greater than 1.5, V should not be greater than:

$$2/3\, S(0.2)\, I_E W / R_d R_o$$

Where $S(T_a)$ shall be calculated by $S_a(T_a)F_a$ or $S_a(T_a)F_v$, depending on fundamental lateral period T_a. The terms, which are relevant to the geotechnical conditions at the site, are acceleration-based site coefficient F_a and velocity-based site coefficient F_v.

For the subject site, classified as Class B based on the borehole information, the applicable values of Fa and Fv are 0.8. and 0.6, respectively. A structural consultant should review all factors.

8.0 BASEMENT WALLS

Underground parking walls should be designed to resist a pressure "p", at any depth, "h" below the surface, as given by the expression:

$$p = K[\gamma h + q]$$

Where: K = 0.40 is the earth pressure coefficient considered applicable

K = 0.25 is the shale pressure coefficient considered applicable

γ = 21.7 kN/m^3 is the unit weight of backfill

q = an allowance for surcharge.

The above equation assumes that perimeter drains will be provided and that the backfill against subsurface walls, where applicable, would be a free draining granular material.

However, subject to further groundwater monitoring results, we suggest that perimeter walls below the groundwater level be designed for hydrostatic pressure to resist a pressure "p", at any depth "h" below the surface, as given by the expression:

$$p = \begin{cases} Kq + K\gamma_m h & h \le D_w \\ Kq + K\gamma_w D_w + K(\gamma_s - \gamma_w)(h - D_w) + \gamma_w(h - D_w) & h > D_w \end{cases}$$

Where: K = 0.50 is the earth pressure coefficient considered applicable

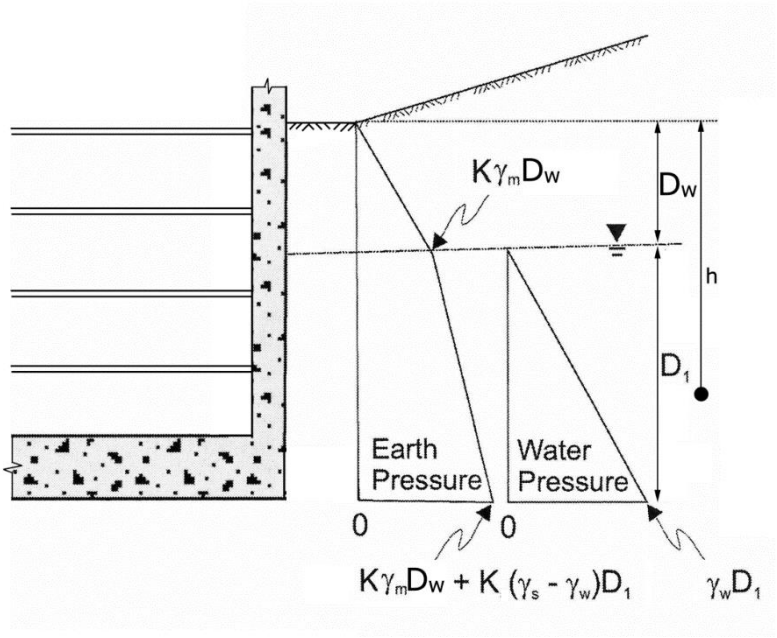
K = 0.25 is the shale pressure coefficient considered applicable

γ_m = 20 kN/m^3 is moist or wet soil unit weight

γ_s = 21.7 kN/m^3 is saturated soil unit weight

γ_w = 9.80 kN/m^3 is the unit weight of water

q = an allowance for surcharge



9.0 DEWATERING

The excavation for the proposed underground parking will extend below the groundwater table.

For soldier pile/lagging, to protect the sides of the excavation from being disturbed by excess groundwater pressure, i.e. to prevent quick sand/dilating silt conditions, the **water table must initially be lowered to at least 1.0 m below the top of bedrock.**

The selected dewatering system, eductors/well points/deep inclined rock embedded wells, designed by a speciality contractor, will be most effective if it is installed and activated at the earliest opportunity during general excavation.

To control potential localized groundwater influx, bedrock could be trenched, and temporary sump pumps installed.

The dewatering contract must be performance driven and the contractor must provide a performance bond. In addition, upon completion of system's installation, contractor must produce a written statement that "The system installed is robust enough to lower and maintain groundwater at least 1.0 m below the lowest footing/shaft elevation, without impacting the integrity of shoring or foundation soils.

Where caisson wall shoring is required, any breaches in caisson wall shoring might result in localized piping. Creation of piping channels might increase the volume of both temporary dewatering and permanent drainage. It is critical that during general excavation **potential formation of localized piping be carefully evaluated and appropriate corrective measures implemented.**

In addition, a pre-construction survey of adjacent structures/roads should be carried out prior to the dewatering/shoring construction stage. Potential adverse effects on adjacent structures, due to the dewatering must be assessed/quantified and suitable preventive/remedial measures implemented.

10.0 EXCAVATION AND BACKFILL

Excess soils shall be managed in accordance to O. Reg. 406/19. As of January 1, 2022, the Project Leader may be required to file a notice in the registry as prescribed under Section 8 of the regulation. The notice shall contain the information set out in Schedule 1 of the regulation. Before the notice is filed the Project Leader shall ensure that a Qualified Person (Qualified Person within the meaning of Section 5 or 6 of O. Reg. 153/04) prepares the documents, as required, under Sections 11, 12, 13 of the regulation.

The Project Leader shall, if required to file a notice and before removing excess soil from the project area, develop and apply a tracking system in accordance with the Soil Rules, to track each load of excess soil during its transportation and deposit.

No major problems will be encountered for the anticipated depth of general excavations, carried out within a shoring wall enclosure.

The excavation in weathered shale bedrock can be carried out with a heavy-duty backhoe. However, the shoring/foundation contractor must be aware that the harder and thick limestone/dolostone slabs are interbedded with the shale bedrock.
For excavation above the water table, the anticipated water seepage, if any, into the excavations from the more permeable seams/lenses or surface run-off can be handled by conventional pumping methods.

A dewatering system such as eductors/well points/deep inclined wells embedded in bedrock will be required for excavation at/below the groundwater level, above bedrock, subject to long term groundwater monitoring results.

In service trenches (outside the building), the fill should be suitable for compaction, i.e. free of limestone fragments of a size greater than 150 mm, and with natural moisture content, which is within 2 percent of the optimum moisture content.

The backfill material should be compacted to at least 98 percent of the Standard Proctor Maximum Dry Density (SPMDD).

The backfill under floor slab against subsurface walls, where applicable, should be free draining granular fill, preferably conforming to the Ontario Provincial Standard Specification for granular base course, Granular B.

11.0 SHORING

A shoring system should be designed to protect adjacent structures and services. The fourth edition of the Foundation Manual should be referred to for the design of the shoring system.

It should be noted that groundwater and cobbles/boulders might be encountered during soldier pile/caisson construction, and the contractor must be prepared to deal with boulders and water seepage into the caisson shafts without undue delays.

Specifically, the shoring contractor may experience difficulties during the drilling the much harder/thick limestone slabs.

Subject to groundwater conditions/monitoring results; it might be difficult to prevent groundwater from penetrating into the excavation through gaps in timber lagging.

The geotechnical parameters, which are considered to be applicable for the design, are as follows:

Active earth pressure coefficient Ka = 0.45 for walls in areas where structures or sensitive services are being supported.

Active earth pressure coefficient Ka = 0.28 for remaining areas.

Natural unit weight of soil = 21.7 kN/m^3

Passive pressure coefficient in shale bedrock Kp = 5

Any surcharge loads must be included in the lateral pressure calculations.

Lateral movements of the shoring wall, designed using Ka = 0.28, are expected to be in order of 15 mm. They are expected to be less if Ka value of 0.45 is used. The expected movements are based on a properly constructed system.

The horizontal and vertical movements should be monitored during construction to ensure satisfactory performance of the shoring system.

The soil and rock anchors should be designed for 20 and 600 kPa respectively subject to confirmation by on-site load tests. It is re-iterated that subsurface conditions **may vary beyond the site's confines**. As a result, the design values must be confirmed by at least two load tests, carried out to twice the design load.

It is imperative that a stability analysis of the entire support system is undertaken prior to commencement of construction. The final shoring design should be reviewed by our office.

Space and groundwater influx permitting, lowest parking level could be excavated "neat" into the rock face. A sufficient rock bench/rock bolts will be required to secure the integrity of the shoring system.

The exposed rock face could be shotcreted (if required) and covered as shown on Drawing No. 4, subject to site condition/field inspection during excavation.

The shoring system and surrounding structures must be monitored for horizontal and vertical movements, prior to, during and after the excavation.

In addition, a pre-construction survey of adjacent structures/roads should be carried out prior to the shoring/design/construction stage. Any potential adverse effect on adjacent structures should be assessed and suitable preventive/remedial measures implemented.

12.0 SLAB ON GRADE AND PERMANENT DRAINAGE

The lowest garage floor slabs can be constructed as slab on grade (SOG), supported by shale bedrock.

Upon completion of foundation work, the SOG should rest on a well compacted bed of size 19 mm clear stone at least 200 mm thick. The stone bed would act as a barrier and prevent capillary rise of moisture from the subgrade to the floor slab.

A permanent Private Water Drainage System (PWDS), as shown on Drawings No. 4 and 5, where shoring is constructed, should be considered. Please note that MCR does not prepare working/shop drawings for the PWDS.

To minimize siltation, all drainage pipe connections must be solid slotted PVC, with elbows and Ts, no "butt" end connections should be permitted. The pipes should slope to a sump at a minimum 1% slope.

Perimeter drainage pipes, with a positive gravity outlet, should be solid and slotted PVC with a minimum of 0.5% slope. In addition, silt traps must be provided at convenient/accessible locations.

We request that PWDS drawings indicate design elevations for both perimeter and underfloor installation. MCR will provide calculations for sizing of permanent pumps, when required.

Upon completion of general excavation, scope and adequacy of the PWDS is to be re-evaluated. The installation of PWDS must be inspected by our office, prior to placement of filter stone.

Any design changes must be approved by the architect and reflected on mandatory

as built drawings*.

* A copy of this section “Slab on grade and Permanent Water Drainage System” page should be posted at a site office as a permanent display.

In addition, the elevator pit should be fully waterproofed as shown on Drawing No. 6.

13.0 PAVEMENT

The critical section of pavement will be at the transition from the infinitely rigid substructure onto soil/backfill subgrade.

As a result, we suggest that an approach type slab be considered to protect underground utilities (on the City’s property) at the entrance/exit points, as shown on Drawing No. 7.

The approach slab will alleviate detrimental effects of dynamic loading/settlement/pavement depression in the backfill to the rigid substructure.

Subject to the anticipated road traffic volumes/AADT/axle loads, the pavement structural design matrix as per City of Mississauga Standards presented in Table 2 and attached in Appendix E, must be followed.

In pavement areas, any organic soil/topsoil/loose fill should be removed (subject to field inspection) and the base should be thoroughly proof-rolled. Any soft spots revealed during proof rolling should be sub-excavated and backfilled with suitable materials, compacted to 98 % SPMDD.

The natural soil is of a low permeability and frost susceptible. The design of pavement is therefore mainly influenced by the need to minimize the effects of freezing and thawing. Consequently, the ground must not be unnecessarily disturbed and drainage must be provided.

The subgrade should be sloped at least 2% to facilitate drainage towards catch basins and the final subgrade should be compacted before the pavement is constructed.

Table 2 – Pavement Structural Design Matrix as Per City of Mississauga

Class of Road	Structural Road Component	Minimum Structural Road Depth (mm)			
Arterial / Industrial & Residential / Collector Local Industrial	Top Course Asphalt	40	40	40	40
	Base Course Asphalt	60	85	100	100
	Granular Base	200	200	200	200
	Granular Sub-Base	65	325	400	400
	Total Depth	**365**	**650**	**740**	**740**
Minor Local Industrial / Minor Residential / Collector	Top Course Asphalt	40	40	40	40
	Base Course Asphalt	50	85	100	100
	Granular Base	200	200	200	200
	Granular Sub-Base	0	225	325	360
	Total Depth	**290**	**580**	**665**	**700**
Residential (Minor Local/Local)	Top Course Asphalt	40	40	40	40
	Base Course Asphalt	50	85	85	100
	Granular Base	200	200	200	200
	Granular Sub-Base	0	175	235	250
	Total Depth	**290**	**500**	**560**	**590**
Frost Susceptibility Factor		1 (80% Sand)	3 5 7 (30% MAX. Silt; 30% MIN. Sand)	11 (55% MAX. Silt)	15 (+55% Silt)

A typical pavement structure above garage roof slab, please see Drawings No. 8 and 9.

It should be noted that the subgrade should be dry, not spongy, during the compaction and construction of the [sub] base.

Soft or spongy subgrade areas should also be sub-excavated and properly replaced with suitable approved backfill, compacted to 98 % SPMDD.

The subgrade will suffer strength regression if water is allowed to infiltrate into the mantle. Therefore, sub-drains should be installed (subject to field inspection) to prevent surface water from infiltrating into the road subgrade.

For construction of concrete curbs, it is recommended that the concrete curbs be constructed on a granular base of at least 300 mm thick of granular A material, subject to pavement design.

In addition, in soft and/or wet areas Geotextile filter fabric/Geogrid may have to be used.

All granular materials used in the pavement construction should be compacted to 100 % of the Standard Proctor Maximum Dry Density.

Should the proposed roads be constructed during wet seasons, the moisture content in the subgrade will probably be above the optimum, and this will render its shear strength inadequate to support paving equipment traffic. In the above case, the granular sub/base should be replaced by an equal thickness of compacted size 50 mm Crusher-Run Limestone.

14.0 CHEMICAL PROPERTIES OF THE SOIL

One (1) sample from BH 101 (by MCR) was submitted to Bureau Veritas to be tested for common corrosion parameters, including pH, resistivity, oxygen reduction potential (redox), chlorides, sulfides and sulphate content. The laboratory test results are presented in Appendix D.

14.1 CORROSIVITY

The results regarding corrosivity of the subsurface soil and the corresponding points based on American Water Works Association (AWWA) document, “Polyethylene Encasement for Ductile-Iron Pipe Systems” ANSI/AWWA C105/A21.5-18, dated December 1, 2018, are presented in Table 3.

Table 3 – Results of Soil Corrosivity Potential

Sample ID	Depth (m)	Parameter	Measured Value	ANSI/AWWA Point Rating	Total ANSI/AWWA Points
BH101 SS5	2.44	Sulphide (%)	0.00015	2	13
		pH	7.83	0	
		Resistivity (ohm.cm)	1100	10	
		Redox Potential (mV)	260	0	
		Moisture (%)	14	1	

According to AWWA ten points indicates that soil is corrosive to ductile-iron pipe; protection is needed. It should be noted that the analytical results only provide an indication of the potential for corrosion.

14.2 SULPHATE ATTACK

The concentration of water-soluble sulphate content of the tested sample was 0.004% which is below the CSA Standard of 0.1% water-soluble sulphate (Table 3 - Additional Requirements for Concrete Subjected to Sulphate Attack from Canadian Standard CSA A23.1). Therefore, no particular protection measure, such as special concrete mix, against sulphate attack needs to be implemented.

15.0 GENERAL COMMENTS

The comments given in this report are intended only as guidance for design engineers and are subject to field verification during construction. As more specific subsurface information, with respect to conditions between boreholes becomes available during excavations on the subject site, this report should be updated.

Contractors bidding on or undertaking the work should decide on their own investigations, as well as their own interpretations of the factual borehole results. This concern specifically applies to the classification of the subsurface soil and the potential reuse of these soils on/off site.

The contractors must draw their own conclusions as to how the near surface and subsurface conditions may affect them.

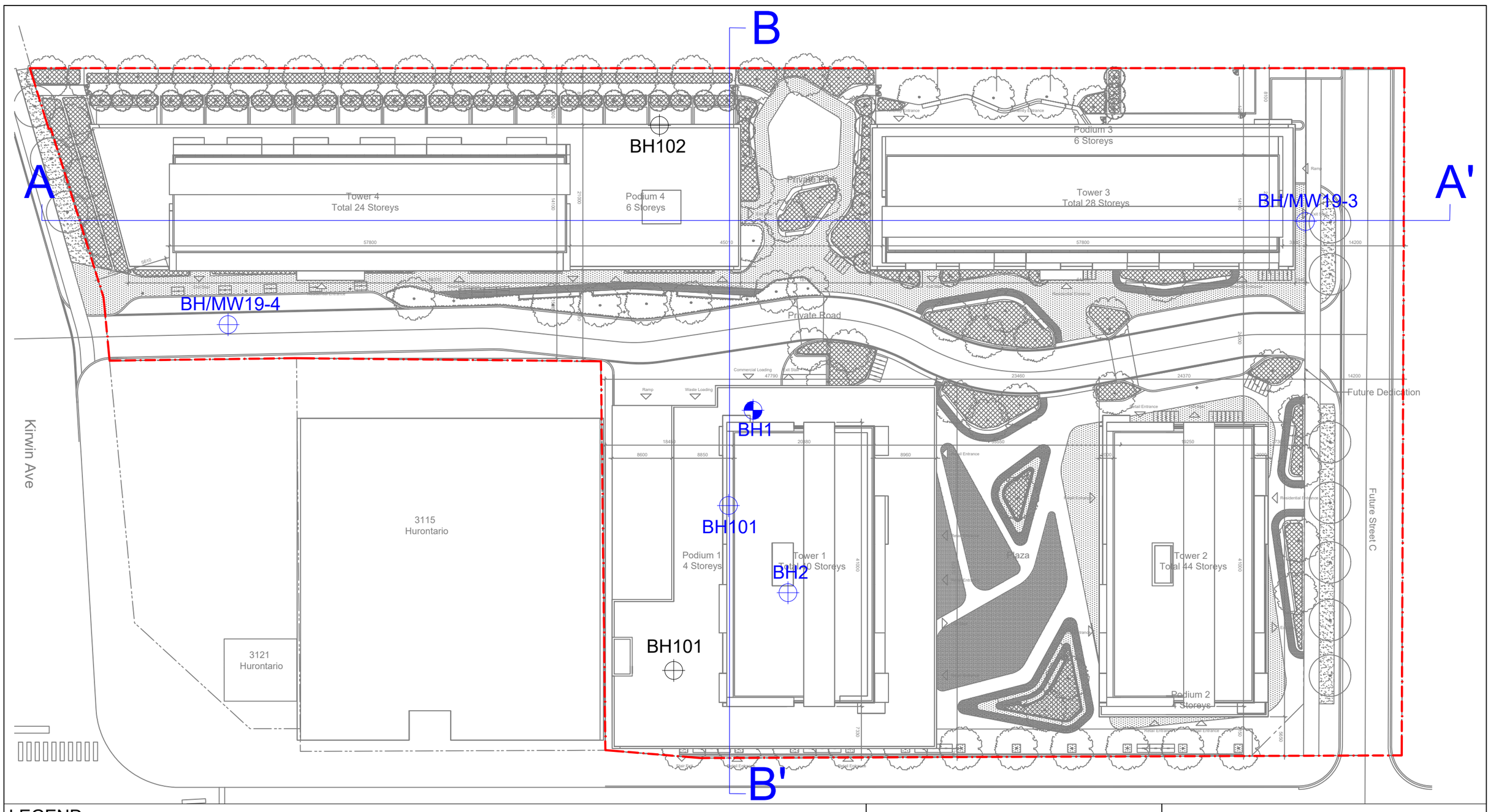
We trust this report contains information requested at this time. However, if any clarification is required or if we can be of further assistance, please call us.

Respectfully,
MCR ENGINEERS LTD.

S. Tavassoli, M.Sc., E.I.T.

L.J. Rak, M.Eng., P.Eng.

FIGURES



LEGEND:

- PROPERTY BOUNDARY
- MONITORING WELL INSTALLED BY MCR, 2023
- BOREHOLE/MONITORING WELL BY OTHERS, 2019

PROJECT NORTH

TRUE NORTH

0 5 10 20

SCALE (m)

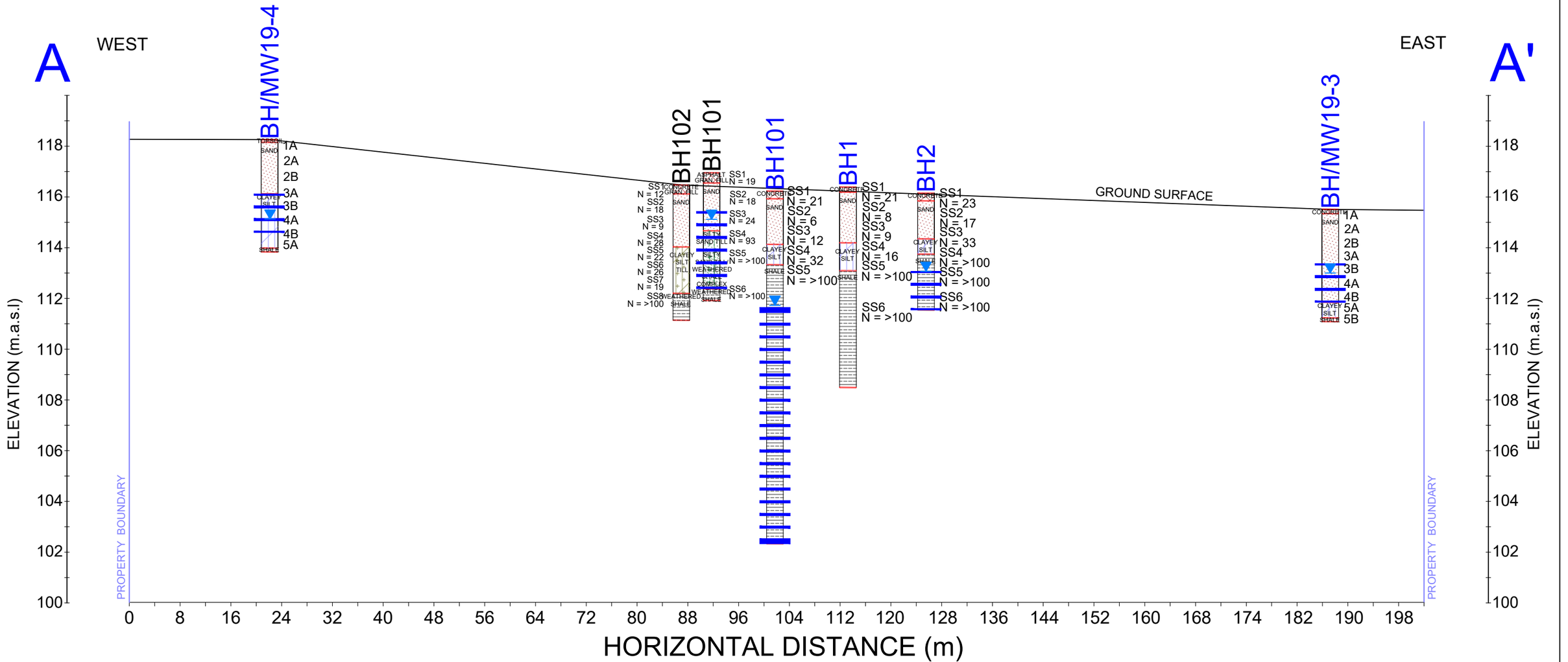
MCR ENGINEERS LTD
GEO-ENVIRONMENTAL CONSULTANTS

3085-3105 HURONTARIO STREET, MISSISSAUGA, ONTARIO

BOREHOLE
LOCATION PLAN

Project No.	Date	Drawn by:	Checked by:	Drawing No.
GE5822	AUGUST 2023	CM	ST	1

Drawing Notes: Image drafted from property survey, Toronto Maps, Google Maps, and site inspections. Not for construction purposes.



LEGEND:

- SCREENED INTERVALS
- ELEVATION MARK (masl)
- APPROXIMATE WATER LEVEL
- FILL
- SAND
- SILTY SAND
- SHALE
- SILT
- CLAYEY SILT
- SANDY SILT

MCR ENGINEERS LTD
GEO-ENVIRONMENTAL CONSULTANTS

3085-3105 HURONTARIO STREET, MISSISSAUGA, ONTARIO

CROSS-SECTION A-A'

Project No.	Date	Drawn by:	Checked by:	Drawing No.
GE5822	AUGUST 2023	CM	ST	2

B

NORTH

SOUTH

B'

GROUND SURFACE

BH102

SS1 N = 12
SS2 N = 18
SS3 N = 9
SS4 N = 28
SS5 N = 22
SS6 N = 26
SS7 N = 19
SS8 N = >100

CONCRETE
GRANULAR FILL
SAND
CLAYEY SILT TILL
WEATHERED SHALE

BH/MW19-3

CONCRETE
SAND
1A
2A
2B
3A
3B
4A
4B
5A
CLAYEY SILT
SHALE
5B

BH/MW19-4

TOPSOIL
SAND
1A
2A
2B
CLAYEY SILT
3A
3B
4A
4B
SHALE
5A

BH1

CONCRETE
SAND
SS1 N = 21
SS2 N = 8
SS3 N = 9
SS4 N = 16
SS5 N = >100
CLAYEY SILT
SHALE
SS6 N = >100

BH101

CONCRETE
SAND
SS1 N = 21
SS2 N = 6
SS3 N = 12
SS4 N = 32
SS5 N = >100
CLAYEY SILT
SHALE

BH2

CONCRETE
SAND
SS1 N = 23
SS2 N = 17
SS3 N = 33
SS4 N = >100
SS5 N = >100
SS6 N = >100
CLAYEY SILT
SHALE

BH101

ASPHALT
GRANULAR FILL
SAND
SS1 N = 19
SS2 N = 18
SS3 N = 24
SILTY SAND TILL
SS4 N = 93
SILTY SAND WEATHERED COMPLEX
SS5 N = >100
WEATHERED SHALE
SS6 N = >100

PROPERTY BOUNDARY

PROPERTY BOUNDARY

ELEVATION (m.a.s.l)

118
116
114
112
110
108
106
104
102
100

0 4 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64 68 72 76 80 84 88 92 96 100

HORIZONTAL DISTANCE (m)

LEGEND:

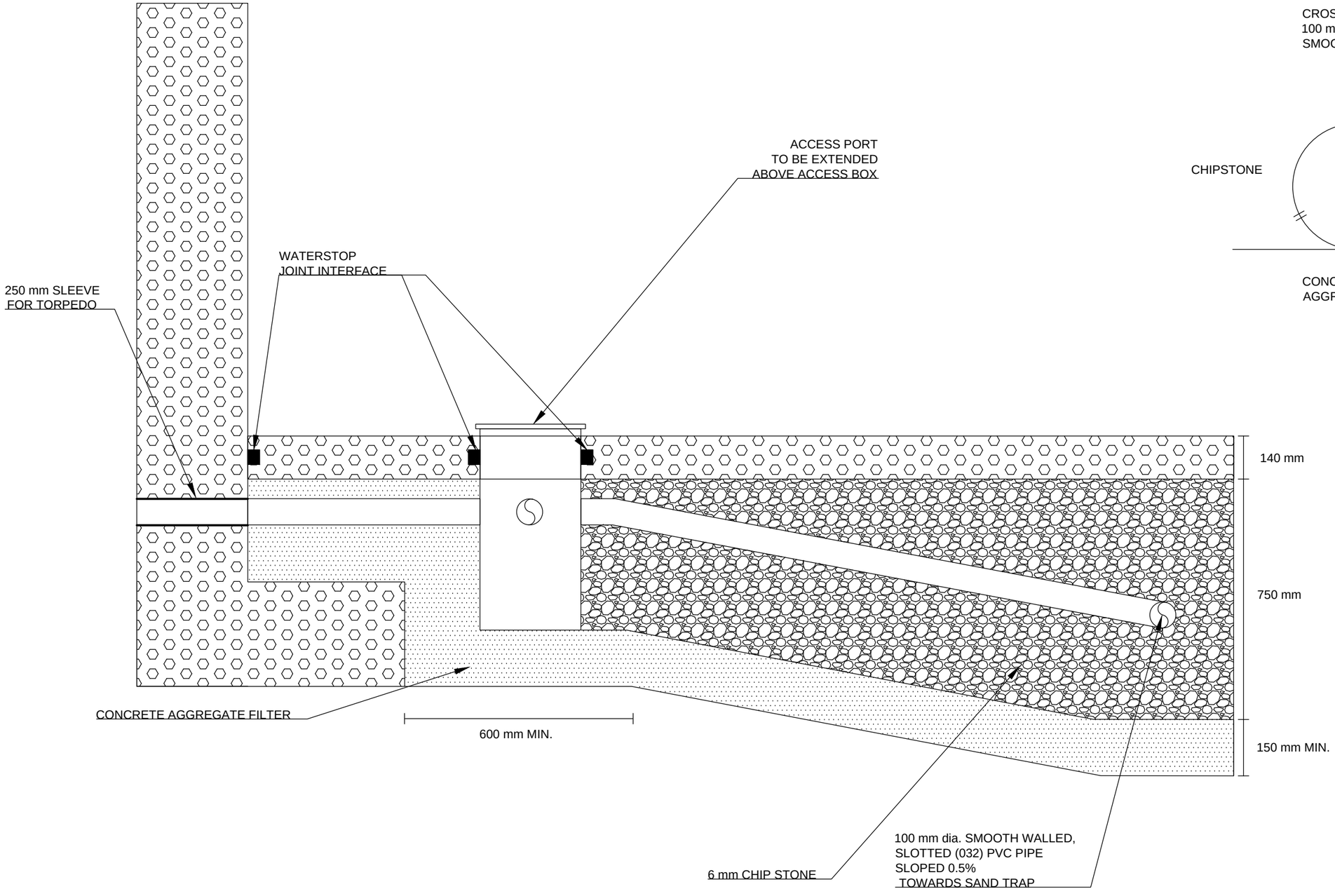
- SCREENED INTERVALS
- ELEVATION MARK (masl)
- APPROXIMATE WATER LEVEL
- FILL
- SAND
- SILTY SAND
- SHALE
- SILT
- CLAYEY SILT
- SANDY SILT

MCR ENGINEERS LTD
GEO-ENVIRONMENTAL CONSULTANTS

3085-3105 HURONTARIO STREET, MISSISSAUGA, ONTARIO

CROSS-SECTION B-B'

Project No.	Date	Drawn by:	Checked by:	Drawing No.
GE5822	AUGUST 2023	CM	ST	3



MCR ENGINEERS LTD.
GEO-ENVIRONMENTAL CONSULTANTS

PRIVATE WATER DRAINAGE SYSTEM

Scale:	Drawing No.
NTS	3

TABLES

McCLYMONT AND RAK ENGINEERS INC.
GEO-ENVIRONMENTAL CONSULTANTS

TABLE 1
CONSTRUCTION DETAILS AND ELEVATION OF MONITORING WELLS

MONITORING WELL ID	GROUND SURFACE ELEVATION (masl)	WATER LEVEL (mbgs)	GROUNDWATER ELEVATION (masl)	DATE OF MEASUREMENT (mm/dd/yyyy)	DEPTH OF WELL (mbgs)	DEPTH OF BENTONITE (mbgs)	LENGTH OF SCREEN (m)	INSIDE DIAMETER OF PIPE (mm)	TOP OF MONITORING WELL
Boreholes by Soil-Mat									
BH 2	116.15	3.10	113.05	04/24/2019	4.40	2.80	1.52	50	FLUSH MOUNT
		3.00	113.15	05/07/2019					
		3.10	113.05	04/17/202					
BH 101	116.23	4.60	111.63	03/27/2020	13.63	4.30	9.20	50	FLUSH MOUNT
		4.50	111.73	04/17/2020					
Boreholes by WSP									
BH 19-3	115.51	2.51	113.00	8/9/2019	3.55	1.85	3.05	50	FLUSH MOUNT
BH 19-4	118.26	3.13	115.13	8/9/2019	3.55	1.85	3.05	50	FLUSH MOUNT
Boreholes by MCR									
BH 101	116.95	1.83	115.12	04/11/2023	4.57	0.91	3.05	50	FLUSH MOUNT
BH 102	116.47	3.71	112.76	04/11/2023	5.33	1.68	3.05	50	FLUSH MOUNT
Min	115.51	1.83	111.63	-	3.55	-	-	-	-
Max	118.26	4.60	115.13	-	13.63	-	-	-	-
Average	116.60	3.28	113.18	-	5.84	-	-	-	-

NOTE:

mbgs - meters below ground surface

masl - meters above sea level

N/A - Not Applicable

NF - Not Found

McCLYMONT AND RAK ENGINEERS INC.
GEO-ENVIRONMENTAL CONSULTANTS

TABLE 2
GROUNDWATER ANALYTICAL RESULTS - PEEL REGION SEWERS BY-LAW DISCHARGE CRITERIA
MCR JOB#: G5822
SITE ADDRESS: 3085 - 3105 Hurontario Street, Mississauga, ON

PARAMETER	UNITS	LIMITS FOR STORM SEWER DISCHARGE	LIMITS FOR SANITARY & COMBINED SEWERS DISCHARGE	BH 102
				13-Apr-23
pH	pH Units	6.0 - 9.0	5.5 - 10.0	8.05
Total Suspended Solids	mg/L	15	350	7
Fluoride (F-)	mg/L	-	10	0.199
Total Kjeldahl Nitrogen (TKN)	mg/L	1	100	0.398
Total Phosphorus (P)	mg/L	0.4	10	0.093
Sulfate (SO4)	mg/L	-	1500	35.5
Total Cyanide (CN)	mg/L	0.02	2	<0.0020
Escherichia Coli	CFU/100mL	200	-	<1
Total Aluminum (Al)	mg/L	-	50	0.357
Total Antimony (Sb)	mg/L	-	5	<0.00100
Total Arsenic (As)	mg/L	0.02	1	<0.00100
Total Cadmium (Cd)	mg/L	0.008	0.7	<0.0000500
Total Chromium (Cr)	mg/L	0.08	5	<0.00500
Total Cobalt (Co)	mg/L	-	5	0.00102
Total Copper (Cu)	mg/L	0.05	3	<0.00500
Total Lead (Pb)	mg/L	0.12	3	0.00119
Total Manganese (Mn)	mg/L	0.05	5	**0.136**
Total Mercury (Hg)	mg/L	0.0004	0.01	<0.0000050
Total Molybdenum (Mo)	mg/L	-	5	0.0278
Total Nickel (Ni)	mg/L	0.08	3	<0.00500
Total Selenium (Se)	mg/L	0.02	1	0.000566
Total Silver (Ag)	mg/L	0.12	5	<0.000100
Total Tin (Sn)	mg/L	-	5	<0.00100
Total Titanium (Ti)	mg/L	-	5	0.00844
Total Zinc (Zn)	mg/L	0.04	3	<0.0300
Biological Oxygen Demand	mg/L	15	300	**686**
Total Oil & Grease (Animal/Vegetable)	mg/L	-	150	<5.0
Total Oil & Grease Mineral/Synthetic	mg/L	-	15	<5.0
Phenols-4AAP	mg/L	0.008	1	0.0013
Benzene	µg/L	2	10	<0.50
Chloroform	µg/L	2	40	<0.50
1,2-Dichlorobenzene	µg/L	5.6	50	<0.50
1,4-Dichlorobenzene	µg/L	6.8	80	<0.50
cis-1,2-Dichloroethylene	µg/L	5.6	4000	<0.50
Dichloromethane (Methylene Chloride)	µg/L	5.2	2000	<1.0
trans-1,3-Dichloropropene	µg/L	5.6	140	<0.30
Ethylbenzene	µg/L	2	160	<0.50
Methyl Ethyl Ketone	µg/L	-	8000	<20
Styrene	µg/L	-	200	<0.50
1,1,2,2-Tetrachloroethane	µg/L	17	1400	<0.50
Tetrachloroethylene	µg/L	4.4	1000	<0.50
Toluene	µg/L	2	270	<0.50
Trichloroethylene	µg/L	8	400	<0.50
Xylene (Total)	µg/L	4.4	1400	<0.50
Bis(2-ethylhexyl)phthalate	µg/L	8.8	12	<2.0
Di-n-butylphthalate	µg/L	15	80	<1.0
Total PCBs	µg/L	0.4	1	<0.060
Nonylphenol	µg/L	-	20	<1.0
Total Nonylphenol Ethoxylates	µg/L	-	200	<2.0

Note:

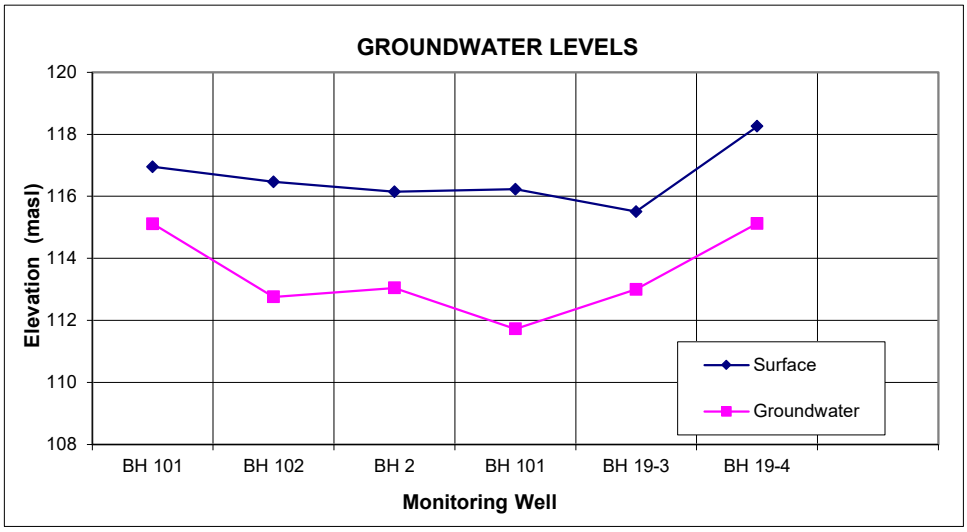
BOLD	Exceeds Criteria - Peel Region Sanitary By-Law
BOLD	Non-Detect Exceeds Criteria - Peel Region Sanitary By-Law
BOLD	Exceeds Criteria - Peel Region Storm By-Law
BOLD	Non-Detect Exceeds Criteria - Peel Region Storm By-Law

MCR	MCR ENGINEERS LTD.	GROUNDWATER
	GEO-ENVIRONMENTAL CONSULTANTS	

Project: Proposed Residential Development
Location: 3085 - 3105 Hurontario Street, Mississauga, ON
Date: August-23
Project #: G5822

TABLE 3
GROUNDWATER MONITORING DATA

Borehole Number	Surface Elevation	Water Level Depth	Water Level Elevation	Monitoring Date	NOTES
	(masl)	(mbgs)	(masl)	(mm/dd/yyy)	
BH 101	116.95	1.83	115.12	4/1/2023	
BH 102	116.47	3.71	112.76	4/1/2023	
BH 2	116.15	3.10	113.05	4/17/2020	by Soil-Mat
BH 101	116.23	4.50	111.73	4/17/2020	by Soil-Mat
BH 19-3	115.51	2.51	113.00	8/9/2019	by WSP
BH 19-4	118.26	3.13	115.13	8/9/2019	by WSP
Average	116.60	3.13	113.47		
Max			115.13		



Project: Proposed Residential Development
Location: 3085 - 3105 Hurontario Street, Mississauga, ON
Date: August-23
Project #: G5822

TABLE 4
DISCHARGE ESTIMATION OF CONSTRUCTION DEWATERING

Site Parameters	P4	Units
Initial Water Level before Dewatering	113.47	(m)
Lowest Water Level during Construction Dewatering	99.45	(m)
Length of Site X	100.00	(m)
Width of Site W	130.00	(m)
Equivalent Radius r_e	64.33	(m)
Hydraulic Conductivity of Aquifer (k)	0.20	(m/day)
Aquifer Bottom Elevation	98.45	(m)
Applied Radius of Influence (Ro)	63.97	(m)
Height btw Initial Water Level and Aquifer Bottom (H)	15.02	(m)
Height btw Lowest Water Level and Aquifer Bottom (h_w)	1.00	(m)
Radius of Influence (R)	128.30	(m)
Factor of Safety (FS)	1.50	

$$Q = \frac{\pi k (H^2 - h_w^2)}{Ln(R/r)}$$

Estimated steady-state discharge of dewatering	306	(m^3/day)
	56	(USG/min)

Project:	**Proposed Residential Development**
Location:	**3085 - 3105 Hurontario Street, Mississauga, ON**
Date:	**August-23**
Project #:	**G5822**

TABLE 5
DISCHARGE ESTIMATION OF PERMANENT DRAINAGE SYSTEM

Site Parameters	P4	Units
Initial Water Level before Dewatering	113.47	(m)
Lowest Water Level under PDS conditions	100.45	(m)
Length of Site X	100.00	(m)
Width of Site W	130.00	(m)
Equivalent Radius r_e	64.33	(m)
Hydraulic Conductivity of Aquifer (k)	0.20	(m/day)
Aquifer Bottom Elevation	99.45	(m)
Applied Radius of Influence (Ro)	59.41	(m)
Height btw Initial Water Level and Aquifer Bottom (H)	14.02	(m)
Height btw Lowest Water Level and Aquifer Bottom (h_w)	1.00	(m)
Radius of Influence (R)	123.73	(m)
Factor of Safety (FS)	1.50	

$$Q = \frac{\pi k (H^2 - h_w^2)}{Ln(R/r)}$$

Estimated steady-state discharge of dewatering	**282**	(m^3/day)
	52	(USG/min)

APPENDIX A

PLAN OF SURVEY OF LOT 15, CONCESSION 1 NORTH OF DUNDAS STREET, PART OF BLOCKS A AND B, REGISTERED PLAN 645 AND PART OF VILLAGE LOT 9, SAVIGNEY'S PLAN OF COOKSVILLE (PLAN TOR–12) CITY OF MISSISSAUGA REGIONAL MUNICIPALITY OF PEEL

SCALE 1:300

10m 5m 0 10m 20m 30 metres

R–PE SURVEYING LTD., O.L.S.

METRIC

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

NOTES

□	DENOTES MONUMENT SET
■	DENOTES MONUMENT FOUND
SSIB	DENOTES SHORT STANDARD IRON BAR
SIB	DENOTES STANDARD IRON BAR
IB	DENOTES IRON BAR
RSIB	DENOTES ROUND STANDARD IRON BAR
CC	DENOTES CUT CROSS
PL1	DENOTES PLAN 43R–17198
PL2	DENOTES PLAN 43R–33188
PL3	DENOTES EXPROPRIATION PLAN PR3525321
PL6	DENOTES UNREGISTERED PEEL STANDARD CONDOMINIUM PLAN BY CHAMBERS & ASSOCIATES SURVEYING LTD., O.L.S. DATED AUGUST 23, 2018 (FILE No. 10–12)
(1225)	DENOTES DAVID B. SEARLES SURVEYING LTD., O.L.S.
(1654)	DENOTES CHAMBERS & ASSOCIATES SURVEYING LTD., O.L.S.
(NI)	DENOTES NOT IDENTIFIED
(WIT)	DENOTES WITNESS
P.I.N.	DENOTES PROPERTY IDENTIFIER NUMBER
RW	DENOTES RETAINING WALL
SCP	DENOTES SPECIFIED CONTROL POINT
CLF	DENOTES CHAIN LINK FENCE

INTEGRATION NOTE

BEARINGS ARE UTM GRID, DERIVED FROM SPECIFIED CONTROL POINTS 2016079 AND 2016080, UTM ZONE 17, NAD–1983:CSRS:CBNV6–2010.0.

COORDINATES ARE UTM ZONE 17, NAD–1983:CSRS:CBNV6–2010.0, TO URBAN ACCURACY PER SEC. 14 (2) OF O.REG. 216/10, AND CANNOT, IN THEMSELVES, BE USED TO RE–ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

POINT ID	NORTHING	EASTING
SCP 2016079	4826446.77	611405.54
SCP 2016080	4826342.28	611561.12

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999739.

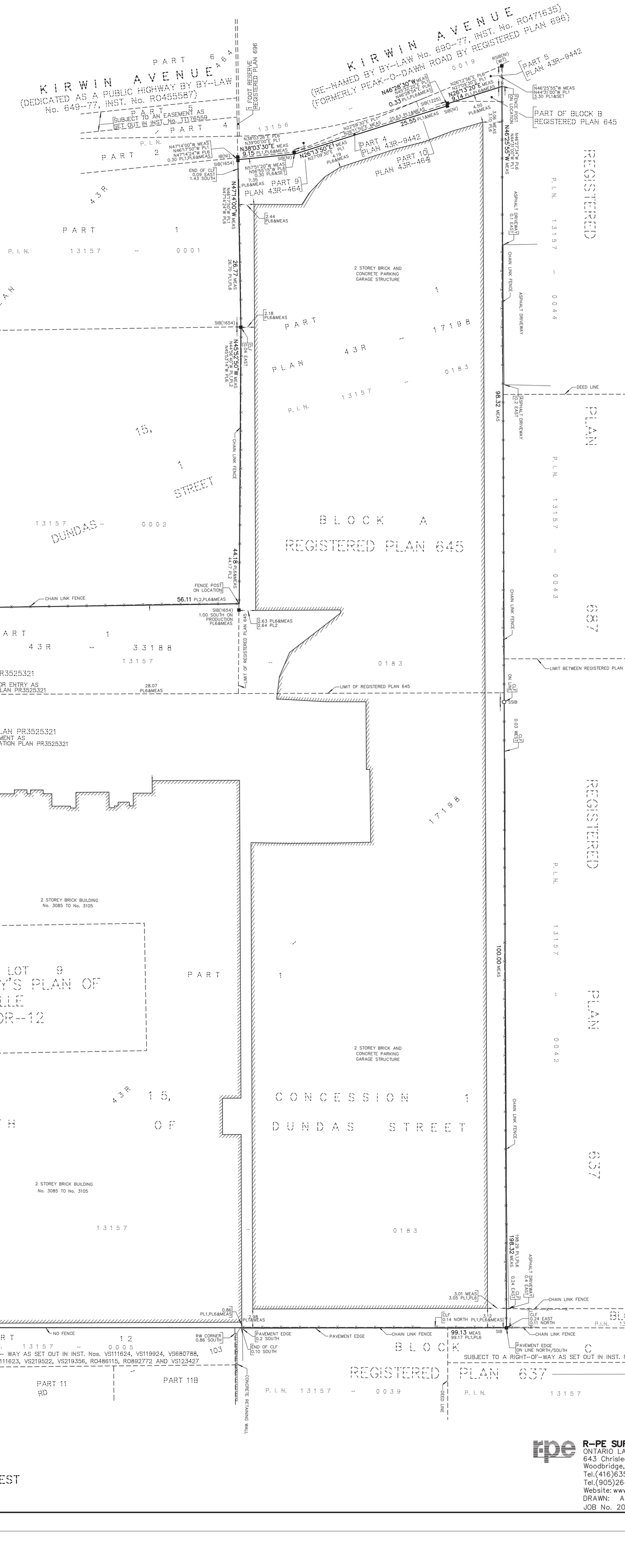
SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 08th DAY OF FEBRUARY ,2021.

DATE FEBRUARY 24th ,2021

S. GOONEWARDENA
ONTARIO LAND SURVEYOR



ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2153932
THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR
In accordance with Regulation 1026, Section 29(3).

R–PE SURVEYING LTD.
ONTARIO LAND SURVEYORS
643 Chrislea Road, Suite 7
Woodbridge, Ontario L4L 8A3
Tel.(416)635–5000 Fax (416)635–5001
Tel.(905)264–0881 Fax (905)264–2099
Website: www.r–pe.ca

DRAWN: A.Q. CHECKED: S.G.
JOB No. 20–257 CAD FILE No.20257PS01

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APPENDIX C

JAGUAR VALLEY

3130 Jaguar Valley

3112 Jaguar Valley

3094 Jaguar Valley

28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

A B C D E F G H I J K L M N O

12500 3900 2000 15703 8302

Building 4
20 Storeys

6841 4500

COURT

18500

51600

12500 3900 2000 25000

Building 3
24 Storeys

3600 25000

KIRWIN AVE

3121 Hurontario

3115 Hurontario

19137 2800 6500 25600 2800 3700 3900 14050

35800

4000

Building 1
40 Storeys

SQUARE

Building 2
44 Storeys

3569 4395 3569 4000

3075 Hurontario

HURONTARIO ST

diamond schmitt

Preliminary - Context Plan P110A

3085 Hurontario St 05/29/23 1 : 750

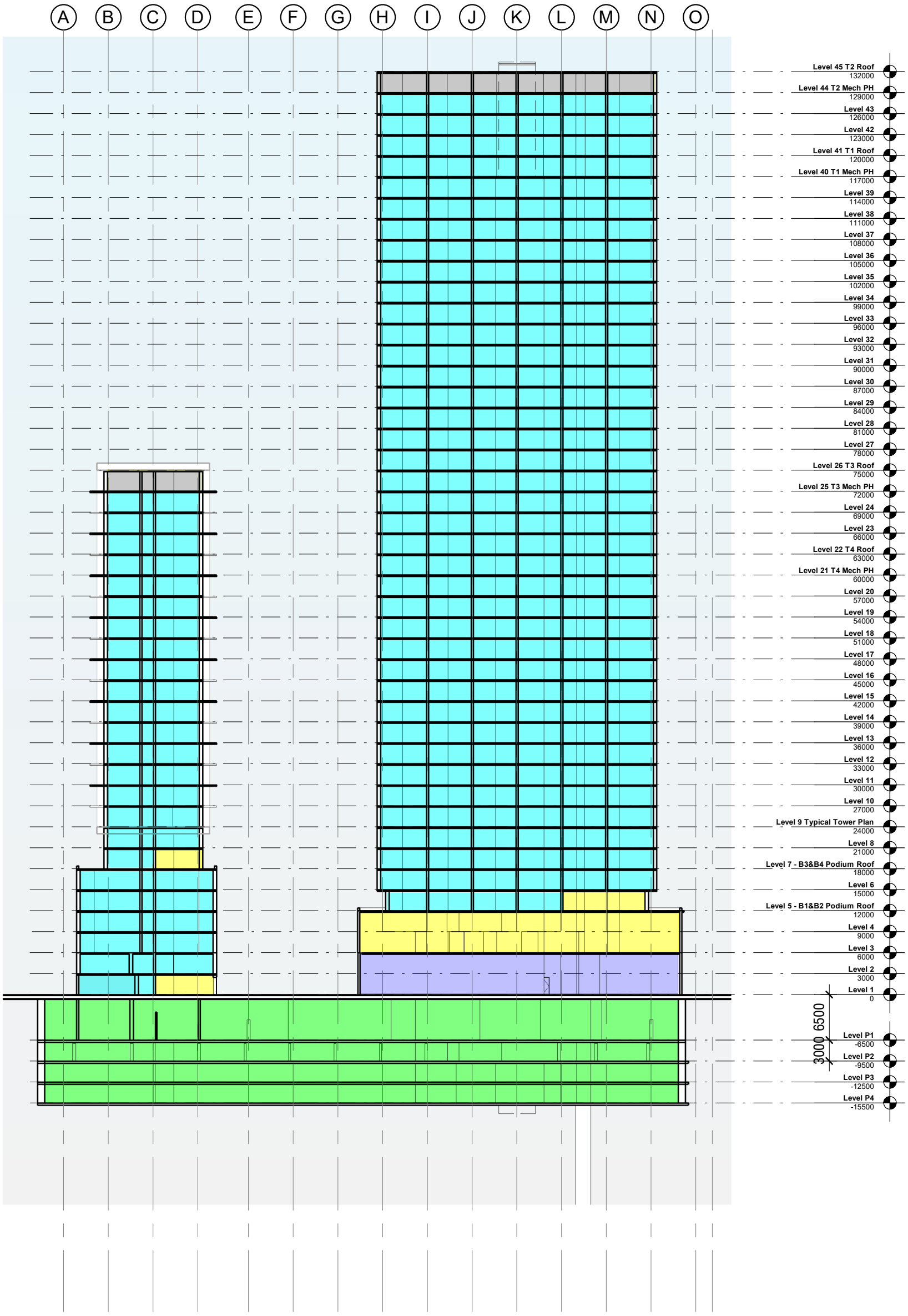
Building Section - B2 & B3

3085 Hurontario St

P401

03/30/21

1 : 600



Mech

Residential

Amenity

Commercial

Parking

diamond schmitt

APPENDIX B

RECORD OF BOREHOLE 101

PROJECT : GE5822
LOCATION : 3085-3105 Hurontario Street, Mississauga, Ontario
STARTED : March 16, 2023
COMPLETED : March 16, 2023

MC CLYMONT & RAK ENGINEERS, INC.

SHEET 1 OF 1
DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) ⊗ 100 200 300 400 / % LEL - (hexane) □ 20 40 60 80	SHEAR STRENGTH: Cu, KPa nat V - ✚ rem V - ● Q - ✖ U - ▲ 20 40 60 80 / WATER CONTENT, PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		116.95							
	POWER BORING / HOLLOW STEM AUGER	150mm ASPHALT		116.80							Flush Mount Cover
		250mm GRANULAR FILL		0.15	1	SS	19				
		SAND: fine, brown, moist, compact.		116.55 0.40	2	SS	18				Bentonite
					3	SS	24				116.04
2											1.52 m Long 50 mm ID PVC Riser
		SILTY SAND TILL: trace of shale fragments and gravel, brown, wet, very dense.		114.66 2.29	4	SS	93				
		SILTY SAND TILL/WEATHERED SHALE COMPLEX: trace of gravel, brown, wet, very dense.		113.90 3.05	5	SS	>100				Silica Sand
4											3.05 m Long 50 mm ID Well Screen
		WEATHERED SHALE: grey, moist.		112.38 4.57	6	SS	>100				112.38
		End of Borehole		111.92 5.03							
6		Note: 1) Water level was not measured on completion of drilling. 2) Water level was measured at 1.83 mbgs on Apr. 11, 2023.									

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL: 1.83 m bgs

▼ DEEP/DUAL INSTALLATION
WATER LEVEL:

LOGGED : RS
CHECKED : CM

MCR LOG ENVIRONMENTAL 5822.GPJ 4-13-23

RECORD OF BOREHOLE 102

PROJECT : GE5822
LOCATION : 3085-3105 Hurontario Street, Mississauga, Ontario
STARTED : March 15, 2023
COMPLETED : March 16, 2023

MC CLYMONT & RAK ENGINEERS, INC.

SHEET 1 OF 1
DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) ⊗ 100 200 300 400 / % LEL - (hexane) □ 20 40 60 80	SHEAR STRENGTH: Cu, KPa nat V - ✚ rem V - ● Q - ✖ U - ▲ 20 40 60 80 / WATER CONTENT, PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		116.47							
	POWER BORING / HOLLOW STEM AUGER	200mm CONCRETE		116.27							Flush Mount Cover
		150mm GRANULAR FILL		0.20 116.12	1	SS	12				
		SAND: fine, dark brown to brown, moist to wet, compact to dense. - trace of gravel until 0.61 m.		0.35	2	SS	18				Bentonite
					3	SS	9				114.79
2					4	SS	28				2.29 m Long 50 mm ID PVC Riser
		CLAYEY SILT TILL: trace of sand and gravel, brown to grey, moist, very stiff.		114.03 2.44	5	SS	22				
					6	SS	26				Silica Sand
4					7	SS	19				▽
		WEATHERED SHALE		112.20 4.27	8	SS	>100				3.05 m Long 50 mm ID Well Screen
					9	SS					
		End of Borehole Note: 1) Water level was not measured on completion of drilling. 2) Water level was measured at 3.71 mbgs on Apr. 11, 2023.		111.14 5.33							111.14
6											

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL: 3.71 m bgs

▼ DEEP/DUAL INSTALLATION
WATER LEVEL:

LOGGED : RS
CHECKED : CM

MCR LOG ENVIRONMENTAL 5822.GPJ 4-13-23

APPENDIX C

Log of Borehole No. 1

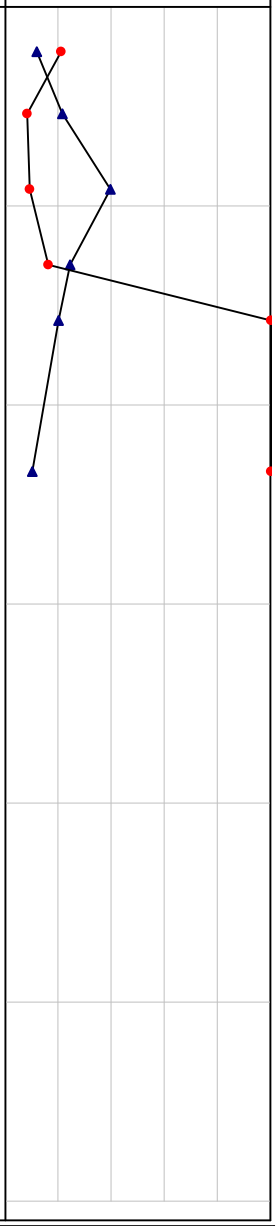
Project No: SM 190138-G
Project: Proposed Condominium Building
Location: 3085 Hurontario Street, Mississauga
Client: Oakhill Environmental Inc.

Project Manager: Kyle Richardson
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4826460
E: 611511

Soil-Mat

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
	116.39	Ground Surface								
0 / 0	116.09	**Pavement Structure** Approximately 100 millimetres of asphaltic concrete over 200 millimetres of compact granular base.								
1 /		**Sand** Brown, medium in gradation, trace gravel, occasional organics in upper level, loose.		SS	1	9,10,11,7	21			
2 / 1				SS	2	3,4,4,9	8			
6 /	114.20			SS	3	5,5,4,6	9			
9 / 2		**Clayey Silt** Grey, trace gravel, very stiff.		SS	4	4,7,9,12	16		>4.5	
10 / 3	113.10			SS	5	14,50/5"	100			
13 / 4		**Dundas Shale** Grey with occasional harder limestone layers, highly weathered in upper levels, becoming more sound with depth, hard.			6	50/4"	100			
19 / 6				NQ	7	RQD 29.4%				
23 / 7				NQ	8	RQD 35.7%				
25 /	108.50									
26 / 8		End of Borehole NOTES: 1. Borehole was advanced using hollow stem auger equipment on April 8, 2019 to auger refusal at a depth of 5.2 metres, then the bedrock cored to a depth of approximately 7.9 metres using Nq diamond barrel equipment. 2. Borehole was backfilled as per Ontario Regulation 903. 3. Soil samples will be discarded after 3 months unless otherwise directed by our client.								
29 / 9										
33 / 10										
36 / 11										
39										

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



Drill Method: Hollow Stem Augers
Drill Date: April 8, 2019
Hole Size: 200 millimetres
Drilling Contractor: Geo-Environmental

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Benchmark
Field Logged by: ZRV
Checked by: KR
Sheet: 1 of 1

Log of Borehole No. 2

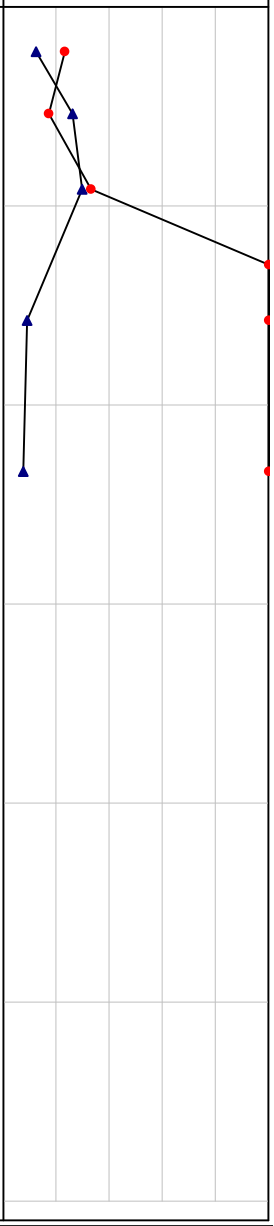
Project No: SM 190138-G
Project: Proposed Condominium Building
Location: 3085 Hurontario Street, Mississauga
Client: Oakhill Environmental Inc.

Project Manager: Kyle Richardson
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4826436
E: 611503

Soil-Mat

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)
	116.15	Ground Surface								
0 / 0	115.85	**Pavement Structure** Approximately 150 millimetres of asphaltic concrete over 150 millimetres of compact granular base.								
4 / 1	114.40	**Sand** Brown, medium in gradation, trace gravel, occasional organics in upper level, compact.		SS	1	12,12,11,9	23			
7 / 2	113.70	**Clayey Silt** Grey, trace gravel, hard.		SS	2	3,5,12,19	17			
10 / 3	111.50	**Dundas Shale** Grey with occasional harder limestone layers, highly weathered in upper levels, becoming more sound with depth, hard.		SS	3	12,22,11,13	33			
				SS	4	11,50/4"	100			
				SS	5	50/5"	100			
15 / 5		End of Borehole			6	50/3"	100			

Moisture Content w% (10 20 30 40)
Standard Penetration Test blows/300mm (20 40 60 80)



NOTES:

1. Borehole was advanced using hollow stem auger equipment on April 8, 2019 to auger refusal on assumed bedrock at a depth of approximately 4.6 metres.

2. Borehole was backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free groundwater level readings have been measured:

April 24, 2019 - 3.1 metres

May 7, 2019 - 3.0 metres

April 17, 2020 - 3.1 metres

Drill Method: Hollow Stem Augers
Drill Date: April 8, 2019
Hole Size: 200 millimetres
Drilling Contractor: Geo-Environmental

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Temporary Benchmark
Field Logged by: ZRV
Checked by: KR
Sheet: 1 of 1

Log of Borehole No. 101

Project No: SM 190138-G
Project: Proposed Condominium Building
Location: 3085 Hurontario Street, Mississauga
Client: Oakhill Environmental Inc.

Project Manager: Kyle Richardson
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4826448
E: 611500

Soil-Mat

Depth (ft / m)	Elevation (m)	Description	Well Data	SAMPLE Type	Number	Blow Counts	Blows/300mm	Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
	116.23	Ground Surface									
0 / 0	115.93	**Pavement Structure** Approximately 100 millimetres of asphaltic concrete over 200 millimetres of compact granular base.									
1 /		**Sand** Brown, medium in gradation, trace gravel, loose to compact.		SS	1	12,11,10,9	21				
2 / 1				SS	2	5,4,2,2	6				
3 /				SS	3	4,5,7,9	12				
4 /	114.10	**Clayey Silt** Grey, trace gravel, very stiff.		SS	4	6,10,22,50/3"	32		>4.5		
5 / 2	113.40	**Dundas Shale** Grey with occasional harder limestone layers, highly weathered in upper levels, becoming more sound with depth, hard.		SS	5	50/3"	100				
6 /				NQ	7	RQD 0%					
7 / 3				NQ	8	RQD 64.2%					
8 /				NQ	9	RQD 78.8%					
9 / 4				NQ	10	RQD 62.9%					13.8 MPa 13.5 MPa
10 /				NQ	11	RQD 44.2%					11.8 MPa 14.2 MPa
11 / 5				NQ	12	RQD 23.6%					69.3 MPa
12 /											
13 / 6											
14 /											
15 / 7											
16 /											
17 / 8											
18 /											
19 / 9											
20 /											
21 / 10											
22 /											
23 / 11											
24 /											
25 /											
26 / 12											
27 /											
28 / 13											
29 /											
30 /											
31 / 14											
32 /											
33 / 15											
34 /											
35 /											
36 / 16											
37 /											
38 / 17											
39 /											

Drill Method: Hollow Stem Augers
Drill Date: March 12, 2020
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
E: info@soil-mat.ca

Datum: Temporary Benchmark
Field Logged by: SW
Checked by: KR
Sheet: 1 of 2

Log of Borehole No. 101

Project No: SM 190138-G
Project: Proposed Condominium Building
Location: 3085 Hurontario Street, Mississauga
Client: Oakhill Environmental Inc.

Project Manager: Kyle Richardson
Borehole Location: See Drawing No. 1
UTM Coordinates - N: 4826448
E: 611500

Soil-Mat

Depth	Elevation (m)	Symbol	Description	Well Data	SAMPLE Type	SAMPLE Number	SAMPLE Blow Counts	SAMPLE Blows/300mm	SAMPLE Recovery	PP (kgf/cm2)	U.Wt.(kN/m3)	Moisture Content w% (10 20 30 40) / Standard Penetration Test blows/300mm (20 40 60 80)
40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79	13 14 15 16 17 18 19 20 21 22 23				NQ	13	RQD 56.7%					56.3 MPa 12.4 MPa
	102.40		End of Borehole									

NOTES:

1. Borehole was advanced using hollow stem auger equipment on March 12, 2020 to auger refusal at a depth of 3.0 metres, then the bedrock cored to a depth of approximately 13.8 metres using Nq diamond barrel equipment.

2. Borehole was backfilled as per Ontario Regulation 903.

3. Soil samples will be discarded after 3 months unless otherwise directed by our client.

4. A monitoring well was installed. The following free ground water level readings have been measured:

March 27, 2020 - 4.6 metres below the existing ground surface

April 17, 2020 - 4.5 metres below the existing ground surface

Drill Method: Hollow Stem Augers
Drill Date: March 12, 2020
Hole Size: 200 millimetres
Drilling Contractor: Davis Drilling

Soil-Mat Engineers & Consultants Ltd.
130 Lancing Drive, Hamilton, ON L8W 3A1
T: 905.318.7440 F: 905.318.7455
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Datum: Temporary Benchmark
Field Logged by: SW
Checked by: KR
Sheet: 2 of 2

MONITORING WELL DRILLING RECORD : **BH19-3**

Project Number: **191-02120-01**

3085 Hurontario Street, Mississuaga, Ontario
Phase Two Environmental Site Assessment
Equity Builders

DRILLING DETAILS

Date (Start):	7/3/2019
Date (End):	7/3/2019
Drilling Company:	Strata Drilling Group
Drilling Equipment:	CME 420M
Drilling Method:	Solid Stem Auger
Borehole Diameter:	38.1 mm
Drilling Fluid:	N/A

SURVEY DETAILS

Easting:	m
Northing:	m
Surface Elevation:	115.51 masl
Top of Well Elevation:	115.44 masl

ODOUR
L - Light
M - Medium
S - Strong

VISUAL
D - Dispersed with Product
S - Saturated with Product

SAMPLE TYPE
DC - Diamond Corer
SS - Split Spoon
MA - Manual Auger
TR - Trowel
ST - Shelby Tube
DT - Dual Tube
MC - Macro Core
NR - No Recovery

CHEMICAL ANALYSIS

Metals	Sb As Ba Be B Cd Cr Co Cu Pb Mo Ni Se Ag Tl U V Zn
Inorg.	Inorganic Compounds
PHC	Petroleum Hydrocarbons (F1-F4)
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
VOC	Volatile Organic Compounds
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
D/F	Dioxins & Furans
Phenol	Phenolic Compounds
GSA	Grain-size Analysis

(m) DEPTH / *ELEVATION* (masl)	LITHOLOGY / GEOLOGY: STRATIGRAPHY	LITHOLOGY / GEOLOGY: DESCRIPTION	OBSERVATIONS: PID *CGD* (ppm)	OBSERVATIONS: ODOUR (L M S)	OBSERVATIONS: VISUAL (D S)	SAMPLES: SAMPLE TYPE & No.	SAMPLES: % RECOVERY	SAMPLES: N (Blow/15cm)	SAMPLES: CHEMICAL ANALYSIS	SAMPLES: DUPLICATE	MONITORING WELL: DIAGRAM	MONITORING WELL: DESCRIPTION	REMARKS
0.05 / *115.81*		**CONCRETE** : approximately 165.1 mm										— CONCRETE (FLUSH MOUNT)	
115.46		**SAND** : trace gravel, light brown, moist	0			DT1A	50%						
0.5		*some silt*											0.5
			0			DT2A	67%		pH				
1.0												BENTONITE	1.0
1.5			0			DT2B	67%						1.5
			0.1			DT3A	58%						
2.0			0			DT3B	58%						2.0
2.5		*light brown, wet*	0.2			DT4A	100%						2.5
3.0		*some silt, trace boulder, light brown, wet @ 3.05m*	0			DT4B	100%					SAND SCREEN Length: 1.52 m Diam.: 38.1 mm Slot: #10	3.0
3.5													3.5
3.66 / *111.85*		**CLAYEY SILT** : grey, very moist, dense	0.2			DT5A	100%		GSA Gr % Sa % Si % Cl % Hydrometer				
4.0													4.0
4.27 / *111.24*		**SHALE** : moist, grey	0			DT5B	83%						
4.42		***END OF BOREHOLE*** *Bedrock refusal @ 4.48m; MW Installed at 3.57 m.*										WATER MARKER Depth : 2.51 m Elev. : 113 m Date : 8/9/2019	
4.5													4.5

Project : DATABASE_MASTER.GPJ Report : WSP_EN_WELL-ENVIRONMENTAL 8/13/2019

Prepared by: Sheema Everett
Reviewed by: Lindsy Levesque

MONITORING WELL DRILLING RECORD : **BH19-4**

Project Number: **191-02120-01**

3085 Hurontario Street, Mississuaga, Ontario
Phase Two Environmental Site Assessment
Equity Builders

DRILLING DETAILS		SURVEY DETAILS		ODOUR	SAMPLE TYPE	CHEMICAL ANALYSIS	
Date (Start):	7/3/2019	Easting:	611464.98 m	L - Light	DC - Diamond Corer	Metals	Sb As Ba Be B Cd Cr Co Cu Pb Mo Ni Se Ag Tl U V Zn
Date (End):	7/3/2019	Northing:	4826526.176 m	M - Medium	SS - Split Spoon	Inorg.	Inorganic Compounds
Drilling Company:	Strata Drilling Group	Surface Elevation:	118.26 masl	S - Strong	MA - Manual Auger	PHC	Petroleum Hydrocarbons (F1-F4)
Drilling Equipment:	CME 420M	Top of Well Elevation:	118.18 masl	VISUAL	TR - Trowel	BTEX	Benzene, Toluene, Ethylbenzene, Xylene
Drilling Method:	Solid Stem Auger			D - Dispersed with Product	ST - Shelby Tube	VOC	Volatile Organic Compounds
Borehole Diameter:	38.1 mm			S - Saturated with Product	DT - Dual Tube	PAH	Polycyclic Aromatic Hydrocarbons
Drilling Fluid:	N/A				MC - Macro Core	PCB	Polychlorinated Biphenyl
					NR - No Recovery	D/F	Dioxins & Furans
						Phenol	Phenolic Compounds
						GSA	Grain-size Analysis

(m) DEPTH / *ELEVATION* (masl)	LITHOLOGY / GEOLOGY: STRATIGRAPHY	LITHOLOGY / GEOLOGY: DESCRIPTION	OBSERVATIONS: PID / *CGD* (ppm)	OBSERVATIONS: ODOUR (L M S)	OBSERVATIONS: VISUAL (D S)	SAMPLES: SAMPLE TYPE & No.	SAMPLES: % RECOVERY	SAMPLES: N (Blow/15cm)	SAMPLES: CHEMICAL ANALYSIS	SAMPLES: DUPLICATE	MONITORING WELL: DIAGRAM	MONITORING WELL: DESCRIPTION	REMARKS
118.26 / 0.10		**TOPSOIL** : approximately 101.6 mm										CONCRETE (FLUSH MOUNT)	
118.16		**SAND** : light brown, moist, loose	125.4			DT1A	83%						
0.5													0.5
			2.1			DT2A	75%						
1.0												BENTONITE	1.0
		some silt, light brown, moist											
1.5			0.3			DT2B	75%						1.5
		very moist											
2.0			0.3			DT3A	63%		pH GSA Gr % Sa % Si % Cl %				2.0
2.13 / 116.13		**CLAYEY SILT** : grey, very moist to wet,											
2.5			0.1			DT3B	42%						2.5
3.0		*trace boulders, coarse sand seam @ 3.05m, wet*	15.7			DT4A	100%		PHC VOC			SAND SCREEN Length: 1.52 m Diam.: 38.1 mm Slot: #10	3.0
3.5			0.1			DT4B	100%						3.5
4.0			0.1			DT5A	44%						4.0
4.27 / 113.99		**SHALE** : moist, grey											
4.42		*Bedrock refusal at 4.48 m. MW Install at 3.57m.*											
4.5												WATER MARKER Depth : 3.13 m Elev. : 115.13 m Date : 8/9/2019	4.5

Project : DATABASE_MASTER.GPJ Report : WSP_EN_WELL-ENVIRONMENTAL 8/13/2019

Prepared by: Sheema Everett
Reviewed by: Lindsy Levesque

APPENDIX D

ALS Canada Ltd.

right solutions.
right partner.

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: **WT2309350**	Page	: 1 of 7
Client	: **McClymont & Rak Engineers Inc.**	Laboratory	: Waterloo - Environmental
Contact	: Richard Sukhu	Account Manager	: Emily Smith
Address	: 111 Zenway Blvd. Unit 4 Vaughan ON Canada L4H 3H9	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: 416 675 0160	Telephone	: +1 519 886 6910
Project	: 5822	Date Samples Received	: 13-Apr-2023 17:30
PO	: ----	Date Analysis Commenced	: 14-Apr-2023
C-O-C number	: 17-620765	Issue Date	: 25-Apr-2023 18:00
Sampler	: BR		
Site	: ----		
Quote number	: 2022 Price List		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Amanda Ganouri-Lumsden	Department Manager - Microbiology and Prep	Microbiology, Waterloo, Ontario
Danielle Gravel	Supervisor - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Inorganics, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Metals, Waterloo, Ontario
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Organics, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Inorganics, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Metals, Waterloo, Ontario
Katrina Zwambag	Business Manager - Environmental	LCMS, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	VOC, Waterloo, Ontario

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.
Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

Unit	*Description*
µg/L	micrograms per litre
CFU/100mL	colony forming units per hundred millilitres
mg/L	milligrams per litre
pH units	pH units

>: greater than.
<: less than.
Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).
For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit .

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*
HTD	*Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.*
PEHR	*Parameter exceeded recommended holding time on receipt: Proceeded with analysis as requested.*

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	Method	LOR	Unit	Client sample ID: BH 102 Sampling date/time: 13-Apr-2023 09:00 WT2309350-001		MISSUB STM	RMPSUB SAN	RMPSUB STM			
Physical Tests											
pH	E108	0.10	pH units	8.05		**6 - 9 pH units**	**5.5 - 10 pH units**	**6 - 9 pH units**	--	--	--
Solids, total suspended [TSS]	E160	3.0	mg/L	7.0		**15 mg/L**	**350 mg/L**	**15 mg/L**	--	--	--
Anions and Nutrients											
Fluoride	E235.F	0.020	mg/L	0.199	DLDS	--	10 mg/L	--	--	--	--
Kjeldahl nitrogen, total [TKN]	E318	0.050	mg/L	0.398		**1 mg/L**	**100 mg/L**	**1 mg/L**	--	--	--
Phosphorus, total	E372-U	0.0020	mg/L	0.0930		**0.4 mg/L**	**10 mg/L**	**0.4 mg/L**	--	--	--
Sulfate (as SO4)	E235.SO4	0.30	mg/L	35.5	DLDS	--	1500 mg/L	--	--	--	--
Cyanides											
Cyanide, strong acid dissociable (Total)	E333	0.0020	mg/L	<0.0020		**0.02 mg/L**	**2 mg/L**	**0.02 mg/L**	--	--	--
Inorganics											
Chlorine, total	E326	0.050	mg/L	<0.050	PEHR	1 mg/L	--	--	--	--	--
Microbiological Tests											
Coliforms, Escherichia coli [E. coli]	E012A.EC	1	CFU/100mL	Not Detected		**200 CFU/100mL**	**--**	**200 CFU/100mL**	--	--	--
Total Metals											
Aluminum, total	E420	0.0030	mg/L	0.357	DLHC	1 mg/L	50 mg/L	--	--	--	--
Antimony, total	E420	0.00010	mg/L	<0.00100	DLHC	--	5 mg/L	--	--	--	--
Arsenic, total	E420	0.00010	mg/L	<0.00100	DLHC	**0.02 mg/L**	**1 mg/L**	**0.02 mg/L**	--	--	--
Cadmium, total	E420	0.0000050	mg/L	<0.0000500	DLHC	**0.008 mg/L**	**0.7 mg/L**	**0.008 mg/L**	--	--	--
Chromium, total	E420	0.00050	mg/L	<0.00500	DLHC	**0.08 mg/L**	**5 mg/L**	**0.08 mg/L**	--	--	--
Cobalt, total	E420	0.00010	mg/L	0.00102	DLHC	--	5 mg/L	--	--	--	--
Copper, total	E420	0.00050	mg/L	<0.00500	DLHC	**0.04 mg/L**	**3 mg/L**	**0.05 mg/L**	--	--	--
Lead, total	E420	0.000050	mg/L	0.00119	DLHC	**0.12 mg/L**	**3 mg/L**	**0.12 mg/L**	--	--	--
Manganese, total	E420	0.00010	mg/L	0.136	DLHC	**0.05 mg/L**	**5 mg/L**	**0.05 mg/L**	--	--	--
Mercury, total	E508	0.0000050	mg/L	<0.0000050		**0.0004 mg/L**	**0.01 mg/L**	**0.0004 mg/L**	--	--	--
Molybdenum, total	E420	0.000050	mg/L	0.0278	DLHC	--	5 mg/L	--	--	--	--
Nickel, total	E420	0.00050	mg/L	<0.00500	DLHC	**0.08 mg/L**	**3 mg/L**	**0.08 mg/L**	--	--	--
Selenium, total	E420	0.000050	mg/L	0.000566	DLHC	**0.02 mg/L**	**1 mg/L**	**0.02 mg/L**	--	--	--
Silver, total	E420	0.000010	mg/L	<0.000100	DLHC	**0.12 mg/L**	**5 mg/L**	**0.12 mg/L**	--	--	--
Tin, total	E420	0.00010	mg/L	<0.00100	DLHC	--	5 mg/L	--	--	--	--

Analyte	Method	LOR	Unit	WT2309350-001 (Continued)	MISSUB STM	RMPSUB SAN	RMPSUB STM			
Total Metals - Continued										
Titanium, total	E420	0.00030	mg/L	0.00844 DLHC	--	5 mg/L	--	--	--	--
Zinc, total	E420	0.0030	mg/L	<0.0300 DLHC	**0.04 mg/L**	**3 mg/L**	**0.04 mg/L**	--	--	--
Speciated Metals										
Chromium, hexavalent [Cr VI], total	E532	0.00050	mg/L	<0.00050	--	--	--	--	--	--
Aggregate Organics										
Biochemical oxygen demand [BOD]	E550	2.0	mg/L	686 HTD	15 mg/L	300 mg/L	--	--	--	--
Carbonaceous biochemical oxygen demand [CBOD]	E555	2.0	mg/L	587 HTD	--	**300 mg/L**	**15 mg/L**	--	--	--
Oil & grease (gravimetric)	E567	5.0	mg/L	<5.0	--	--	--	--	--	--
Oil & grease, animal/vegetable (gravimetric)	EC567A.SG	5.0	mg/L	<5.0	--	150 mg/L	--	--	--	--
Oil & grease, mineral (gravimetric)	E567SG	5.0	mg/L	<5.0	--	15 mg/L	--	--	--	--
Phenols, total (4AAP)	E562	0.0010	mg/L	0.0013	**0.008 mg/L**	**1 mg/L**	**0.008 mg/L**	--	--	--
Volatile Organic Compounds										
Benzene	E611D	0.50	µg/L	<0.50	**2 µg/L**	**10 µg/L**	**2 µg/L**	--	--	--
Chloroform	E611D	0.50	µg/L	<0.50	--	**40 µg/L**	**2 µg/L**	--	--	--
Dichlorobenzene, 1,2-	E611D	0.50	µg/L	<0.50	--	**50 µg/L**	**5.6 µg/L**	--	--	--
Dichlorobenzene, 1,4-	E611D	0.50	µg/L	<0.50	--	**80 µg/L**	**6.8 µg/L**	--	--	--
Dichloroethylene, cis-1,2-	E611D	0.50	µg/L	<0.50	--	**4000 µg/L**	**5.6 µg/L**	--	--	--
Dichloromethane	E611D	1.0	µg/L	<1.0	--	**2000 µg/L**	**5.2 µg/L**	--	--	--
Dichloropropylene, trans-1,3-	E611D	0.30	µg/L	<0.30	--	**140 µg/L**	**5.6 µg/L**	--	--	--
Ethylbenzene	E611D	0.50	µg/L	<0.50	**2 µg/L**	**160 µg/L**	**2 µg/L**	--	--	--
Methyl ethyl ketone [MEK]	E611D	20	µg/L	<20	--	8000 µg/L	--	--	--	--
Styrene	E611D	0.50	µg/L	<0.50	--	200 µg/L	--	--	--	--
Tetrachloroethane, 1,1,2,2-	E611D	0.50	µg/L	<0.50	--	**1400 µg/L**	**17 µg/L**	--	--	--
Tetrachloroethylene	E611D	0.50	µg/L	<0.50	--	**1000 µg/L**	**4.4 µg/L**	--	--	--
Toluene	E611D	0.50	µg/L	<0.50	**2 µg/L**	**270 µg/L**	**2 µg/L**	--	--	--
Trichloroethylene	E611D	0.50	µg/L	<0.50	--	**400 µg/L**	**8 µg/L**	--	--	--
Xylene, m+p-	E611D	0.40	µg/L	<0.40	--	--	--	--	--	--
Xylene, o-	E611D	0.30	µg/L	<0.30	--	--	--	--	--	--
Xylenes, total	E611D	0.50	µg/L	<0.50	**4.4 µg/L**	**1400 µg/L**	**4.4 µg/L**	--	--	--
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	E611D	1.0	%	105	--	--	--	--	--	--
Difluorobenzene, 1,4-	E611D	1.0	%	99.5	--	--	--	--	--	--

Analyte	Method	LOR	Unit	WT2309350-001 (Continued)	MISSUB STM	RMPSUB SAN	RMPSUB STM			
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	E641A	0.010	µg/L	<0.010	--	--	--	--	--	--
Acenaphthylene	E641A	0.010	µg/L	<0.010	--	--	--	--	--	--
Anthracene	E641A	0.010	µg/L	<0.010	--	--	--	--	--	--
Benz(a)anthracene	E641A	0.010	µg/L	<0.010	--	--	--	--	--	--
Benzo(a)pyrene	E641A	0.0050	µg/L	<0.0050	--	--	--	--	--	--
Benzo(b+j)fluoranthene	E641A	0.010	µg/L	<0.010	--	--	--	--	--	--
Benzo(g,h,i)perylene	E641A	0.010	µg/L	<0.010	--	--	--	--	--	--
Benzo(k)fluoranthene	E641A	0.010	µg/L	<0.010	--	--	--	--	--	--
Chrysene	E641A	0.010	µg/L	<0.010	--	--	--	--	--	--
Dibenz(a,h)anthracene	E641A	0.0050	µg/L	<0.0050	--	--	--	--	--	--
Fluoranthene	E641A	0.010	µg/L	<0.010	--	--	--	--	--	--
Fluorene	E641A	0.010	µg/L	<0.010	--	--	--	--	--	--
Indeno(1,2,3-c,d)pyrene	E641A	0.010	µg/L	<0.010	--	--	--	--	--	--
Methylnaphthalene, 1-	E641A	0.010	µg/L	<0.010	--	--	--	--	--	--
Methylnaphthalene, 2-	E641A	0.010	µg/L	<0.010	--	--	--	--	--	--
Naphthalene	E641A	0.050	µg/L	<0.050	--	--	--	--	--	--
Phenanthrene	E641A	0.020	µg/L	<0.020	--	--	--	--	--	--
Pyrene	E641A	0.010	µg/L	<0.010	--	--	--	--	--	--
PAHs, total (CCME sewer 18)	E641A	0.070	µg/L	<0.070	2 µg/L	--	--	--	--	--
Chrysene-d12	E641A	0.1	%	82.4	--	--	--	--	--	--
Naphthalene-d8	E641A	0.1	%	97.4	--	--	--	--	--	--
Phenanthrene-d10	E641A	0.1	%	99.7	--	--	--	--	--	--
Phthalate Esters										
bis(2-Ethylhexyl) phthalate [DEHP]	E655F	2.0	µg/L	<2.0	--	**12 µg/L**	**8.8 µg/L**	--	--	--
Di-n-butyl phthalate	E655F	1.0	µg/L	<1.0	--	**80 µg/L**	**15 µg/L**	--	--	--
Semi-Volatile Organics Surrogates										
Fluorobiphenyl, 2-	E655F	1.0	%	85.1	--	--	--	--	--	--
Terphenyl-d14, p-	E655F	1.0	%	92.8	--	--	--	--	--	--
Phenolics Surrogates										
Tribromophenol, 2,4,6-	E655F	0.20	%	106	--	--	--	--	--	--
Nonylphenols										
Nonylphenol diethoxylates [NP2EO]	E749B	0.10	µg/L	<0.10	--	--	--	--	--	--
Nonylphenol ethoxylates, total	E749B	2.0	µg/L	<2.0	--	200 µg/L	--	--	--	--

Analyte	Method	LOR	Unit	WT2309350-001 (Continued)	MISSUB STM	RMPSUB SAN	RMPSUB STM			
Nonylphenols - Continued										
Nonylphenol monoethoxylates [NP1EO]	E749B	2.0	µg/L	<2.0	--	--	--	--	--	--
Nonylphenols [NP]	E749A	1.0	µg/L	<1.0	--	20 µg/L	--	--	--	--
Polychlorinated Biphenyls										
Aroclor 1016	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1221	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1232	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1242	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1248	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1254	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1260	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1262	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Aroclor 1268	E687	0.020	µg/L	<0.020	--	--	--	--	--	--
Polychlorinated biphenyls [PCBs], total	E687	0.060	µg/L	<0.060	--	**1 µg/L**	**0.4 µg/L**	--	--	--
Decachlorobiphenyl	E687	0.1	%	116	--	--	--	--	--	--
Tetrachloro-m-xylene	E687	0.1	%	98.2	--	--	--	--	--	--

Please refer to the General Comments section for an explanation of any qualifiers detected.

Summary of Guideline Breaches by Sample

SampleID/Client ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
BH 102	Water	Manganese, total		MISSUB	STM	0.136 mg/L	0.05 mg/L
	Water	Biochemical oxygen demand [BOD]		MISSUB	STM	686 mg/L	15 mg/L
	Water	Biochemical oxygen demand [BOD]		RMPSUB	SAN	686 mg/L	300 mg/L
	Water	Carbonaceous biochemical oxygen demand [CBOD]		RMPSUB	SAN	587 mg/L	300 mg/L
	Water	Manganese, total		RMPSUB	STM	0.136 mg/L	0.05 mg/L
	Water	Carbonaceous biochemical oxygen demand [CBOD]		RMPSUB	STM	587 mg/L	15 mg/L

Key:

MISSUB	Ontario Mississauga Storm Sewer Use By-Law (0046-2022) (March 2022)
STM	Mississauga Storm Sewer (0046-2022)
RMPSUB	Ontario Reg.Mun. of Peel Sewer Bylaw #53-2010 (APR, 2019)
SAN	Peel Sanitary Sewer (53-2010)
STM	Peel Storm Sewer (53-2010)

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2309350**	Page	: 1 of 13
Client	: **McClymont & Rak Engineers Inc.**	Laboratory	: Waterloo - Environmental
Contact	: Richard Sukhu	Account Manager	: Emily Smith
Address	: 111 Zenway Blvd. Unit 4 Vaughan ON Canada L4H 3H9	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: 416 675 0160	Telephone	: +1 519 886 6910
Project	: 5822	Date Samples Received	: 13-Apr-2023 17:30
PO	: ----	Issue Date	: 25-Apr-2023 18:00
C-O-C number	: 17-620765		
Sampler	: BR		
Site	: ----		
Quote number	: 2022 Price List		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Matrix Spike outliers occur.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Laboratory Control Sample (LCS) Recoveries								
Volatile Organic Compounds	QC-MRG2-9017180 02	----	Methyl ethyl ketone [MEK]	78-93-3	E611D	148 % LCS-H	70.0-130%	Recovery greater than upper control limit

Result Qualifiers

Qualifier	Description
LCS-H	*Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.*

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-4d]										
BH 102	E550	13-Apr-2023	----	----	----		20-Apr-2023	4 days	7 days	× EHT
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT-4d]										
BH 102	E555	13-Apr-2023	----	----	----		20-Apr-2023	4 days	7 days	× EHT
Aggregate Organics : Mineral Oil & Grease by Gravimetry										
Amber glass (hydrochloric acid)										
BH 102	E567SG	13-Apr-2023	21-Apr-2023	28 days	8 days	✓	21-Apr-2023	40 days	0 days	✓
Aggregate Organics : Oil & Grease by Gravimetry										
Amber glass (hydrochloric acid)										
BH 102	E567	13-Apr-2023	21-Apr-2023	28 days	8 days	✓	21-Apr-2023	40 days	0 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) [ON MECP]										
BH 102	E562	13-Apr-2023	22-Apr-2023	----	----		22-Apr-2023	28 days	9 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP]										
BH 102	E235.F	13-Apr-2023	18-Apr-2023	----	----		18-Apr-2023	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP]										
BH 102	E235.SO4	13-Apr-2023	18-Apr-2023	----	----		18-Apr-2023	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) [ON MECP]										
BH 102	E318	13-Apr-2023	19-Apr-2023	----	----		19-Apr-2023	28 days	6 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) [ON MECP]										
BH 102	E372-U	13-Apr-2023	19-Apr-2023	----	----		20-Apr-2023	28 days	7 days	✓
Cyanides : Total Cyanide										
HDPE - total (sodium hydroxide)										
BH 102	E333	13-Apr-2023	19-Apr-2023	----	----		19-Apr-2023	14 days	6 days	✓
Inorganics : Total Chlorine (Residual) by DPD Colourimetry										
HDPE [ON MECP]										
BH 102	E326	13-Apr-2023	----	----	----		18-Apr-2023	0.25 hrs	120 hrs	× EHTR-FM
Microbiological Tests : E. coli (MF-mFC-BCIG)										
Sterile HDPE (Sodium thiosulphate) [ON MECP]										
BH 102	E012A.EC	13-Apr-2023	----	----	----		14-Apr-2023	48 hrs	28 hrs	✓
Nonylphenols : Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode										
Amber glass/Teflon lined cap - LCMS										
BH 102	E749B	13-Apr-2023	14-Apr-2023	7 days	1 days	✓	14-Apr-2023	7 days	0 days	✓
Nonylphenols : Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode										
Amber glass/Teflon lined cap - LCMS										
BH 102	E749A	13-Apr-2023	14-Apr-2023	7 days	1 days	✓	14-Apr-2023	7 days	0 days	✓
Phthalate Esters : BNA (Ontario Sanitary Sewer SVOC Target List) by GC-MS										
Amber glass/Teflon lined cap [ON MECP]										
BH 102	E655F	13-Apr-2023	18-Apr-2023	14 days	5 days	✓	19-Apr-2023	40 days	1 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP]										
BH 102	E108	13-Apr-2023	18-Apr-2023	----	----		19-Apr-2023	14 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TSS by Gravimetry										
HDPE [ON MECP]										
BH 102	E160	13-Apr-2023	----	----	----		18-Apr-2023	7 days	5 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Amber glass/Teflon lined cap [ON MECP]										
BH 102	E687	13-Apr-2023	18-Apr-2023	14 days	5 days	✓	19-Apr-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) [ON MECP]										
BH 102	E641A	13-Apr-2023	18-Apr-2023	7 days	5 days	✓	18-Apr-2023	40 days	1 days	✓
Speciated Metals : Total Hexavalent Chromium (Cr VI) by IC										
HDPE - total (sodium hydroxide)										
BH 102	E532	13-Apr-2023	----	----	----		14-Apr-2023	28 days	1 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) [ON MECP]										
BH 102	E508	13-Apr-2023	14-Apr-2023	----	----		14-Apr-2023	28 days	1 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
BH 102	E420	13-Apr-2023	14-Apr-2023	----	----		14-Apr-2023	180 days	2 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
BH 102	E611D	13-Apr-2023	18-Apr-2023	----	----		18-Apr-2023	14 days	5 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Biochemical Oxygen Demand - 5 day	E550	897340	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	897569	1	14	7.1	5.0	✓
E. coli (MF-mFC-BCIG)	E012A.EC	897728	1	3	33.3	5.0	✓
Fluoride in Water by IC	E235.F	901447	1	11	9.0	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	897633	1	8	12.5	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	897632	1	8	12.5	5.0	✓
pH by Meter	E108	901441	1	15	6.6	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	906864	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	901448	1	11	9.0	5.0	✓
Total Chlorine (Residual) by DPD Colourimetry	E326	901104	1	2	50.0	5.0	✓
Total Cyanide	E333	903588	1	20	5.0	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	897519	1	11	9.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	901841	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	897737	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	898147	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	901840	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	901162	1	19	5.2	4.7	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	901718	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Biochemical Oxygen Demand - 5 day	E550	897340	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	897569	1	14	7.1	5.0	✓
BNA (Ontario Sanitary Sewer SVOC Target List) by GC-MS	E655F	900969	1	2	50.0	5.0	✓
Fluoride in Water by IC	E235.F	901447	1	11	9.0	5.0	✓
Mineral Oil & Grease by Gravimetry	E567SG	905683	1	16	6.2	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	897633	1	8	12.5	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	897632	1	8	12.5	5.0	✓
Oil & Grease by Gravimetry	E567	905682	1	20	5.0	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	900959	1	2	50.0	5.0	✓
PCB Aroclors by GC-MS	E687	900975	1	19	5.2	4.7	✓
pH by Meter	E108	901441	1	15	6.6	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	906864	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	901448	1	11	9.0	5.0	✓
Total Chlorine (Residual) by DPD Colourimetry	E326	901104	1	2	50.0	5.0	✓
Total Cyanide	E333	903588	1	20	5.0	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	897519	1	11	9.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	901841	1	20	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Mercury in Water by CVAAS	E508	897737	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	898147	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	901840	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	901162	1	19	5.2	4.7	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	901718	1	20	5.0	5.0	✓
Method Blanks (MB)							
Biochemical Oxygen Demand - 5 day	E550	897340	1	20	5.0	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	897569	1	14	7.1	5.0	✓
BNA (Ontario Sanitary Sewer SVOC Target List) by GC-MS	E655F	900969	1	2	50.0	5.0	✓
E. coli (MF-mFC-BCIG)	E012A.EC	897728	1	3	33.3	5.0	✓
Fluoride in Water by IC	E235.F	901447	1	11	9.0	5.0	✓
Mineral Oil & Grease by Gravimetry	E567SG	905683	1	16	6.2	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	897633	1	8	12.5	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	897632	1	8	12.5	5.0	✓
Oil & Grease by Gravimetry	E567	905682	1	20	5.0	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	900959	1	2	50.0	5.0	✓
PCB Aroclors by GC-MS	E687	900975	1	19	5.2	4.7	✓
Phenols (4AAP) in Water by Colorimetry	E562	906864	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	901448	1	11	9.0	5.0	✓
Total Chlorine (Residual) by DPD Colourimetry	E326	901104	1	2	50.0	5.0	✓
Total Cyanide	E333	903588	1	20	5.0	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	897519	1	11	9.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	901841	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	897737	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	898147	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	901840	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	901162	1	19	5.2	4.7	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	901718	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Fluoride in Water by IC	E235.F	901447	1	11	9.0	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	897633	1	8	12.5	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	897632	1	8	12.5	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	906864	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	901448	1	11	9.0	5.0	✓
Total Chlorine (Residual) by DPD Colourimetry	E326	901104	1	2	50.0	5.0	✓
Total Cyanide	E333	903588	1	20	5.0	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	897519	1	11	9.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	901841	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	897737	1	20	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Total metals in Water by CRC ICPMS	E420	898147	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	901840	1	20	5.0	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	901718	1	20	5.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
E. coli (MF-mFC-BCIG)	E012A.EC Waterloo - Environmental	Water	ON E3433 (mod)	Following filtration (0.45 µm), and incubation at 44.5±0.2°C for 24 hours, colonies exhibiting characteristic morphology of the target organism are enumerated.
pH by Meter	E108 Waterloo - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Waterloo - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
Fluoride in Water by IC	E235.F Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Waterloo - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Waterloo - Environmental	Water	Method Fialab 100, 2018	TKN in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021).
Total Chlorine (Residual) by DPD Colourimetry	E326 Waterloo - Environmental	Water	APHA 4500-Cl G (mod)	Chlorine (residual), as free or total, is analyzed using the DPD colourimetric method. The recommended hold time for this test is 15 minutes and field testing is recommended when determining Chlorine concentrations at the time of sampling. Chlorine if present in a sample container after sampling can be rapidly consumed by any inorganic or organic matter in the sample and dissipates rapidly into headspace. Laboratory results may be requested when chlorine concentrations that may be present at the time of laboratory analysis are required for the interpretation of other laboratory analysis where the presence of Chlorine may affect results. e.g. laboratory toxicity testing

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Cyanide	E333 Waterloo - Environmental	Water	ISO 14403 (mod)	Total or Strong Acid Dissociable (SAD) Cyanide is determined by Continuous Flow Analyzer (CFA) with in-line UV digestion followed by colourmetric analysis. Method Limitation: High levels of thiocyanate (SCN) may cause positive interference (up to 0.5% of SCN concentration).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U Waterloo - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total metals in Water by CRC ICPMS	E420 Waterloo - Environmental	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 Waterloo - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Total Hexavalent Chromium (Cr VI) by IC	E532 Waterloo - Environmental	Water	APHA 3500-Cr C (Ion Chromatography)	Hexavalent Chromium is measured by Ion chromatography-Post column reaction and UV detection. Results are based on an un-filtered, field-preserved sample.
Biochemical Oxygen Demand - 5 day	E550 Waterloo - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555 Waterloo - Environmental	Water	APHA 5210 B (mod)	Samples are diluted and incubated for a specified time period, after which the oxygen depletion is measured using a dissolved oxygen meter. Nitrification inhibitor is added to samples to prevent nitrogenous compounds from consuming oxygen resulting in only carbonaceous oxygen demand being reported by this method. Free chlorine is a negative interference in the BOD method; please advise ALS when free chlorine is present in samples.
Phenols (4AAP) in Water by Colorimetry	E562 Waterloo - Environmental	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K3Fe(CN)6) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.
Oil & Grease by Gravimetry	E567 Waterloo - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane and the extract is evaporated to dryness. The residue is then weighed to determine Oil and Grease.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Mineral Oil & Grease by Gravimetry	E567SG Waterloo - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane, followed by silica gel treatment after which the extract is evaporated to dryness. The residue is then weighed to determine Mineral Oil and Grease.
VOCs (Eastern Canada List) by Headspace GC-MS	E611D Waterloo - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs by Hexane LVI GC-MS	E641A Waterloo - Environmental	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
BNA (Ontario Sanitary Sewer SVOC Target List) by GC-MS	E655F Waterloo - Environmental	Water	EPA 8270E (mod)	BNA are analyzed by GC-MS.
PCB Aroclors by GC-MS	E687 Waterloo - Environmental	Water	EPA 8270E (mod)	PCB Aroclors are analyzed by GC-MS
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A Waterloo - Environmental	Water	J. Chrom A849 (1999) p.467-482	An aliquot of 5.0 ± 0.10 mL of filtered sample is spiked with Nonylphenol-D4, Nonylphenol Diethoxylate 13C6, and Bisphenol A 13C12 internal standards and analyzed by LC-MS/MS.
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B Waterloo - Environmental	Water	J. Chrom A849 (1999) p.467-482	Water samples are filtered and analyzed on LCMS/MS by direct injection.
Animal & Vegetable Oil & Grease by Gravimetry	EC567A.SG Waterloo - Environmental	Water	APHA 5520 (mod)	Animal & vegetable oil and grease is calculated as follows: Oil & Grease (gravimetric) minus Mineral Oil & Grease (gravimetric)

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for TKN in water	EP318 Waterloo - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Digestion for Total Phosphorus in water	EP372 Waterloo - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Oil & Grease Extraction for Gravimetry	EP567 Waterloo - Environmental	Water	BC MOE Lab Manual (Oil & Grease) (mod)	The entire water sample is extracted with hexane by liquid-liquid extraction.
VOCs Preparation for Headspace Analysis	EP581 Waterloo - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Waterloo - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.
BNA Extraction	EP655 Waterloo - Environmental	Water	EPA 3510C (mod)	SVOCs are extracted from aqueous sample using DCM liquid-liquid extraction.
Pesticides, PCB, and Neutral Extractable Chlorinated Hydrocarbons Extraction	EP660 Waterloo - Environmental	Water	EPA 3511 (mod)	Samples are extracted from aqueous sample using an organic solvent liquid-liquid extraction.
Preparation of Nonylphenol and Nonylphenol Ethoxylates	EP749 Waterloo - Environmental	Water	J. Chrom A849 (1999) p.467-482	An aliquot of 5.0 ± 0.10 mL of filtered sample is spiked with Nonylphenol-D4, Nonylphenol Diethoxylate 13C6, and Bisphenol A 13C12 internal standards and analyzed by LC-MS/MS.

QUALITY CONTROL REPORT

Work Order	: **WT2309350**	Page	: 1 of 15
Client	: McClymont & Rak Engineers Inc.	Laboratory	: Waterloo - Environmental
Contact	: Richard Sukhu	Account Manager	: Emily Smith
Address	: 111 Zenway Blvd. Unit 4 Vaughan ON Canada L4H 3H9	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	:	Telephone	: +1 519 886 6910
Project	: 5822	Date Samples Received	: 13-Apr-2023 17:30
PO	: ----	Date Analysis Commenced	: 14-Apr-2023
C-O-C number	: 17-620765	Issue Date	: 25-Apr-2023 18:00
Sampler	: BR 416 675 0160		
Site	: ----		
Quote number	: 2022 Price List		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Amanda Ganouri-Lumsden	Department Manager - Microbiology and Prep	Waterloo Microbiology, Waterloo, Ontario
Danielle Gravel	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Waterloo Inorganics, Waterloo, Ontario
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Jon Fisher	Production Manager, Environmental	Waterloo Metals, Waterloo, Ontario
Katrina Zwambag	Business Manager - Environmental	Waterloo LCMS, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 901162)											
WT2309547-001	Anonymous	Solids, total suspended [TSS]	----	E160	30.0	mg/L	2330	2390	2.37%	20%	----
Physical Tests (QC Lot: 901441)											
WT2309388-001	Anonymous	pH	----	E108	0.10	pH units	7.64	7.75	1.43%	4%	----
Anions and Nutrients (QC Lot: 901447)											
WT2309367-001	Anonymous	Fluoride	16984-48-8	E235.F	0.200	mg/L	<0.200	<0.200	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 901448)											
WT2309367-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	3.00	mg/L	70.7	70.2	0.644%	20%	----
Anions and Nutrients (QC Lot: 901840)											
WT2309288-014	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0067	0.0055	0.0012	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 901841)											
HA2300138-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.137	0.144	0.007	Diff <2x LOR	----
Cyanides (QC Lot: 903588)											
EO2302909-001	Anonymous	Cyanide, strong acid dissociable (Total)	----	E333	0.0050	mg/L	0.0074	0.0074	0.00002	Diff <2x LOR	----
Inorganics (QC Lot: 901104)											
WT2309350-001	BH 102	Chlorine, total	7782-50-5	E326	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Microbiological Tests (QC Lot: 897728)											
WT2309350-001	BH 102	Coliforms, Escherichia coli [E. coli]	----	E012A.EC	1	CFU/100mL	<1	<1	0	Diff <2x LOR	----
Total Metals (QC Lot: 897737)											
BF2300013-008	Anonymous	Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 898147)											
WT2309350-001	BH 102	Aluminum, total	7429-90-5	E420	0.0300	mg/L	0.357	0.392	9.20%	20%	----
		Antimony, total	7440-36-0	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000500	mg/L	<0.0000500	<0.0000500	0	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00100	mg/L	0.00102	0.00108	0.00006	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		Lead, total	7439-92-1	E420	0.000500	mg/L	0.00119	0.00121	0.000020	Diff <2x LOR	----
		Manganese, total	7439-96-5	E420	0.00100	mg/L	0.136	0.141	2.96%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 898147) - continued											
WT2309350-001	BH 102	Molybdenum, total	7439-98-7	E420	0.000500	mg/L	0.0278	0.0292	5.08%	20%	----
		Nickel, total	7440-02-0	E420	0.00500	mg/L	<0.00500	<0.00500	0	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000500	mg/L	0.000566	0.000556	0.000011	Diff <2x LOR	----
		Silver, total	7440-22-4	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00300	mg/L	0.00844	0.00832	0.00012	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0300	mg/L	<0.0300	<0.0300	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 897519)											
WT2309024-001	Anonymous	Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 897340)											
WT2309319-001	Anonymous	Biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 897569)											
WT2309340-002	Anonymous	Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 906864)											
WP2304935-001	Anonymous	Phenols, total (4AAP)	----	E562	0.0010	mg/L	0.0026	0.0024	0.0002	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 901718)											
WT2309668-001	Anonymous	Benzene	71-43-2	E611D	0.50	µg/L	0.75	0.76	0.01	Diff <2x LOR	----
		Chloroform	67-66-3	E611D	0.50	µg/L	3.32	3.42	2.97%	30%	----
		Dichlorobenzene, 1,2-	95-50-1	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, cis-1,2-	156-59-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E611D	1.0	µg/L	5.9	6.0	0.04	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611D	0.50	µg/L	119	120	1.58%	30%	----
		Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	103	113	10	Diff <2x LOR	----
		Styrene	100-42-5	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.50	µg/L	0.51	0.58	0.07	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611D	0.50	µg/L	1.22	1.27	0.05	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611D	0.40	µg/L	231	236	2.06%	30%	----
		Xylene, o-	95-47-6	E611D	0.30	µg/L	4.31	4.37	1.38%	30%	----
Nonylphenols (QC Lot: 897632)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Nonylphenols (QC Lot: 897632) - continued											
WT2309182-001	Anonymous	Nonylphenols [NP]	84852-15-3	E749A	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
Nonylphenols (QC Lot: 897633)											
WT2309182-001	Anonymous	Nonylphenol diethoxylates [NP2EO]	n/a	E749B	0.10	µg/L	<0.10	<0.10	0	Diff <2x LOR	----
		Nonylphenol monoethoxylates [NP1EO]	n/a	E749B	10.0	µg/L	<10.0	<10.0	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 901162)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 901447)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 901448)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 901840)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 901841)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Cyanides (QCLot: 903588)						
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	<0.0020	----
Inorganics (QCLot: 901104)						
Chlorine, total	7782-50-5	E326	0.05	mg/L	<0.050	----
Microbiological Tests (QCLot: 897728)						
Coliforms, Escherichia coli [E. coli]	----	E012A.EC	1	CFU/100mL	<1	----
Total Metals (QCLot: 897737)						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 898147)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 898147) - continued						
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Speciated Metals (QCLot: 897519)						
Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0005	mg/L	<0.00050	----
Aggregate Organics (QCLot: 897340)						
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 897569)						
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 905682)						
Oil & grease (gravimetric)	----	E567	5	mg/L	<5.0	----
Aggregate Organics (QCLot: 905683)						
Oil & grease, mineral (gravimetric)	----	E567SG	5	mg/L	<5.0	----
Aggregate Organics (QCLot: 906864)						
Phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Volatile Organic Compounds (QCLot: 901718)						
Benzene	71-43-2	E611D	0.5	µg/L	<0.50	----
Chloroform	67-66-3	E611D	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	<0.50	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	<0.50	----
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	<0.50	----
Dichloromethane	75-09-2	E611D	1	µg/L	<1.0	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	<0.30	----
Ethylbenzene	100-41-4	E611D	0.5	µg/L	<0.50	----
Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	----
Styrene	100-42-5	E611D	0.5	µg/L	<0.50	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	<0.50	----
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611D	0.5	µg/L	<0.50	----
Trichloroethylene	79-01-6	E611D	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611D	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611D	0.3	µg/L	<0.30	----
Polycyclic Aromatic Hydrocarbons (QCLot: 900959)						
Acenaphthene	83-32-9	E641A	0.01	µg/L	<0.010	----
Acenaphthylene	208-96-8	E641A	0.01	µg/L	<0.010	----
Anthracene	120-12-7	E641A	0.01	µg/L	<0.010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 900959) - continued						
Benz(a)anthracene	56-55-3	E641A	0.01	µg/L	<0.010	----
Benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	<0.0050	----
Benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	<0.010	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	<0.010	----
Benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	<0.010	----
Chrysene	218-01-9	E641A	0.01	µg/L	<0.010	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	<0.0050	----
Fluoranthene	206-44-0	E641A	0.01	µg/L	<0.010	----
Fluorene	86-73-7	E641A	0.01	µg/L	<0.010	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	<0.010	----
Methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	<0.010	----
Methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	<0.010	----
Naphthalene	91-20-3	E641A	0.05	µg/L	<0.050	----
Phenanthrene	85-01-8	E641A	0.02	µg/L	<0.020	----
Pyrene	129-00-0	E641A	0.01	µg/L	<0.010	----
Phthalate Esters (QCLot: 900969)						
bis(2-Ethylhexyl) phthalate [DEHP]	117-81-7	E655F	2	µg/L	<2.0	----
Di-n-butyl phthalate	84-74-2	E655F	1	µg/L	<1.0	----
Nonylphenols (QCLot: 897632)						
Nonylphenols [NP]	84852-15-3	E749A	1	µg/L	<1.0	----
Nonylphenols (QCLot: 897633)						
Nonylphenol diethoxylates [NP2EO]	n/a	E749B	0.1	µg/L	<0.10	----
Nonylphenol monoethoxylates [NP1EO]	n/a	E749B	2	µg/L	<2.0	----
Polychlorinated Biphenyls (QCLot: 900975)						
Aroclor 1016	12674-11-2	E687	0.02	µg/L	<0.020	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	<0.020	----
Aroclor 1232	11141-16-5	E687	0.02	µg/L	<0.020	----
Aroclor 1242	53469-21-9	E687	0.02	µg/L	<0.020	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	<0.020	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	<0.020	----
Aroclor 1260	11096-82-5	E687	0.02	µg/L	<0.020	----
Aroclor 1262	37324-23-5	E687	0.02	µg/L	<0.020	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	<0.020	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 901162)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	96.0	85.0	115	----
Physical Tests (QCLot: 901441)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Anions and Nutrients (QCLot: 901447)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 901448)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	98.0	90.0	110	----
Anions and Nutrients (QCLot: 901840)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.845 mg/L	99.2	80.0	120	----
Anions and Nutrients (QCLot: 901841)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	97.6	75.0	125	----
Cyanides (QCLot: 903588)									
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	0.25 mg/L	95.6	80.0	120	----
Inorganics (QCLot: 901104)									
Chlorine, total	7782-50-5	E326	0.05	mg/L	0.28861 mg/L	100	75.0	125	----
Total Metals (QCLot: 897737)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	97.1	80.0	120	----
Total Metals (QCLot: 898147)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	0.1 mg/L	94.9	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	0.05 mg/L	98.0	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	0.05 mg/L	102	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.005 mg/L	103	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.0125 mg/L	98.4	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.0125 mg/L	101	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.0125 mg/L	100	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.025 mg/L	107	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.0125 mg/L	101	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.0125 mg/L	93.5	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.025 mg/L	99.0	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Total Metals (QCLot: 898147) - continued									
Selenium, total	7782-49-2	E420	0.00005	mg/L	0.05 mg/L	101	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.005 mg/L	98.4	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.025 mg/L	98.4	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.0125 mg/L	95.1	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.025 mg/L	98.8	80.0	120	----
Speciated Metals (QCLot: 897519)									
Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0005	mg/L	0.025 mg/L	98.8	80.0	120	----
Aggregate Organics (QCLot: 897340)									
Biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	99.2	85.0	115	----
Aggregate Organics (QCLot: 897569)									
Carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	104	85.0	115	----
Aggregate Organics (QCLot: 905682)									
Oil & grease (gravimetric)	----	E567	5	mg/L	200 mg/L	98.4	70.0	130	----
Aggregate Organics (QCLot: 905683)									
Oil & grease, mineral (gravimetric)	----	E567SG	5	mg/L	100 mg/L	94.8	70.0	130	----
Aggregate Organics (QCLot: 906864)									
Phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	95.7	85.0	115	----
Volatile Organic Compounds (QCLot: 901718)									
Benzene	71-43-2	E611D	0.5	µg/L	100 µg/L	98.4	70.0	130	----
Chloroform	67-66-3	E611D	0.5	µg/L	100 µg/L	99.8	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	100 µg/L	94.4	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	100 µg/L	81.0	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	100 µg/L	100	70.0	130	----
Dichloromethane	75-09-2	E611D	1	µg/L	100 µg/L	108	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	100 µg/L	102	70.0	130	----
Ethylbenzene	100-41-4	E611D	0.5	µg/L	100 µg/L	93.7	70.0	130	----
Methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	100 µg/L	# 148	70.0	130	LCS-H
Styrene	100-42-5	E611D	0.5	µg/L	100 µg/L	102	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	0.5	µg/L	100 µg/L	115	70.0	130	----
Tetrachloroethylene	127-18-4	E611D	0.5	µg/L	100 µg/L	89.4	70.0	130	----
Toluene	108-88-3	E611D	0.5	µg/L	100 µg/L	88.5	70.0	130	----
Trichloroethylene	79-01-6	E611D	0.5	µg/L	100 µg/L	98.2	70.0	130	----
Xylene, m+p-	179601-23-1	E611D	0.4	µg/L	200 µg/L	89.0	70.0	130	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Volatile Organic Compounds (QCLot: 901718) - continued									
Xylene, o-	95-47-6	E611D	0.3	µg/L	100 µg/L	96.4	70.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 900959)									
Acenaphthene	83-32-9	E641A	0.01	µg/L	0.5263 µg/L	107	50.0	140	----
Acenaphthylene	208-96-8	E641A	0.01	µg/L	0.5263 µg/L	96.3	50.0	140	----
Anthracene	120-12-7	E641A	0.01	µg/L	0.5263 µg/L	95.5	50.0	140	----
Benz(a)anthracene	56-55-3	E641A	0.01	µg/L	0.5263 µg/L	108	50.0	140	----
Benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	0.5263 µg/L	98.2	50.0	140	----
Benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	0.5263 µg/L	100	50.0	140	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	0.5263 µg/L	109	50.0	140	----
Benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	0.5263 µg/L	102	50.0	140	----
Chrysene	218-01-9	E641A	0.01	µg/L	0.5263 µg/L	110	50.0	140	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	0.5263 µg/L	104	50.0	140	----
Fluoranthene	206-44-0	E641A	0.01	µg/L	0.5263 µg/L	111	50.0	140	----
Fluorene	86-73-7	E641A	0.01	µg/L	0.5263 µg/L	86.3	50.0	140	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	0.5263 µg/L	114	50.0	140	----
Methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	0.5263 µg/L	91.8	50.0	140	----
Methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	0.5263 µg/L	94.5	50.0	140	----
Naphthalene	91-20-3	E641A	0.05	µg/L	0.5263 µg/L	92.9	50.0	140	----
Phenanthrene	85-01-8	E641A	0.02	µg/L	0.5263 µg/L	107	50.0	140	----
Pyrene	129-00-0	E641A	0.01	µg/L	0.5263 µg/L	111	50.0	140	----
Phthalate Esters (QCLot: 900969)									
bis(2-Ethylhexyl) phthalate [DEHP]	117-81-7	E655F	2	µg/L	6.4 µg/L	110	50.0	140	----
Di-n-butyl phthalate	84-74-2	E655F	1	µg/L	6.4 µg/L	102	50.0	140	----
Nonylphenols (QCLot: 897632)									
Nonylphenols [NP]	84852-15-3	E749A	1	µg/L	10 µg/L	105	75.0	125	----
Nonylphenols (QCLot: 897633)									
Nonylphenol diethoxylates [NP2EO]	n/a	E749B	0.1	µg/L	1 µg/L	95.4	75.0	125	----
Nonylphenol monoethoxylates [NP1EO]	n/a	E749B	2	µg/L	20 µg/L	112	75.0	125	----
Polychlorinated Biphenyls (QCLot: 900975)									
Aroclor 1016	12674-11-2	E687	0.02	µg/L	0.2 µg/L	114	60.0	140	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	0.2 µg/L	114	60.0	140	----
Aroclor 1232	11141-16-5	E687	0.02	µg/L	0.2 µg/L	114	60.0	140	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Polychlorinated Biphenyls (QCLot: 900975) - continued									
Aroclor 1242	53469-21-9	E687	0.02	µg/L	0.2 µg/L	114	60.0	140	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	0.2 µg/L	97.2	60.0	140	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	0.2 µg/L	102	60.0	140	----
Aroclor 1260	11096-82-5	E687	0.02	µg/L	0.2 µg/L	121	60.0	140	----
Aroclor 1262	37324-23-5	E687	0.02	µg/L	0.2 µg/L	121	60.0	140	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	0.2 µg/L	121	60.0	140	----

Qualifiers

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 901447)										
WT2309367-001	Anonymous	Fluoride	16984-48-8	E235.F	9.67 mg/L	10 mg/L	96.7	75.0	125	----
Anions and Nutrients (QCLot: 901448)										
WT2309367-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	912 mg/L	1000 mg/L	91.2	75.0	125	----
Anions and Nutrients (QCLot: 901840)										
WT2309288-014	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.102 mg/L	0.1 mg/L	102	70.0	130	----
Anions and Nutrients (QCLot: 901841)										
HA2300138-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.73 mg/L	2.5 mg/L	109	70.0	130	----
Cyanides (QCLot: 903588)										
EO2302909-001	Anonymous	Cyanide, strong acid dissociable (Total)	----	E333	0.229 mg/L	0.25 mg/L	91.7	75.0	125	----
Inorganics (QCLot: 901104)										
WT2309350-001	BH 102	Chlorine, total	7782-50-5	E326	0.250 mg/L	0.28861 mg/L	86.6	70.0	130	----
Total Metals (QCLot: 897737)										
BF2300013-009	Anonymous	Mercury, total	7439-97-6	E508	0.0000975 mg/L	0.0001 mg/L	97.5	70.0	130	----
Total Metals (QCLot: 898147)										
WT2309355-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0998 mg/L	0.1 mg/L	99.8	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0519 mg/L	0.05 mg/L	104	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0534 mg/L	0.05 mg/L	107	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00510 mg/L	0.005 mg/L	102	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0129 mg/L	0.0125 mg/L	104	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0130 mg/L	0.0125 mg/L	104	70.0	130	----
		Copper, total	7440-50-8	E420	0.0122 mg/L	0.0125 mg/L	97.9	70.0	130	----
		Lead, total	7439-92-1	E420	0.0257 mg/L	0.025 mg/L	103	70.0	130	----
		Manganese, total	7439-96-5	E420	0.0130 mg/L	0.0125 mg/L	104	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0126 mg/L	0.0125 mg/L	101	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0248 mg/L	0.025 mg/L	99.3	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0509 mg/L	0.05 mg/L	102	70.0	130	----
		Silver, total	7440-22-4	E420	0.00474 mg/L	0.005 mg/L	94.8	70.0	130	----
		Tin, total	7440-31-5	E420	0.0255 mg/L	0.025 mg/L	102	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0132 mg/L	0.0125 mg/L	106	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 898147) - continued										
WT2309355-001	Anonymous	Zinc, total	7440-66-6	E420	0.0237 mg/L	0.025 mg/L	94.8	70.0	130	----
Speciated Metals (QCLot: 897519)										
WT2309024-001	Anonymous	Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0395 mg/L	0.04 mg/L	98.8	70.0	130	----
Aggregate Organics (QCLot: 906864)										
WP2304935-001	Anonymous	Phenols, total (4AAP)	----	E562	0.0199 mg/L	0.02 mg/L	99.5	75.0	125	----
Volatile Organic Compounds (QCLot: 901718)										
WT2309668-001	Anonymous	Benzene	71-43-2	E611D	99.9 µg/L	100 µg/L	99.9	60.0	140	----
		Chloroform	67-66-3	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		Dichlorobenzene, 1,2-	95-50-1	E611D	96.0 µg/L	100 µg/L	96.0	60.0	140	----
		Dichlorobenzene, 1,4-	106-46-7	E611D	83.9 µg/L	100 µg/L	83.9	60.0	140	----
		Dichloroethylene, cis-1,2-	156-59-2	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		Dichloromethane	75-09-2	E611D	106 µg/L	100 µg/L	106	60.0	140	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611D	104 µg/L	100 µg/L	104	60.0	140	----
		Ethylbenzene	100-41-4	E611D	ND µg/L	100 µg/L	ND	60.0	140	----
		Methyl ethyl ketone [MEK]	78-93-3	E611D	ND µg/L	100 µg/L	ND	60.0	140	----
		Styrene	100-42-5	E611D	98.2 µg/L	100 µg/L	98.2	60.0	140	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611D	116 µg/L	100 µg/L	116	60.0	140	----
		Tetrachloroethylene	127-18-4	E611D	91.9 µg/L	100 µg/L	91.9	60.0	140	----
		Toluene	108-88-3	E611D	92.8 µg/L	100 µg/L	92.8	60.0	140	----
		Trichloroethylene	79-01-6	E611D	99.2 µg/L	100 µg/L	99.2	60.0	140	----
		Xylene, m+p-	179601-23-1	E611D	ND µg/L	200 µg/L	ND	60.0	140	----
		Xylene, o-	95-47-6	E611D	101 µg/L	100 µg/L	101	60.0	140	----
Nonylphenols (QCLot: 897632)										
WT2309182-001	Anonymous	Nonylphenols [NP]	84852-15-3	E749A	12.6 µg/L	10 µg/L	126	60.0	140	----
Nonylphenols (QCLot: 897633)										
WT2309182-001	Anonymous	Nonylphenol diethoxylates [NP2EO]	n/a	E749B	0.92 µg/L	1 µg/L	91.5	60.0	140	----
		Nonylphenol monoethoxylates [NP1EO]	n/a	E749B	15.2 µg/L	20 µg/L	76.0	60.0	140	----

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 17 - 620765

Page 1 of 1

Report To	Contact and company name below will appear on the final report	Report Format / Distribution	Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)
Company:	MCR	Select Report Format: [X] PDF [ ] EXCEL [ ] EDD (DIGITAL)	Regular [R] [X] Standard TAT if received by 3 PM - business days - no surcharges apply
Contact:	Richard Sukhu	Quality Control (QC) Report with Report [X] YES [ ] NO	PRIORITY (Business Days): 4 day [P4-20%] [ ] / 3 day [P3-25%] [ ] / 2 day [P2-50%] [ ]
Phone:		[X] Compare Results to Criteria on Report - provide details below if box checked	EMERGENCY: 1 Bu / Sam / (Lab
	Company address below will appear on the final report	Select Distribution: [X] EMAIL [ ] MAIL [ ] FAX	Date and Time Required for all E&P TATs:
Street:	111 Zenway Blvd	Email 1 or Fax rsukhu@mcrak.com	For tests that can not be performed according to the service level selected, you will be contacted.
City/Province:	Vaughan	Email 2	Ana
Postal Code:		Email 3	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
Invoice To	Same as Report To [X] YES [ ] NO	Invoice Distribution	
	Copy of Invoice with Report [ ] YES [X] NO	Select Invoice Distribution: [X] EMAIL [ ] MAIL [ ] FAX	
Company:		Email 1 or Fax	
Contact:		Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:		AFE/Cost Center:	PO#
Job #:	5822	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):	WT2309350	ALS Contact:	Sampler: BR

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Peel Region Storm & Sanitary Sewer By-Laws	Mississauga Storm & Sanitary Sewer By-Laws	SAMPLES ON HOLD	Sample is hazardous (please provide MSDS)	NUMBER OF CONTAINERS
	BH 102	4/13/23	9:00Am	GW		X			

Environmental Division
Waterloo
Work Order Reference
WT2309350

Telephone : +1 519 886 6910

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? [ ] YES [X] NO	
Are samples for human consumption/ use? [ ] YES [X] NO	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen [ ]		SIF Observations	Yes [ ]	No	[ ]
Ice Packs [ ]	Ice Cubes [ ]	Custody seal intact [ ]	Yes [ ]	No	[ ]
Cooling Initiated [ ]					

INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C
	6.4

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
MCR	4/13/2023					FK	Apr 13, 23	5:30 pm

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JULY 2017 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

HCl VH-2C 1 mm 824 N-695