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G1187V2 **DECEMBER 2022**

PRELIMINARY GEOHYDROLOGY ASSESSMENT
190 RUTLEDGE ROAD
MISSISSAUGA, ONTARIO

DISTRIBUTION:

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PREPARED FOR:

FOREST GREEN HOMES
5332 HIGHWAY 7
WOODBRIDGE, ON
L4L 1T3

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1.0 INTRODUCTION

Forest Green Homes (the Client) intends to redevelop the property located at 190 Rutledge Road, Mississauga, Ontario, (hereafter referred to as 'the Site'). McClymont & Rak Engineers Inc. (MCR) was retained to conduct a Geohydrology Assessment for the Site to evaluate the requirements for temporary dewatering and permanent drainage for the proposed redevelopment.

1.1 SCOPE OF WORK

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

- 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, engineering 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 Regional Municipality of Peel (the Municipality), respectively.
- Summarize the findings in a Geohydrology Assessment Report.

1.2 SITE DESCRIPTION

The Site is located on the northwest side of Rutledge Road, approximately 785 m southwest of the intersection of Queen Street South and Britannia Road West, in a residential-commercial area of the City of Mississauga, Ontario. The Site is irregular in shape with an area of approximately 6,232 m^2 and is currently a vacant lot with a one storey building.

The Site is bounded by Rutledge Road to the east and south, and a tree covered area to west and north.

According to a Survey Plan by KRCMAR presented in Appendix A, the Site is legally described as: Part of Lot 4, Concession 5, West of Hurontario Street, City of Mississauga, Regional Municipality of Peel.

1.3 PROPOSED DEVELOPMENT

The Site is proposed for residential development consisting of a ten [10] storey building with three to four [3 to 4] levels of below grade parking.

Based on the architectural drawings presented in Appendix B, ground finished floor slab elevation (FFE) will be at 164.00 m, P3 FFE will be at elevations of 153.845 to 150.895 m and partial P4 FFE will be at 150.645 to 149.450 m.

Presently, it is assumed that the proposed buildings can be supported on spread/strip footings founded in weathered shale bedrock. The size of the shoring plan layout was assumed to cover approximately 115 m by 55 m.

With spread/strip footings supporting the structure, a sub-floor Private Water Drainage System (PWDS), with perimeter weeping tile below the P3/P4 slab, will be required. A soldier pile and lagging wall shoring system will be sufficient for the Site except where adjacent structures exist where a caisson wall will be utilized.

1.4 PROPERTY OWNERSHIP

The Site is owned by Forest Green Homes and represented by Mr. Renato Gallace, with the following contact information:

Mr. Renato Gallace
Project/Construction Manager, Highrise Division
5332 Highway No. 7
Woodbridge, Ontario
L4L 1T3
E-mail: renato@fgh.net

1.5 REVIEW OF PREVIOUS REPORTS

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

- MCR report titled: *Preliminary Geotechnical Report, Proposed Residential Development, 190 Rutledge Road, Mississauga, Ontario,* prepared for Forest Green Homes, dated December 2022.

2.0 HYDROGEOLOGICAL CONDITIONS

2.1 PHYSICAL SETTING

The Site is located in the western portion of the City of Mississauga and is situated in a mixed-use residential and commercial area. The nearest major intersection is Queen Street South and Britannia Road. The nearest surface water body is the Mullet Creek, approximately 20 m west of the Site.

The Site is located at an average geodetic elevation of approximately 156 masl and the natural topography across the Site is generally flat with a gentle slope towards the south.

The Site is bounded by the following properties/features:

North	Tree covered area
South	Rutledge Road
East	Rutledge Road
West	Tree covered area

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 natural ground surface at the Site is relatively flat with the surrounding area sloping gently to the southwest.

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 silt to silty clay matrix, high in matrix carbonate content and clast poor. The groundwater typically tends to flow south, towards the Credit River.

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 towards west, towards Mullet Creek.

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

- The field investigation included the advancement of eight boreholes (BH 101, in the vicinity of the Site, to BH 104), by MCR in April 2007. The boreholes were advanced to depths ranging from 5.20 to 7.65 m.
- Additional boreholes (201 to 204) were drilled by MCR, in February 2020. The boreholes were advanced to depths ranging from 6.60 to 13.00 m.
- Boreholes 102, 202 and 203 were equipped with monitoring wells for long-term groundwater monitoring and sampling.
- The borehole locations are shown on Drawing No. 1 and the borehole records are presented in Appendix C.
- Groundwater levels were recorded from all available monitoring wells over various dates and the data is presented in Table 1.
- Groundwater samples were collected from BH 202 for chemical analysis of the Municipality of Peel Sewers By-Law criteria.

3.2 MONITORING WELL INSTALLATION

All monitoring wells by MCR were installed with a 50 mm diameter schedule 40 PVC pope and a 3.05 m 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

Boreholes 101 to 104 elevations referred to in this report are geodetic and metric and are referenced to the top of the railway crossing, located at the southeast corner of the subject site, with an Elevation of 159.65 m, as per the Preliminary grading plan by Land-Pro Engineering Consultants Inc., issued in January 2004.

Borehole 201 to 204 elevations, referred to in this report, are geodetic and metric, and are referenced to two local benchmarks; a catch basin with a reported elevation of 163.38 m and a manhole with a reported elevation of 160.67 m, based on a survey plan by Land Survey Group dated October 16, 2019.

Borehole elevations are shown on the borehole logs in Appendix C.

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 D. The contact information for the laboratory used is included below.

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

Groundwater samples were submitted for bulk chemical analysis for the criteria provided in the *Regional Municipality of Pell By-Law No. 53-2010.* 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 of the boreholes ranged from 157.00 masl (BH 101) to 165.40 masl (BH 202). Based on the investigation, the geologic formations beneath the Site are illustrated in the borehole logs (Appendix C) and summarized on a Soil Profile/Drawing No. 2&3, as follows:

Fill: Soft to stiff/loose fill was found at the surface of all boreholes and extended to depths of 1.00 to 9.15 m. The grey to black/brown to black/brown fill consisted of silty clay/clayey silt/sandy silt soils. The fill contained trace to some sand and gravel, trace of organics and rootlets, shale fragments and was in a moist to wet condition.

Due to the nature of fill and for the purpose of offsite disposal, the type/quality and extent of the existing fill should be explored by further test pit investigation.

Organics: A layer of firm peat was found below the fill in borehole 103 and extended to the depth of 3.05 m. The black peat layer was in a moist condition.

Sand: Compact to loose layer of fine to medium sand was detected below fill in borehole 102 and extended to the depth of 2.30 m. The brown sand layer contained trace of silt, gravel and organics and was in a moist condition.

Clayey Silt (Till)/Silty Clay: Firm to hard layer of clayey silt (till)/silty clay was observed below the fill/organics/sand in all boreholes and extend to the depths of 4.25 to 12.20 m. The brown to grey/mottled grey/black clayey silt (till)/silty clay deposit contained wet sandy silt seams, cobbles, some gravel and sand, trace organics and rootlets, oxidized fissures and was in a moist to wet condition.

Sandy Silt Till/Weathered Shale Complex: Grey moist sandy silt till/weathered shale complex was encountered below the clayey silt (till)/silty clay in all boreholes at depths ranging from 4.25 to 12.20 m i.e., elevations 152.75 to 154.25 m and extended to depths 4.55 to 12.95 m, i.e., elevations 150.90 to 152.95 m to the

underlying weathered shale in boreholes 101, 104, 201 to 203 and refusal due to probable shale or limestone in boreholes 102, 103 and 204.

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

Shale Bedrock: Grey, moist shale bedrock was detected below the sandy silt till/weathered shale complex in all the boreholes except 102, 103 and 204 at about depths of 4.55 to 12.95 m i.e., elevations 150.90 to 152.95 m and extended to extended to the maximum explored depth of the boreholes.

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

Groundwater: Upon completion of drilling, boreholes 101, 104, 202, 203 and 204 remained dry. Groundwater was measured at depths ranging from 3.65 to 5.30 m in rest of the boreholes.

On April 30, 2007, and May 01, 2007, groundwater levels were measured, in the monitoring well, at about 10 cm above ground in borehole 102.

On February 19, 2020, groundwater levels were measured, in the monitoring wells, at depths of 8.45 and 6.60 m in boreholes 202 and 203.

On November 03, 2022, groundwater levels were measured, in the monitoring wells, at depths of 9.04 and 4.76 m in boreholes 202 and 203.

On November 16, 2022, groundwater levels were measured, in the monitoring wells, at depths of 9.16 and 4.75 m in boreholes 202 and 203.

The results are summarized on the Record of Borehole Sheets in Appendix C and Table 1.

In addition, the sedimentary bedrock may contain water-bearing bedding planes. When these bedding planes are intercepted by excavation, a substantial amount

of water, often under a hydrostatic head, may be encountered.

4.2 GROUNDWATER LEVEL MONITORING

All groundwater measurement data is presented in the enclosed 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 2022 round of water table elevation measurements, since this event provided water table elevations from the majority of the monitoring wells. Confidence in the groundwater flow direction could be increased with additional rounds of water table elevation measurements. The interpreted local direction of hydraulic movement across the Site is inferred to be in a west direction, towards Mullet Creek.

4.3 GROUNDWATER QUALITY

Groundwater samples collected in November 2022 from BH 202 were analyzed for the Peel Region Sewers By-Law criteria. The results of chemical analysis (Table 2) indicate that the following exceedances were recorded for the *Table 2 Limits for Sanitary & Combined Sewers Discharge:* Total Manganese (5.9 mg/L vs. 0.05 mg/L) and following exceedances were recorded for the *Table 2 Limits for Storm Sewer Discharge:* Total Manganese (5.9 mg/L vs. 0.05 mg/L) and detection limit exceedance for Total Aluminum, Total Arsenic, Total Chromium, Total Copper, Total Nickel, Total Selenium and Total Zinc.

4.4 GROUNDWATER DISCHARGE ASSESSMENT

Presently, the groundwater onsite can be discharged to the City sanitary or combined sewer system with a filtration/treatment system for total manganese. A filtration/treatment system for total manganese, total aluminum, total arsenic, total chromium, total copper, total nickel, total selenium and total zinc would also 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 three to four level underground parking structure will extend into shale bedrock. Positive dewatering such as well points will be required for the proposed excavation. It should be noted that during water drawdown onsite soils might be subject to localized piping, leading to an increase in the volume of both temporary 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 three to four underground levels, groundwater is required to be drawn down minimum 1 m below the underside of the P4 footing. 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 152.25 masl. Localized trenches and sumps can be used within bedrock to lower the water level below the underside of the P4 slab and footings, to an approximate elevation of 146.95 masl. This result is preliminary and should be confirmed during the construction phase and final stage of detailed design.

The average ground water level recorded in the monitoring wells is at an elevation of 156.26 masl, representing an approximate 9.3 m hydrostatic head requiring dewatering. The size of the shoring plan layout was assumed to cover approximately 115 m by 55 m.

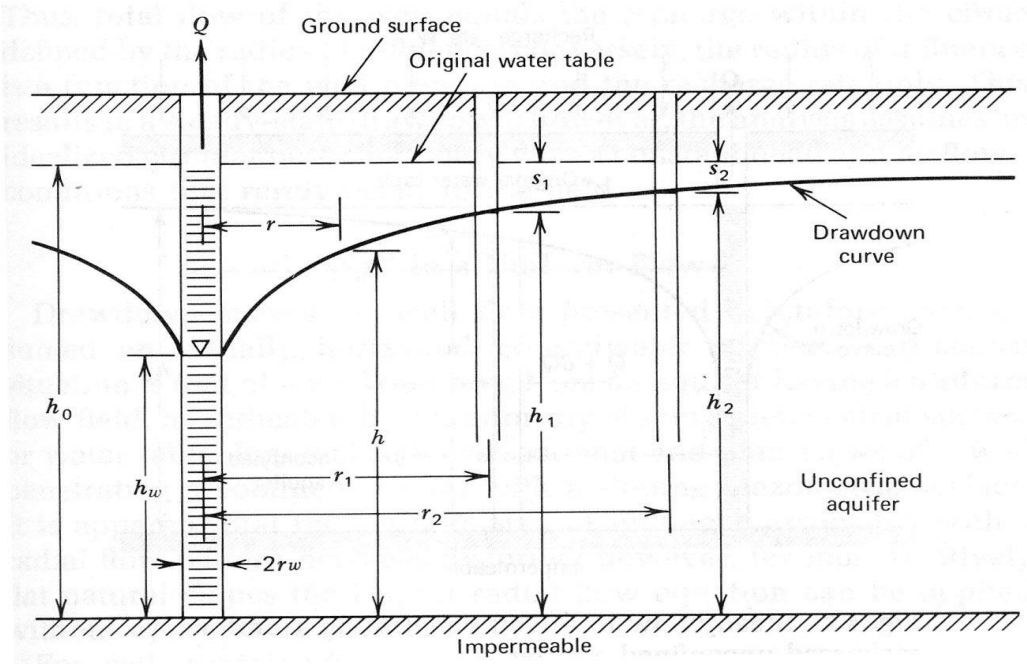
Theoretically, the groundwater drawdown for a single well pumping can be described as:

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

And further we have:

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

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 centre 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 estimated at 0.3 m/day.

The estimated steady state discharge rate for temporary construction dewatering was calculated at approximately 193 m^3/day (35 USG/min), with a safety factor of 1.5. It should be noted that the initial drawdown pumping rate, due to potential accumulation from rainfall, may be higher and this would be confirmed by the dewatering contractor.

5.2 PERMANENT FOUNDATION DRAIN FLOW RATES

For the proposed redevelopment, it is assumed that the finished floor slab elevation (FFE) at ground will be at an approximate elevation of 164.00 masl. The lowest P4 FFE will be at an approximate elevation of 149.45 masl.

With spread/strip footings, a conventional sub-floor Private Water Drainage System (PWDS) with perimeter/underfloor weeping tile will be required 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 148.95 masl.

The proposed PWDS is shown on 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 3and 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 estimated at 0.3 m/day.

The estimated steady state discharge rate for the PWDS was calculated at approximately 117 m^3/day (21 USG/min) with a safety factor of 1.50.

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 PTTW through a limited online application process. 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 anticipated temporary dewatering discharge rate was calculated at approximately 193 m^3/day. Therefore, a limited PTTW application will be required to be applied for with the MECP.

The flow rate from the PWDS was calculated at approximately 117 m^3/day. Therefore, a complete PTTW application for the PWDS will be required for the proposed developments.

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 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 due to the PWDS elevation located below the groundwater table, or by storm water infiltration.

The groundwater quality samples collected in 2022 indicated that the water onsite could be discharged into the City sanitary and combined sewer system with filtration/treatment for total manganese. A filtration/treatment system for total manganese, total aluminum, total arsenic, total chromium, total copper, total nickel, total selenium and total zinc would also be required prior to discharging to the storm sewer system. Updated groundwater samples should be collected during a pumping test to confirm the current groundwater quality.

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 drainage basin and the river is approximately 0.5 km north 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 and bedrock within the shoring precinct, to a depth of approximately 15 mbgs. Temporary groundwater dewatering will lower the groundwater table to below the underground parking foundation levels. The extracted water will be discharged into the sanitary sewer, or to the storm sewer with filtration/treatment. 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

McClymont & Rak Engineers Inc. was retained to conduct a Geohydrology Assessment for the Site in relation to the proposed redevelopment. The Site is presently vacant lot with a one storey building.

The Site is proposed for residential development consisting of a ten [10] storey building with three to four [3 to 4] levels of below grade parking.

Based on the architectural drawings presented in Appendix B, ground finished floor slab elevation (FFE) will be at an elevation of 164.00 m, P3 FFE will be at 153.845 to 150.895 m and partial P4 FFE will be at elevations of 150.645 to 149.450 m.

Presently, it is assumed that the proposed building can be supported on spread/strip footings founded in weathered shale bedrock. The size of the shoring plan layout was assumed to cover approximately 115 m by 55 m.

With spread/strip footings supporting the structure, a sub-floor Private Water Drainage System (PWDS), with perimeter weeping tile below the P3/P4 slab, will be required. A soldier pile and lagging wall shoring system will be sufficient for the Site except where adjacent structures exist where a caisson wall will be utilized.

The excavation for the proposed three to four level underground parking structure will extend into shale bedrock. Positive dewatering such as well points will be required for the proposed excavation. Onsite soils might be subject to localized piping during dewatering. It should be noted that during water drawdown onsite soils might be subject to localized piping, leading to an increase in the volume of both temporary 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 three to four underground levels, groundwater is required to be drawn down minimum 1 m below the underside of the P4 footing. 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 152.25 masl. Localized trenches and sumps can be used within bedrock to lower the water level below the underside of the P4 slab and footings, to an approximate elevation of 146.95 masl. This result is preliminary and should be confirmed during the construction phase and final stage of detailed design.

The average ground water level recorded in the monitoring wells is at an elevation of 156.26 masl, representing an approximate 9.3 m hydrostatic head requiring dewatering.

The steady state discharge rate for temporary construction dewatering was estimated at approximately 193 m^3/day (35 USG/min) for the proposed development. Therefore, based on the amended O.Reg. 63/16 to the Environmental Protection Act, a limited PTTW application through the ESAR will be required from 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 the PWDS was calculated at approximately 117 m^3/day (21 USG/min) for the proposed development. Therefore, a complete PTTW will be required from the MECP for the PWDS for the development. 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 a filtration/treatment system for total manganese. A filtration/treatment system for total manganese, total aluminum, total arsenic, total chromium, total copper, total nickel, total selenium and total zinc would also 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.

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 the Municipality 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. MCR report titled: Preliminary Geotechnical Report, Proposed Residential Development, 190 Rutledge Road, Mississauga, Ontario, prepared for Forest Green Homes, dated December 2022.

8.0 STATEMENT OF LIMITATIONS

McClymont & Rak Engineers, Inc. (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 report and its attachments were prepared for and made available for the sole use of the client. MCR will not be responsible for any use or interpretation of the information contained in this report by any other party without the prior expressed written consent of MCR.

9.0 CLOSURE

In accordance with your request and authorization, McClymont and Rak Engineers Inc. 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 McClymont & Rak Engineers, Inc. for this project.

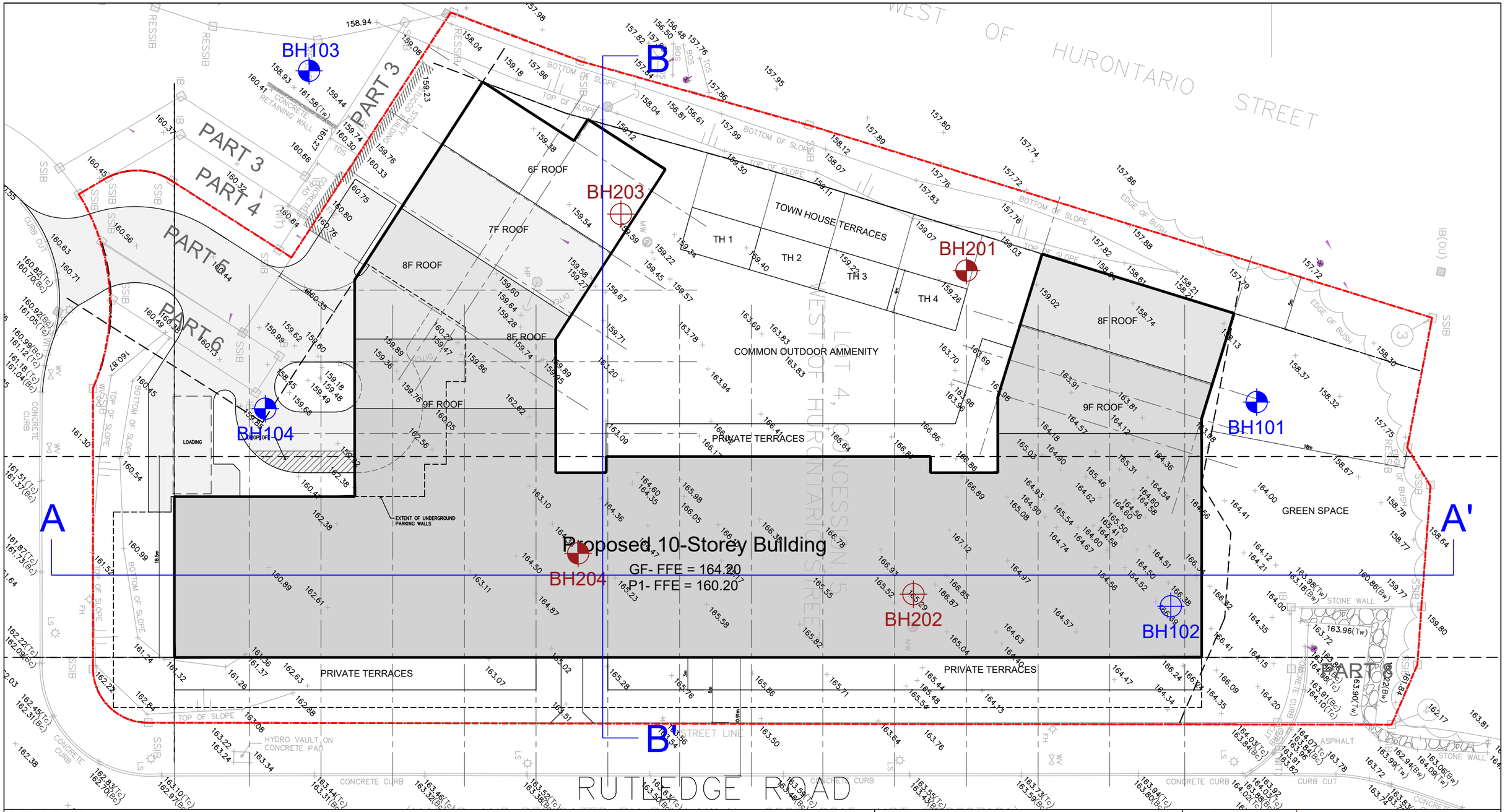
Respectfully,
McCLYMONT & RAK ENGINEERS INC.

Prepared By:
Salman Tavassoli, EIT

Reviewed By:
Lad Rak, P.Eng.

Date of Issue: December 12, 2022

FIGURES



LEGEND:

- BOREHOLE/MONITORING WELL INSTALLED BY MCR, 2007
- BOREHOLE/MONITORING WELL INSTALLED BY MCR, 2020

PROJECT NORTH

TRUE NORTH

0 2 5 10 20

SCALE (m)

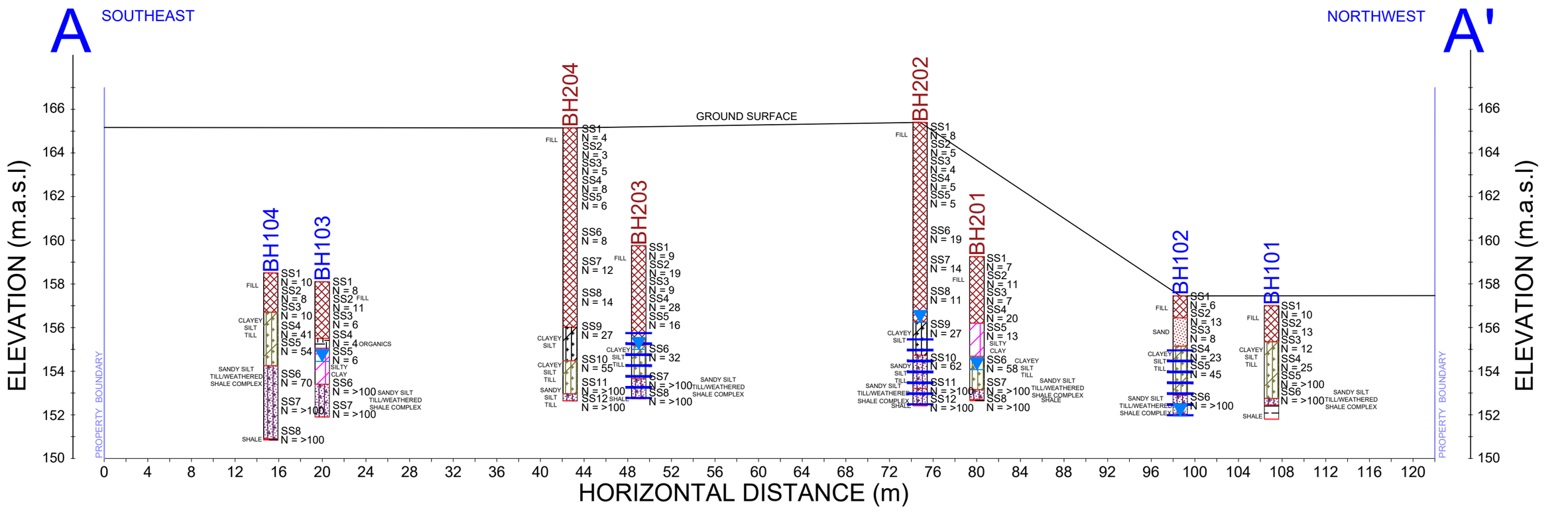
Drawing Notes: Image drafted from property survey, Toronto Maps, Google Maps, and site inspections. Not for construction purposes.

McCLYMONT&RAK ENGINEERS, INC.
GEO-ENVIRONMENTAL CONSULTANTS

RUTLEDGE ROAD, MISSISSAUGA, ONTARIO

BOREHOLE LOCATION PLAN

Project No.	Date	Drawing No.
G1187V2	DECEMBER 2022	1



LEGEND:

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

McCLYMONT&RAK ENGINEERS, INC.
GEO-ENVIRONMENTAL CONSULTANTS

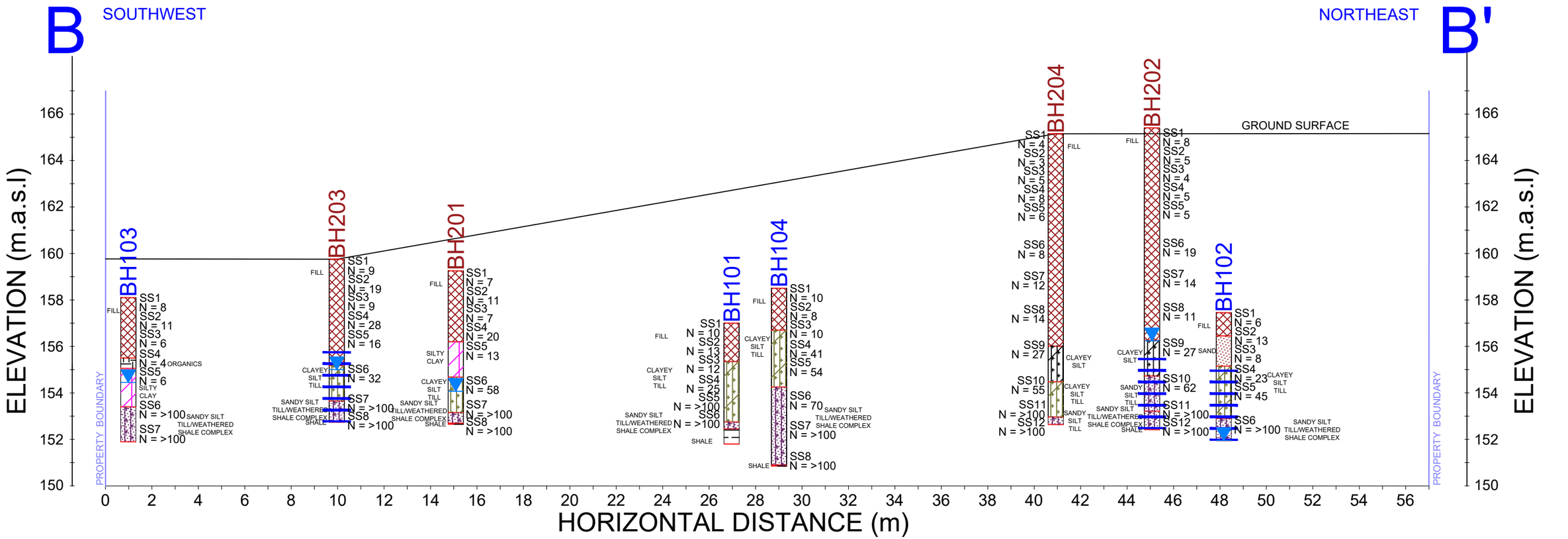
RUTLEDGE ROAD, MISSISSAUGA, ONTARIO

CROSS-SECTION A-A'

Project No.	Date	Drawing No.
G1187V2	DECEMBER 2022	2

B SOUTHWEST

NORTHEAST B'



LEGEND:

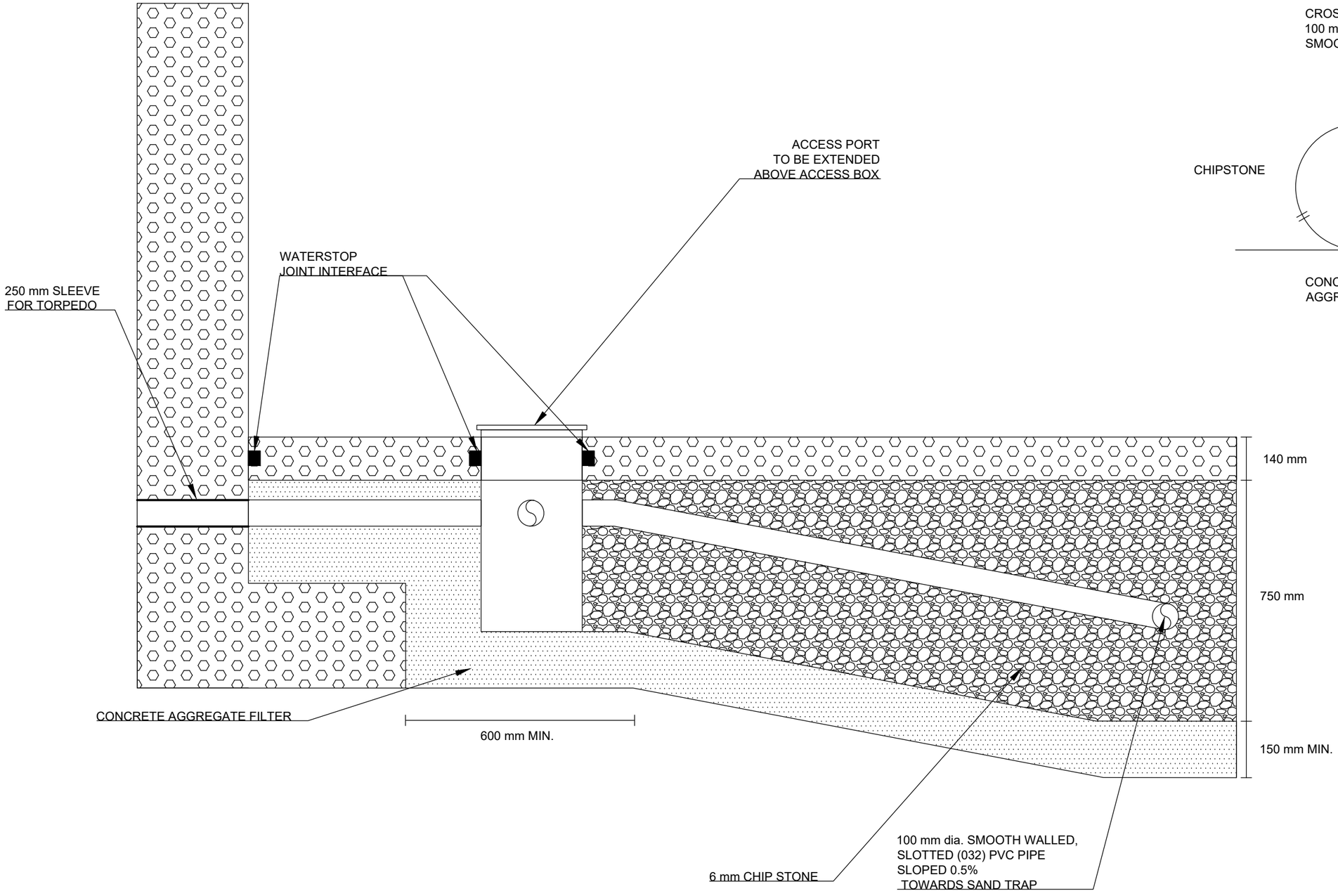
- SCREENED INTERVALS
- ELEVATION MARK (masl)
- APPROXIMATE WATER LEVEL
- FILL
- SAND
- SILTY SAND
- SHALE
- SILT
- CLAYEY SILT
- SANDY SILT

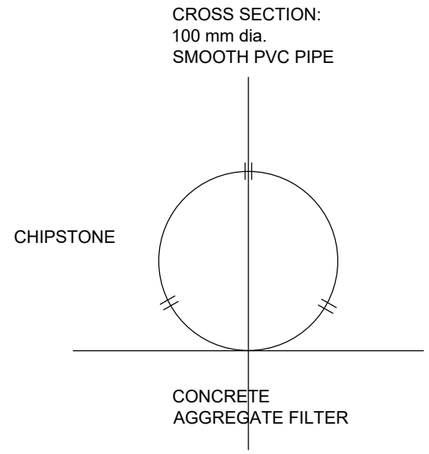
McCLYMONT&RAK ENGINEERS, INC.
GEO-ENVIRONMENTAL CONSULTANTS

RUTLEDGE ROAD, MISSISSAUGA, ONTARIO

CROSS-SECTION B-B'

Project No.	Date	Drawing No.
G1187V2	DECEMBER 2022	3





McCLYMONT&RAK
ENGINEERS, INC.
GEO-ENVIRONMENTAL CONSULTANTS

PRIVATE WATER DRAINAGE SYSTEM

Scale:	Drawing No.
NTS	4

TABLES

McCLYMONT AND RAK ENGINEERS INC.
GEO-ENVIRONMENTAL CONSULTANTS

TABLE 1
CONSTRUCTION DETAILS AND ELEVATION OF MONITORING WELLS

MONITORING WELL ID	GROUND SURFACE ELEVATION (masl)	WATER LEVEL (mbgs)	GROUNDWATER ELEVATION (masl)	DATE OF MEASUREMENT (mm/dd/yyyy)	DEPTH OF WELL (mbgs)	DEPTH OF BENTONITE (mbgs)	LENGTH OF SCREEN (m)	INSIDE DIAMETER OF PIPE (mm)	TOP OF MONITORING WELL
BH 102	157.45	-0.10	157.55	04/30/2007	5.50	2.15	3.05	50	Protective Metal Casing
		-0.10	157.55	05/01/2007					
BH 202	165.40	8.45	156.95	02/19/2020	12.80	9.14	3.05	50	Protective Metal Casing
		9.04	156.36	11/03/2022					
		9.16	156.24	11/16/2022					
BH 203	159.75	6.61	153.14	02/19/2020	7.01	3.35	3.05	50	Protective Metal Casing
		4.76	154.99	11/03/2022					
		4.75	155.00	11/16/2022					
Min	157.45	-0.10	153.14	-	5.50	-	-	-	-
Max	165.40	9.16	157.55	-	12.80	-	-	-	-
Average	160.87	5.32	155.97	-	8.44	-	-	-	-

NOTE:

mbgs - meters below ground surface

masl - meters above sea level

N/A - Not Applicable

NF - Not Found

McCLYMONT AND RAK ENGINEERS INC.
GEO-ENVIRONMENTAL CONSULTANTS

TABLE 2
GROUNDWATER ANALYTICAL RESULTS - PEEL REGION SEWERS BY-LAW DISCHARGE CRITERIA (By-Law 53-2010)
MCR JOB#: G1187V2
SITE ADDRESS: 190 Rutledge Road, Mississauga, Ontario

PARAMETER	UNITS	LIMITS FOR STORM SEWER DISCHARGE	LIMITS FOR SANITARY & COMBINED SEWERS DISCHARGE	BH 202
				17-Nov-22
pH	pH Units	6.0 - 9.0	5.5 - 10.0	8.08
Total Suspended Solids	mg/L	15	350	9.2
Fluoride (F-)	mg/L	-	10	0.737
Total Kjeldahl Nitrogen (TKN)	mg/L	1	100	0.753
Total Phosphorus (P)	mg/L	0.4	10	0.0196
Sulfate (SO4)	mg/L	-	1500	167
Total Cyanide (CN)	mg/L	0.02	2	<0.0020
Escherichia Coli	CFU/100mL	200	-	<1
Total Aluminum (Al)	mg/L	1	50	**<3.00**
Total Antimony (Sb)	mg/L	-	5	<0.100
Total Arsenic (As)	mg/L	0.02	1	**<0.100**
Total Cadmium (Cd)	mg/L	0.008	0.7	<0.00500
Total Chromium (Cr)	mg/L	0.08	5	**<0.500**
Total Cobalt (Co)	mg/L	-	5	<0.100
Total Copper (Cu)	mg/L	0.05	3	**<0.500**
Total Lead (Pb)	mg/L	0.12	3	<0.0500
Total Manganese (Mn)	mg/L	0.05	5	**5.9**
Total Mercury (Hg)	mg/L	0.0004	0.01	<0.0000050
Total Molybdenum (Mo)	mg/L	-	5	<0.0500
Total Nickel (Ni)	mg/L	0.08	3	**<0.500**
Total Selenium (Se)	mg/L	0.02	1	**<0.0500**
Total Silver (Ag)	mg/L	0.12	5	<0.0100
Total Tin (Sn)	mg/L	-	5	<0.100
Total Titanium (Ti)	mg/L	-	5	<0.300
Total Zinc (Zn)	mg/L	0.04	3	**<3.00**
Biological Oxygen Demand	mg/L	15	300	<3.0
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	0.0048
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	<0.063
Nonylphenol	µg/L	-	20	<1.0
Total Nonylphenol Ethoxylates	µg/L	-	200	<2.0

Note:

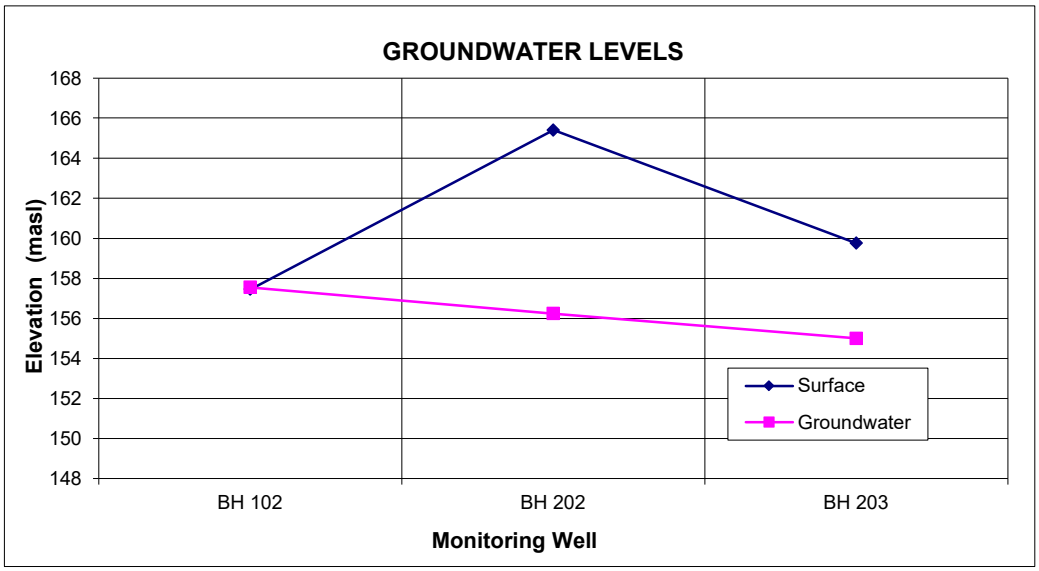
BOLD	Exceeds Criteria - Peel Region Sanitary By-Law
BOLD	Non-Detect Exceeds Criteria - Peel Region Sanitary By-Law
BOLD	Exceeds Criteria - Peel Region Storm By-Law
BOLD	Non-Detect Exceeds Criteria - Peel Region Storm By-Law

MCR	McCLYMONT & RAK ENGINEERS, INC. GEO-ENVIRONMENTAL CONSULTANTS	GROUNDWATER

Project: Proposed Residential Development
Location: 190 Rutledge Road, Mississauga, Ontario
Date: December-22
Project #: G1187V2

TABLE 3
GROUNDWATER MONITORING DATA

Borehole Number	Surface Elevation	Water Level Depth	Water Level Elevation	Monitoring Date	NOTES
	(masl)	(mbgs)	(masl)	(mm/dd/yyyy)	
BH 102	157.45	-0.10	157.55	05/01/2007	
BH 202	165.40	9.16	156.24	11/16/2022	
BH 203	159.75	4.75	155.00	11/16/2022	
Average	160.87	4.60	156.26		
Max			157.55		



Project: Proposed Residential Development
Location: 190 Rutledge Road, Mississauga, Ontario
Date: December-22
Project #: G1187V2

TABLE 4
DISCHARGE ESTIMATION OF CONSTRUCTION DEWATERING OF M 5 DEVELOPMENT

Site Parameters		Units
Initial Water Level before Dewatering	156.26	(m)
Lowest Water Level during Construction Dewatering	146.95	(m)
Length of Site X	115.00	(m)
Width of Site W	55.00	(m)
Equivalent Radius r_e	44.87	(m)
Hydraulic Conductivity of Aquifer (k)	0.30	(m/day)
Aquifer Bottom Elevation	145.95	(m)
Applied Radius of Influence (Ro)	52.06	(m)
Height btw Initial Water Level and Aquifer Bottom (H)	10.31	(m)
Height btw Lowest Water Level and Aquifer Bottom ($h_{w)}$	1.00	(m)
Radius of Influence (R)	96.93	(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	**193.39**	(m^3/day)
	35	(USG/min)

Project: Proposed Residential Development
Location: 190 Rutledge Road, Mississauga, Ontario
Date: December-22
Project #: G1187V2

TABLE 5
DISCHARGE ESTIMATION OF PERMANENT DRAINAGE SYSTEM OF M 5 DEVELOPMENT

Site Parameters		Units
Initial Water Level before Dewatering	156.26	(m)
Lowest Water Level under PDS conditions	148.95	(m)
Length of Site X	115.00	(m)
Width of Site W	55.00	(m)
Equivalent Radius r_e	44.87	(m)
Hydraulic Conductivity of Aquifer (k)	0.30	(m/day)
Aquifer Bottom Elevation	148.95	(m)
Applied Radius of Influence (Ro)	40.88	(m)
Height btw Initial Water Level and Aquifer Bottom (H)	7.31	(m)
Height btw Lowest Water Level and Aquifer Bottom ($h_{w)}$	0.00	(m)
Radius of Influence (R)	85.75	(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	**116.74**	(m^3/day)
	21	(USG/min)

APPENDIX A

TOPOGRAPHY OF

PART OF LOT 4
CONCESSION 5
WEST OF HURONTARIO STREET

(GEOGRAPHIC TOWNSHIP OF TORONTO)

CITY OF MISSISSAUGA

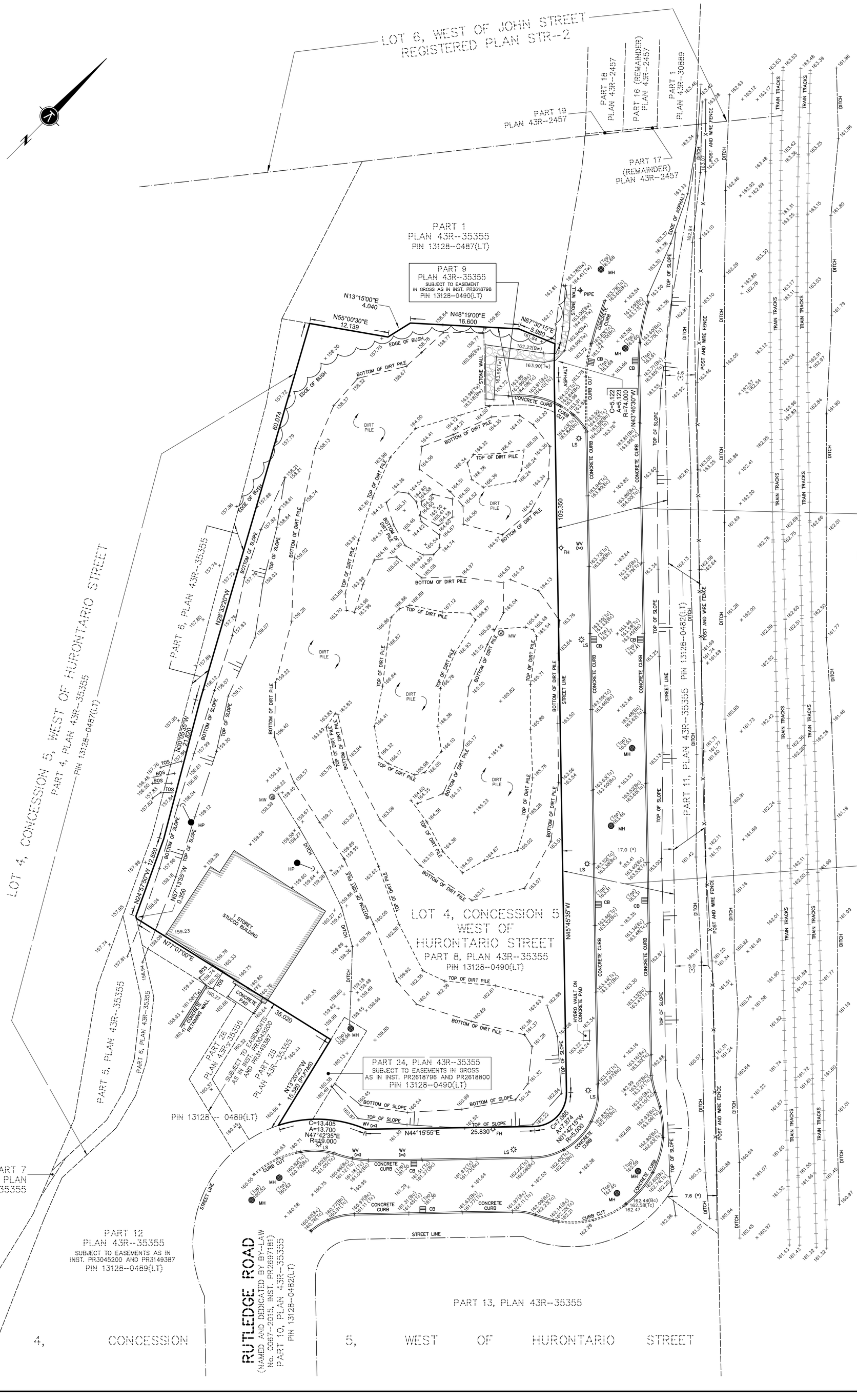
REGIONAL MUNICIPALITY OF PEEL

SCALE 1:300

5 0 5 10 15 20 25m

KRCMAR SURVEYORS LTD. 2022

METRIC: DISTANCES SHOWN HEREON ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048



BOUNDARY

BOUNDARY BEARINGS AND DISTANCES SHOWN HEREON ARE DERIVED FROM AVAILABLE LEGAL INFORMATION AND HAVE NOT BEEN VERIFIED BY FIELD MEASUREMENT.

NOTE

(*) – DISTANCES OBTAINED FROM PLAN 43R–35355 AND HAVE NOT BEEN VERIFIED BY FIELD MEASUREMENT.

MISSISSAUGA ELEVATION NOTE

ELEVATIONS SHOWN HEREON ARE CANADIAN GEODETIC DATUM, 1928 (NOT 1978 SOUTHERN ONTARIO READJUSTMENT) AND ARE RELATED TO CITY OF MISSISSAUGA BENCH MARK No. 63–4, HAVING AN ELEVATION OF 163.543 METRES.

LEGEND

BOS	DENOTES BOTTOM OF SLOPE
FFE	DENOTES FINISHED FLOOR ELEVATION
TOS	DENOTES TOP OF SLOPE
(Bc)	DENOTES BOTTOM OF CURB
(Bw)	DENOTES BOTTOM OF WALL
(Tc)	DENOTES TOP OF CURB
(Tw)	DENOTES TOP OF WALL
×123.45	DENOTES EXISTING GRADE ELEVATION
CB	DENOTES CATCH BASIN
	DENOTES DOWN GUY ANCHOR
FH	DENOTES FIRE HYDRANT
HP	DENOTES HYDRO POLE
LS	DENOTES LAMP STANDARD
MH	DENOTES MANHOLE
MW	DENOTES MONITORING WELL
Pipe	DENOTES PIPE
WV	DENOTES WATER VALVE
—x—	DENOTES FENCE
	DENOTES TRAIN TRACK

FIELD WORK WAS COMPLETED ON THE 18th DAY OF APRIL, 2022

DATE MAY 2 , 2022

UPDATE

NOVEMBER 8, 2022 – UPDATED TO SHOW ADDITIONAL TOPOGRAPHICAL INFORMATION ON RUTLEDGE ROAD AND CANADIAN PARCIFIC RAILWAY LANDS BASED ON FIELD WORK CONDUCTED ON NOVEMBER 7, 2022.

MUNICIPAL ADDRESS: No. 180 RUTLEDGE DRIVE, MISSISSAUGA.

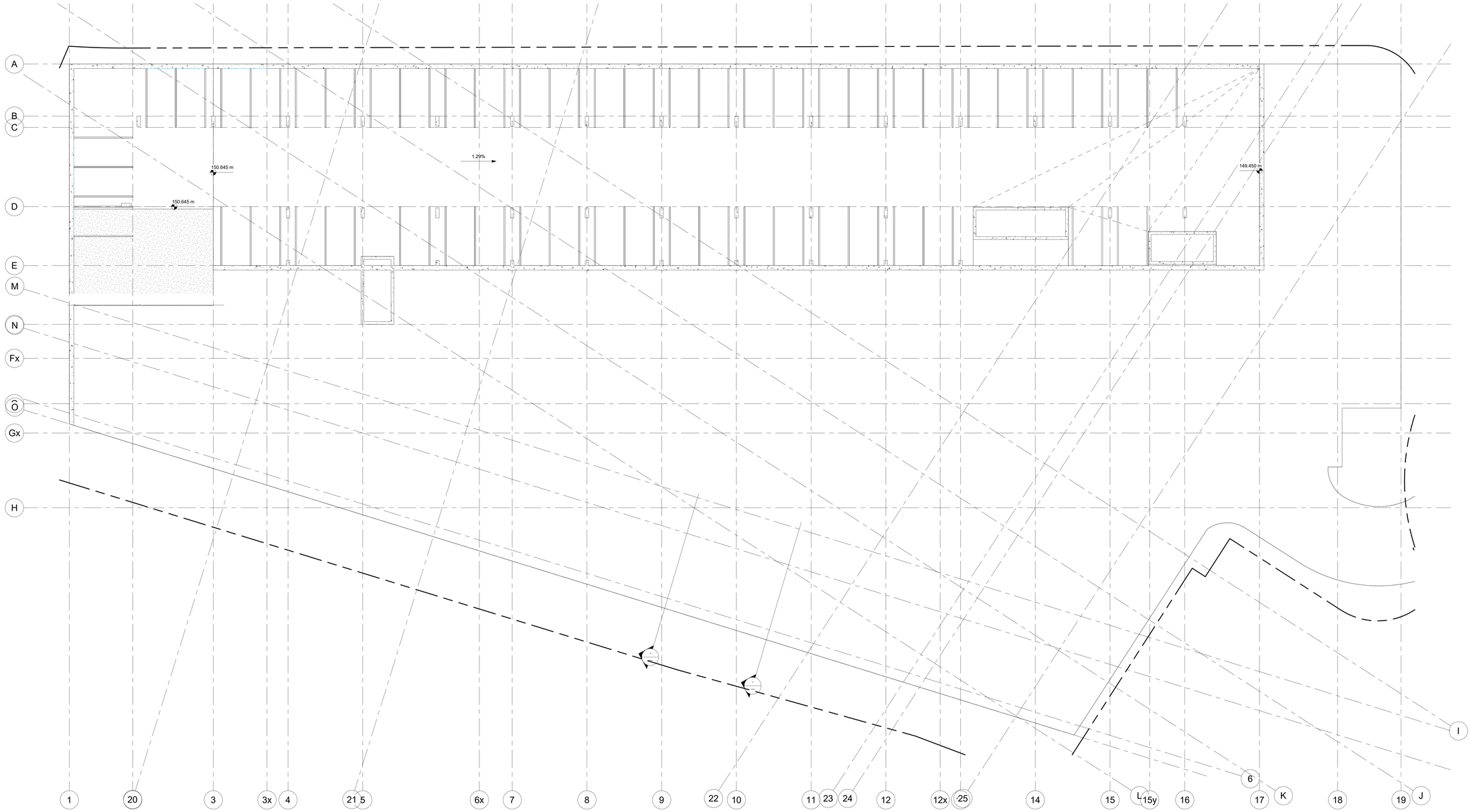
FIELD:	J.Z.	DRAWN:	C.L.	CHECKED:	S.N.R./R.W.	JOB NO:	21-035
DWG NAME:	21-035TP01	PLOT INFO:	15:56 08/Nov/2022			WORK ORDER NO:	36310

1137 Centre Street Thornhill ON L4J 3M6 905.738.0053 F 905.738.9221 www.krcmar.ca

PLAN AVAILABLE AT www.ProtectYourBoundaries.ca

KRCMAR

APPENDIX B



DATE	ISSUED FOR

NO.	DATE	DESCRIPTION
1		

REVISIONS

Contractor must check and verify all dimensions and be responsible for same. Reporting any discpancies to the Architect before commencing work.

All drawings, prints and specifications are the property of the ARchitect and must be returned to him on completion of work. Latest drawings only to be used for construction.

Prints are not to be scaled.

ONTARIO ASSOCIATION OF ARCHITECTS
MEMBER REGULAR LICENCE
0081

GLOBAL ARCHITECT INC.
6 Leswyn Road, Toronto, Ontario M6A 1K2
ph: 416 256 4440 fx: 416 256 4449

CLIENT

PROJECT NAME: Vic 2
RUTLEDGE RD.

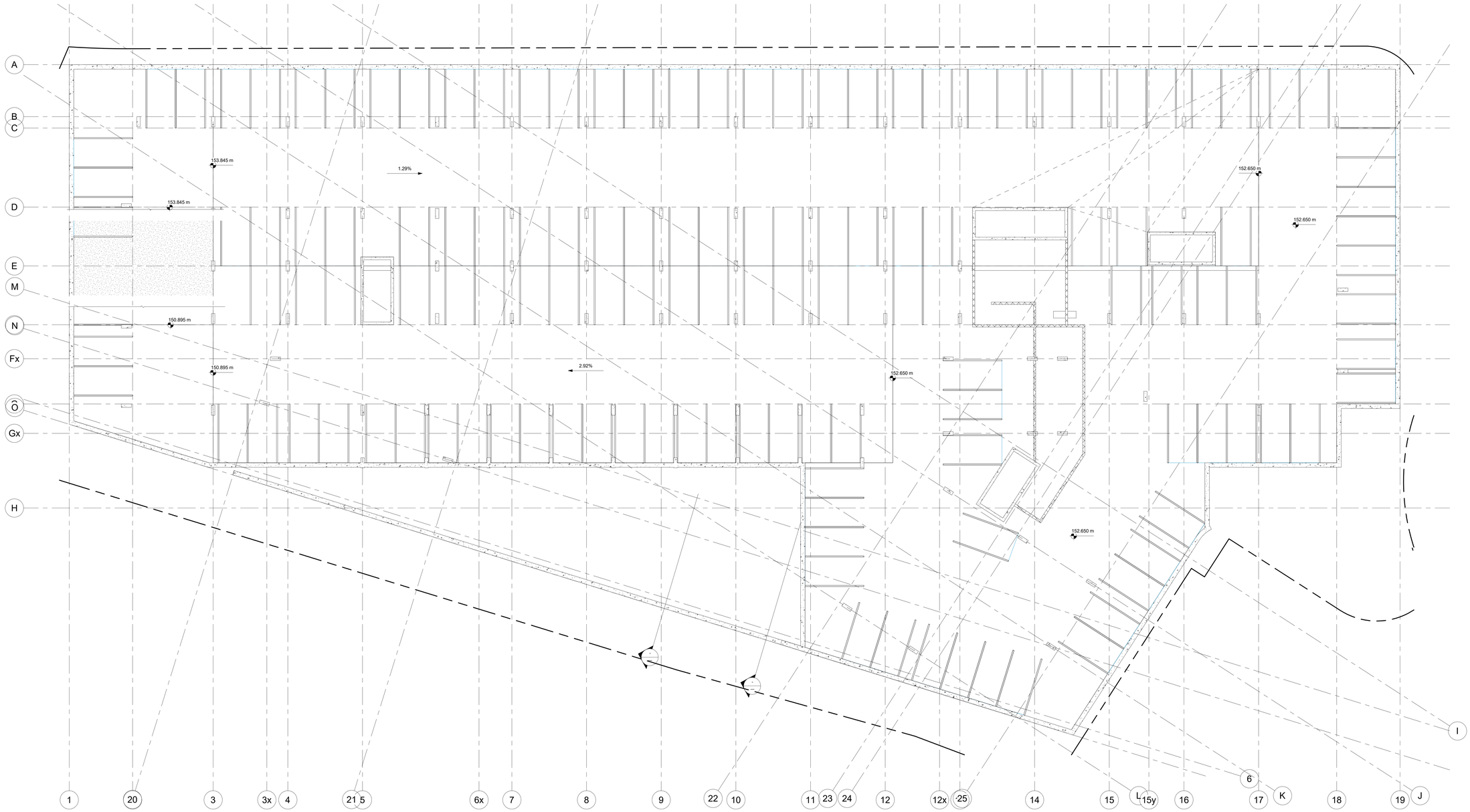
DRAWN BY	CM
CHECKED BY	RP, PP
DATE	04/28/22
SCALE	1 : 125

DWG. TITLE

P4 PLAN

PROJECT NO.: 22-03

A200



DATE	ISSUED FOR

NO.	DATE	DESCRIPTION
1		

REVISIONS

Contractor must check and verify all dimensions and be responsible for same. Reporting any discpancies to the Architect before commencing work.

All drawings, prints and specifications are the property of the ARchitect and must be returned to him on completion of work. Latest drawings only to be used for construction.

Prints are not to be scaled.

ONTARIO ASSOCIATION OF ARCHITECTS
RICHARD PERSAUD PERSAUD
ONTARIO
5081

GLOBAL ARCHITECTS INC.
6 Leswyn Road, Toronto, Ontario M6A 1K2
ph: 416 256 4440 fx: 416 256 4449

CLIENT

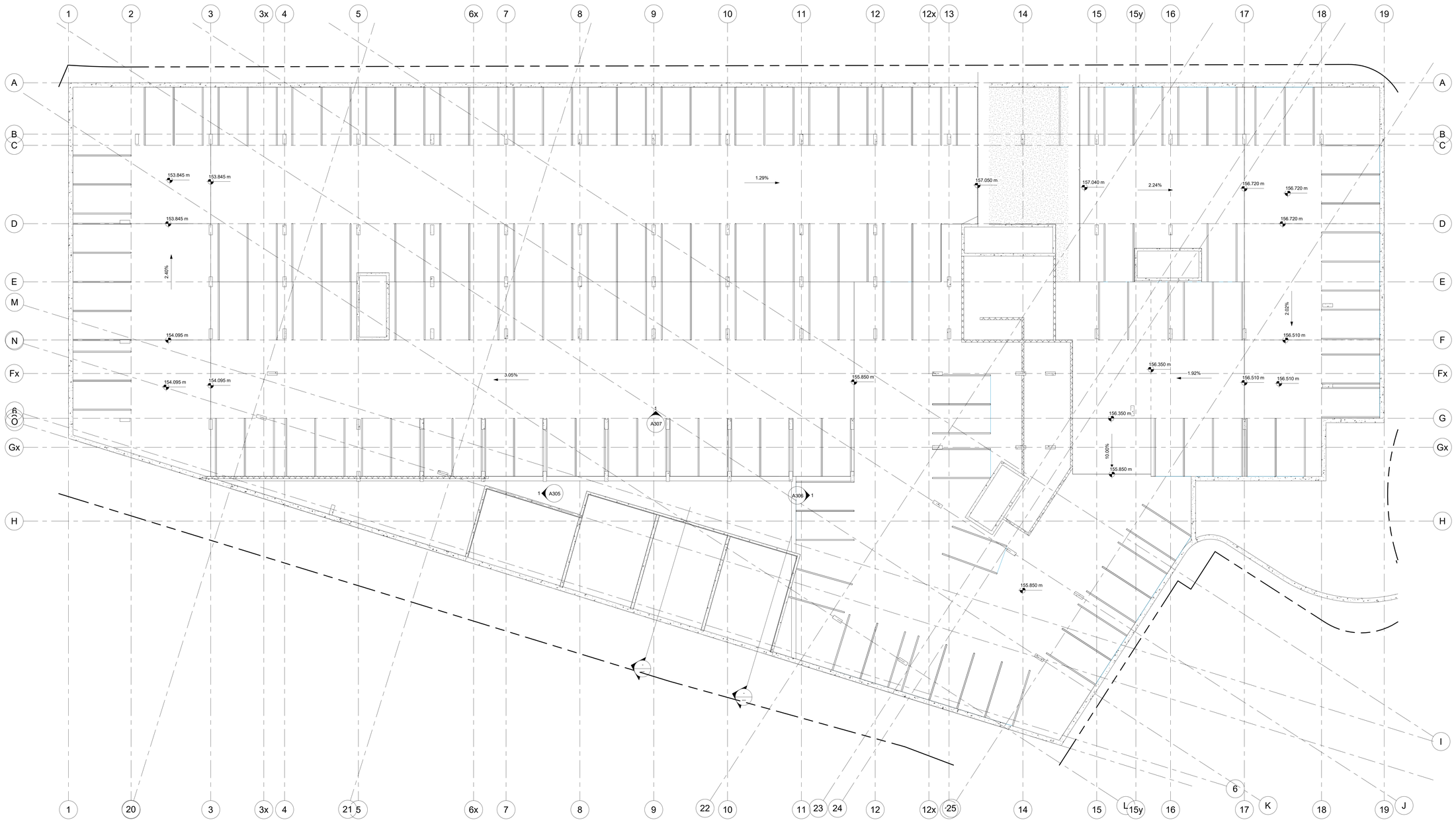
PROJECT NAME: Vic 2
RUTLEDGE RD.

DRAWN BY	CM
CHECKED BY	RP, PP
DATE	04/28/22
SCALE	1 : 125

DWG. TITLE

P3 PLAN

PROJECT NO.	
22-03	A201



DATE	ISSUED FOR

NO.	DATE	DESCRIPTION
1		

REVISIONS

Contractor must check and verify all dimensions and be responsible for same. Reporting any discrpancies to the Architect before commencing work.

All drawings, prints and specifications are the property of the ARchitect and must be returned to him on completion of work. Latest drawings only to be used for construction.

Prints are not to be scaled.

ONTARIO ASSOCIATION OF ARCHITECTS
ROSS MACKAY
5081

GLOBAL ARCHITECTING
6 Leswyn Road, Toronto, Ontario M6A 1K2
ph: 416 256 4440 fx: 416 256 4449

CLIENT

PROJECT NAME: Vic 2
RUTLEDGE RD.

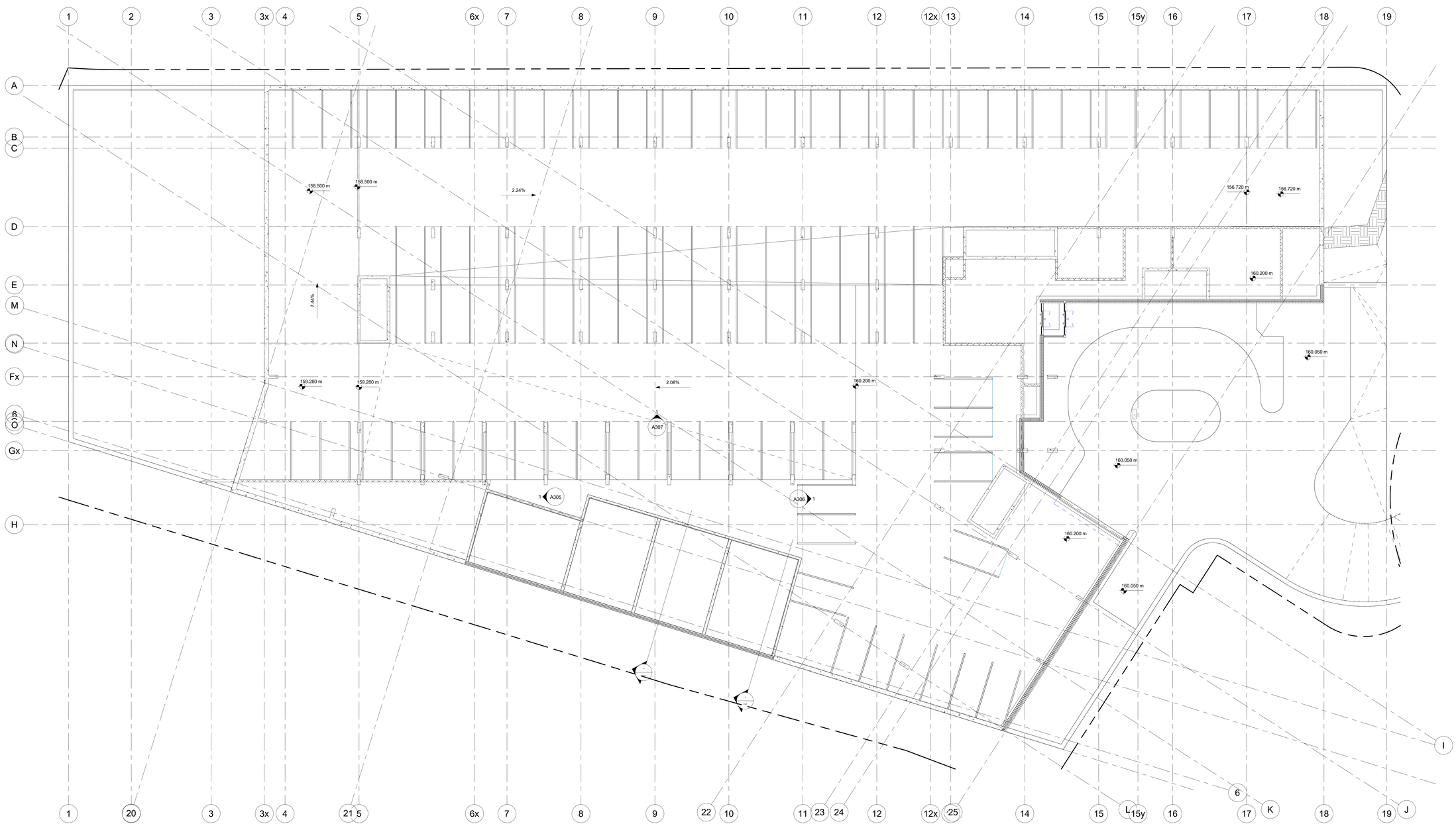
DRAWN BY	CM
CHECKED BY	RP, PP
DATE	04/28/22
SCALE	1 : 125

DWG. TITLE

P2 PLAN

PROJECT NO.: 22-03

A202



DATE	ISSUED FOR

NO.	DATE	DESCRIPTION
1		

REVISIONS

Contractor must check and verify all dimensions and be responsible for same. Reporting any discpancies to the Architect before commencing work.

All drawings, prints and specifications are the property of the ARchitect and must be returned to him on completion of work. Latest drawings only to be used for construction.

Prints are not to be scaled.

ONTARIO ASSOCIATION OF ARCHITECTS
ROGER PHILIP MAN
5081

GLOBAL ARCHITECTS INC.
6 Leswyn Road, Toronto, Ontario M6A 1K2
ph: 416 256 4440 fx: 416 256 4449

CLIENT

PROJECT NAME: Vic 2
RUTLEDGE RD.

DRAWN BY	CM
CHECKED BY	RP, PP
DATE	04/28/22
SCALE	1 : 125

DWG. TITLE

P1 PLAN

PROJECT NO.	
22-03	A203

1 Courtyard West
1 : 150

DATE	ISSUED FOR

Exterior Finish

6	Window Wall Vision Panel
7	Window Wall Spandrel Panel

NOTE:
BUILDING MATERIALS/CLADDING SELECTIONS ARE REPRESENTATIVE OF SIZE AND COLOR OF MATERIALS TO BE CHOSEN AT A LATER DATE

NO.	DATE	DESCRIPTION
1		

REVISIONS

ONTARIO ASSOCIATION OF ARCHITECTS
KANWAR PREMJIT CHHABRA
5081

GLOBAL ARCHITECTS INC.
6 Leswyn Road, Toronto, Ontario M6A 1K2
ph: 416 256 4440 fx: 416 256 4449

CLIENT

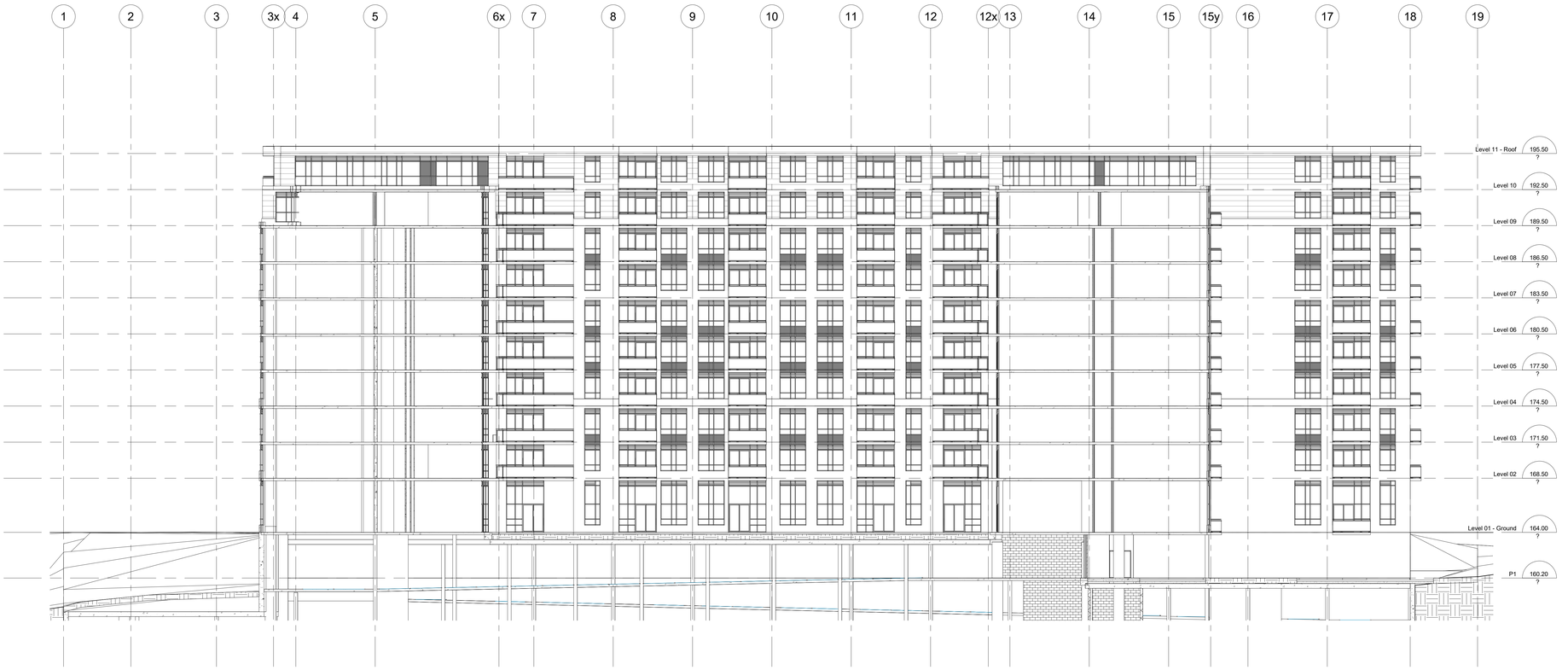
PROJECT NAME: Vic 2
RUTLEDGE RD.

DRAWN BY: Author
CHECKED BY: Checker
DATE: 06/29/21
SCALE: 1 : 150

DWG. TITLE
WEST COURT ELEVATION

PROJECT NO.
22-03

A306



1 Courtyard South
1 : 150

DATE	ISSUED FOR

Exterior Finish

6	Window Wall Vision Panel
7	Window Wall Spandrel Panel

NOTE:
BUILDING MATERIALS/CLADDING SELECTIONS ARE REPRESENTATIVE OF SIZE AND COLOR OF MATERIALS TO BE CHOSEN AT A LATER DATE

NO.	DATE	DESCRIPTION
1		

REVISIONS

ONTARIO ASSOCIATION OF ARCHITECTS
Member
9061

GLOBAL ARCHITECTS INC.
6 Leswyn Road, Toronto, Ontario M6A 1K2
ph: 416 256 4440 fx: 416 256 4449

CLIENT

PROJECT NAME	Vic 2 RUTLEDGE RD.
DRAWN BY	Author
CHECKED BY	Checker
DATE	06/29/21
SCALE	1 : 150

DWG. TITLE
SOUTH COURT ELEVATION

PROJECT NO.	
22-03	A307

APPENDIX C

RECORD OF BOREHOLE 101

PROJECT : G1187A2
LOCATION : Ville Condominiums, 180 Rutledge Road, Mississauga, Ontario
STARTED : April 26, 2007
COMPLETED : April 26, 2007

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		157.00							
	POWER BORING / SOLID STEM AUGER	FILL: silty clay, some gravel, trace of fine to coarse sand, trace of organics, grey to black, moist, stiff.			1	SS	10				
					2	SS	13				
		CLAYEY SILT TILL: some gravel and sand, trace of organics and rootlets, oxidized fissures, disturbed in the upper 150 mm, brown to grey, moist, stiff to hard.		155.35 1.65	3	SS	12				
2					4	SS	25				
		-sandy silt seam, brown, wet at 3.43 m depth. -cobbles at 3.45 m depth.			5	SS	>100				
4		SANDY SILT TILL/WEATHERED SHALE COMPLEX: grey, moist.		152.75 4.25							
		SHALE: limestone fragments, grey, moist.		152.45 4.55	6	SS	>100				
		End of Borehole: Auger Refusal. Note: 1)Borehole remained dry on completion of drilling.		151.80 5.20							
6											
8											

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION WATER LEVEL: m bgs

▼ DEEP/DUAL INSTALLATION WATER LEVEL:

LOGGED : AL
CHECKED : LM

MCR LOG ENVIRONMENTAL 1187A.GPJ 11-18-22

RECORD OF BOREHOLE 102

PROJECT : G1187A2
LOCATION : Ville Condominiums, 180 Rutledge Road, Mississauga, Ontario
STARTED : April 26, 2007
COMPLETED : April 26, 2007

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		157.45							
	POWER BORING / SOLID STEM AUGER	FILL: silty clay, some sand and gravel, brown, to grey, moist, firm to stiff.			1	SS	6				
				156.45 / 1.00	2	SS	13				bentonite
		SAND: fine to medium, trace of silt and gravel, trace of organics, brown, moist, compact to loose.			3	SS	8				
2				155.15 / 2.30							3 m Long 20 mm ID PVC Riser 155.30 155.00
		CLAYEY SILT TILL: some sand and gravel, oxidized fissures, brown, moist, very stiff to hard. -silt grey to black, trace of organics, wet in the upper 159 mm.			4	SS	23				
					5	SS	45				Silica sand
4				152.90 / 4.55							
		SANDY SILT TILL/ WEATHERED SHALE COMPLEX: grey, moist.			6	SS	>100				3 m Long 20 mm ID Well Screen ▽
		-shale/limestone at 5.5 m depth.		151.95 / 5.50							151.95
6		End of Borehole: Auger Refusal.									
		Note: 1)Water level was measured at 5.3 m on completion of drilling. 2)Combustible vapour reading was 130 ppm at 2.3 m depth in open borehole. 3)Water level was measured at +0.1 m on April 30, 2007. 4)Water level was measured at +0.1 m on May 1, 2007.									
8											

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION — WATER LEVEL: 5.3 m bgs

▼ DEEP/DUAL INSTALLATION — WATER LEVEL:

LOGGED : AL
CHECKED : LM

MCR LOG ENVIRONMENTAL 1187A.GPJ 11-18-22

RECORD OF BOREHOLE 103

PROJECT : G1187A2
LOCATION : Ville Condominiums, 180 Rutledge Road, Mississauga, Ontario
STARTED : April 30, 2007
COMPLETED : April 30, 2007

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		158.10							
	POWER BORING / SOLID STEM AUGER	FILL: silty clay/clayey silt, trace of gravel and sand, trace of organics and rootlets, brown, moist to wet, firm to stiff.			1	SS	8				
					2	SS	11				
					3	SS	6				
2					4	SS	4				
		ORGANICS: peat, black moist, firm.		155.50 2.60							
		SILTY CLAY: some organics, peat, brown, moist to wet. firm.		155.05 3.05	5	SS	6				▽
4		-sand and gravel,wet at 4.55 m depth.		153.40 4.70							
		SANDY SILT TILL/WEATHERED SHALE COMPLEX: moist.			6	SS	>100				
6		limestone at 6.2 m depth.		151.90 6.20	7	SS	>100				
		End of Borehole, Auger Refusal.									
8		Note: 1)Water level was measured at 3.65 m on completion of drilling. 2)Combustible vapour reading was 110 ppm at 3.05 m depth in open borehole. 3)Combustible vapour reading was 120 ppm at 4.75 m depth in open borehole.									

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL: 3.65 m bgs

▼ DEEP/DUAL INSTALLATION
WATER LEVEL:

LOGGED : AL
CHECKED : LM

MCR LOG ENVIRONMENTAL 1187A.GPJ 11-18-22

RECORD OF BOREHOLE 104

PROJECT : G1187A2
LOCATION : Ville Condominiums, 180 Rutledge Road, Mississauga, Ontario
STARTED : April 30, 2007
COMPLETED : April 30, 2007

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		158.50							
	POWER BORING / SOLID STEM AUGER	FILL: silty clay with organics, trace of gravel and sand, trace of rootlets, shale fragments, dark brown to brown, moist to wet, stiff to firm..			1	SS	10				
					2	SS	8				
				156.70 1.80	3	SS	10				
2		CLAYEY SILT TILL: some sand, trace of gravel, trace of rootlets and organics in the upper 100 mm, fissured, brown, moist, stiff to hard.			4	SS	41				
		-some gravel, oxidized fissures below 3.35 m depth.			5	SS	54				
4				154.25 4.25							
		SANDY SILT TILL/WEATHERED SHALE COMPLEX: grey, moist.			6	SS	70				
		-moist to dry at 4.85 m depth.									
6					7	SS	>100				
				150.90 7.60							
		SHALE: weathered, grey, moist.		150.85 7.65	8	SS	>100				
8		End of Borehole.									
		Note: 1)Borehole remained dry on completion of drilling.									

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL: m bgs

▼ DEEP/DUAL INSTALLATION
WATER LEVEL:

LOGGED : AL
CHECKED : LM

MCR LOG ENVIRONMENTAL 1187A.GPJ 11-18-22

RECORD OF BOREHOLE 201

PROJECT : G1187V-2
LOCATION : Rutledge Road, Mississauga, Ontario
STARTED : February 18, 2020
COMPLETED : February 18, 2020

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
		GROUND SURFACE		159.25			
	POWER BORING / SOLID STEM AUGER	FILL: silty clay, trace of sand and organics, brown, moist, firm to stiff.			1	SS	7
					2	SS	11
					3	SS	7
2		silty clay, trace of sand and gravel, trace of shale fragments and organics brown to grey, moist to wet, stiff.		156.96 / 2.29	4	SS	20
		SILTY CLAY: trace of sand and gravel, brown, mottled grey, moist to wet, stiff. -trace of organics in the upper 350 mm.		156.20 / 3.05	5	SS	13
4		CLAYEY SILT TILL: some sand, trace of gravel, oxidized fissures, brown, moist, hard.		154.68 / 4.57	6	SS	58
6		SANDY SILT TILL/WEATHERED SHALE COMPLEX: grey, wet, very dense.		153.15 / 6.10	7	SS	>100
		SHALE: grey, moist.		152.70 / 6.55	8	SS	>100
		End of Borehole. Auger Refusal.		152.69 / 6.60			
8		Note: 1) Water level was measured at 5.18 m bgs on completion of drilling. 2) Combustible vapour reading was 25 ppm at 4.6 m depth in open borehole.					

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

▽

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL: 5.18 m bgs

▼ DEEP/DUAL INSTALLATION
WATER LEVEL:

LOGGED : FR
CHECKED : LM

MCR LOG ENVIRONMENTAL 1187V2.GPJ 11-16-22

RECORD OF BOREHOLE 202

PROJECT : G1187V-2
LOCATION : Rutledge Road, Mississauga, Ontario
STARTED : February 18, 2020
COMPLETED : February 18, 2020

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		165.40							
	POWER BORING / SOLID STEM AUGER	FILL: sandy silt, trace of clay and gravel, brown, moist, loose.			1	SS	8				Protective Metal Casing 165.10
				164.64 / 0.76							
		silty clay, trace of sand and gravel, brown, moist, soft to stiff.			2	SS	5				
					3	SS	4				
2		-trace of plastics pieces at 2.3 m depth.			4	SS	5				
					5	SS	5				Bentonite
4		-trace of organics and cinders, black below 4.55 m depth.			6	SS	19				
6					7	SS	14				9.75 m Long 20 mm ID PVC Riser
		-trace of brick pieces at 7.6 m depth.			8	SS	11				
8				156.26 / 9.14							▽ 156.26
		CLAYEY SILT: trace of sand and gravel, brown, mottled grey, moist to wet, very stiff. -trace of organics in the upper 300 mm.			9	SS	27				Silics Sand 155.65
10				154.73 / 10.67							
		SANDY SILT TILL: some clay, trace of gravel, brown, moist, very dense.			10	SS	62				3.05 m Long 50 mm ID Well Screen
12				153.21 / 12.19	11	SS	>100				152.60
		SANDY SILT TILL/WEATHERED SHALE COMPLEX: grey, moist, very dense.		152.45	12	SS	>100				
		SHALE: grey, moist.		152.42 / 12.98							
		End of Borehole. Auger Refusal.									
14		Note: 1) Borehole remained dry on completion of drilling. 2) Combustible vapour reading was 15 ppm at 4.6 m and 85 ppm at 9.2 m depth in open borehole. 3) Water level was measured at 8.45 m bgs on February 19, 2020. 4) Water level was measured at 9.04 m bgs on November 3, 2022. 5) Water level was measured at 9.16 m bgs on November 16, 2022.									
16											
18											

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION — WATER LEVEL: 9.16 m bgs

▼ DEEP/DUAL INSTALLATION — WATER LEVEL:

LOGGED : FR
CHECKED : LM

MCR LOG ENVIRONMENTAL 1187V2.GPJ 11-16-22

RECORD OF BOREHOLE 203

PROJECT : G1187V-2
LOCATION : Rutledge Road, Mississauga, Ontario
STARTED : February 18, 2020
COMPLETED : February 18, 2020

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		159.75							
	POWER BORING / SOLID STEM AUGER	FILL: silty clay, trace of sand and gravel, brown, moist, stiff.			1	SS	9				Protective Metal Casing 159.45
					2	SS	19				Bentonite
					3	SS	9				
2					4	SS	28				3.96 m Long 20 mm ID PVC Riser
		-trace of shale fragments and plastics pieces below 3.05 m depth.			5	SS	16				156.40 Silics Sand
4											155.79
		CLAYEY SILT TILL: some sand, trace of gravel, brown, moist, hard.		155.18 4.57	6	SS	32				3.05 m Long 50 mm ID Well Screen
6		SANDY SILT TILL/WEATHERED SHALE COMPLEX: grey, moist, very dense.		153.65 6.10	7	SS	>100				
		SHALE: grey, moist.		152.74 7.02	8	SS	>100				152.74
8		End of Borehole. Auger Refusal.									

Note:
1) Borehole remained dry on completion of drilling.
2) Combustible vapour reading was 25 ppm at 4.6 m depth in open borehole.
3) Water level was measured at 6.61 m bgs on February 19, 2020.
4) Water level was measured at 4.76 m bgs on November 3, 2022.
5) Water level was measured at 4.75 m bgs on November 16, 2022.

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION — WATER LEVEL: 4.75 m bgs

▼ DEEP/DUAL INSTALLATION — WATER LEVEL:

LOGGED : FR
CHECKED : LM

MCR LOG ENVIRONMENTAL 1187V2.GPJ 11-16-22

RECORD OF BOREHOLE 204

PROJECT : G1187V-2
LOCATION : Rutledge Road, Mississauga, Ontario
STARTED : February 13, 2020
COMPLETED : February 13, 2020

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
		GROUND SURFACE		165.15			
	POWER BORING / SOLID STEM AUGER	FILL: silty clay, trace of sand and gravel, brown, moist, soft to stiff. -trace of rootlets in the upper 250 mm.			1	SS	4
					2	SS	3
					3	SS	5
2					4	SS	8
		-trace of red shale fragments at 3.05 m depth.			5	SS	6
4					6	SS	8
6		-trace of organics and rootlets below 6.1 m depth.			7	SS	12
8		-trace of shale fragments and grey below 7.6 m depth.			8	SS	14
		CLAYEY SILT: trace of sand and gravel, grey, moist, very stiff. -trace of organics in the upper 200 mm.		156.01 9.14	9	SS	27
10		CLAYEY SILT TILL: some sand, trace of gravel, oxidized stains, brown, moist, hard.		154.48 10.67	10	SS	55
12		SANDY SILT TILL: some clay, trace of gravel and shale fragments, grey, moist, very dense.		152.96 12.19	11	SS	>100
		End of Borehole. Auger Refusal due to Probable Shale Bedrock.		152.64 12.51	12	SS	>100
14		Note: 1) Borehole remained dry on completion of drilling. 2) Combustible vapour reading was 110 ppm at 10.7 m depth in open borehole.					
16							
18							

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

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL: m bgs

▼ DEEP/DUAL INSTALLATION
WATER LEVEL:

LOGGED : FR
CHECKED : LM

MCR LOG ENVIRONMENTAL 1187V2.GPJ 11-16-22

APPENDIX D

ALS Canada Ltd.

right solutions.
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CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: **WT2222208**	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	: 1187	Date Samples Received	: 17-Nov-2022 16:13
PO	: ----	Date Analysis Commenced	: 17-Nov-2022
C-O-C number	: 20-1007464	Issue Date	: 28-Nov-2022 15:57
Sampler	: CLIENT		
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
Amaninder Dhillon	Team Lead - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Inorganics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Metals, Waterloo, Ontario
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Organics, Waterloo, Ontario
Katrina Zwambag	Business Manager - Environmental	LCMS, Waterloo, Ontario
Manuel TavaraTello	Supervisor - Semi-Volatile Extractions	Organics, Waterloo, Ontario
Sanja Risticevic	Department Manager - LCMS	LCMS, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Organics, 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 is greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.
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*
BODL	*Limit of Reporting for BOD was increased to account for the largest volume of sample tested.*
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).*
DLIS	*Detection Limit Adjusted due to insufficient sample.*
PEHR	*Parameter exceeded recommended holding time on receipt: Proceeded with analysis as requested.*

Analytical Results

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

Analyte	Method	LOR	Unit	Client sample ID: BH202 Sampling date/time: 17-Nov-2022 09:00 WT2222208-001		MISSUB STM	RMPSUB SAN	RMPSUB STM			
Physical Tests											
pH	E108	0.10	pH units	8.08		**6 - 9 pH units**	**5.5 - 10 pH units**	**6 - 9 pH units**	--	--	--
solids, total suspended [TSS]	E160	3.0	mg/L	9.2		**15 mg/L**	**350 mg/L**	**15 mg/L**	--	--	--
Anions and Nutrients											
fluoride	E235.F	0.020	mg/L	0.737	DLDS	--	10 mg/L	--	--	--	--
Kjeldahl nitrogen, total [TKN]	E318	0.050	mg/L	0.753		**1 mg/L**	**100 mg/L**	**1 mg/L**	--	--	--
phosphorus, total	E372-U	0.0020	mg/L	0.0196		**0.4 mg/L**	**10 mg/L**	**0.4 mg/L**	--	--	--
sulfate (as SO4)	E235.SO4	0.30	mg/L	167	DLDS	--	--	--	--	--	--
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	<3.00	DLHC	1 mg/L	50 mg/L	--	--	--	--
antimony, total	E420	0.00010	mg/L	<0.100	DLHC	--	5 mg/L	--	--	--	--
arsenic, total	E420	0.00010	mg/L	<0.100	DLHC	**0.02 mg/L**	**1 mg/L**	**0.02 mg/L**	--	--	--
cadmium, total	E420	0.0000050	mg/L	<0.00500	DLHC	**0.008 mg/L**	**0.7 mg/L**	**0.008 mg/L**	--	--	--
chromium, total	E420	0.00050	mg/L	<0.500	DLHC	**0.08 mg/L**	**5 mg/L**	**0.08 mg/L**	--	--	--
cobalt, total	E420	0.00010	mg/L	<0.100	DLHC	--	5 mg/L	--	--	--	--
copper, total	E420	0.00050	mg/L	<0.500	DLHC	**0.04 mg/L**	**3 mg/L**	**0.05 mg/L**	--	--	--
lead, total	E420	0.000050	mg/L	<0.0500	DLHC	**0.12 mg/L**	**3 mg/L**	**0.12 mg/L**	--	--	--
manganese, total	E420	0.00010	mg/L	5.90	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	<0.0500	DLHC	--	5 mg/L	--	--	--	--
nickel, total	E420	0.00050	mg/L	<0.500	DLHC	**0.08 mg/L**	**3 mg/L**	**0.08 mg/L**	--	--	--
selenium, total	E420	0.000050	mg/L	<0.0500	DLHC	**0.02 mg/L**	**1 mg/L**	**0.02 mg/L**	--	--	--
silver, total	E420	0.000010	mg/L	<0.0100	DLHC	**0.12 mg/L**	**5 mg/L**	**0.12 mg/L**	--	--	--
tin, total	E420	0.00010	mg/L	<0.100	DLHC	--	5 mg/L	--	--	--	--

Analyte	Method	LOR	Unit	WT2222208-001 (Continued)	MISSUB STM	RMPSUB SAN	RMPSUB STM			
Total Metals - Continued										
titanium, total	E420	0.00030	mg/L	<0.300 DLHC	--	5 mg/L	--	--	--	--
zinc, total	E420	0.0030	mg/L	<3.00 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	<3.0 BODL	15 mg/L	300 mg/L	--	--	--	--
carbonaceous biochemical oxygen demand [CBOD]	E555	2.0	mg/L	<3.0 BODL	--	**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	0.0048	**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	%	84.6	--	--	--	--	--	--
difluorobenzene, 1,4-	E611D	1.0	%	98.5	--	--	--	--	--	--

Analyte	Method	LOR	Unit	WT2222208-001 (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	%	89.4	--	--	--	--	--	--
naphthalene-d8	E641A	0.1	%	91.4	--	--	--	--	--	--
phenanthrene-d10	E641A	0.1	%	97.9	--	--	--	--	--	--
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	%	83.1	--	--	--	--	--	--
terphenyl-d14, p-	E655F	1.0	%	96.3	--	--	--	--	--	--
Phenolics Surrogates										
tribromophenol, 2,4,6-	E655F	0.20	%	105	--	--	--	--	--	--
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	WT2222208-001 (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	<0.021 DLIS	--	--	--	--	--	--
Aroclor 1221	E687	0.020	µg/L	<0.021 DLIS	--	--	--	--	--	--
Aroclor 1232	E687	0.020	µg/L	<0.021 DLIS	--	--	--	--	--	--
Aroclor 1242	E687	0.020	µg/L	<0.021 DLIS	--	--	--	--	--	--
Aroclor 1248	E687	0.020	µg/L	<0.021 DLIS	--	--	--	--	--	--
Aroclor 1254	E687	0.020	µg/L	<0.021 DLIS	--	--	--	--	--	--
Aroclor 1260	E687	0.020	µg/L	<0.021 DLIS	--	--	--	--	--	--
Aroclor 1262	E687	0.020	µg/L	<0.021 DLIS	--	--	--	--	--	--
Aroclor 1268	E687	0.020	µg/L	<0.021 DLIS	--	--	--	--	--	--
polychlorinated biphenyls [PCBs], total	E687	0.060	µg/L	<0.063 DLIS	--	**1 µg/L**	**0.4 µg/L**	--	--	--
decachlorobiphenyl	E687	0.1	%	67.3	--	--	--	--	--	--
tetrachloro-m-xylene	E687	0.1	%	88.6	--	--	--	--	--	--

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
BH202	Water	aluminum, total		MISSUB	STM	<3.00	1 mg/L
	Water	arsenic, total		MISSUB	STM	<0.100	0.02 mg/L
	Water	chromium, total		MISSUB	STM	<0.500	0.08 mg/L
	Water	copper, total		MISSUB	STM	<0.500	0.04 mg/L
	Water	manganese, total		MISSUB	STM	5.90 mg/L	0.05 mg/L
	Water	nickel, total		MISSUB	STM	<0.500	0.08 mg/L
	Water	selenium, total		MISSUB	STM	<0.0500	0.02 mg/L
	Water	zinc, total		MISSUB	STM	<3.00	0.04 mg/L
	Water	manganese, total		RMPSUB	SAN	5.90 mg/L	5 mg/L
	Water	arsenic, total		RMPSUB	STM	<0.100	0.02 mg/L
	Water	chromium, total		RMPSUB	STM	<0.500	0.08 mg/L
	Water	copper, total		RMPSUB	STM	<0.500	0.05 mg/L
	Water	manganese, total		RMPSUB	STM	5.90 mg/L	0.05 mg/L
	Water	nickel, total		RMPSUB	STM	<0.500	0.08 mg/L
	Water	selenium, total		RMPSUB	STM	<0.0500	0.02 mg/L
	Water	zinc, total		RMPSUB	STM	<3.00	0.04 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	: **WT2222208**	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	: 1187	Date Samples Received	: 17-Nov-2022 16:13
PO	: ----	Issue Date	: 28-Nov-2022 15:57
C-O-C number	: 20-1007464		
Sampler	: CLIENT		
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.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- Matrix Spike 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

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.

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-752755-002	----	methyl ethyl ketone [MEK]	78-93-3	E611D	135 % MES	70.0-130%	Recovery greater than upper control limit

Result Qualifiers

Qualifier	Description
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Matrix Spike (MS) Recoveries								
Volatile Organic Compounds	Anonymous	Anonymous	methyl ethyl ketone [MEK]	78-93-3	E611D	143 % MES	60.0-140%	Recovery greater than upper data quality objective

Result Qualifiers

Qualifier	Description
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

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]										
BH202	E550	17-Nov-2022	----	----	----		18-Nov-2022	4 days	1 days	✓
Aggregate Organics : Biochemical Oxygen Demand (Carbonaceous) - 5 day										
HDPE [BOD HT-4d]										
BH202	E555	17-Nov-2022	----	----	----		18-Nov-2022	4 days	1 days	✓
Aggregate Organics : Mineral Oil & Grease by Gravimetry										
Amber glass (hydrochloric acid)										
BH202	E567SG	17-Nov-2022	21-Nov-2022	28 days	4 days	✓	21-Nov-2022	40 days	0 days	✓
Aggregate Organics : Oil & Grease by Gravimetry										
Amber glass (hydrochloric acid)										
BH202	E567	17-Nov-2022	21-Nov-2022	28 days	4 days	✓	21-Nov-2022	40 days	0 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) [ON MECP]										
BH202	E562	17-Nov-2022	22-Nov-2022	----	----		22-Nov-2022	28 days	5 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP]										
BH202	E235.F	17-Nov-2022	18-Nov-2022	----	----		22-Nov-2022	28 days	5 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP]										
BH202	E235.SO4	17-Nov-2022	18-Nov-2022	----	----		22-Nov-2022	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]										
BH202	E318	17-Nov-2022	22-Nov-2022	----	----		22-Nov-2022	28 days	5 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) [ON MECP]										
BH202	E372-U	17-Nov-2022	22-Nov-2022	----	----		23-Nov-2022	28 days	6 days	✓
Cyanides : Total Cyanide										
UV-inhibited HDPE - total (sodium hydroxide)										
BH202	E333	17-Nov-2022	25-Nov-2022	----	----		25-Nov-2022	14 days	8 days	✓
Inorganics : Total Chlorine (Residual) by DPD Colourimetry										
HDPE [ON MECP]										
BH202	E326	17-Nov-2022	----	----	----		23-Nov-2022	0.25 hrs	144 hrs	× EHTR-FM
Microbiological Tests : E. coli (MF-mFC-BCIG)										
Sterile HDPE (Sodium thiosulphate) [ON MECP]										
BH202	E012A.EC	17-Nov-2022	----	----	----		18-Nov-2022	48 hrs	26 hrs	✓
Nonylphenols : Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode										
Amber glass/Teflon lined cap - LCMS										
BH202	E749B	17-Nov-2022	18-Nov-2022	7 days	1 days	✓	18-Nov-2022	7 days	0 days	✓
Nonylphenols : Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode										
Amber glass/Teflon lined cap - LCMS										
BH202	E749A	17-Nov-2022	18-Nov-2022	7 days	1 days	✓	18-Nov-2022	7 days	0 days	✓
Phthalate Esters : BNA (Ontario Sanitary Sewer SVOC Target List) by GC-MS										
Amber glass/Teflon lined cap [ON MECP]										
BH202	E655F	17-Nov-2022	23-Nov-2022	14 days	7 days	✓	24-Nov-2022	40 days	1 days	✓
Physical Tests : pH by Meter										
HDPE [ON MECP]										
BH202	E108	17-Nov-2022	18-Nov-2022	----	----		19-Nov-2022	14 days	2 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]										
BH202	E160	17-Nov-2022	----	----	----		18-Nov-2022	7 days	1 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS										
Amber glass/Teflon lined cap										
BH202	E687	17-Nov-2022	18-Nov-2022	14 days	1 days	✓	21-Nov-2022	40 days	3 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate)										
BH202	E641A	17-Nov-2022	21-Nov-2022	14 days	4 days	✓	22-Nov-2022	40 days	1 days	✓
Speciated Metals : Total Hexavalent Chromium (Cr VI) by IC										
HDPE - total (NaOH+Buf) [ON MECP]										
BH202	E532	17-Nov-2022	----	----	----		18-Nov-2022	28 days	1 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid)										
BH202	E508	17-Nov-2022	18-Nov-2022	----	----		18-Nov-2022	28 days	1 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
BH202	E420	17-Nov-2022	17-Nov-2022	----	----		18-Nov-2022	180 days	1 days	✓
Volatile Organic Compounds : VOCs (Eastern Canada List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
BH202	E611D	17-Nov-2022	22-Nov-2022	----	----		22-Nov-2022	14 days	5 days	✓

Legend & Qualifier Definitions

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

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	748642	1	19	5.2	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	748643	1	20	5.0	5.0	✓
E. coli (MF-mFC-BCIG)	E012A.EC	748768	0	13	0.0	5.0	×
Fluoride in Water by IC	E235.F	749331	1	6	16.6	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	748472	1	9	11.1	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	748473	1	9	11.1	5.0	✓
pH by Meter	E108	749333	1	19	5.2	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	752318	1	12	8.3	5.0	✓
Sulfate in Water by IC	E235.SO4	749332	1	6	16.6	5.0	✓
Total Chlorine (Residual) by DPD Colourimetry	E326	754070	1	2	50.0	5.0	✓
Total Cyanide	E333	757482	1	19	5.2	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	748542	1	12	8.3	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	751924	1	4	25.0	5.0	✓
Total Mercury in Water by CVAAS	E508	748497	1	9	11.1	5.0	✓
Total metals in Water by CRC ICPMS	E420	748283	1	6	16.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	752317	1	12	8.3	5.0	✓
TSS by Gravimetry	E160	748400	1	20	5.0	4.7	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	752755	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Biochemical Oxygen Demand - 5 day	E550	748642	1	19	5.2	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	748643	1	20	5.0	5.0	✓
BNA (Ontario Sanitary Sewer SVOC Target List) by GC-MS	E655F	755346	1	2	50.0	5.0	✓
Fluoride in Water by IC	E235.F	749331	1	6	16.6	5.0	✓
Mineral Oil & Grease by Gravimetry	E567SG	748135	1	8	12.5	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	748472	1	9	11.1	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	748473	1	9	11.1	5.0	✓
Oil & Grease by Gravimetry	E567	748136	1	11	9.0	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	750859	1	7	14.2	5.0	✓
PCB Aroclors by GC-MS	E687	749048	1	10	10.0	4.7	✓
pH by Meter	E108	749333	1	19	5.2	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	752318	1	12	8.3	5.0	✓
Sulfate in Water by IC	E235.SO4	749332	1	6	16.6	5.0	✓
Total Chlorine (Residual) by DPD Colourimetry	E326	754070	1	2	50.0	5.0	✓
Total Cyanide	E333	757482	0	19	0.0	5.0	×
Total Hexavalent Chromium (Cr VI) by IC	E532	748542	1	12	8.3	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	751924	1	4	25.0	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	748497	1	9	11.1	5.0	✓
Total metals in Water by CRC ICPMS	E420	748283	1	6	16.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	752317	1	12	8.3	5.0	✓
TSS by Gravimetry	E160	748400	1	20	5.0	4.7	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	752755	1	20	5.0	5.0	✓
Method Blanks (MB)							
Biochemical Oxygen Demand - 5 day	E550	748642	1	19	5.2	5.0	✓
Biochemical Oxygen Demand (Carbonaceous) - 5 day	E555	748643	1	20	5.0	5.0	✓
BNA (Ontario Sanitary Sewer SVOC Target List) by GC-MS	E655F	755346	1	2	50.0	5.0	✓
E. coli (MF-mFC-BCIG)	E012A.EC	748768	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	749331	1	6	16.6	5.0	✓
Mineral Oil & Grease by Gravimetry	E567SG	748135	1	8	12.5	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	748472	1	9	11.1	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	748473	1	9	11.1	5.0	✓
Oil & Grease by Gravimetry	E567	748136	1	11	9.0	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	750859	1	7	14.2	5.0	✓
PCB Aroclors by GC-MS	E687	749048	1	10	10.0	4.7	✓
Phenols (4AAP) in Water by Colorimetry	E562	752318	1	12	8.3	5.0	✓
Sulfate in Water by IC	E235.SO4	749332	1	6	16.6	5.0	✓
Total Chlorine (Residual) by DPD Colourimetry	E326	754070	1	2	50.0	5.0	✓
Total Cyanide	E333	757482	0	19	0.0	5.0	✗
Total Hexavalent Chromium (Cr VI) by IC	E532	748542	1	12	8.3	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	751924	1	4	25.0	5.0	✓
Total Mercury in Water by CVAAS	E508	748497	1	9	11.1	5.0	✓
Total metals in Water by CRC ICPMS	E420	748283	1	6	16.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	752317	1	12	8.3	5.0	✓
TSS by Gravimetry	E160	748400	1	20	5.0	4.7	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	752755	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Fluoride in Water by IC	E235.F	749331	1	6	16.6	5.0	✓
Nonylphenol Ethoxylates in Water by LC-MS-MS Positive Mode	E749B	748472	1	9	11.1	5.0	✓
Nonylphenol, Octylphenol and BPA in Water by LC-MS-MS Negative Mode	E749A	748473	1	9	11.1	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	752318	1	12	8.3	5.0	✓
Sulfate in Water by IC	E235.SO4	749332	1	6	16.6	5.0	✓
Total Chlorine (Residual) by DPD Colourimetry	E326	754070	1	2	50.0	5.0	✓
Total Cyanide	E333	757482	1	19	5.2	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	748542	1	12	8.3	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	751924	1	4	25.0	5.0	✓
Total Mercury in Water by CVAAS	E508	748497	1	9	11.1	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	748283	1	6	16.6	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	752317	1	12	8.3	5.0	✓
VOCs (Eastern Canada List) by Headspace GC-MS	E611D	752755	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	: **WT2222208**	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	: 1187	Date Samples Received	: 17-Nov-2022 16:13
PO	: ----	Date Analysis Commenced	: 17-Nov-2022
C-O-C number	: 20-1007464	Issue Date	: 28-Nov-2022 15:57
Sampler	: CLIENT 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
Amaninder Dhillon	Team Lead - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario
Greg Pokocky	Supervisor - Inorganic	Waterloo Metals, Waterloo, Ontario
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Waterloo Organics, Waterloo, Ontario
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Manuel TavaraTello	Supervisor - Semi-Volatile Extractions	Waterloo Organics, Waterloo, Ontario
Sanja Risticevic	Department Manager - LCMS	Waterloo LCMS, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Waterloo Organics, 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: 748400)											
WT2222102-002	Anonymous	solids, total suspended [TSS]	----	E160	30.0	mg/L	3530	3540	0.396%	20%	----
Physical Tests (QC Lot: 749333)											
WT2222184-001	Anonymous	pH	----	E108	0.10	pH units	7.99	7.99	0.00%	4%	----
Anions and Nutrients (QC Lot: 749331)											
WT2222191-001	Anonymous	fluoride	16984-48-8	E235.F	0.020	mg/L	0.379	0.377	0.437%	20%	----
Anions and Nutrients (QC Lot: 749332)											
WT2222191-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	15.3	15.0	2.24%	20%	----
Anions and Nutrients (QC Lot: 751924)											
TY2204131-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	2.53	2.63	3.77%	20%	----
Anions and Nutrients (QC Lot: 752317)											
TY2204009-037	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0030	<0.0020	0.0010	Diff <2x LOR	----
Cyanides (QC Lot: 757482)											
WT2222062-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Inorganics (QC Lot: 754070)											
WT2222058-001	Anonymous	chlorine, total	7782-50-5	E326	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Total Metals (QC Lot: 748283)											
TY2204072-001	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	0.00075	0.00075	0.0000002	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.125	0.126	0.933%	20%	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00026	0.00028	0.00001	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	0.00085	0.00085	0.000001	Diff <2x LOR	----
		lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.0180	0.0184	2.06%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00679	0.00682	0.401%	20%	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	0.00123	0.00125	0.00002	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	0.000070	0.000061	0.000009	Diff <2x LOR	----
		silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----

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: 748283) - continued											
TY2204072-001	Anonymous	tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
Total Metals (QC Lot: 748497)											
WT2222033-001	Anonymous	mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 748542)											
WT2222058-001	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: 748642)											
WT2222196-001	Anonymous	biochemical oxygen demand [BOD]	----	E550	2.0	mg/L	3.2	3.2	0.0%	30%	----
Aggregate Organics (QC Lot: 748643)											
WT2222170-002	Anonymous	carbonaceous biochemical oxygen demand [CBOD]	----	E555	2.0	mg/L	<2.0	<2.0	0.0%	30%	----
Aggregate Organics (QC Lot: 752318)											
WT2222208-001	BH202	phenols, total (4AAP)	----	E562	0.0010	mg/L	0.0048	0.0046	0.0002	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 752755)											
WT2222192-001	Anonymous	benzene	71-43-2	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		chloroform	67-66-3	E611D	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		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	<1.0	<1.0	0	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	<0.50	<0.50	0	Diff <2x LOR	----
		methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	<20	<20	0	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	<0.50	<0.50	0	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	<0.50	<0.50	0	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	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611D	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Nonylphenols (QC Lot: 748472)											
WT2222187-002	Anonymous	nonylphenol diethoxylates [NP2EO]	n/a	E749B	0.17	µg/L	<0.17	<0.17	0	Diff <2x LOR	----
		nonylphenol monoethoxylates [NP1EO]	n/a	E749B	2.0	µg/L	<2.0	<2.0	0	Diff <2x LOR	----

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: 748473)											
WT2222187-002	Anonymous	nonylphenols [NP]	84852-15-3	E749A	1.0	µg/L	<1.0	<1.0	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: 748400)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 749331)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 749332)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 751924)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 752317)						
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Inorganics (QCLot: 754070)						
chlorine, total	7782-50-5	E326	0.05	mg/L	<0.050	----
Microbiological Tests (QCLot: 748768)						
coliforms, Escherichia coli [E. coli]	----	E012A.EC	1	CFU/100mL	<1	----
Total Metals (QCLot: 748283)						
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	----
titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Total Metals (QCLot: 748497)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Speciated Metals (QCLot: 748542)						
chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0005	mg/L	<0.00050	----
Aggregate Organics (QCLot: 748135)						
oil & grease, mineral (gravimetric)	----	E567SG	5	mg/L	<5.0	----
Aggregate Organics (QCLot: 748136)						
oil & grease (gravimetric)	----	E567	5	mg/L	<5.0	----
Aggregate Organics (QCLot: 748642)						
biochemical oxygen demand [BOD]	----	E550	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 748643)						
carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	<2.0	----
Aggregate Organics (QCLot: 752318)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Volatile Organic Compounds (QCLot: 752755)						
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: 750859)						
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	----
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 750859) - continued						
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: 755346)						
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: 748472)						
nonylphenol diethoxylates [NP2EO]	n/a	E749B	0.1	µg/L	<0.10	----
nonylphenol monoethoxylates [NP1EO]	n/a	E749B	2	µg/L	<2.0	----
Nonylphenols (QCLot: 748473)						
nonylphenols [NP]	84852-15-3	E749A	1	µg/L	<1.0	----
Polychlorinated Biphenyls (QCLot: 749048)						
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: 748400)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	107	85.0	115	----
Physical Tests (QCLot: 749333)									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
Anions and Nutrients (QCLot: 749331)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	99.2	90.0	110	----
Anions and Nutrients (QCLot: 749332)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	105	90.0	110	----
Anions and Nutrients (QCLot: 751924)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 752317)									
phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.53 mg/L	104	80.0	120	----
Inorganics (QCLot: 754070)									
chlorine, total	7782-50-5	E326	0.05	mg/L	0.27584 mg/L	105	75.0	125	----
Total Metals (QCLot: 748283)									
aluminum, total	7429-90-5	E420	0.003	mg/L	0.1 mg/L	104	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	0.05 mg/L	103	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	0.05 mg/L	106	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.005 mg/L	97.7	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.0125 mg/L	102	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.0125 mg/L	103	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.0125 mg/L	99.8	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.025 mg/L	102	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	97.7	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.025 mg/L	102	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	0.05 mg/L	102	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.005 mg/L	93.7	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.025 mg/L	100	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.0125 mg/L	99.1	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.025 mg/L	102	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: 748497)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	98.7	80.0	120	----
Speciated Metals (QCLot: 748542)									
chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0005	mg/L	0.025 mg/L	96.0	80.0	120	----
Aggregate Organics (QCLot: 748135)									
oil & grease, mineral (gravimetric)	----	E567SG	5	mg/L	100 mg/L	85.2	70.0	130	----
Aggregate Organics (QCLot: 748136)									
oil & grease (gravimetric)	----	E567	5	mg/L	200 mg/L	90.9	70.0	130	----
Aggregate Organics (QCLot: 748642)									
biochemical oxygen demand [BOD]	----	E550	2	mg/L	198 mg/L	89.6	85.0	115	----
Aggregate Organics (QCLot: 748643)									
carbonaceous biochemical oxygen demand [CBOD]	----	E555	2	mg/L	198 mg/L	94.6	85.0	115	----
Aggregate Organics (QCLot: 752318)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	95.0	85.0	115	----
Volatile Organic Compounds (QCLot: 752755)									
benzene	71-43-2	E611D	0.5	µg/L	100 µg/L	109	70.0	130	----
chloroform	67-66-3	E611D	0.5	µg/L	100 µg/L	109	70.0	130	----
dichlorobenzene, 1,2-	95-50-1	E611D	0.5	µg/L	100 µg/L	101	70.0	130	----
dichlorobenzene, 1,4-	106-46-7	E611D	0.5	µg/L	100 µg/L	93.4	70.0	130	----
dichloroethylene, cis-1,2-	156-59-2	E611D	0.5	µg/L	100 µg/L	92.9	70.0	130	----
dichloromethane	75-09-2	E611D	1	µg/L	100 µg/L	106	70.0	130	----
dichloropropylene, trans-1,3-	10061-02-6	E611D	0.3	µg/L	100 µg/L	99.0	70.0	130	----
ethylbenzene	100-41-4	E611D	0.5	µg/L	100 µg/L	98.7	70.0	130	----
methyl ethyl ketone [MEK]	78-93-3	E611D	20	µg/L	100 µg/L	# 135	70.0	130	MES
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	111	70.0	130	----
tetrachloroethylene	127-18-4	E611D	0.5	µg/L	100 µg/L	96.4	70.0	130	----
toluene	108-88-3	E611D	0.5	µg/L	100 µg/L	99.3	70.0	130	----
trichloroethylene	79-01-6	E611D	0.5	µg/L	100 µg/L	98.9	70.0	130	----
xylene, m+p-	179601-23-1	E611D	0.4	µg/L	200 µg/L	93.9	70.0	130	----
xylene, o-	95-47-6	E611D	0.3	µg/L	100 µg/L	104	70.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 750859)									
acenaphthene	83-32-9	E641A	0.01	µg/L	0.5263 µg/L	93.9	50.0	140	----

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
Polycyclic Aromatic Hydrocarbons (QCLot: 750859) - continued									
acenaphthylene	208-96-8	E641A	0.01	µg/L	0.5263 µg/L	91.6	50.0	140	----
anthracene	120-12-7	E641A	0.01	µg/L	0.5263 µg/L	83.4	50.0	140	----
benz(a)anthracene	56-55-3	E641A	0.01	µg/L	0.5263 µg/L	97.4	50.0	140	----
benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	0.5263 µg/L	85.0	50.0	140	----
benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	0.5263 µg/L	80.7	50.0	140	----
benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	0.5263 µg/L	117	50.0	140	----
benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	0.5263 µg/L	97.7	50.0	140	----
chrysene	218-01-9	E641A	0.01	µg/L	0.5263 µg/L	111	50.0	140	----
dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	0.5263 µg/L	106	50.0	140	----
fluoranthene	206-44-0	E641A	0.01	µg/L	0.5263 µg/L	103	50.0	140	----
fluorene	86-73-7	E641A	0.01	µg/L	0.5263 µg/L	98.2	50.0	140	----
indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	0.5263 µg/L	119	50.0	140	----
methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	0.5263 µg/L	94.5	50.0	140	----
methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	0.5263 µg/L	92.8	50.0	140	----
naphthalene	91-20-3	E641A	0.05	µg/L	0.5263 µg/L	93.2	50.0	140	----
phenanthrene	85-01-8	E641A	0.02	µg/L	0.5263 µg/L	95.4	50.0	140	----
pyrene	129-00-0	E641A	0.01	µg/L	0.5263 µg/L	102	50.0	140	----
Phthalate Esters (QCLot: 755346)									
bis(2-ethylhexyl) phthalate [DEHP]	117-81-7	E655F	2	µg/L	6.4 µg/L	106	50.0	140	----
di-n-butyl phthalate	84-74-2	E655F	1	µg/L	6.4 µg/L	108	50.0	140	----
Nonylphenols (QCLot: 748472)									
nonylphenol diethoxylates [NP2EO]	n/a	E749B	0.1	µg/L	1 µg/L	102	75.0	125	----
nonylphenol monoethoxylates [NP1EO]	n/a	E749B	2	µg/L	20 µg/L	119	75.0	125	----
Nonylphenols (QCLot: 748473)									
nonylphenols [NP]	84852-15-3	E749A	1	µg/L	10 µg/L	98.6	75.0	125	----
Polychlorinated Biphenyls (QCLot: 749048)									
Aroclor 1016	12674-11-2	E687	0.02	µg/L	0.2 µg/L	97.0	60.0	140	----
Aroclor 1221	11104-28-2	E687	0.02	µg/L	0.2 µg/L	97.0	60.0	140	----
Aroclor 1232	11141-16-5	E687	0.02	µg/L	0.2 µg/L	97.0	60.0	140	----
Aroclor 1242	53469-21-9	E687	0.02	µg/L	0.2 µg/L	97.0	60.0	140	----
Aroclor 1248	12672-29-6	E687	0.02	µg/L	0.2 µg/L	81.4	60.0	140	----
Aroclor 1254	11097-69-1	E687	0.02	µg/L	0.2 µg/L	98.4	60.0	140	----
Aroclor 1260	11096-82-5	E687	0.02	µg/L	0.2 µg/L	92.9	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: 749048) - continued									
Aroclor 1262	37324-23-5	E687	0.02	µg/L	0.2 µg/L	92.9	60.0	140	----
Aroclor 1268	11100-14-4	E687	0.02	µg/L	0.2 µg/L	92.9	60.0	140	----

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: 749331)										
WT2222191-001	Anonymous	fluoride	16984-48-8	E235.F	1.01 mg/L	1 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 749332)										
WT2222191-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	102 mg/L	100 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 751924)										
TY2204131-001	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	ND mg/L	2.5 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 752317)										
TY2204009-037	Anonymous	phosphorus, total	7723-14-0	E372-U	0.0888 mg/L	0.1 mg/L	88.8	70.0	130	----
Cyanides (QCLot: 757482)										
WT2222062-001	Anonymous	cyanide, strong acid dissociable (total)	----	E333	0.229 mg/L	0.25 mg/L	91.8	75.0	125	----
Inorganics (QCLot: 754070)										
WT2222058-001	Anonymous	chlorine, total	7782-50-5	E326	0.250 mg/L	0.27584 mg/L	90.6	70.0	130	----
Total Metals (QCLot: 748283)										
WT2221819-015	Anonymous	aluminum, total	7429-90-5	E420	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		antimony, total	7440-36-0	E420	0.0512 mg/L	0.05 mg/L	102	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0519 mg/L	0.05 mg/L	104	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00468 mg/L	0.005 mg/L	93.6	70.0	130	----
		chromium, total	7440-47-3	E420	0.0125 mg/L	0.0125 mg/L	100	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0128 mg/L	0.0125 mg/L	102	70.0	130	----
		copper, total	7440-50-8	E420	0.0120 mg/L	0.0125 mg/L	96.2	70.0	130	----
		lead, total	7439-92-1	E420	0.0250 mg/L	0.025 mg/L	100	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0120 mg/L	0.0125 mg/L	95.6	70.0	130	----
		nickel, total	7440-02-0	E420	0.0249 mg/L	0.025 mg/L	99.5	70.0	130	----
		selenium, total	7782-49-2	E420	0.0518 mg/L	0.05 mg/L	104	70.0	130	----
		silver, total	7440-22-4	E420	0.00447 mg/L	0.005 mg/L	89.4	70.0	130	----
		tin, total	7440-31-5	E420	0.0228 mg/L	0.025 mg/L	91.4	70.0	130	----
		titanium, total	7440-32-6	E420	0.0123 mg/L	0.0125 mg/L	98.7	70.0	130	----
		zinc, total	7440-66-6	E420	0.0217 mg/L	0.025 mg/L	86.8	70.0	130	----
Total Metals (QCLot: 748497)										

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: 748497) - continued										
WT2222109-001	Anonymous	mercury, total	7439-97-6	E508	0.000103 mg/L	0.0001 mg/L	103	70.0	130	----
Speciated Metals (QCLot: 748542)										
WT2222058-001	Anonymous	chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0384 mg/L	0.04 mg/L	96.0	70.0	130	----
Aggregate Organics (QCLot: 752318)										
WT2222208-001	BH202	phenols, total (4AAP)	----	E562	0.0216 mg/L	0.02 mg/L	108	75.0	125	----
Volatile Organic Compounds (QCLot: 752755)										
WT2222192-001	Anonymous	benzene	71-43-2	E611D	112 µg/L	100 µg/L	112	60.0	140	----
		chloroform	67-66-3	E611D	113 µg/L	100 µg/L	113	60.0	140	----
		dichlorobenzene, 1,2-	95-50-1	E611D	106 µg/L	100 µg/L	106	60.0	140	----
		dichlorobenzene, 1,4-	106-46-7	E611D	95.6 µg/L	100 µg/L	95.6	60.0	140	----
		dichloroethylene, cis-1,2-	156-59-2	E611D	95.1 µg/L	100 µg/L	95.1	60.0	140	----
		dichloromethane	75-09-2	E611D	110 µg/L	100 µg/L	110	60.0	140	----
		dichloropropylene, trans-1,3-	10061-02-6	E611D	101 µg/L	100 µg/L	101	60.0	140	----
		ethylbenzene	100-41-4	E611D	103 µg/L	100 µg/L	103	60.0	140	----
		methyl ethyl ketone [MEK]	78-93-3	E611D	143 µg/L	100 µg/L	143	60.0	140	MES
		styrene	100-42-5	E611D	104 µg/L	100 µg/L	104	60.0	140	----
		tetrachloroethane, 1,1,2,2-	79-34-5	E611D	120 µg/L	100 µg/L	120	60.0	140	----
		tetrachloroethylene	127-18-4	E611D	95.7 µg/L	100 µg/L	95.7	60.0	140	----
		toluene	108-88-3	E611D	104 µg/L	100 µg/L	104	60.0	140	----
		trichloroethylene	79-01-6	E611D	98.4 µg/L	100 µg/L	98.4	60.0	140	----
		xylene, m+p-	179601-23-1	E611D	193 µg/L	200 µg/L	96.7	60.0	140	----
		xylene, o-	95-47-6	E611D	109 µg/L	100 µg/L	109	60.0	140	----
Nonylphenols (QCLot: 748472)										
WT2222187-002	Anonymous	nonylphenol diethoxylates [NP2EO]	n/a	E749B	1.03 µg/L	1 µg/L	103	60.0	140	----
		nonylphenol monoethoxylates [NP1EO]	n/a	E749B	13.0 µg/L	20 µg/L	65.1	60.0	140	----
Nonylphenols (QCLot: 748473)										
WT2222187-002	Anonymous	nonylphenols [NP]	84852-15-3	E749A	11.6 µg/L	10 µg/L	116	60.0	140	----

Qualifiers

Qualifier	Description
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Chain of Custody (COC) / Analytical Request Form

COC Number: 20 - 1007464

Page 1

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Environmental Division Waterloo
Work Order Reference
WT2222208

Telephone : +1 519 886 6910

Report To	Contact and company name below will appear on the final report	Reports / Recipients	Turnaround Time (TAT) Requested
Company:	McClymont & Rak	Select Report Format: ☒ PDF ☐ EXCEL ☐ EDD (DIGITAL)	☒ Routine [R] If received by 3pm M-F - no surcharges apply
Contact:	Richard Sukhu	Merge QC/QCI Reports with COA ☒ YES ☐ NO ☐ N/A	☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimu
Phone:	675-0160	☒ Compare Results to Criteria on Report - provide details below if box checked	☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minim
	Company address below will appear on the final report	Select Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minim
Street:	ZENWAY	Email 1 or Fax rsukhu@mccmak.com	☐ 1 day [E] If received by 3pm M-F - 100% rush surcharge minim
City/Province:	VAUGHAN	Email 2	☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. / may apply to rush requests on weekends, statutory holidays and n
Postal Code:		Email 3	Date and Time Required for all E&P TATs:
Invoice To	Same as Report To ☒ YES ☐ NO	Invoice Recipients	For all tests with rush TATs requested, p
	Copy of Invoice with Report ☐ YES ☒ NO	Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX	Analys
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 #:	1187	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (ALS use only):		ALS Contact:	Sampler:

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P)	SAMPLES ON HOLD	EXTENDED STORAGE REQ	SUSPECTED HAZARD (see notes)
	BH202	NOV. 17	9a	GW	21	X MISSISSAUGA/PEEL STORM + SANITARY SEWER CODE			

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☒ NO	
Are samples for human consumption/ use? ☐ YES ☒ NO	

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☑ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
				1.6			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by: R.M	Date: 17/11/22	Time: 5:30P

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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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.

B-290 VW-100 N-420 GC-097, L-20747 OR-059, MM-423, OGG-254, CN-241 SC-143 OS-558