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G5822 **AUGUST 2023**

GEOHYDROLOGY ASSESSMENT
3085 – 3105 HURONTARIO STREET
MISSISSAUGA, ONTARIO

DISTRIBUTION:

1 COPY (electronic)	MATTAMY HOMES CANADA
1 COPY	MCR ENGINEERS LTD.

PREPARED FOR:

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TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

1.0 INTRODUCTION

Mattamy Homes Canda intends to redevelop the property located at 3085 – 3105 Hurontario Street, Mississauga, Ontario (hereafter referred to as 'the Site). MCR Engineers Ltd. (MCR) was retained to conduct a Geohydrology Assessment for the Site to evaluate the requirement for temporary dewatering and permanent drainage in relation to the proposed redevelopment.

1.1 SCOPE OF WORK

The objectives of the Geohydrology Assessment are to determine the following:

- Determine Hydrogeological conditions of the Site, including the groundwater and phreatic surface, subsurface elevations and flow patterns and the interaction with the design and construction of the proposed development.
- Review the available background information for the Site obtained from MCR's files, City of Toronto, and architectural drawings.
- Estimate the potential temporary dewatering flow rates during construction and assessment of potential impacts on the surrounding environment.
- Estimate the long term flow rates from the Private Water Drainage System (PWDS) of the proposed building.
- Assess the permitting requirements for both dewatering and discharge with the Ministry of Environment, Conservation and Parks (MECP) and the City of Toronto – Toronto Water (the City), respectively.
- Summarize the findings in a Geohydrology Assessment Report.

1.2 SITE DESCRIPTION

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.

According to a Survey Plan by R-PE Surveying Ltd. presented in Appendix A, the Site is legally described as: 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.

1.3 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 masl and P4 FFE will be at 100.95 masl.

Presently, it is assumed that the proposed building structure can be supported on conventional spread/strip footings. The size of the shoring plan layout was assumed to cover approximately 100 m by 130 m.

A sub-floor Private Water Drainage System (PWDS) with perimeter weeping tile will be required. A soldier pile and lagging shoring system is expected for temporary dewatering/excavation except where adjacent structures exist, or heritage structures are to remain, in which case a caisson shoring system would be necessary.

1.4 PROPERTY OWNERSHIP

The Site is intended for redevelopment by Mattamy Homes Canda. The Client is represented by Ms. Helen Xie with the following contact information:

Mattamy Homes Canda
3300 Bloor St. West, Suite 1800

Toronto, Ontario
M8X 2X2
Ms. Helen Xie
Development Manager
Email: Helen.Xie@mattamycorp.com

1.5 REVIEW OF PREVIOUS REPORTS

The following geo-environmental reports were provided for review prior to initiating the investigation:

- MCR report titled, *Geotechnical Report, Proposed Development, 3085 – 3105 Hurontario Street, Mississauga, Ontario,* prepared for Mattamy Homes Canada., dated August 2023.

2.0 HYDROGEOLOGICAL CONDITIONS

2.1 PHYSICAL SETTING

The Site is located in the southern portion of the City of Mississauga and is situated in a mixed-use residential and commercial area. The nearest major intersection is Hurontario Street and Dundas Street East, approximately 300 m south of the Site. There are no areas of natural significance within 250 m. There are no water bodies or areas of natural significance within 30 m of the Site boundaries. The nearest surface water bodies are Cooksville Creek, at approximately 0.3 km east of the Site and Mary Fix Creek, at approximately 1.3 km west of the Site

The Site is located at an elevation of approximately 115 m above sea level (asl) (377 ft) and the topography across the Site is generally flat. Surrounding area slopes gently down to the southwest.

The Site is bounded by the following properties/features:

North	Residential buildings and asphalt parking area
South	Hurontario Street
East	Residential buildings and asphalt parking area
West	Hurontario Street and Kirwin Ave

2.2 TOPOGRAPHY

According to the topographic map, Map 30 M/11, 9th Edition published by Government of Canada; Natural Resources Canada; Earth Sciences Sector; Canada Centre for Mapping and Earth Observation, on July 19, 2013, the ground surface at the Site is relatively flat with the surrounding area sloping gently to the southwest towards Credit River.

2.3 REGIONAL GEOLOGY AND HYDROGEOLOGY

According to the geological map entitled "Quaternary Geology of Ontario, Southern Sheet" Map 2556, published by the Ontario Ministry of Development and Mines, dated 1991, the overburden in the study area consists of predominantly undifferentiated carbonate and clastic sedimentary rock, exposed at surface or

covered by a discontinuous, thin layer of drift. The groundwater typically tends to flow southwest, towards Lake Ontario.

According to Ontario Ministry of Development and Mines, Map No. 2544, “Bedrock Geology of Ontario, Southern Sheet, 1991”, the bedrock typically consists of Upper Ordovician shale, limestone, dolostone and siltstone. Groundwater tends to flow south-west, towards the Credit River.

2.4 LOCAL GEOLOGY AND HYDROGEOLOGY

On a local scale, geological conditions and hydrogeology are similar to the ones at a regional scale. Locally, near surface groundwater flow may be influenced by underground structures (e.g., service trenches, catch basins, and building foundations or surface watercourses). No surface water features are present onsite and there are no Provincially Significant Wetlands in the vicinity of the Site.

3.0 SCOPE OF INVESTIGATION

3.1 OVERVIEW OF 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.
- All boreholes, except borehole 1, were equipped with wells for long-term groundwater monitoring and sampling.
- The borehole locations are shown in Drawing No. 1 and the records are presented in Appendices C&D.
- Groundwater levels were recorded from the available monitoring well over various dates and the data is presented in Table 1.
- Groundwater samples were collected from BH 102 in April 2023 for chemical analysis of the City of Mississauga Sewers By-Law criteria.

3.2 MONITORING WELL INSTALLATION

All MCR monitoring wells were installed with a 50 mm diameter schedule 40 PVC pipe and a 3.05m long slotted well screen. Well screens were surrounded by a silica sand pack to at least 0.6 m above the top of screen with a bentonite seal extending from above the sand pack to within 0.5 m of the ground surface. All monitoring wells were completed with a flush mounted cover at ground surface. Monitoring well installation was done in accordance with the *Ontario Water Resources Act*, Sections 35 to 50.

3.3 ELEVATION SURVEYING

Elevations referred to in this report are geodetic and metric and were interpolated from the topographic survey by R-PE Surveying Ltd. The borehole logs are

presented in Appendices C&D.

3.4 GROUNDWATER SAMPLING

All groundwater sampling activities were conducted in accordance with Ontario Regulation (O.Reg.)153/04, as amended to O.Reg.511/09, July 2011. All monitoring wells were developed prior to sampling activities using a Waterra Hydrolift II (HL-1217) inertial lift pump by purging at least three well volumes or until the monitoring well was purged dry. Groundwater samples were obtained at least 24 hours' post-development under static conditions. No samples were field filtered prior to laboratory analysis, in accordance with the standard.

3.5 GROUNDWATER ANALYSIS

All groundwater samples were submitted to ALS Laboratory Group (ALS) of Richmond Hill, Ontario, certified by the Canadian Association for Laboratory Accreditation (CALA), for chemical analysis. The Certificates of Analysis received are included in Appendix E. The contact information for the laboratory used is included below.

ALS Laboratory Group
95 West Beaver Creek Road
Richmond Hill, ON L4B 1H2

All groundwater samples were submitted for bulk chemical analysis for the criteria provided in the *Toronto Municipal Code, Chapter 681, Sewers By-law*. The results of chemical analysis were compared to the criteria provided in *Table 1 – Limits for Sanitary and Combined Sewers Discharge and Table 2 – Limits for Storm Sewer Discharge*. These guidelines establish the maximum allowable concentrations of specific analytical parameters for water discharged into either the municipal sanitary and/or storm sewer system respectively.

4.0 INVESTIGATION RESULTS

4.1 GEOLOGY

The ground surface elevation for the boreholes ranges from 118.26 masl (BH 19-4) to 115.51 masl (BH 19-3). Based on the investigation, the geologic formations beneath the Site are illustrated in the borehole logs (Appendices C&D), Drawing No. 2&3 and include the following (from surface to depth):

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/quantity and extent of the existing fill layer should be explored by further test pit 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 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 shoring/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 are summarized on the Record of Borehole Sheets in Appendices C&D and Table 1.

4.2 GROUNDWATER LEVEL MONITORING

All current and past groundwater monitoring data is presented in Table 1. It should be noted that groundwater levels are subject to seasonal fluctuations. All groundwater levels were measured manually using an electric water level meter and with respect to the geodetic borehole elevations within the property boundary. The monitoring wells must be decommissioned, prior to construction, in accordance with Regulation 903 by a qualified contractor.

The interpreted groundwater flow direction is based on the 2019, 2020 and 2023 round of water table elevation measurements, to include all the available data. Groundwater levels were measured in all available wells (BH 101 and 102), in April 2023. The interpreted local direction of hydraulic movement across the Site is inferred to be in a south-west direction, towards the Credit River.

4.3 GROUNDWATER QUALITY

The groundwater sample collected from BH 102 in April 2023 was analyzed for the City of Toronto Sewers By-Law criteria. The results of chemical analysis (Table 2) indicate that the sample exceeds the Table 1 Limits for Sanitary & Combined Sewers Discharge for Biological Oxygen Demand (686 mg/L vs. 300 mg/L). The following exceedance was recorded for the Table 2 Limits for Storm Sewer Discharge: Biological Oxygen Demand (686 mg/L vs. 15 mg/L) and Total Manganese (0.136 mg/L vs. 0.05 mg/L).

4.4 GROUNDWATER DISCHARGE ASSESSMENT

Presently, the groundwater onsite can be discharged to the city sanitary or combined sewer system with filtration/treatment for Biological Oxygen Demand (BOD). A filtration/treatment system for BOD and manganese will be required prior to discharging to the storm sewer system. A dewatering contractor should be approached to explore the possibility of treatment if discharge to the storm sewer is required.

5.0 REVIEW AND EVALUATION

5.1 TEMPORARY DEWATERING ASSESSMENT

The excavation for the proposed four level underground parking structure will extend into shale bedrock. In order to protect the sides/bottom of the excavation from being disturbed by excess groundwater pressure, i.e., to prevent quicksand/dilating silt conditions, the groundwater will need to be lowered below the top of shale bedrock.

Positive dewatering, such as localized sumps/well points might be required for the proposed excavation. Onsite soils might be subject to localized piping during dewatering. Creation of piping channels may result in a substantial increase in the volume of both temporary dewatering and permanent drainage.

In addition, the (weathered) sedimentary bedrock can be fractured, fissured, or contain water-bearing bedding planes. When these bedding planes are intercepted in rock excavation, a substantial amount of water, often under a significant hydrostatic head, may be encountered. The depths and condition of shale bedrock vary across the Site; therefore, its quality should be confirmed during shoring installation and general excavation through inspections in the field.

For the proposed four underground levels, groundwater is required to be drawn down 1 m below the underside of the footing. The foundation elevation is assumed to be at approximately 100.45 masl. However, for the purpose of temporary/construction dewatering, given the encountered subsurface conditions, groundwater cannot be lowered with well points below the average top elevation of shale bedrock at approximately 112.85 masl. Localized trenches and sumps can be used within bedrock to lower the water level below the underside of the footings, to an approximate elevation of 99.45 masl. This result is preliminary and should be confirmed during the construction phase and final stage of detailed design.

The average groundwater elevation was estimated at approximately 113.47 masl (Table 3), representing an approximate 14 m of hydrostatic head requiring dewatering. The size of the shoring plan layout was assumed to cover the

equivalent of approximately 100 m by 130 m.

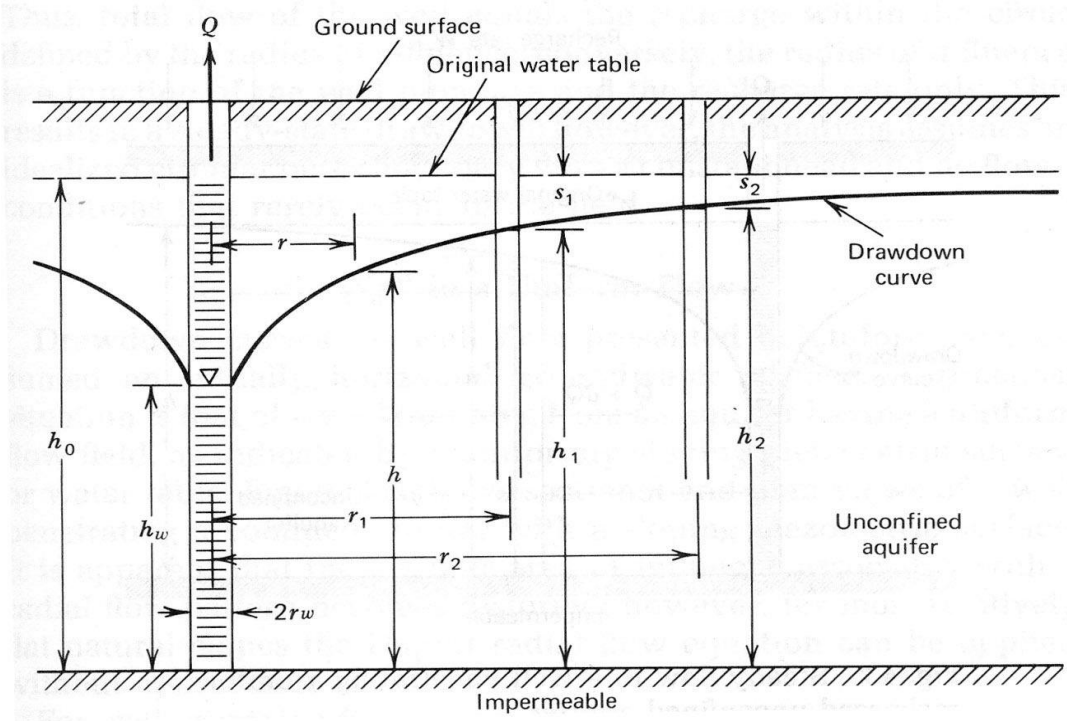
Theoretically, the discharge rate for a single pumping well in an unconfined aquifer can be described as:

$$Q = -2\pi r K h \frac{dh}{dr} \quad (1)$$

By integrating Equation (1) and separating variables h and r, we obtain

$$h^2 = -\frac{Q}{\pi K}\ln(r / r_w) + h_w{}^2 \quad (2)$$

where
h [m] is the height of the water table above an impervious base
Q [m³/day] is the rate of pumping discharge
K [m/day] is hydraulic conductivity
R [m] is the radius from the center of well location
r_w *[m]* is the radius of pumping well (see Schematic A below).



Schematic A: Radial flow to an unconfined aquifer (Todd, 1980)

5.1.1 Numerical Analysis

The abovementioned Site parameters were used to calculate the estimated steady state discharge rate for temporary construction dewatering. Groundwater monitoring data is presented in Table 3. The calculations for temporary dewatering rates are shown in Table 4.

From the observed soil types and based on soil sample descriptions (Todd, 1980; Mays, 2001; and Craig, 2004), the average hydraulic conductivity (K) of the aquifer was conservatively estimated at 0.2 m/day.

The steady state discharge rate for temporary construction dewatering was calculated at approximately 306 m^3/day (56 USG/min), with a safety factor of 1.50. The steady state discharge is 204 m^3/day (38 USG/min), with a safety factor of 1.0.

It should be noted that the initial drawdown pumping rate and accumulation from rainfall will be higher, and this should be confirmed by the dewatering contractor.

5.2 PERMANENT FOUNDATION DRAIN FLOW RATES

For the proposed redevelopment, the ground finished floor elevation (FFE) ranges from 117.96 to 116.00 masl and P4 FFE will be at 100.95 masl.

A sub-floor Private Water Drainage System (PWDS) with perimeter/underfloor weeping tile is proposed below the P4 level slab. The invert of the PWDS is assumed to be approximately 0.5 m below the FFE of the P4 slab, i.e., at approximately 100.45 masl.

The proposed PWDS is shown in Drawing No. 4. The slotted pipes should slope to a minimum 1% slope. Perimeter drainage pipes, with a positive gravity outlet, should be solid PVC with a minimum 0.5% slope. In addition, silt traps must be provided at convenient/accessible locations.

5.2.1 Numerical Analysis

The abovementioned Site parameters were used to calculate the estimated steady state discharge rate for the PWDS. Groundwater monitoring data is presented in Table 3. The calculations for permanent drainage flow rates are shown in Table 5.

From the observed soil types and based on soil sample descriptions (Todd, 1980; Mays, 2001; and Craig, 2004), the average hydraulic conductivity (K) of the aquifer was conservatively estimated at 0.2 m/day.

The estimated steady state discharge rate for the PWDS was calculated at 282 m^3/day (52 USG/min).

Please note that due to the presence of bedding planes/vertical fissures in the bedrock, the discharge volume might increase with time. Monitoring of permanent sumps is recommended for quality and quantity of discharge.

5.3 MECP Permit to Take Water Requirement

The Permit to Take Water (PTTW) requirements for construction site dewatering have been updated to the current O.Reg.63/16 amendment to Environmental Protection Act. In accordance with the updated regulation, construction site dewatering will require a complete PTTW application when water takings greater than 400,000 L/day are predicted. Groundwater taking between 50,000 L/day and 400,000 L/day will require a limited PTTW via an online application process through the Environmental Activity and Sector Registry (EASR). Groundwater taking from a proposed building structure by means of a PWDS will require a PTTW when water taking is greater than 50,000 L/day. The complete permit application process for PTTW takes approximately twelve weeks to review and is required prior to applying for the discharge permits.

The estimated steady state discharge rate for temporary construction dewatering was calculated at approximately 306 m^3/day (56 USG/min). Therefore, a limited PTTW application through the ESAR will be required to be applied for with the MECP.

The estimated steady state discharge rate for PWDS was calculated at approximately 282 m^3/day (52 USG/min). Therefore, a complete PTTW application for the PWDS will be required for the proposed building.

In accordance with the current Ontario Regulation 387/04 for Water Taking, every person to whom a permit has been issued under Section 34 of the Act shall collect and record data on the volume of water taken daily. The data collected shall be measured by a flow meter or calculated using a method acceptable to a Director.

5.4 MUNICIPAL WATER DISCHARGE PERMIT REQUIREMENTS

The Municipality requires that any private water to be discharged into the City sewer system must have a permit or agreement in place in order to discharge; this applies to all water not purchased from the City water supply. For temporary dewatering during the construction phase, this includes all groundwater and storm water that is collected or encountered during site excavation. For the PWDS, this includes all groundwater that is constantly pumped as a result of the PWDS elevation located below the groundwater table elevation or through storm water infiltration.

The groundwater quality sample collected in April 2023 indicates that groundwater onsite can be discharged to the city sanitary or combined sewer system with filtration/treatment for Biological Oxygen Demand (BOD). A filtration/treatment system for BOD and manganese will be required prior to discharging to the storm sewer system. A dewatering contractor should be approached to explore the possibility of treatment if discharge to the storm sewer is required.

A short-term temporary discharge permit must be applied for construction dewatering with the Municipality. A long-term permanent discharge permit must be applied for the proposed PWDS since the drainage system is located below the long-term groundwater elevation. The permanent discharge permit will involve coordination with the mechanical and site servicing consultant to provide calculations and drawing specifications for the ultimate discharge location and the sampling port required by the Municipality.

5.5 ENVIRONMENTAL PROTECTION

The Site is located within the Credit River basin and the river is 3 km south-west of the Site. There are no surface water features and no areas of natural significance or provincially significant wetlands in the vicinity of the Site. The Site is located in the City of Mississauga urban environment which obtains its municipal water supply from Lake Ontario. Therefore, there are no potable groundwater users within the vicinity of the Site.

The proposed redevelopment plan will remove the overburden to a depth of approximately 16 mbgs, subject to final design. Temporary groundwater dewatering, where required, will lower the groundwater table to below the underground parking foundation levels. The extracted water can be discharged to the city sanitary or combined sewer system with filtration/treatment for Biological Oxygen Demand (BOD). A filtration/treatment system for BOD and manganese will be required prior to discharging to the storm sewer system. Updated groundwater monitoring will be conducted by the dewatering contractor prior to and during construction activities to ensure that no additional adverse groundwater impacts are identified throughout the project's construction.

6.0 CONCLUSIONS AND RECOMMENDATIONS

MCR Engineers Ltd. (MCR). was retained to conduct a Geohydrology Assessment for the Site in relation to the proposed redevelopment. 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.

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 masl and P4 FFE will be at 100.95 masl.

The average groundwater elevation was estimated at approximately 113.47 masl (Table 3), representing an approximate 14 m of hydrostatic head requiring dewatering. The size of the shoring plan layout was assumed to cover the equivalent of approximately 100 m by 130 m.

A sub-floor Private Water Drainage System (PWDS) with perimeter weeping tile will be required. A soldier pile and lagging shoring system is expected for temporary dewatering/excavation except where adjacent structures exist, or heritage structures are to remain, in which case a caisson shoring system would be necessary.

The excavation for the proposed four level underground parking structure will extend into shale bedrock. In order to protect the sides/bottom of the overburden excavation from being disturbed by excess groundwater pressure, i.e., to prevent quicksand/dilating silt conditions, the groundwater will need to be lowered below the top of shale bedrock.

Positive dewatering, such as localized sumps/well points might be required for the proposed excavation. Onsite soils might be subject to localized piping during dewatering. Creation of piping channels may result in a substantial increase in the

volume of both temporary dewatering and permanent drainage.

In addition, the (weathered) sedimentary bedrock can be fractured, fissured, or contain water-bearing bedding planes. When these bedding planes are intercepted in rock excavation, a substantial amount of water, often under a significant hydrostatic head, may be encountered. The depths and condition of shale bedrock vary across the Site; therefore, its quality should be confirmed during shoring installation and general excavation through inspections in the field.

For the proposed four underground levels, groundwater is required to be drawn down 1 m below the underside of the footing. The foundation elevation is assumed to be at approximately 100.45 masl. However, for the purpose of temporary/construction dewatering, given the encountered subsurface conditions, groundwater cannot be lowered with well points below the average top elevation of shale bedrock at approximately 112.85 masl. Localized trenches and sumps can be used within bedrock to lower the water level below the underside of the footings, to an approximate elevation of 99.45 masl. This result is preliminary and should be confirmed during the construction phase and final stage of detailed design.

The average groundwater elevation was estimated at approximately 113.47 masl (Table 3), representing an approximate 14 m of hydrostatic head requiring dewatering. The size of the shoring plan layout was assumed to cover the equivalent of approximately 100 m by 130 m.

The estimated steady state discharge rate for temporary construction dewatering was calculated at approximately 306 m^3/day (56 USG/min). Therefore, a limited PTTW application through the ESAR will be required to be applied for with the MECP, and a temporary discharge permit will be required from the Municipality. It should be noted that the initial drawdown pumping rate and accumulation from rainfall will be higher and this should be confirmed by the dewatering contractor.

The estimated steady state discharge rate for PWDS was calculated at approximately 282 m^3/day (52 USG/min). Therefore, a complete PTTW application for the PWDS will be required for the proposed building from the MECP. A long-term permanent discharge permit will be required from the Municipality since the drainage will be installed below the long-term groundwater elevation.

Presently, the groundwater onsite can be discharged to the city sanitary or combined sewer system with filtration/treatment for Biological Oxygen Demand (BOD). A filtration/treatment system for BOD and manganese will be required prior to discharging to the storm sewer system. Updated groundwater monitoring will be conducted by the dewatering contractor prior to and during construction activities to ensure that no additional adverse groundwater impacts are identified throughout the project's construction.

The application process, where a PTTW is required, can take at least three months for a review by the MECP and is required to be approved prior to applying for discharge permits. It is recommended that applications to Toronto Water for discharge permits be applied for at least three months prior to the required start dates. Applications are to be supported by drawings and calculations provided by the mechanical and the site servicing consultant and coordination is required amongst all disciplines.

7.0 REFERENCES

1. Ontario Ministry of the Environment. *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act.* April15, 2011.
2. Ministry of Northern Development and Mines. *Quaternary Geology of Toronto and Southern Ontario - Southern, Sheet Map 2504,* 1980.
3. Ministry of Northern Development and Mines. *Bedrock Geology of Ontario-Southern Sheet,* 1991.
4. D.K. Todd, *Groundwater Hydrology,* 2nd Edition, John Wiley & Sons, New York, 1980.
5. L.W. Mays, *Water Resources Engineering*, 1st Edition, John Wiley & Sons, New York, 2001.
6. R.F. Craig, *Soil Mechanics*, 7th Edition, Spon Press, London, 2004.
7. MCR report titled, Geotechnical Report, Proposed Development, 3085 – 3105 Hurontario Street, Mississauga, Ontario, prepared for Mattamy Homes Canada., dated August 2023.

8.0 STATEMENT OF LIMITATIONS

MCR Engineers Ltd. (MCR) conducted the work associated with this report in accordance with the scope of services, time and budget limitations imposed for this work. The work has been conducted according to reasonable and generally accepted local standards for an environmental consultant at the time of the work. No other warranty or representation, expressed or implied, is included or intended in this report.

The work was designed to provide an overall assessment of the environmental conditions at the Site. The conclusions presented in this report are based on the information obtained during the investigation. The work is intended to reduce the client's risk with respect to environmental impairment. No work can completely eliminate the possibility of further environmental impairment on the Site.

It should be noted that subsurface conditions might vary at locations and depths other than those locations where borings, surveys or explorations were made by MCR. Other contaminants, not tested for in this work, may also potentially be present on the Site. Even with exhaustive investigation, it is not possible to warranty the Site will be free of contaminants. Should conditions, not observed during the work, become apparent, MCR should be immediately notified to assess the situation and conduct additional work, where required. The findings of this report are based on conditions as they were observed at the time of the work.

No assurance is made regarding changes in conditions subsequent to the time of the work. Remediation cost estimates is based on the available information. The estimated costs for remediation only represent the costs for the clean-up of known contaminants that have been identified during the work. Additional costs may be incurred as a result of other contaminants or areas of contamination identified by subsequent work.

Regulatory statutes are subject to interpretation. These statutes and their interpretation may change over time, thus these issues should be reviewed with appropriate legal counsel.

MCR relied on information provided by others in this report. MCR cannot guarantee the accuracy, completeness and reliability of the information provided by others, although MCR staff attempted to seek clarification on information provided and verifies authenticity, where practical.

The information provided in this report can be relied upon by the City of Toronto regarding the short and long term Sanitary Discharge Agreement applications for the Site.

9.0 CLOSURE

In accordance with your request and authorization, MCR Engineers Ltd. completed this Geohydrology Assessment Report. This report presented the methodology, findings and conclusions of the investigation. The Statement of Limitations for all work performed as part of this investigation is included.

We trust that the information provided in this report is sufficient for your present requirements. Should you have any further questions, please do not hesitate to contact our office. Thank you for retaining MCR Engineers Ltd. for this project.

Respectfully,
MCR Engineers Ltd.

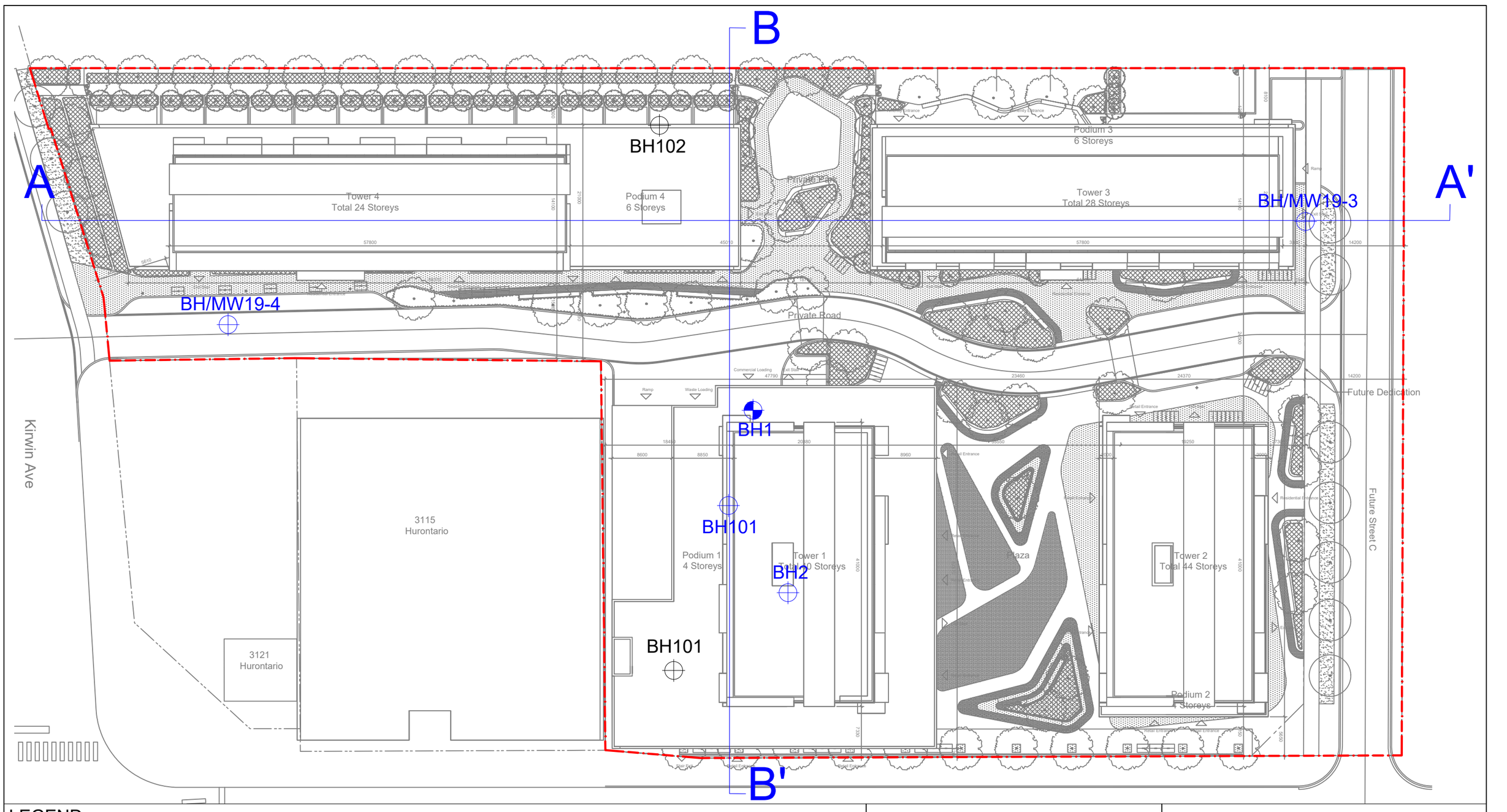
S. Tavassoli

Prepared By:
Salman Tavassoli, M.Sc., E.I.T

Reviewed By:
Lad Rak, P.Eng., M.Eng., QP$_{ESA}$

Date of Issue: August 21, 2023

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)

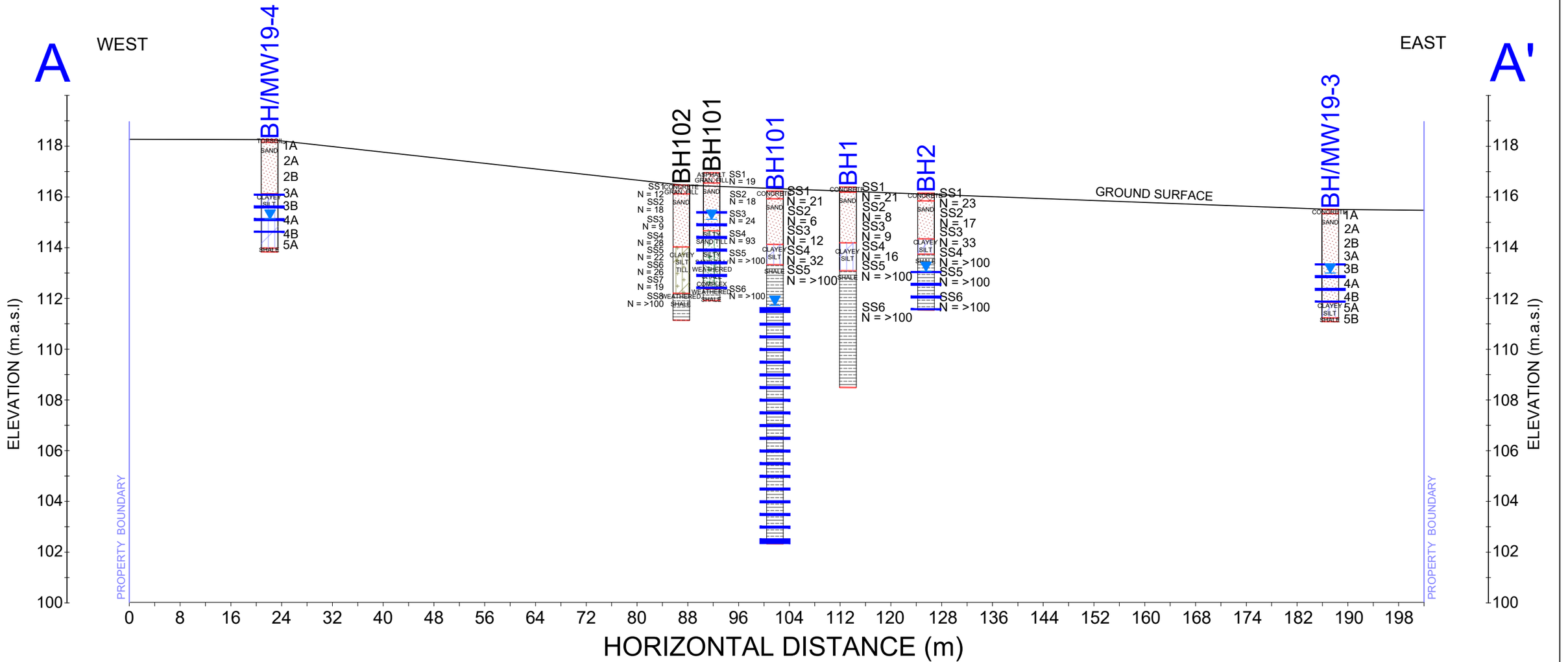
MCR ENGINEERS LTD
GEO-ENVIRONMENTAL CONSULTANTS

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:

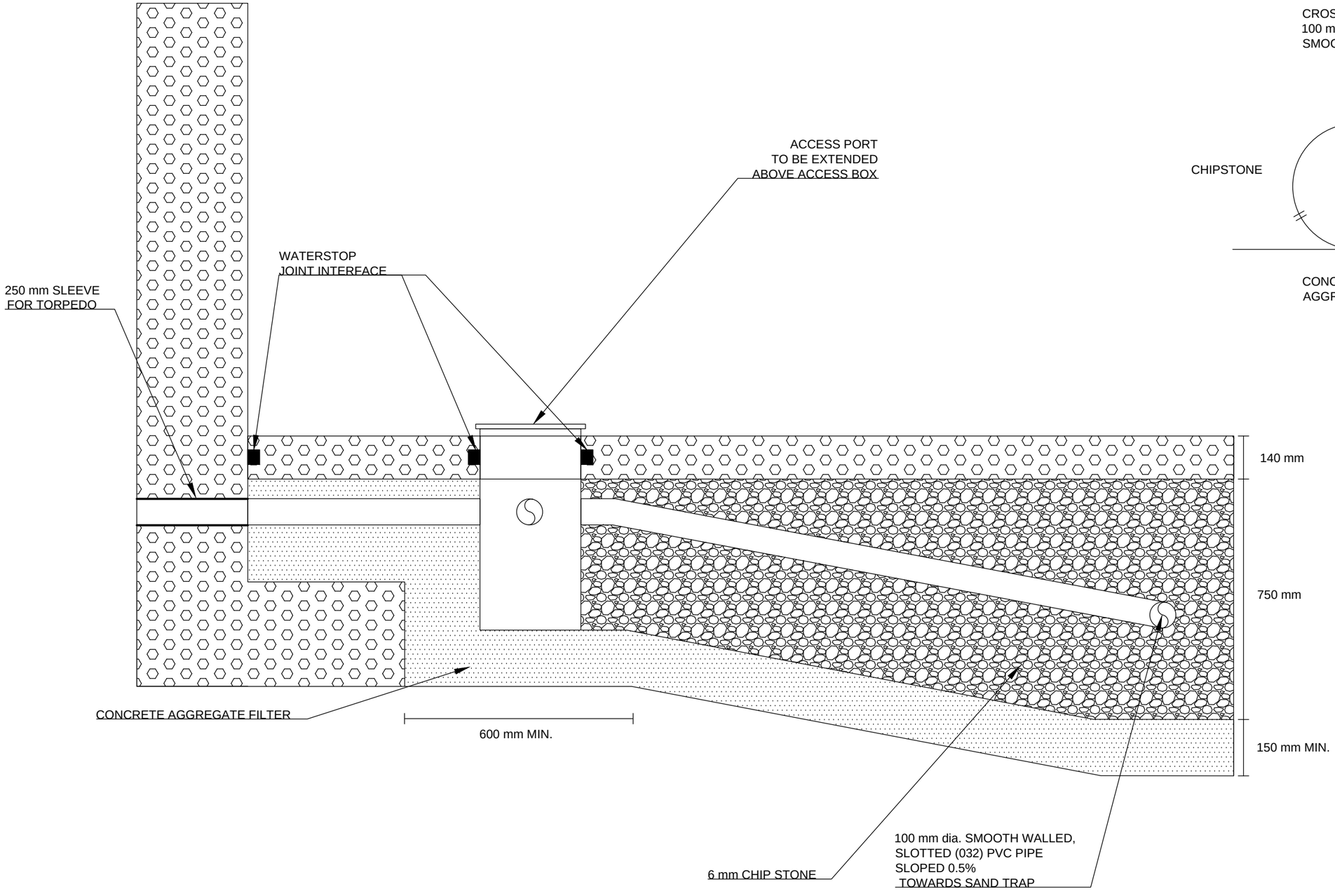
- SCREENED INTERVALS
- ELEVATION MARK (masl)
- APPROXIMATE WATER LEVEL
- FILL
- SAND
- SILTY SAND
- SHALE
- SILT
- CLAYEY SILT
- SANDY SILT

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

MCR ENGINEERS LTD.
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

MCR ENGINEERS LTD.
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:

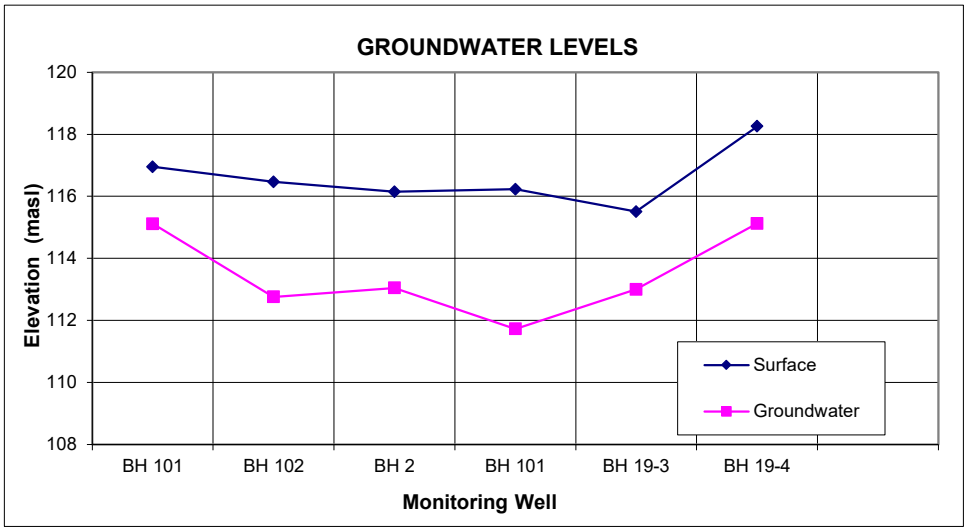
BOLD	Exceeds Criteria - Peel Region Sanitary By-Law
BOLD	Non-Detect Exceeds Criteria - Peel Region Sanitary By-Law
BOLD	Exceeds Criteria - Peel Region Storm By-Law
BOLD	Non-Detect Exceeds Criteria - Peel Region Storm By-Law

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.

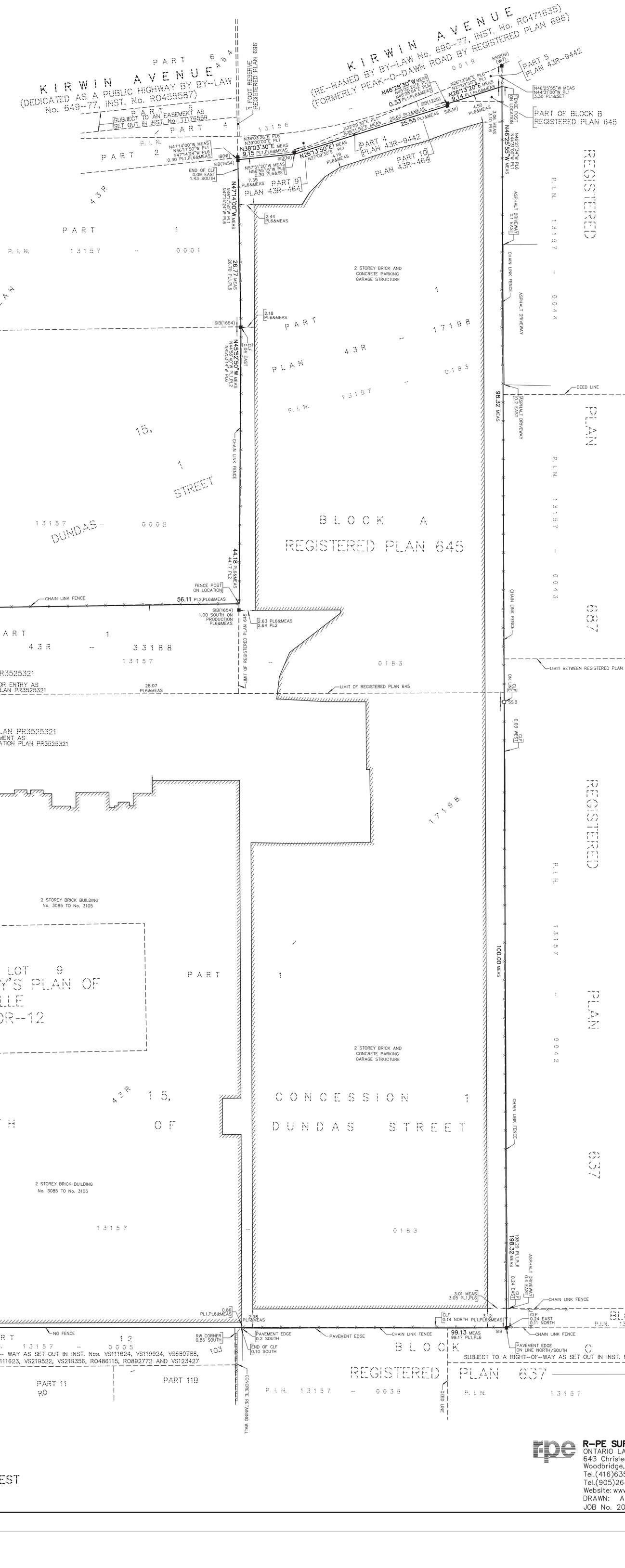
SURVEYOR'S CERTIFICATE

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

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

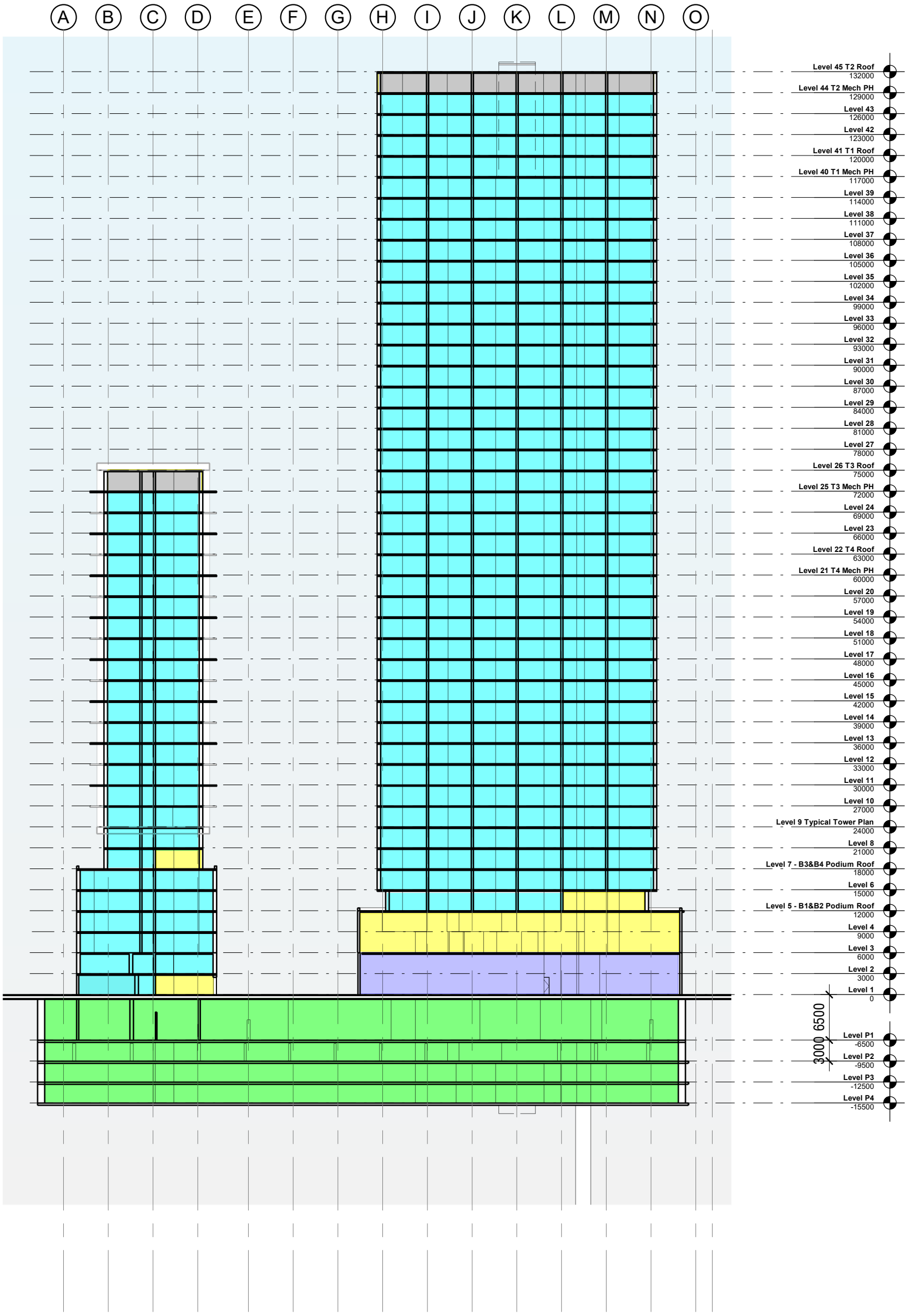
Building Section - B2 & B3

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

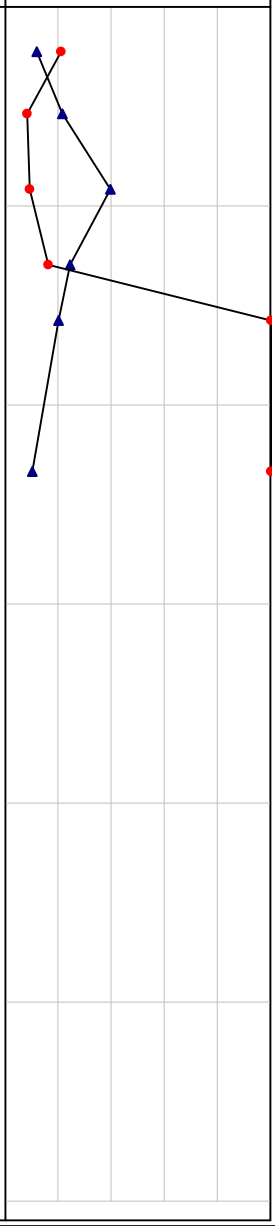
Project No: SM 190138-G
Project: Proposed Condominium Building
Location: 3085 Hurontario Street, Mississauga
Client: Oakhill Environmental Inc.

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

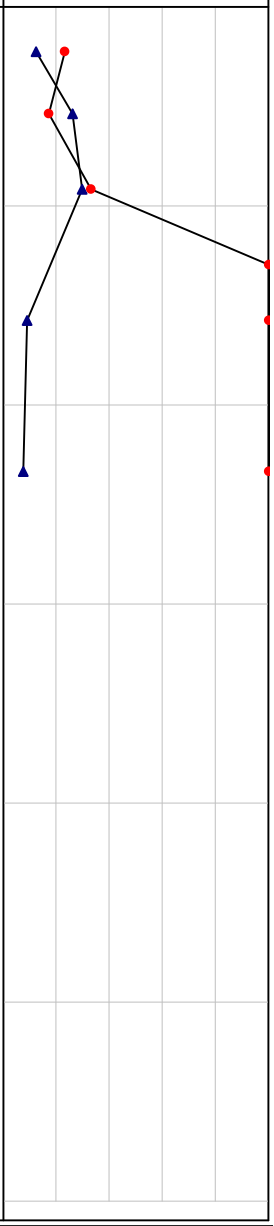
Project No: SM 190138-G
Project: Proposed Condominium Building
Location: 3085 Hurontario Street, Mississauga
Client: Oakhill Environmental Inc.

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
E: info@soil-mat.ca

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
Greg Pokocky	Manager - Inorganics	Waterloo Metals, Waterloo, Ontario
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Waterloo Organics, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Waterloo Inorganics, Waterloo, Ontario
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