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G5820 JULY 2023

PRELIMINARY GEOHYDROLOGY ASSESSMENT NORTHWESTERN CORNER OF REGIONAL ROAD 25 AND BRITANNIA ROAD MILTON, ONTARIO

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1 COPY McCLYMONT & RAK ENGINEERS, INC.

PREPARED FOR:

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1.0 INTRODUCTION

Mattamy (Milton West) Limited (the Client) intends to redevelop the property located at North-western corner of the intersection of Regional Road 25 and Britannia Road, Milton, 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 temporary dewatering and permanent drainage in relation to the proposed redevelopment.

1.1 SCOPE OF WORK

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

- 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.
- Reviewing the available background information for the Site obtained from MCR's files, 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 Municipality of Halton (the City), respectively.
- Summarize the findings in a Geohydrology Assessment Report.

1.2 SITE DESCRIPTION

The Site is located at the northwestern corner of Regional Road 25 and Britannia Road, in a mixed-use rural, residential and commercial area of the city of Milton, Ontario. The site is irregular in shape with an approximate area of 41,511 m².

The Site is bounded by a pond to the north, Regional Road 25 to the east,

Britannia Road to the south, and a pond/channel to the west. Etheridge Avenue

bisects the Site, running west to east. The Site is presently a vacant lot.

Currently the Site does not have a Legal description. The topographic surveys

are attached in Appendix A.

1.3 PROPOSED DEVELOPMENT

The Site is proposed for residential development (Appendix B) and will consist

of:

• North Block: A thirteen [13] storey building (Building 5), a twelve [12]

storey building (Building 6), and a fifteen [15] storey building (Building 7)

over two [2] levels of underground parking.

• South Block: A fifteen [15] storey building (Building 1), a fourteen [14]

storey building (Building 2), a thirteen [13] storey building (Building 3), and a fifteen [15] storey building (Building 4) over two [2] levels of

underground parking.

The finished floor elevation (FFE) at ground level is expected to be at an

elevation of 188.15 to 188.25 meters above sea level (masl) for the North Block

and 184.50 to 186.95 masl for the South Block.

The P2 FFE will be at an approximate elevation of 180.70 to 180.80 masl for the

North Block and 177.05 to 179.0 masl for the South Block.

Presently it is assumed that the proposed buildings will be supported by

conventional spread/strip footings founded in silty to sandy/clayey silt soils. The

size of the shoring play layout was assumed to cover approximately:

North Block: 165 m by 80 m

South Block: 230 m by 84 m

A sub-floor Private Water Drainage System (PWDS) with perimeter weeping tile

will be required for the proposed development. A soldier pile and lagging shoring

system is expected for temporary excavation.

1.4 PROPERTY OWNERSHIP

The Site is owned and intended for redevelopment by Mattamy (Milton West) Limited. The Owner is represented by Ms. Christine Chea, with the following contact information:

Ms. Christine Chea, MCIP, RPP
Direction, Development, GTA Urban
3300 Bloor Street West, Suite 1800
Toronto, Ontario
M8X 2X2

Email: christine.chea@mattamycorp.com

1.5 REVIEW OF PREVIOUS REPORTS

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

- Shad & Associates Inc. report titled, Geotechnical Investigation Report, Proposed Residential Condominium Development, Framgard Property – Major Node, Regional Road 25, North of Britannia Road, Milton, Ontario, prepared for Mattamy Willmott Limited, dated March 2018.
- MCR report titled, Geotechnical Report, Residential Development, Regional Road 25 and Britannia Road, Milton, Ontario, prepared for Mattamy Homes Canada, dated July 2023.

2.0 HYDROGEOLOGICAL CONDITIONS

2.1 PHYSICAL SETTING

The Site is located in the Town of Milton and is situated in a mixed-use rural, residential, and commercial area. The nearest major intersection is Regional Road 25 and Britannia Road, located southeast of the Site. A branch of The West Tributary of the Sixteen Mile Creek is located approximately 30 m west of the Site.

The Site is located at an elevation of approximately 184 to 186 m above sea level (asl) and the topography across the Site slopes from the north to south. The surrounding area slopes from northwest to southeast, towards the Sixteen Mile Creek.

The Site is bounded by the following properties/features:

North A pond

South Britannia Road

East Regional Road 25

West Pond/Channel

2.2 TOPOGRAPHY

According to the topographic map, published by the Government of Canada; Natural Resources Canada at the Government of Canada website: http://atlas.gc.ca/toporama/en/index.html, the ground surface at the Site slopes from north to south and the surrounding area sloping from northwest to southeast towards the Sixteen Mile Creek.

2.3 REGIONAL GEOLOGY AND HYDROGEOLOGY

According to the geological map entitled "Quaternary Geology of Ontario, Southern Sheet", published by the Ontario Ministry of Development and Mines, dated 1991, the overburden in the study area consists mainly of Halton till, predominantly silt and clay, minor sand, basin and quiet water deposits. Groundwater flow is expected to be directed southeast towards the Sixteen Mile

Creek.

According to the Ontario Ministry of Development and Mines, Map No. 2554 "Bedrock Geology of Ontario, Southern Sheet, 1991", the bedrock typically consists of Upper Ordovician shale, limestone, dolostone and siltstone Queenston Formation. On a regional scale, groundwater is expected to flow south-east, towards the Sixteen Mile 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

- Initially, twelve boreholes (BH 1 to BH 12) were drilled by Shad & Associates Inc. from February to March 2018 to depths ranging from 7.80 to 8.10 m.
- Nine boreholes (BH 101 to BH 109) were drilled by MCR in December 2022 to January 2023 to depths ranging from 7.30 to 21.40 m.
- Boreholes 1, 3 to 5, 8 to 10 and 12 were equipped with monitoring wells for long-term groundwater monitoring and sampling.
- The borehole locations are shown in Drawing No. 1 and the 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 1 and 10 in December 2022 for chemical analysis of the Municipality of Halton Sewers By-Law criteria.

3.2 MONITORING WELL INSTALLATION

It is assumed that all monitoring wells by Shad and Associates Inc. were installed with a 50 mm diameter schedule, 40 PVC pipe 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

MCR elevations referred to in this report are metric and geodetic and are interpolated from the provided topographic survey prepared by Rady-Pentek & Edward Surveying Ltd., dated February 9 and April 13, 2018. 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

A groundwater sample collected in December was 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

All groundwater samples were submitted for bulk chemical analysis for the criteria provided in the *Ontario Halton Sanitary Sewer By-Law No. 02-03 (March 2003)*. 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 across the Site varies from 187.50 masl (BH 104) to 184.70 masl (BH 1). Based on the investigations by MCR and Shad and Associates Inc., the geologic formations beneath the Site are illustrated in borehole logs (Appendix C) and include the following (from surface to depth):

Please note that boreholes 102, 103, 106 and 108 were straight drilled to 9.15 m due to proximity to Shad and Associates Inc. boreholes.

Fill: Compact fill material was encountered at the surface of all boreholes. The fill material extended to depths ranging from 0.4 to 0.9 m. The fill consisted of silty sand/sandy silt/clayey silt/silty clay, sand and gravel soils. The brown/dark brown to reddish brown fill was in a moist condition and contained some to trace of organics, clay, gravel, and rootlets.

For the purpose of offsite disposal, the type/quantity and extent of the existing fill should be explored by further test pit investigation prior to general excavation (prior to contract award).

Silty Sand/Sandy Silt: A dense silty sand/sandy silt till layer was encountered below the fill in boreholes 104, 105, 107 and 109. The brown silty sand/sandy silt layer was in a moist condition and contained traces of clay. The silty sand/sandy silt layer extended to the full depth of borehole 104 and a depth of 2.30 m in boreholes 105, 107 and 109.

Clayey Silt/Silty Clay (Till): A very stiff to hard clayey silt/silty clay till layer was encountered below the fill and silty sand/sandy silt layer in all boreholes (except 102, 103, 106 and 108). The reddish brown to grey clayey silt/silty clay till layer was in a moist to wet condition and contained some to trace of sand, gravel and shale fragments. The clayey silt/silty clay till layer extended to the full depth of boreholes 2, 3, 5, 8, 11 and 109 and to depths ranging from 4.55 to 10.65 m in all other boreholes.

Sand and Gravel/Silty Sand/Sandy Silt (Till): A very dense sand and gravel/silty sand/sandy silt till deposit was observed below the clayey silt/silty clay till layer in all boreholes. The brown to reddish brown sand and gravel/silty sand/sandy silt (till) deposit was in a moist to wet condition and contained traces of clay, gravel and shale fragments. The sand and gravel/silty sand/sandy silt till layer extended to a depth of 18.30 m in borehole 101 and to the full depth of all other boreholes.

Clayey Silt Till: A hard layer of clayey silt till was detected below the sand and gravel/silty sand/sandy silt till deposit in borehole 101. The reddish brown layer was in a moist condition and contained traces of sand, gravel and shale fragments. The clayey silt till layer extended to the full depth of borehole exploration.

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

Groundwater: Upon completion of drilling all monitoring wells by Shad and Associates Inc. were dry.

On March 9, 2018, ground water levels were measured at depths ranging from 2.8 to 4.2 m in boreholes 1, 3 to 5, 9 to 10 and 12. On March 16, 2018, groundwater levels were measured at depths ranging from 2.9 to 6.4 m in boreholes 1, 3 to 5, 8 to 10 and 12.

On January 6, 2023, groundwater levels were measured at depths ranging from 0.74 to 3.76 m in boreholes 1, 3 to 5, 9 to 10 and 12. The results are summarized on the Record of Borehole Sheets in Appendix C and Table 1.

4.2 GROUNDWATER LEVEL MONITORING

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

in accordance with Regulation 903 by a qualified contractor.

The interpreted groundwater flow direction is based on the 2018 and 2022 – 2023 round of water table elevation measurements, since this event provided the water table elevations from the majority of the monitoring wells. The interpreted local direction of hydraulic movement across the Site is inferred to be in a southern direction, towards the West Tributary of the Sixteen Mile Creek.

4.3 GROUNDWATER QUALITY

The groundwater samples collected from BH 1 and 10 in December 2022 were analyzed for the Municipality of Halton Sewers By-Law criteria. The results of chemical analysis (Table 2) indicate that the sample complies with the *Table 1 Limits for Sanitary & Combined Sewers Discharge* and *Table 2 Limits for Storm Sewer Discharge* for all parameters analyzed.

4.4 GROUNDWATER DISCHARGE ASSESSMENT

Presently, the groundwater onsite can be discharged to the Municipal sanitary/combined sewer system or storm sewer system with no additional filtration/treatment.

5.0 REVIEW AND EVALUATION

5.1 TEMPORARY DEWATERING ASSESSMENT

The excavation for the proposed two level underground parking structure will extend into native sandy silt soils. In order to protect the sides/bottom of the excavation from being disturbed by excess groundwater pressure, i.e., to prevent quicksand/dilating silt conditions, the groundwater table must be lowered 1.0 m below the bottom of the footing excavations.

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

For the proposed two underground levels, groundwater is required to be drawn down 1 m below the underside of the combined footings. The assumed elevation of the footings is at approximately 179.20 masl for the North Block and 175.55 for the South Block. Therefore, groundwater will need to be lowered to an elevation of 178.20 for the North Block and 174.55 masl for the South Block.

The average ground water level recorded in the monitoring wells is at an elevation of 182.26 masl (Table 3), representing an approximate 7 - 8 m hydrostatic head requiring dewatering. The size of the shoring plan layout was assumed to cover approximately 165 m by 80 m and 230 m by 84 m for the North and South Blocks, respectively.

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

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

And further we have:

$$h^{2} = -\frac{Q}{\pi K} \ln(r/r_{w}) + h_{w}^{2}$$
 (2)

Where:

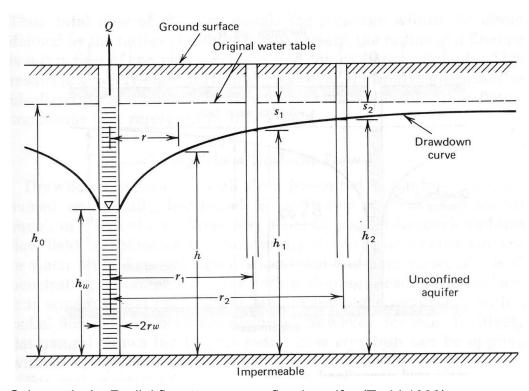
h [m] is the height of the water table above an impervious base

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 Tables 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 0.40 m/day.

The estimated steady state discharge rate for temporary construction dewatering was calculated at approximately:

Block	Discharge (m³/day)
North	182
South	331



It should be noted that the initial drawdown pumping rate and accumulation from rainfall will likely be higher.

5.2 PERMANENT FOUNDATION DRAIN FLOW RATES

For the proposed redevelopment, it is understood that average ground floor slab elevation (FFE) is expected to range from elevations of 184.50 to 188.25 meters above sea level (masl). The P2 floor slab elevation is expected to range from elevations of 177.05 to 180.80 masl.

A sub-floor Private Water Drainage System (PWDS) with perimeter/underfloor weeping tile is proposed below the P2 level slab. The invert of the PWDS is assumed to be approximately 0.5 m below the FFE of the P2 slab, i.e., at approximately 176.55 to 180.30 masl.

The proposed PWDS is shown in Drawing No. 6. The slotted pipes should slope to a sump at a minimum 1% slope. Perimeter drainage pipes, with a positive gravity outlet, should be solid PVC with a minimum of 0.5% slope. In addition, silt traps must be provided at convenient/accessible locations.

5.2.1 Numerical Analysis

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

From the observed soil types and based on soil sample descriptions (Todd,

1980; Mays, 2001; and Craig, 2004), the average hydraulic conductivity (K) of the aquifer was estimated at 0.40 m/day.

The estimated steady state discharge rate for the PWDS was calculated at:

Block	Discharge (m³/day)
North	84
South	205



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 182 m³/day and 331 m³/day for the North and South Blocks, respectively. Therefore, a limited PTTW application will be required to be applied for with the MECP for each Block.



The flow rate from the PWDS was calculated at 84 m³/day and 205 m³/day for the North and South Blocks, respectively. Therefore, a complete PTTW application for the PWDS will be required for each Block.

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

The groundwater quality sample collected in December 2022 indicates that the water onsite could be discharged into the Municipal sanitary and combined sewer system or storm sewer system with no additional filtration or treatment. A short-term temporary discharge permit must be applied for construction dewatering with 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 in the Sixteen Mile Creek drainage basin and a branch is approximately 30 m west of the Site. The Site is located within the Regional Municipality of Halton and there are potential potable groundwater issuers in the Vicinity of the Site. Therefore, the Site is located in a potable groundwater region as defined in Sections 35 to 37 of O.Reg. 153/04.

The proposed redevelopment plan will remove all the overburden to a depth of approximately 8 - 10 mbgs, from the interior Site area. 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 into the storm sewer. 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 an administrative Plan of Subdivision and rezoning application. Etheridge Avenue bisects the Site, running west to east. The

Site is presently a vacant lot.

The Site is proposed for residential development (Appendix B) and will consist of:

• North Block: A thirteen [13] storey building (Building 5), a twelve [12]

storey building (Building 6), and a fifteen [15] storey building (Building 7)

over two [2] levels of underground parking

• South Block: A fifteen [15] storey building (Building 1), a fourteen [14]

storey building (Building 2), a thirteen [13] storey building (Building 3), and

a fifteen [15] storey building (Building 4) over two [2] levels of

underground parking.

The finished floor elevation (FFE) at ground level is expected to be at an elevation of

188.15 to 188.25 meters above sea level (masl) for the North Block and 184.50 to

186.95 masl for the South Block.

The P2 FFE will be at an approximate elevation of 180.70 to 180.80 masl for the

North Block and 177.05 to 179.0 masl for the South Block.

Presently it is assumed that the proposed buildings will be supported by conventional

spread/strip footings founded in silty to sandy/clayey silt soils. The size of the shoring

play layout was assumed to cover approximately:

• **North Block**: 165 m by 80 m

• **South Block:** 230 m by 84 m

A sub-floor Private Water Drainage System (PWDS) with perimeter weeping tile will

be required for the proposed development. A soldier pile and lagging shoring system

is expected for temporary excavation.

The excavation for the proposed two level underground parking structure will extend

into native sandy silt soils. In order to protect the sides/bottom of the excavation from being disturbed by excess groundwater pressure, i.e., to prevent quicksand/dilating silt conditions, the groundwater table must be lowered 1.0 m below the bottom of the footing excavations.

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

For the proposed two underground levels, groundwater is required to be drawn down 1 m below the underside of the combined footings. The assumed elevation of the footings is at approximately 179.20 masl for the North Block and 175.55 for the South Block. Therefore, groundwater will need to be lowered to an elevation of 178.20 for the North Block and 174.55 masl for the South Block.

The average ground water level recorded in the monitoring wells is at an elevation of 182.26 masl (Table 3), representing an approximate 7 - 8 m hydrostatic head requiring dewatering.

The steady-state discharge rate for temporary construction dewatering was calculated at 182 m³/day (33 USG/min) and 331 m³/day (61 USG/min) for the North and South Blocks, respectively Therefore, based on the amended O.Reg. 63/16 to the Environmental Protection Act, a limited PTTW application will be required from the MECP, and a temporary discharge permit will be required from the MECP for each Block. 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 steady state discharge rate for the PWDS was calculated at approximately 84 m³/day (15 USG/min) and 205 m³/day (38 USG/min) for the North and South Blocks, respectively. Therefore, a complete PTTW will be required from the MECP for the PWDS for each Phase. A long-term permanent discharge permit will be required from the Municipality since the drainage will be installed below the long-term groundwater elevation.

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

The Zone of Influence (ZOI) for construction dewatering ranges from 26 to 50 m. The ZOI for permanent drainage ranges from 13 to 37 m. As the ZOI for construction dewatering and permanent drainage intercept the branch of the Sixteen Mile Creek to the west and south, an infiltration gallery, with approval from the Municipality and the MECP with an Environmental Compliance Approval (ECA), could be implemented to offset the potential of drying out the creek.

F

Presently, the groundwater onsite can be discharged to the Municipal sanitary/combined sewer system or storm sewer system with no additional filtration/treatment.

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. R.F. Craig, *Soil Mechanics*, 7th Edition, Spon Press, London, 2004.
- 7. Shad & Associates Inc. report titled, Geotechnical Investigation Report, Proposed Residential Condominium Development, Framgard Property Major Node, Regional Road 25, North of Britannia Road, Milton, Ontario, prepared for Mattamy Willmott Limited, dated March 2018.
- 8. MCR report titled, *Geotechnical Report, Residential Development, Regional Road 25 and Britannia Road, Milton, Ontario*, prepared for Mattamy Homes Canada, dated July 2023.

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:

Richard Sukhu, P.Eng., B.Eng.

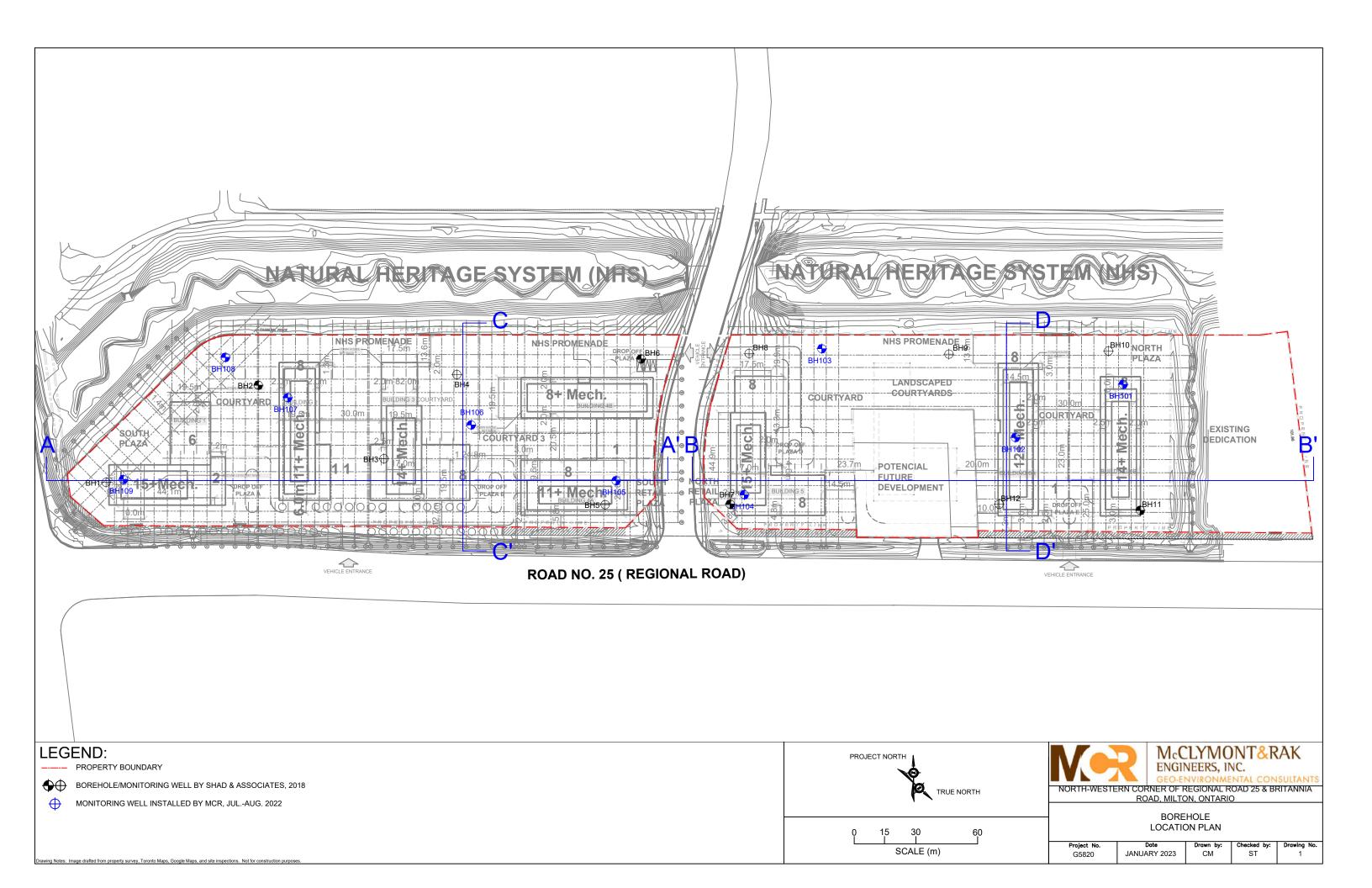


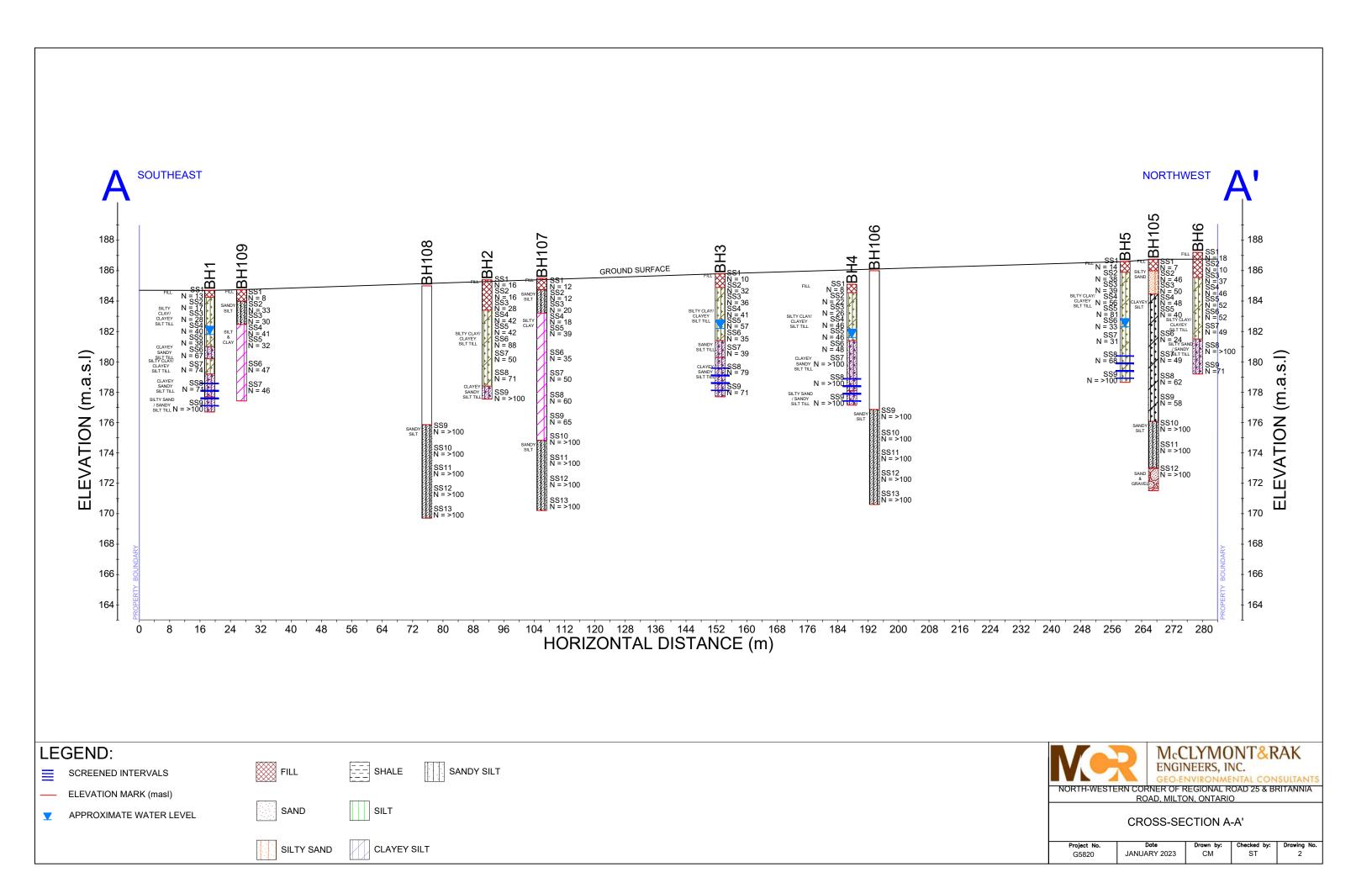
Reviewed By:

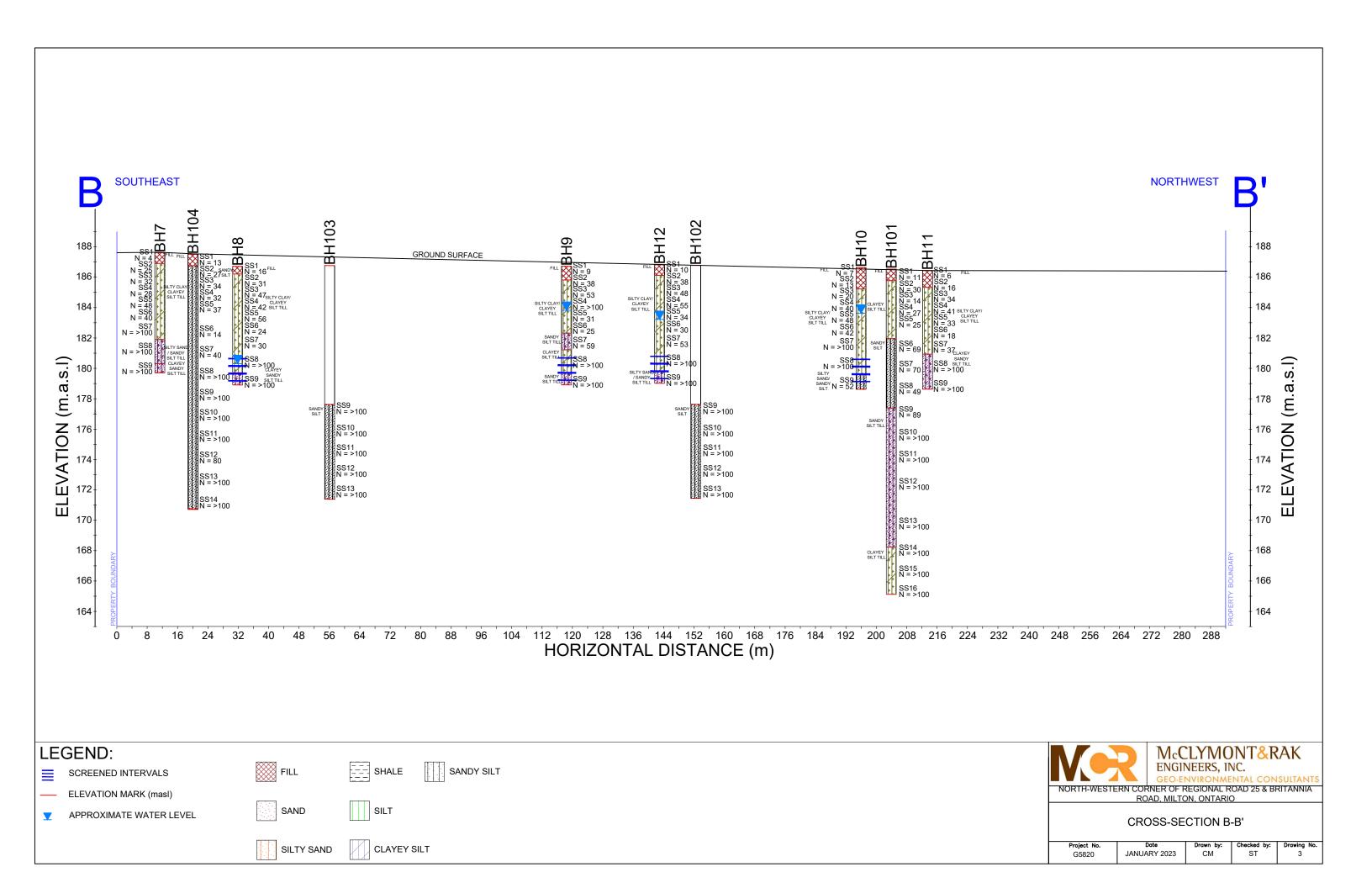
Lad Rak, P.Eng., M.Eng., QP_{ESA}

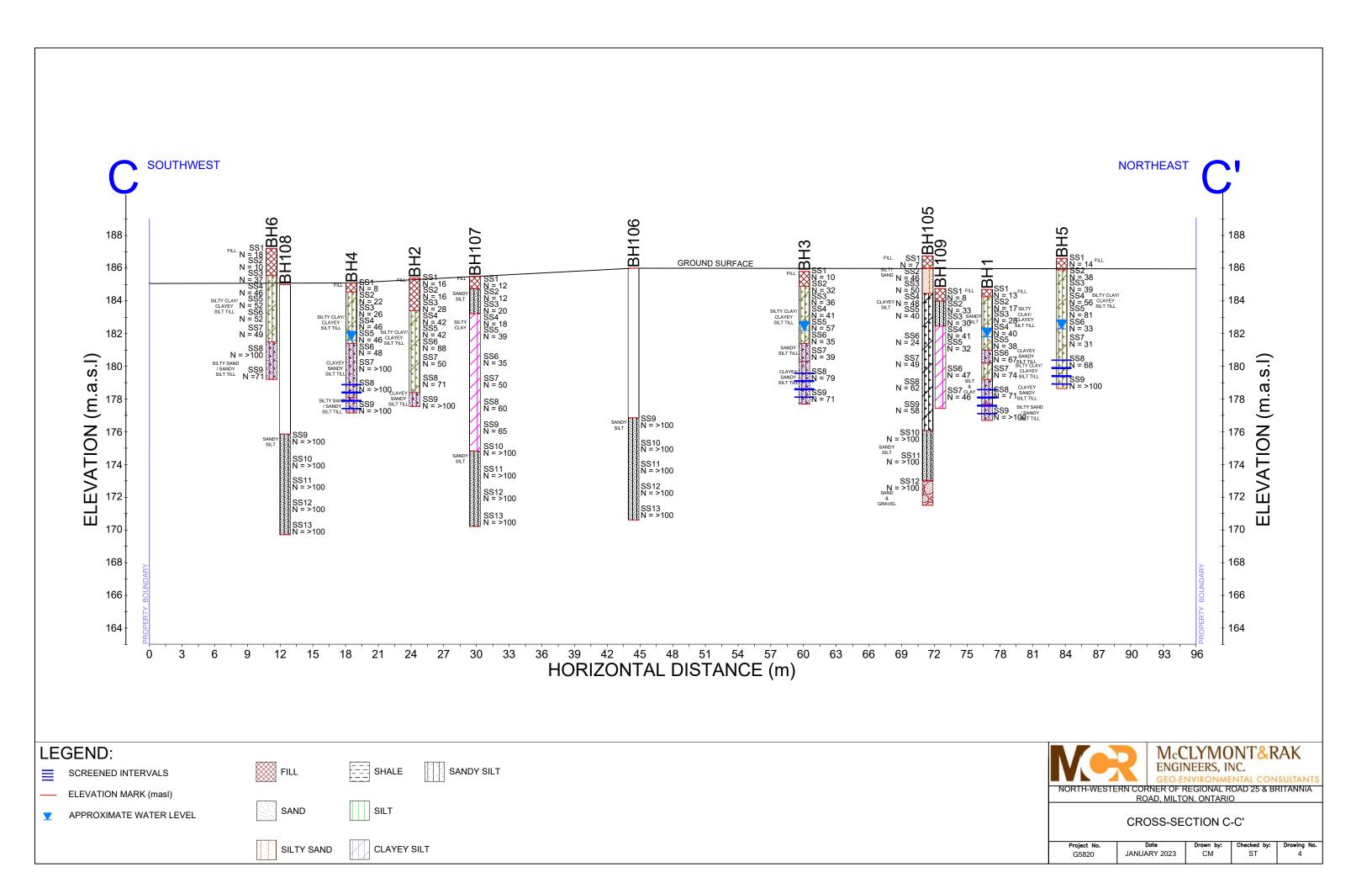
Date of Issue: July 18, 2023

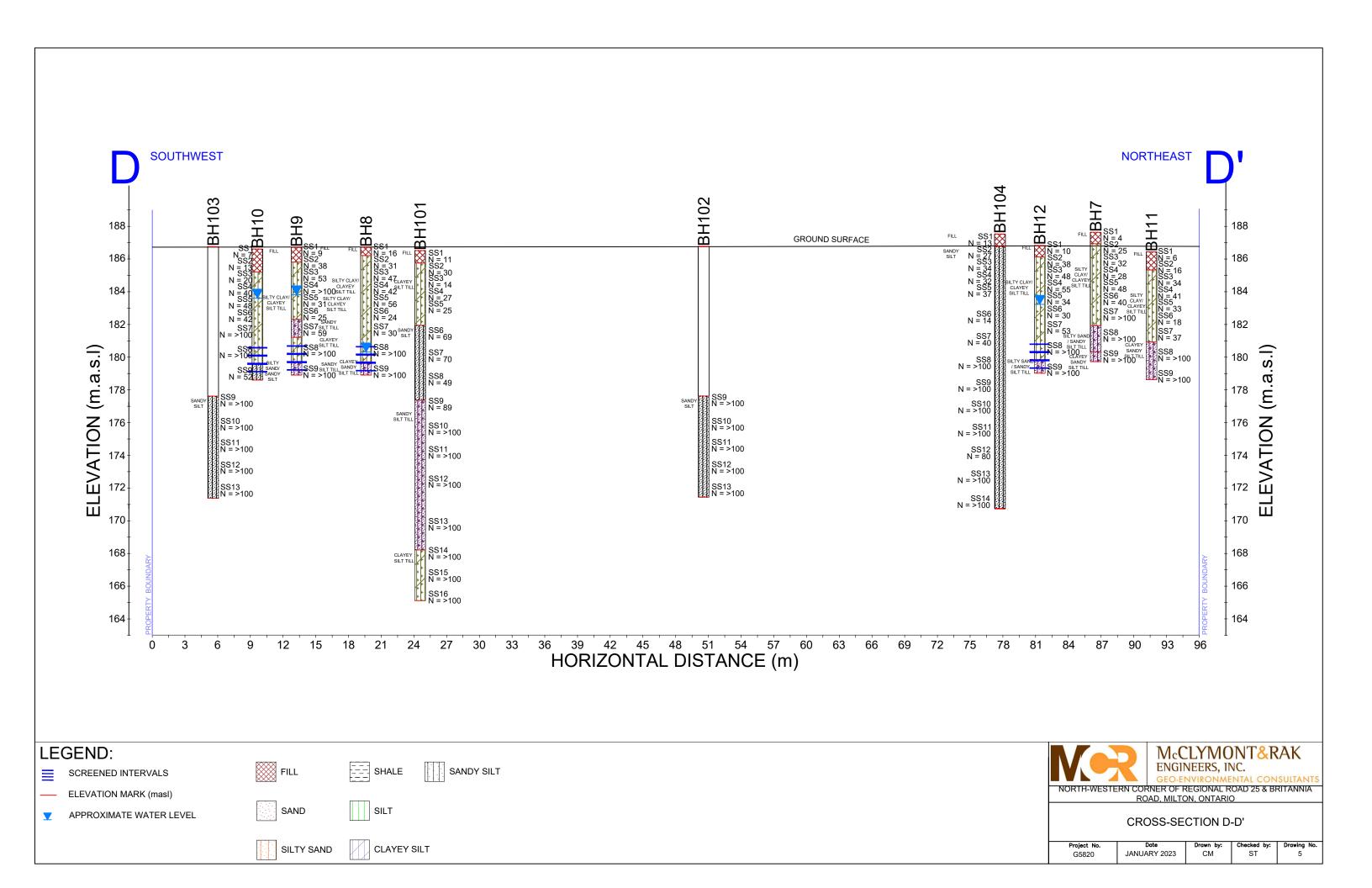
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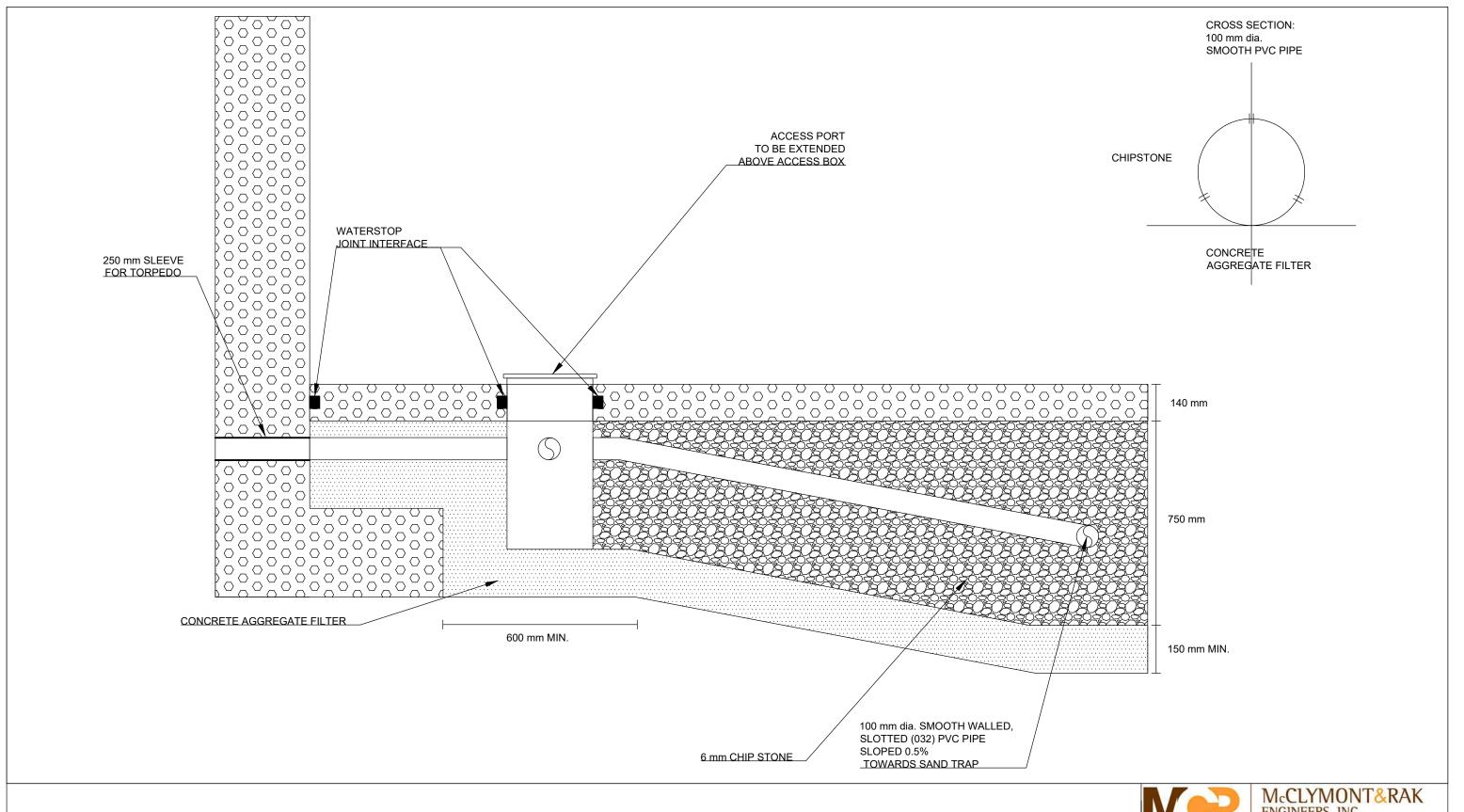














NTS

Drawing No.

6

TABLES

McCLYMONT AND RAK ENGINEERS INC. **GEO-ENVIRONMENTAL CONSULTANTS**

TABLE 1

ONSTRUCTIO	N DETAILS	AND ELE	EVATION	OF MON	ITORING WELLS	ŝ

MONITORING WELL ID	GROUND SURFACE ELEVATION (masl)	WATER LEVEL	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
	(masi)	(mbgs) 2.80	(masi) 181.90	3/9/2018	(mbgs)	(mbgs)	(m)	(mm)	
		2.90	181.80	3/16/2018					
		3.10 2.80	181.60 181.90	12/5/2022 1/6/2023					
		2.80	181.90	2/8/2023					
		2.62	182.08	3/8/2023					
BH 1	184.70			4//2023	7.70	5.70	3.05	50	STICK-UP
				5//2023					
				6//2023 7//2023					
				8//2023					
				9//2023					
				10/2023					
		3.70	182.10	11/2023 3/9/2018					
		3.60	182.20	3/16/2018					
		3.96	181.84	12/5/2022					
		3.74	182.06	1/6/2023					
		3.05 2.73	182.75 183.07	2/8/2023 3/8/2023					
		2.13	163.07	4//2023					
BH 3	185.80			5//2023	7.70	5.70	3.05	50	STICK-UP
				6//2023					
				7//2023					
				8//2023					
				9//2023					
				11/2023					
		3.60	181.50	3/9/2018					
		3.50	181.60	3/16/2018			1		
		3.33	181.77 181.84	12/5/2022 1/6/2023	-		1		
		3.26 2.95	181.84 182.15	1/6/2023 2/8/2023	ł				
		2.76	182.34	3/8/2023	İ		1		STICK-UP
BH 4	185.10			4//2023	7.70	5.70	.70 3.05	50	
DH 4	165.10			5//2023	7.70	5.70			
				6//2023					
				7//2023 8//2023					
				9//2023					
				10/2023	İ				
				11/2023					
		4.20 4.30	182.40 182.30	3/9/2018 3/16/2018					
		4.30	182.30	12/5/2022					
		0.74	185.86	1/6/2023					
		1.87	184.73	2/8/2023					
		1.30	185.30	3/8/2023					
BH 5	186.60			4//2023	7.70	5.70	3.05	50	STICK-UP
				5//2023 6//2023					
				7//2023					
				8//2023					
				9//2023					
				10/2023					
		DRY		11/2023 3/9/2018					
BH 8	186.70	6.40	180.30	3/16/2018	7.70	5.70	3.05	50	STICK-UP
		DESTROYED	-	12/5/2022			5.55		
		2.90	183.80	3/9/2018					
		2.90	183.80	3/16/2018					
		3.92	182.78	12/5/2022	1				
		3.76	182.94 183.41	1/6/2023 2/8/2023					
		2.96	183.74	3/8/2023			3.05	50	STICK-UP
BH 9	186.70			4//2023	7.70	5.70			
DIT 3	100.70			5//2023	7.70	5.70			
				6//2023 7//2023	-		1		
				7//2023 8//2023	ł				
				9//2023	Ì				
				10/2023			1		
				11/2023					
		2.90	183.70 183.60	3/9/2018	}				
		3.00	183.60 183.45	3/16/2018 12/5/2022	+		1		
		2.94	183.66	1/6/2023	İ		1		
		2.94	183.66	2/8/2023	Ì				
		2.71	183.89	3/8/2023					
BH 10	186.60			4//2023	7.70	5.70	3.05	50	STICK-UP
				5//2023 6//2023					
				7//2023					
				8//2023					
				9//2023					
		<u> </u>		10/2023					
		3.60	182 20	11/2023 3/9/2018					
		3.60	183.20 183.20	3/9/2018					
		4.03	182.77	12/5/2022	İ				
		3.72	183.08	1/6/2023	İ				
		3.55	183.25	2/8/2023					
		3.29	183.51	3/8/2023	1				
BH 12	186.80			4//2023 5//2023	7.70	5.70	3.05	50	STICK-UP
				6//2023	ł				
				7//2023					
				8//2023	İ				
				9//2023					
				10/2023					
Min	104.70	0.74	100.20	11/2023	7 70	-	-	_	
Min	184.70 186.80	0.74 6.40	180.30 185.86	-	7.70 7.70	-	-	-	-
Max			100.00		7.70				•

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 - HALTON REGION SEWERS BY-LAW DISCHARGE CRITERIA By-Law No. 02-03
MCR JOB#: G5820

SITE ADDRESS: Northwestern Corner of Regional Road 25 & Britannia Road, Milton, ON

PARAMETER	UNITS	LIMITS FOR STORM	LIMITS FOR SANITARY	BH 1	BH 10
.,		SEWER DISCHARGE	DISCHARGE	08-Dec-22	08-Dec-22
рН	pH Units	6.5 - 8.5	5.5 - 10.0	8.22	8.09
Total Suspended Solids	mg/L	-	350	11.8	35.6
Fluoride (F-)	mg/L	-	10	0.182	0.246
Total Kjeldahl Nitrogen (TKN)	mg/L	-	100	0.112	0.259
Total Phosphorus (P)	mg/L	-	10	0.0167	0.0244
Sulfate (SO4)	mg/L	-	1500	305	385
Total Cyanide (CN)	mg/L	-	2	<0.0020	<0.0020
Escherichia Coli	CFU/100mL	200	-	<1	<1
Total Aluminum (Al)	mg/L	-	50	0.387	0.514
Total Antimony (Sb)	mg/L	-	5	<0.00100	<0.00100
Total Arsenic (As)	mg/L	-	1	0.00461	0.00555
Total Beryllium (Be)	mg/L	-	5	<0.000200	<0.000200
Total Cadmium (Cd)	mg/L	-	0.7	<0.0000500	<0.0000500
Total Chromium (Cr)	mg/L	-	5	<0.00500	<0.00500
Total Cobalt (Co)	mg/L	-	5	0.00108	0.00144
Total Copper (Cu)	mg/L	-	3	<0.00500	<0.00500
Total Iron (Fe)	mg/L	-	50	0.777	0.879
Total Lead (Pb)	mg/L	-	3	<0.000500	0.000546
Total Manganese (Mn)	mg/L	-	5	0.51	0.304
Total Mercury (Hg)	mg/L	-	0.01	<0.000050	<0.0000050
Total Molybdenum (Mo)	mg/L	-	5	0.00532	0.0041
Total Nickel (Ni)	mg/L	-	3	<0.00500	<0.00500
Total Selenium (Se)	mg/L	-	1	< 0.000500	<0.000500
Total Silver (Ag)	mg/L	-	5	< 0.000100	<0.000100
Total Tin (Sn)	mg/L	•	5	0.00198	0.00173
Total Titanium (Ti)	mg/L	•	5	0.00848	0.0109
Total Zinc (Zn)	mg/L	•	3	< 0.0300	<0.0300
Biological Oxygen Demand	mg/L	•	300	<3.0	3.4
Total Oil & Grease (Animal/Vegetable)	mg/L	-	150	<5.0	<5.0
Total Oil & Grease Mineral/Synthetic	mg/L	-	15	<5.0	<5.0
Phenols-4AAP	mg/L	-	1	<0.0010	0.0012
Benzene	μg/L	-	10	<0.50	<0.50
Chloroform	μg/L	-	40	<0.50	<0.50
1,4-Dichlorobenzene	μg/L	-	80	<0.50	<0.50
Dichloromethane (Methylene Chloride)	μg/L	-	2000	<1.0	<1.0
Ethylbenzene	μg/L	-	160	<0.50	<0.50
Tetrachloroethylene	μg/L	-	1000	<0.50	<0.50
Toluene	μg/L	-	16	<0.50	<0.50
Trichloroethylene	μg/L	-	400	<0.50	<0.50
Naphthalene	μg/L	-	140	97.4	103



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

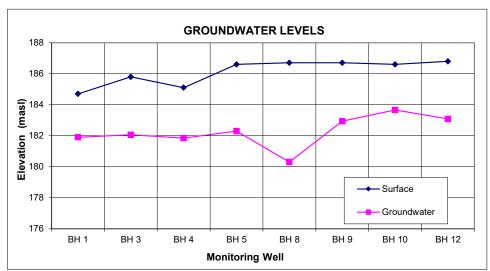
Project: Proposed Residential Development

Location: Northwest corner of Regional Road 25 & Britannia Road, Toronto, ON

Date: July-23 Project #: G5820

TABLE 3
GROUNDWATER MONITORING DATA

Borehole Number	Surface Elevation	Water Level Depth Elevation		Monitoring Date	NOTES
	(masl)	(mbgs)	(masl)	(mm/dd/yyy)	NOTES
BH 1	184.70	2.80	181.90	1/6/2023	
BH 3	185.80	3.74	182.06	1/6/2023	
BH 4	185.10	3.26	181.84	1/6/2023	
BH 5	186.60	4.30	182.30	3/16/2018	
BH 8	186.70	6.40	180.30	3/16/2018	
BH 9	186.70	3.76	182.94	1/6/2023	
BH 10	186.60	2.94	183.66	1/6/2023	
BH 12	186.80	3.72	183.08	1/6/2023	
Average	186.13	3.87	182.26		
Max			183.66		





GROUNDWATER

Project: Proposed Residential Development

Location: Northwest corner of Regional Road 25 & Britannia Road, Toronto, ON

Date: July-23 Project #: G5820

TABLE 4 DISCHARGE ESTIMATION OF CONSTRUCTION DEWATERING

Site Parameters	North Block	South Block	Units
Initial Water Level before Dewatering	182.26	182.26	(m)
Lowest Water Level during Construction Dewatering	178.20	174.55	(m)
Length of Site X	165.00	210.00	(m)
Width of Site W	80.00	82.00	(m)
Equivalent Radius r _e	64.82	74.04	(m)
Hydraulic Conductivity of Aquifer (k)	0.40	0.40	(m/day)
Aquifer Bottom Elevation	176.20	172.55	(m)
Applied Radius of Influence (Ro)	26.21	49.77	(m)
Height btw Initial Water Level and Aquifer Bottom (H)	6.06	9.71	(m)
Height btw Lowest Water Level and Aquifer Bottom (h _w)	2.00	2.00	(m)
Radius of Influence (R)	91.03	123.80	(m)
Factor of Safety (FS)	1.50	1.50	[`

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

Estimated steady-state discharge of dewatering	182	331 (m ³ /day)
	33	61 (USG/min)



GROUNDWATER

Project: Proposed Residential Development

Location: Northwest corner of Regional Road 25 & Britannia Road, Toronto, ON

Date: July-23 Project #: G5820

TABLE 5 DISCHARGE ESTIMATION OF PERMANENT DRAINAGE SYSTEM

	North	South	
Site Parameters	Block	Block	Units
Initial Water Level before Dewatering	182.26	182.26	(m)
Lowest Water Level under PDS conditions	180.20	176.55	(m)
Length of Site X	165.00	210.00	(m)
Width of Site W	80.00	82.00	(m)
Equivalent Radius r _e	64.82	74.04	(m)
Hydraulic Conductivity of Aquifer (k)	0.40	0.40	(m/day)
Aquifer Bottom Elevation	179.20	175.55	(m)
Applied Radius of Influence (Ro)	13.30	36.86	(m)
Height btw Initial Water Level and Aquifer Bottom (H)	3.06	6.71	(m)
Height btw Lowest Water Level and Aquifer Bottom (hw)	1.00	1.00	(m)
Radius of Influence (R)	78.12	110.89	(m)
Factor of Safety (FS)	1.50	1.50	

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

Estimated steady-state discharge of dewatering	84	205 (m ³ /day)
	15	38 (USG/min)



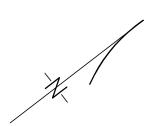
179 180 187.00 (C) 181 ____ ,-- 182 STREET WIDENING 183 184 BLOCK 262 BLOCK PART 185 PLAN 20R-20160 PART OF LOT 6, CONCESSION 2, NEW SURVEY //wⁱll. 186 BLOCK 187 BLOCK 188 189 ---() 190 - 2 188.00-NEW SURVEY) -(7) ()191 25, TRANSFERRED TO THE Ω. BY-LAW 10-04 (UNREGISTERED)) 192 PART 00-1440/97, PLAN 20R-19779 CV. PLAN ZOR-10 \bigcirc AND 193 104) 2 A / ORDER-IN-COUNCIL OC NRT 2, PLAN P-1738-10. BETWEEN CONCESSIONS 2 194 ROAD 195 196 (PART 2, PL/ ALLOWANCE BETWEEN C (FORMERLY THE KING'S HIGHWAY MUNIOPALITY OF HALTON BY ORDER-<₹ 197 PART PLAN 20R-20160 (BY REGIONAL REGIONAL PART OF LOT 6, CONCESSION 2, NEW SURVEY Ω 198 (ROAD ETHERIDGE A VENUE 33 \odot BLOCK 137 Tol a | BLUE. <1 BLOCK PART Ω. PLAN 20R--20160 \bigcirc α : PART OF LOT 6, Ω. CONCESSION 2, NEW SURVEY 111 © RADY-PENTEK & EDWARD SURVEYING LTD., O.L.S. 2018.

PLAN OF TOPOGRAPHY

SCALE 1:1000

RADY-PENTEK & EDWARD SURVEYING LTD., O.L.S.

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



LEGEND

-W-	DENOTES OVERHEAD WIRE
-GR-	DENOTES GUIDE RAIL METAL
UP	DENOTES UTILITY POLE
INV	DENOTES INVERT ELEVATION
GLB	DENOTES GROUND LEVEL BOX UTILITY
МН	DENOTES MANHOLE
MHW	DENOTES MANHOLE WATER
MHSA	DENOTES MANHOLE SANITARY
MHST	DENOTES MANHOLE STORM
LS	DENOTES LAMP STANDARD
CB	DENOTES CATCH BASIN
	DENOTES CURB INLET
WV	DENOTES WATER VALVE
Ø	DENOTES DIAMETER
\downarrow	DENOTES ANCHOR

BOUNDARY NOTE

THIS IS NOT A PLAN OF SURVEY. BOUNDARIES ARE NOT CERTIFIED BY THIS PLAN, AND ARE HAS BEEN TAKEN FROM R-PE CAD FILE Nos. 14014S8F AND 14235S10.

BENCHMARK NOTE

ELEVATIONS ARE GEODETIC AND REFERRED TO THE MTO BENCHMARK No 00819828156 HAVING AN ORTHOMETRIC ELEVATION OF 187.173 METRES. ELEVATIONS ARE REFERENCED TO THE CANADIAN GEODETIC VERTICAL DATUM OF 1928, 1978 ADJUSTMENT (CGVD—1928:1978).

BENCHMARK LOCATED ON A CONCRETE AND STEEL BRIDGE CARRYING HWY 25 OVER SIXTEEN MILE CREEK, 3.2 KM SOUTH OF HWY 25, AND CPR OVERPASS AT MILTON, 71.0 M SOUTH OF DRIVEWAY TO SARGENT FARMS. TABLET IS SET HORIZONTALLY IN EAST FACE OF CONCRETE COPING, 7.1 M EAST OF CENTRELI NE OF HWY 25, 87 CM NORTH OF SOUTHEAST END OF BRIDGE, 10 CM BELOW TOP OF COPING, 54 CM ABOVE GROUND.

FIELD OBSERVATIONS

THE FIELD OBSERVATIONS REPRESENTED ON THIS PLAN WERE COMPLETED ON THE $27^{\,\mathrm{th}}$ Day of March , 2018

AMENDED PLAN TO SHOW ADDITIONAL TOPOGRAPHIC FEATURES ON THE HOLDOUT PARCEL WITH FIELD OBSERVATIONS COMPLETED THE $\frac{13}{10}^{th}$ DAY OF $\frac{13}{10}^{th}$ APRIL , 2018

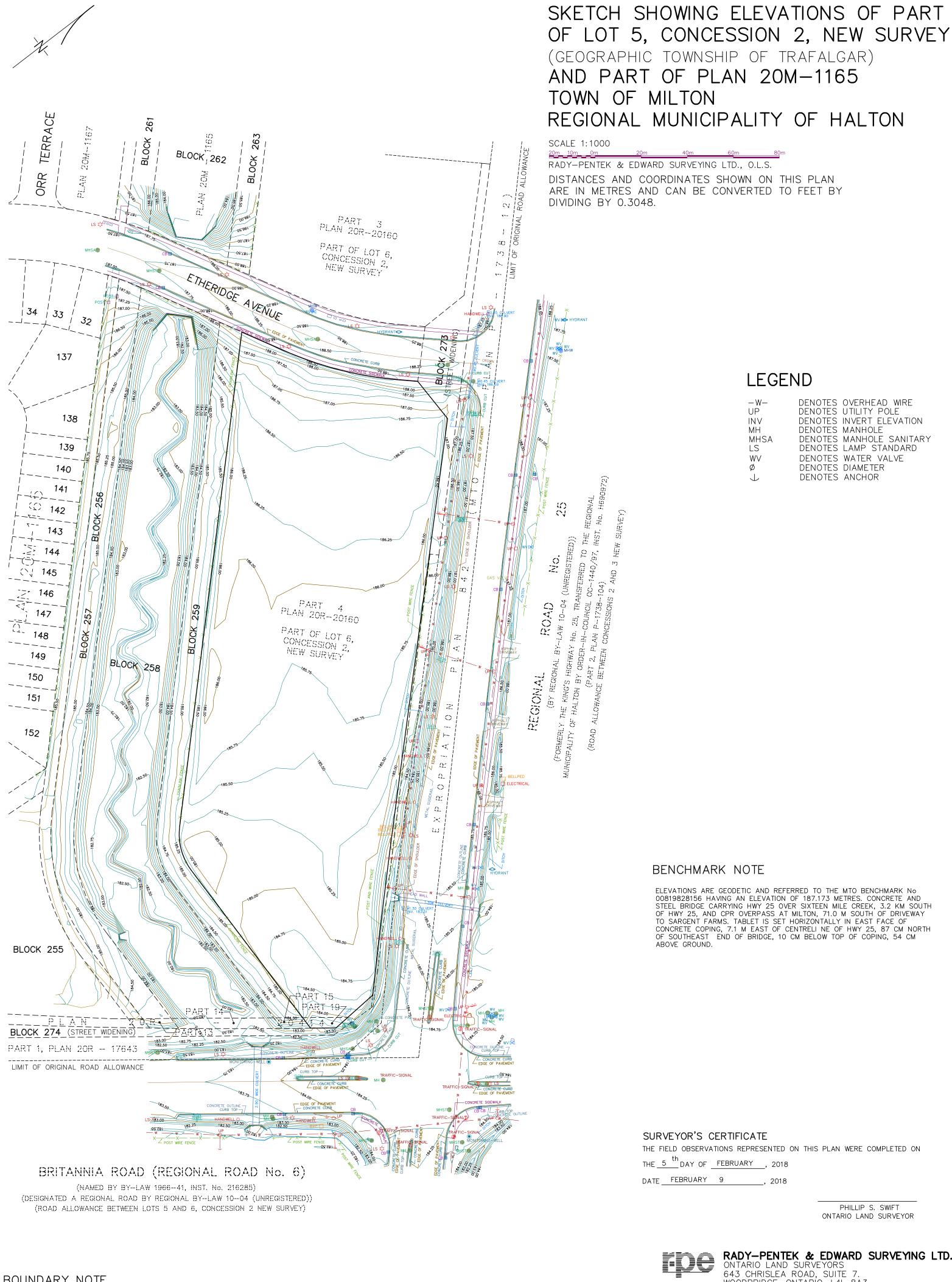


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JOB No. 14-014

CAD FILE 14014tp22a



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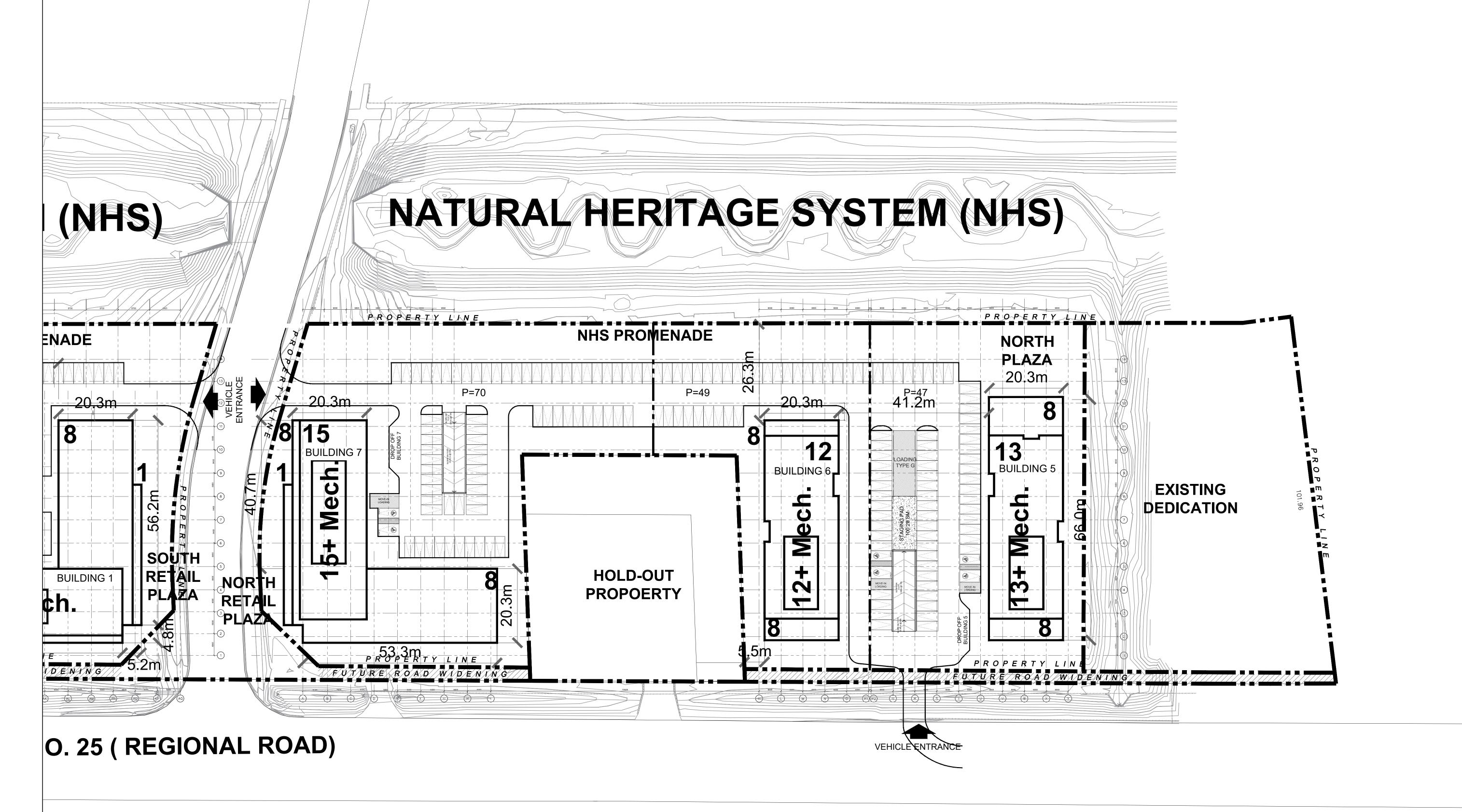
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Feb. 12, 2018 - 16:58





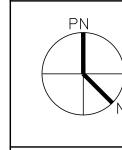
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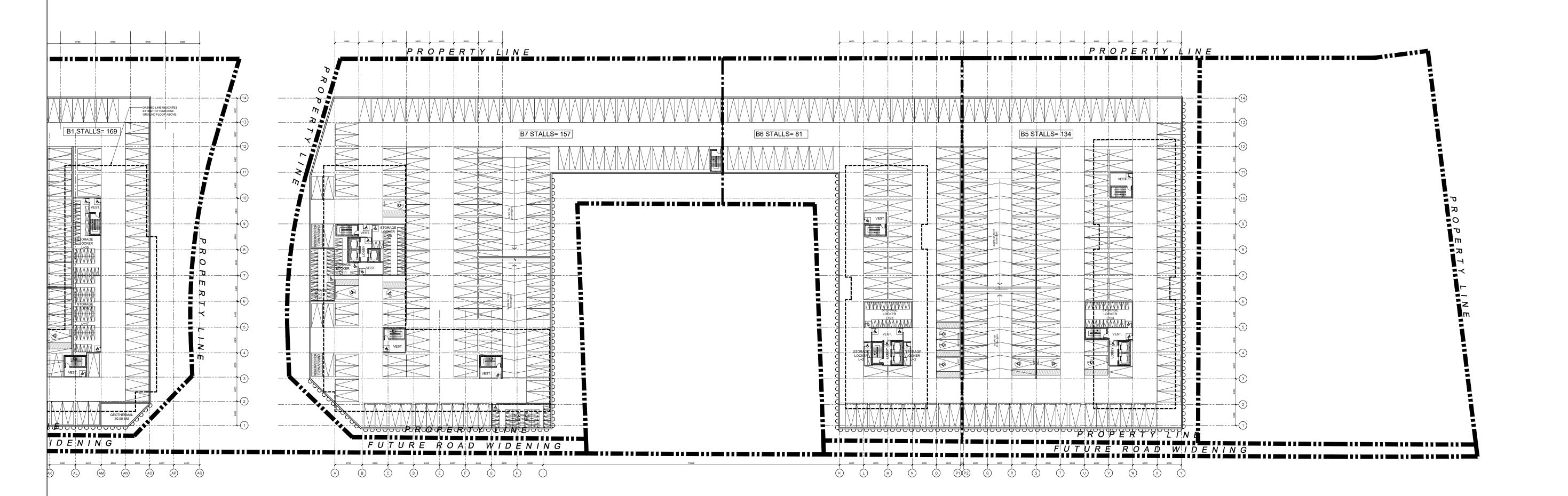
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MILTON WEST, ONTARIO



NORTH BLOCK SITE PLAN

A200



ns

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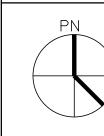
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FRAMGARD MATTAMY

MILTON WEST, ONTARIO



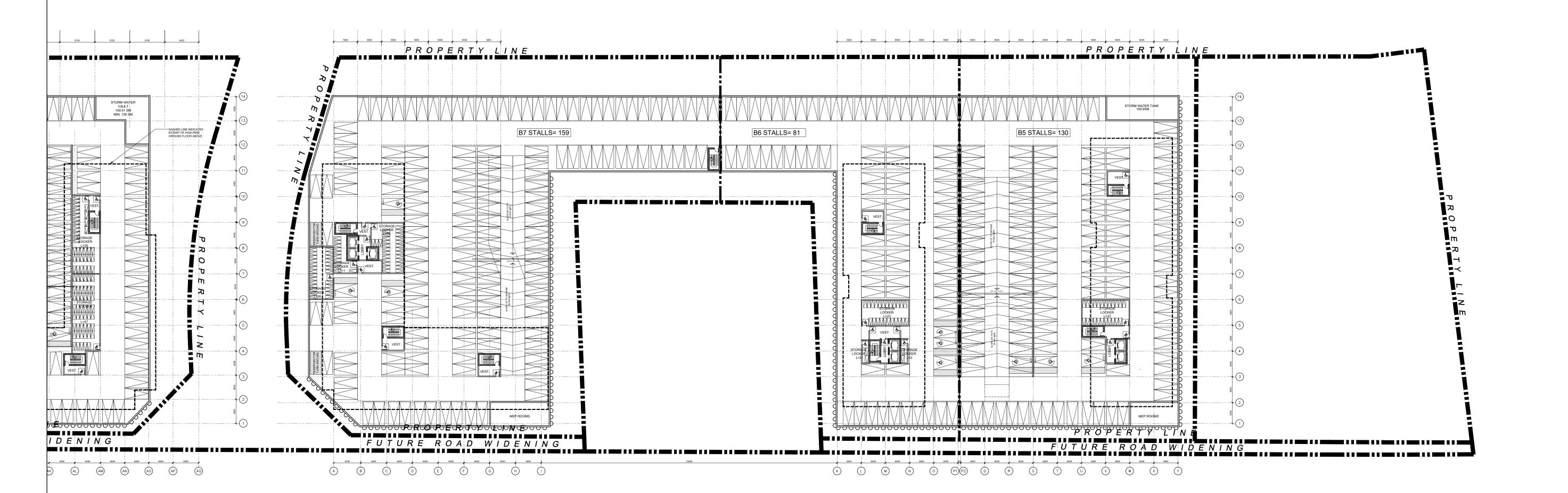
Drawn Scale 1:500

MK, JA 1:500

Checked Date 2023-07-12

NORTH BLOCK PARKING LEVEL P2

Project No. 22-210



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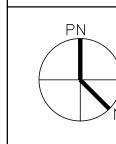
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FRAMGARD MATTAMY

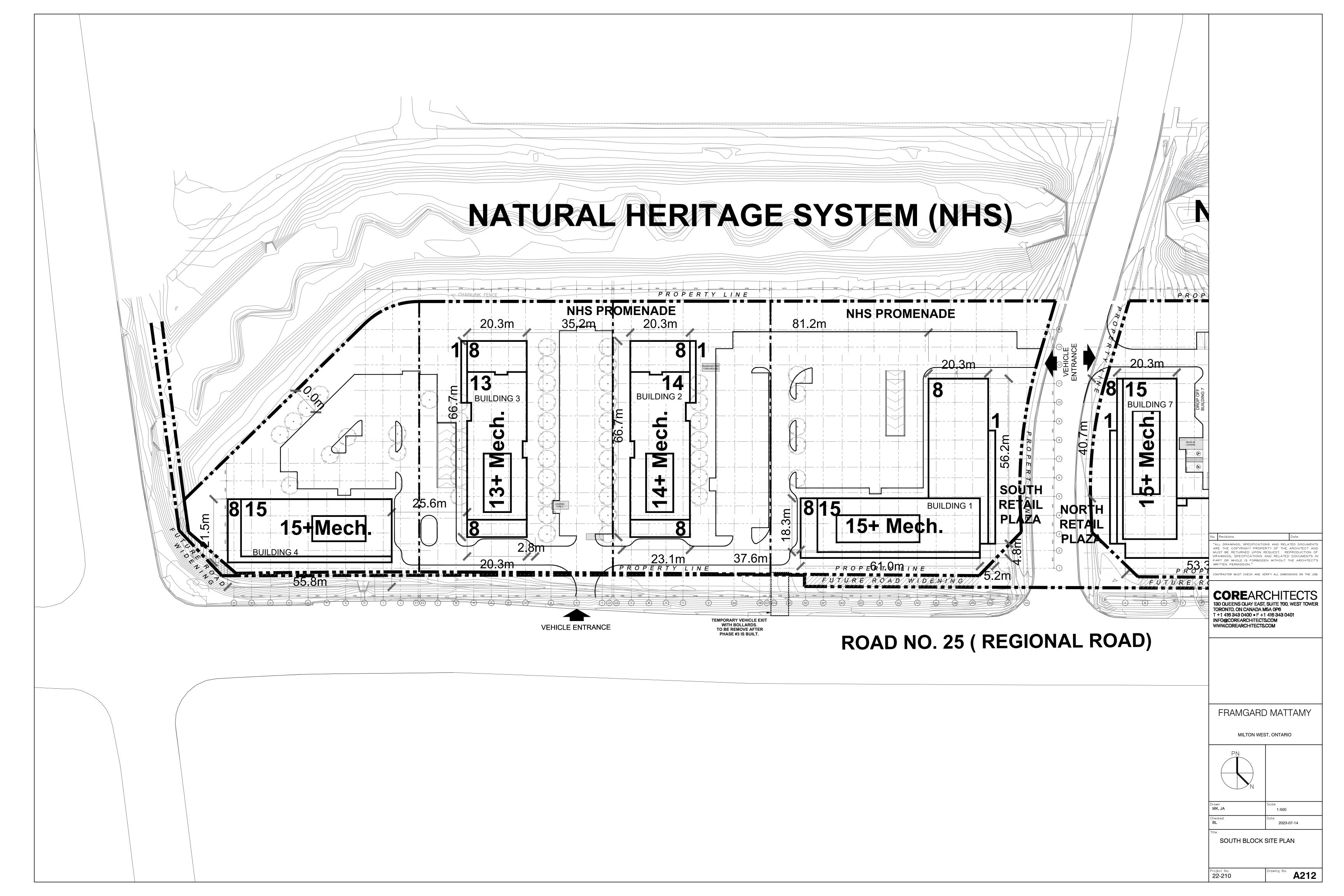
MILTON WEST, ONTARIO

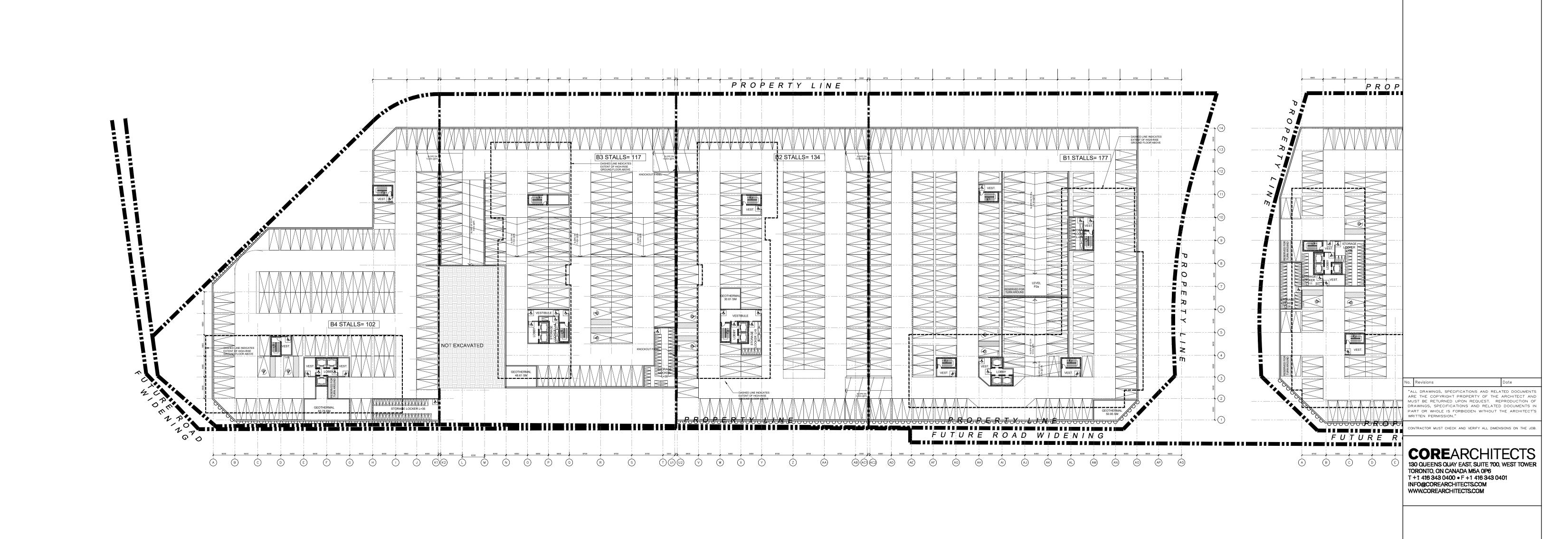


1:500 2023-07-12

> NORTH BLOCK PARKING LEVEL P1

Project No. **22-210**





FRAMGARD MATTAMY

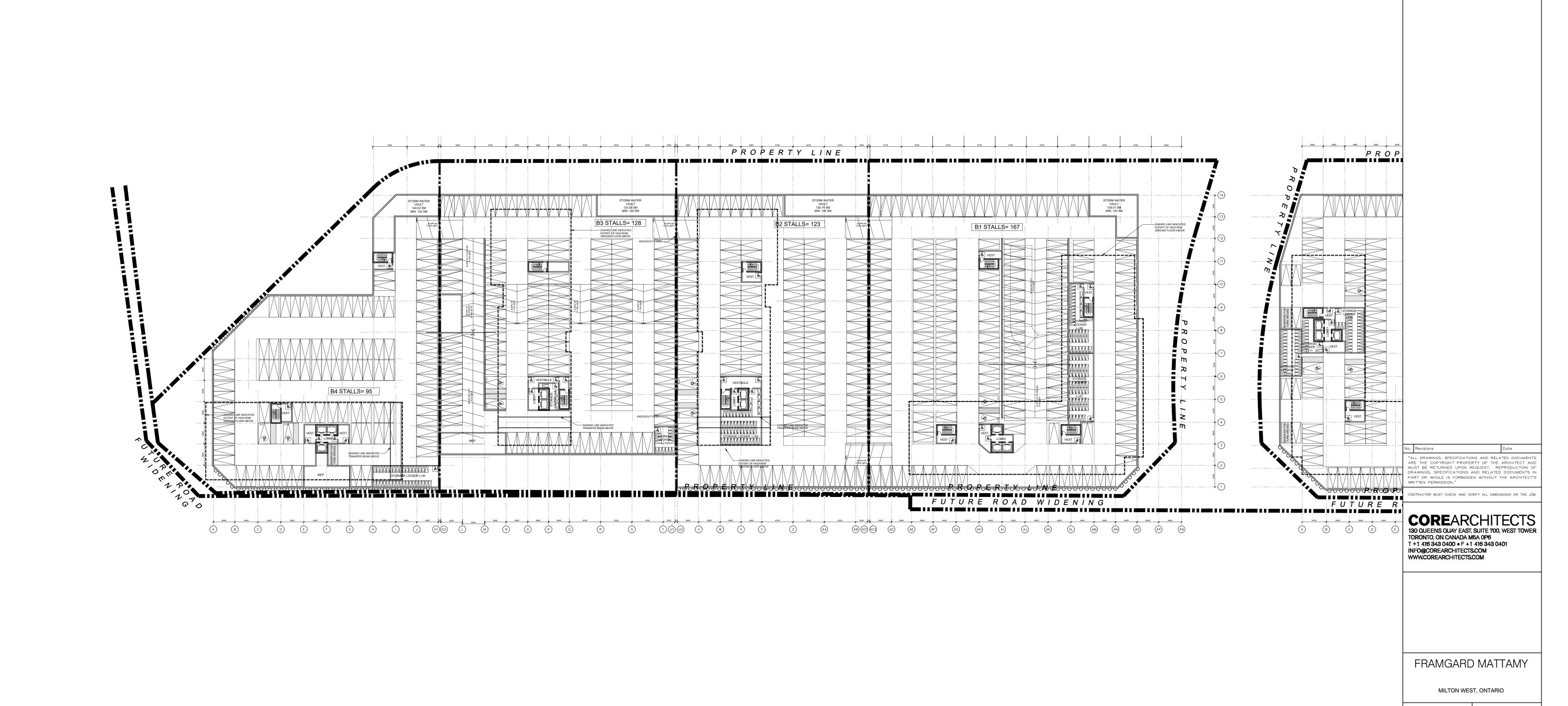
MILTON WEST, ONTARIO

SOUTH BLOCK PARKING LEVEL P2

Project No. **22-210**

1:500

2023-07-14



1:500

SOUTH BLOCK PARKING LEVEL P1

Project No. **22-210**

2023-07-14



PROJECT : G5820

LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario

STARTED : December 20, 2022 COMPLETED : December 20, 2022

WATER LEVEL:

m bgs

MC CLYMONT & RAK ENGINEERS, INC.

SHEET 1 OF 1
DATUM Geodetic

(S	-								⊗			
tre	MET		STRATA PLOT	E1 E) (띪).3m	100 200 300	400	SHEAR STRENGTH: Cu, KPa nat V -	ADDITIONAL LAB. TESTING	PIEZOMETER OR
(metres)	BORING METHOD	DESCRIPTION	ATA F	ELEV. DEPTH	NUMBER	TYPE	BLOWS/0.3m	% LEL - (hexane)		WATER CONTENT, PERCENT wp W	B. TI	STANDPIPE INSTALLATIO
	BOF		STR/	(m)	ž		BLO	20 40 60	80	wp I w I w I w I w I w I w I w I w I w I	₹ 5	
I		GROUND SURFACE	XXXX	186.50						16.9		
		FILL: clayey silt, trace of gravel, organics, topsoil inclusions, rootlets, dark brown, moist, stiff.		_ 185.74. 0.76	1	SS				O 14.5		
		CLAYEY SILT TILL:		0.76	2		30			16.9		
		trace of sand and gravel, reddish brown, moist, very stiff.			3	SS	14			0 12.7		
					4	SS	27			14		
					5	SS	25			0		
				181 93						5.4		
		SANDY SILT: some clay and gravel, reddish brown, moist to wet,		_ 181.93. 4.57	6	SS	69			5.4		
		very dense to dense.										
					7	SS	70			5.5 O		
		- some clayey silt seams at 7.62 m.			8	SS	49			5.9 O		
	AUGER											
	J AU	SANDY SILT TILL:		_ 177.36. 9.14	9	SS	89			14.8 O		
	STEM	trace of gravel, clay, reddish brown, most to wet, very dense.										
Š	HOLLOW	- moist, shale fragments from 10.67 m to 13.72 m.			10	SS	100			6.8		
	HOL											
2					-11	SS	100			9.2		
4		1.1.6			12	SS	100			13.6 O		
1		- shale fragments at 13.87 m.										
6												
			\mathcal{M}		13	SS	100			8.3 O		
			\mathbb{M}									
8				_ 168.21. 18.29	-14	88	100			8.9		
		CLAYEY SILT TILL: trace of sand and gravel, reddish brown, moist, hard.		10.29								
					-15	SS	100			9.3		
0		- grey shale fragments from 19.81 m to 21.39 m.										
				_ 165.11. 21.39	-16		100			14.1 O		
2		End of Borehole		21.39			.00					
		Note:										
4												
3												
,												
<u> </u>												
8												
丄		GROUNDWATER ELEVATION	<u> </u>									

WATER LEVEL:

G5820 **PROJECT**

STARTED

North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario LOCATION

December 21, 2022 SHEET 1 OF 1 COMPLETED : December 21, 2022 DATUM Geodetic

MC CLYMONT & RAK ENGINEERS, INC.

щ	O	25	SOIL PROFILE			SA	MPL	ES	ORG (ppr		VAPOU	R REA	DINGS ⊗	SHEA	R STRI nat V	ENGTH - • - •	: Cu, K	Pa Q - 🗶	٥٫	
DEPTH SCALE (metres)	BORING METHOD			LOT		2		.3m			200 3	00 4	400	2	rem V	- ● 40	60	U - ▲ 80	ADDITIONAL LAB. TESTING	PIEZOMETER OR
TH:	Ŋ		DESCRIPTION	STRATA PLOT	ELEV.	NUMBER	TYPE	BLOWS/0.3m	% L	EL - (l	exane)			WA	ER CC	NTEN	PER	CENT	3. TE	STANDPIPE INSTALLATION
	30RI			TRA.	DEPTH (m)	DN	<u> </u>	3LOV	2	n	40 6	0	80	wp	0 2	0 20	30	H wl 40	I A A	INSTALLATION
	Ī	'	GROUND SURFACE	S	400.75			ш			+0	Î	+		Ĭ	 	+	+		
			STRAIGHT DRILLING TO 9.14 m.		186.75															
-2 -4 -6 -10	POWER BORING	HOLLOW STEM AUGER	SANDY SILT: some clay, some gravel, shale fragments, reddish brown, wet, very dense.		177.61. 9.14	11 12	SS	>100 >100 >100						\$ O \$ C O	1.5					
-16			End of Borehole Note:		15.32															
·18																				
			CPOLINDWATER ELEVATION	Ne	<u> </u>	<u> </u>								<u> </u>						
			GROUNDWATER ELEVATION			, _														
			SHALLOW/SINGLE INSTALLATION	N						ISTA	LLATI	ON				ED :				
			WATER LEVEL: m bgs		V	۷AT	ER L	.⊏VĒ	iL:						CHEC	KED :	CM			

MC CLYMONT & RAK ENGINEERS, INC.

G5820 PROJECT

North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario LOCATION

December 21, 2022 STARTED SHEET 1 OF 1 COMPLETED : December 21, 2022 DATUM Geodetic

щ	ОО	SOIL PROFILE			SA	MPL	ES	ORG (ppr		/APOUI	R REAL	DINGS ⊗	SHEA	R STRE nat V	NGTH:	Cu, KI	Ç - X	ιg	
DEPTH SCALE (metres)	BORING METHOD		LOT		2		.3m			00 3	00 4	00	2	rem V 0 4	- ● 0	50 -	J - ▲ 80	ADDITIONAL LAB. TESTING	PIEZOMETER OR
met (met	NG	DESCRIPTION	TAP	ELEV. DEPTH	NUMBER	TYPE	NS/0	% L	EL - (h	exane)			WAT	ER CO	NTENT	, PERO		B. 7E	STANDPIPE INSTALLATION
DE	BOR		STRATA PLOT	(m)	N	-	BLOWS/0.3m	2	0 4	10 6	§0 (30	wp 1	0 2	0 ;	30	1 wl 40	\[\]	
		GROUND SURFACE		186.75															
2 4 6 8 10	POWER BORING HOLLOW STEM AUGER	SANDY SILT: some clay, some gravel, shale fragments, reddish brown, wet, very dense.		_ 177.61 9.14	10	SS	>100 >100						0	.2					
16		End of Borehole Note:		- 171.38 15.37	13	SS	>100							12.7					
		GROUNDWATER ELEVATIO																	
		$^{ u}$ SHALLOW/SINGLE INSTALLATION	N	_	De	ΞEΡ	/DL	JAL IN	ISTA	LLATI	ON			LOGGF	D :	BR			
		WATER LEVEL: m bgs			VATI											-11			

G5820 PROJECT

North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario LOCATION

STARTED December 19, 2022 MC CLYMONT & RAK ENGINEERS, INC.

SHEET 1 OF 1 DATUM Geodetic

	면	SOIL PROFILE	1.		SA	MPL	.ES	ORGANIC VAPOUR RI (ppm)	EADINGS ⊗	SHEAR STRENGTH: Cu, KPa nat V - • Q- rem V - • U -	× Z	
tres)	MET		PLOT		监	l	0.3m	100 200 300	400 I	20 40 60 80	FSTI	PIEZOMETER OR STANDPIPE
metres)	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH	NUMBER	TYPE	BLOWS/0.3m	% LEL - (hexane)		WATER CONTENT, PERCE	$I \cap m I$	STANDPIPE INSTALLATION
5	BOF		STR	(m)	Ž		BLC	20 40 60	80	10 20 30 40	v 4 3	
	T	GROUND SURFACE		187.50						40.4		
		FILL: sand and gravel, reddish brown, dry, compact.	\bowtie		1	ss	13			12.4 O		
		SANDY SILT:		186.74 0.76		00				13.4		
		trace of gravel, reddish brown, moist to wet, compact to very dense.			2	55	27					
2					3	ss	34			12.9 O		
_										11.1		
					4	SS	32					
				1	5	ss	37			11.7 O		
4												
		- trace of clay, compact from 4.57 m to 6.10 m.]	6	ss	14			12.8 O		
				:	É	F						
]								
6		- some clay, some gravel, shale fragments from 6.10 m to 16.79 m.			7	ss	40			8.2 O		
					Ľ	-	1					
	POWER BORING SOLID STEM AUGER											
_	30RII M AU			1	8	SS	 - -			9.8		
8	IRE STE											
	Pow											
	S				9	SS	 - -			8.7		
					۳		100					
10												
				•	10	SS	100			7.2		
					10	33	7100					
				•								
12					11	SS	≥ 100			10.7		
					Ü	-						
				-	_					10.5		
14				.]	12	SS	80					
					12	SS	100			10.5		
				-	13	00	100					
16												
	\perp			170.71 16.79	14	88	>100			14.2		
		End of Borehole		10.79								
		Note:										
18												
18		GROUNDWATER ELEVATION	NS NS		<u> </u>					1	1 1	
		∇ SHALLOW/SINGLE INSTALLATION			יח.	EER	ו ח/כו	IAL INSTALLATION	J			
		WATER LEVEL: m bgs	/ I N		ال - VAT				٠	LOGGED : BR		

G5820 PROJECT

North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario LOCATION

STARTED December 22, 2022

SHEET 1 OF 1 DATUM Geodetic

MC CLYMONT & RAK ENGINEERS, INC.

COMPLETED : December 22, 2022

111	σc	SOIL PROFILE			SA	MPL	ES	ORGANIC VAPOUR R		SHEAR STF nat \ rem \	RENGTH	Cu, K	Pa Q - ¥		
DEPTH SCALE (metres)	BORING METHOD	-	TC				_	(ppm) 100 200 300	⊗ 400	rem \		30	Ŭ - ▲ 80	ADDITIONAL LAB. TESTING	PIEZOMETER
netre	G ME	DESCRIPTION	STRATA PLOT	ELEV.	NUMBER	TYPE	BLOWS/0.3m	% LEL - (hexane)		WATER C	ONTENT	PFR		TES	OR STANDPIPE
C.	JRIN	DESCRIPTION	RAT,	DEPTH	NOM	\(\(\)	ŏ	, ,		wp —	ow		H wl	ADE LAB.	INSTALLATION
_	H		ST	(m)	Ĺ		Щ	20 40 60	80	10	20	30	40		
	\vdash	GROUND SURFACE FILL:	***	186.75							19.2		+		
		sand, organics, rootlets, dark brown, moist, loose.		405.00	1	SS	7				9				
		SILTY SAND: brown, moist, dense.	T	185.99 0.76	2	SS	46				19.5				
		brown, moist, dense.		:											
.2					3	ss	50				19.5 O				
_		CLAYEY SILT:		184.46 2.29						11.9 O					
		some sand, shale fragments, reddish brown to grey, moist to wet, hard to very stiff.		1	4	SS	48								
			\mathcal{U}]	5	ss	40			10.2 O					
			\mathbb{H}												
4			\mathbb{R}	1											
			\mathbb{R}	1	6	SS	24			11.4					
				1	Ľ	00	27								
]											
6	POWER BORING HOLLOW STEM AUGER	- hard from 6.10 m to 10.67 m.	W		7	SS	49			7.2 O					
	ORIN M AU	1	\mathbb{H}	1	Ľ	33	49								
	STE			1											
	POWER BORING			1						7.4 O					
8	빌]	8	SS	62								
			\mathbb{H}												
			\mathbb{M}							10.3					
				1	9	SS	58								
10			\mathbb{R}	1											
				470.00											
		SANDY SILT:		176.08 10.67	10	SS	100			10 					
		some clay, some gravel, shale fragments, reddish brown, wet, very dense.													
10															
12					11	SS	 - 			12.3 O					
		SAND & GRAVEL:		173.03 13.72	12	-	400			12.4 O					
14		SAND & GRAVEL: brown, wet, very dense.	•]	12	SS	P ¹⁰⁰								
			•												
		5 1 (2) 1 1	•	171.51 15.24											
		End of Borehole Note:		15.24											
16		Note.													
18															
			\perp												
		GROUNDWATER ELEVATION													
		abla shallow/single installatio	NC	<u> </u>	- DI	EEF	P/DL	IAL INSTALLATIO	N	LOGG	SED :	BR			
		WATER LEVEL: m bgs		٧	VAT	ER L	EVE	L:		CHEC	KED :	СМ			

PROJECT : G5820

LOCATION : North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario

MC CLYMONT & RAK ENGINEERS, INC. SHEET 1 OF 1

STARTED: January 3, 2023 COMPLETED: January 3, 2023

DATUM Geodetic

	00		SOIL PROFILE			SA	MPL	ES	(ppm)	C VAP	OUR RI	EADINGS ⊗	SHEA	R STRI nat V rem V	ENGTH	Cu, K	Pa Q - X	ا ن	
(metres)	BORING METHOD			TO.		~		3m	100	200	300	400	2	rem V	- • 10 (30	U - ▲ 80	ADDITIONAL LAB. TESTING	PIEZOMETER OR
netre	2		DESCRIPTION	A PL	ELEV.	IBEF	TYPE	S/0.3	% LEL -				WA	TER CC	NTENT	PFR		ĔĦ	STANDPIPE
١	RIN		DESCRIPTION	STRATA PLOT	DEPTH	NUMBER	_	BLOWS/0.3m		(,		wp	—	ow		H wl	AB.	INSTALLATION
┙	В	í		STI	(m)	_		B	20	40	60	80	1	0 2	20 :	30	40		
4	_	4	GROUND SURFACE		186.00														
			STRAIGHT DRILLING TO 9.14 m.																
I																			
		띪																	
	POWER BORING	NG																	
	NO R	Σ																	
	H.B	STE																	
	OWE	Š.																	
	۵	밁																	
		-1																	
		ŀ	SANDY SILT:	1117	176.86 9.14									13					
			some clay, some gravel, shale fragments, reddish brown, wet, very dense.			9	ss	>100						0					
			brown, wet, very dense.		1														
Ĭ					<u>:</u>														
			- trace of shale, gravel from 10.67 m to 15.24 m.]	10	SS	>100						9.4)					
2					1									0.6					
					<u>:</u>	11	SS	>100						9.6)					
]														
														11					
1			- moist from 13.72 m to 15.24 m.		1	12	SS	>100						þ					
]														
					170.61 15.39	13	SS	>100						11.1 O					
Ī			End of Borehole		15.39														
3			Note:																
-																			
3																			
-																			
3																			
			GROUNDWATER ELEVATION										l						

MCR LOG ENVIRONMENTAL 5820.GPJ 1-26-23

¥ SHALLOW/SINGLE INSTALLATION WATER LEVEL: m bgs

▼ DEEP/DUAL INSTALLATION WATER LEVEL:

LOGGED : BR CHECKED : CM

G5820 PROJECT

North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario LOCATION

MC CLYMONT & RAK ENGINEERS, INC. January 3, 2023 STARTED SHEET 1 OF 1 COMPLETED : January 3, 2023 DATUM Geodetic

ш	ОО	SOIL PROFILE			SAM	PLE	s	ORG.		/APOU	R RE	ADINGS ⊗	SHE	AR STR nat V rem V	ENGTH	l: Cu, I	⟨Pa Q - X	. (1)	
DEPTH SCALE (metres)	BORING METHOD		FOT		2	,	3m	10		00 3	800	400		rem V 20	- ● 40	60	U - ▲ 80	ADDITIONAL LAB. TESTING	PIEZOMETER OR
TH (NG N	DESCRIPTION	TA PI	ELEV.	NUMBER	<u>ا</u> ا	.0/S/0	% LI	EL - (h	exane)			WA	TER CO	NTEN	T, PEF	RCENT	3. TELE	STANDPIPE INSTALLATION
DE	BORI		STRATA PLOT	DEPTH (m)	₽	- 8	BLOWS/0.3m	20) 4	10 6	60	80	w	10	20 V	30	⊣ wl 40	LAB AC	INOTALLATION
	Т	GROUND SURFACE	0)	185.50		$^{+}$	\dagger					+	+						
		FILL: sand, trace of gravel, organics, brown, moist, compact.	\bowtie		1 8	SS 1	12												
		SANDY SILT: trace of clay, brown, moist, compact.		184.74 0.76	2 8	SS 1	12												
					3 8	SS 2	20												
-2		SILTY CLAY:		183.21 2.29		=	18							14. O	4				
		reddish brown, moist to wet, very stiff to hard.												12.8					
					5 8	SS 3	39							0					
-4																			
					6 8	ss 3	35							12.3 O					
-6	NG UGER				7 8	SS 5	50							1 0	7.4				
	BORII TEM A																		
	POWER BORING HOLLOW STEM AUGER				\sqcup									11.4					
-8	ᆔ				8 8	SS 6	60							0					
					9 8	ss e	65							10.7					
-10																			
		SANDY SILT:		174.83 10.67	10 S	SS >1	100							12.7 O					
		some clay, some gravel, shale fragments, reddish brown, wet, very dense.																	
-12					11 8	201	100							9.9					
					11113	<u> </u>	100												
•																			
14					12 S	SS>1	100							9.1 3					
		End of Borehole		170.21 15.29	13 8	S >1	100							14. O	8				
·16		Note:																	
·18																			
10																			
		GROUNDWATER ELEVATION											•	1	1		'	•	
		☐ SHALLOW/SINGLE INSTALLATION	N		DEE				ISTA	LLAT	ION			LOGG					
		WATER LEVEL: m bgs		V	VATEF	(LE	:VEL	:						CHEC	KED :	CM	1		

G5820 PROJECT

North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario LOCATION

MC CLYMONT & RAK ENGINEERS, INC.

STARTED January 3, 2023 COMPLETED :

January 3, 2023

SHEET 1 OF 1 DATUM Geodetic

	阜		SOIL PROFILE			SA	MPL	ES.	ORGANIC (ppm)	VAPO	UK KE	ADINGS ⊗	SHEA	nat V rem V	ENGTH: - 🖶 - 🍑	: Cu, KI (a Q - X	Ę, r	
(metres)	BORING METHOD			STRATA PLOT		띪		BLOWS/0.3m	100 2	00	300	400		20 4	40 6	60	80	ADDITIONAL LAB. TESTING	PIEZOMETER OR
(me	NG		DESCRIPTION	TAF	ELEV. DEPTH	NUMBER	TYPE	WS/C	% LEL - (I	exane)				ONTENT	, PERC		DDIT B. TE	STANDPIPE INSTALLATION
	BOR			TRA	(m)	_≥	[BLO	20	40	60	80	wp	0	w 20 :	30	l wl 40	₹₹	
\dashv	Ť	GR	OUND SURFACE	100	185.00	\vdash		H		+	+		1				+		
		STF	RAIGHT DRILLING TO 9.14 m.		100.00														
																	1		
													1						
																	1		
	, l	į															1		
	RING FING	ž											1						
	POWER BORING												1						
	WER																		
		ál.																	
	Ĭ	=											1						
													1						
		SAN	NDY SILT:		175.86 9.14	9	00	>100						10.9					
		son	ne clay, some gravel, shale fragments, reddish wn, wet, very dense.			9	33	7100						٢					
0			,,,]														
														127					
						10	SS	>100						12.7 O					
2					-														
۱ ٔ						11	SS	>100						9.2					
						12	SS	>100						9.2					
4]	<u> </u>	55	,50									1		
- [1						
					169 71			100						.6			1		
Ī		End	of Borehole	Τ	169.71 15.29	13 ⁻	35	100									1		
6		Not	e:														1		
																	1		
													1						
																	1		
,													1						
5																	1		
													1						
													1						
8			GROUNDWATER ELEVATION)///c		<u> </u>							1				1		
		,									TIC:-								
		-	$^{ortheta}$ shallow/single installatic	N		D	=EP	/DU	AL INSTA	LLA	HON			LOGG	ED :	BR			

G5820 PROJECT

North-western corner of Regional Road 25 and Britannia Road, Milton, Ontario LOCATION

SHEET 1 OF 1

MC CLYMONT & RAK ENGINEERS, INC.

STARTED January 3, 2023 January 3, 2023

DATUM Geodetic

- ((JIVII	PLE	TED : January 3, 2023									TUM Geodetic
щ	-0	ОD	SOIL PROFILE			SA	MPL	.ES	ORGANIC VAPOUR READINGS (ppm) ⊗	SHEAR STRENGT nat V - • rem V - •	H: Cu, KPa Q - ≭	, o
DEPTH SCALE (metres)	l	BORING METHOD		TO.		~		3m	100 200 300 400	rem V - ● 20 40	U - ▲ 60 80	PIEZOMETER OR STANDPIPE INSTALLATION
netre		⊠ B	DESCRIPTION	A P.L	ELEV.	盟	TYPE	8/0.3	% LEL - (hexane)	WATER CONTEN	IT. PERCENT	STANDPIPE
با ب		NIN	DESCRIPTION	STRATA PLOT	DEPTH	NUMBER	≿	BLOWS/0.3m	, , –	wp ⊢ →	w w	installatioi
	Ľ	BŒ		ST	(m)			В	20 40 60 80	10 20	30 40	
	_		GROUND SURFACE FILL:	 	184.75							
			sand, trace of gravel, organics, rootlets, brown, moist, loose.	\bowtie		١,				13.1 O		
			moist, loose.	\bowtie		1	SS	8				
				\bowtie	102.00							
			SANDY SILT: trace of clay, reddish brown, moist, dense.		183.99 0.76					11		
			trace of clay, reduish brown, moist, dense.			2	SS	33				
					1							
]	3	ss	30		13.3 O		
2												
					182.46							
			SILT & CLAY: some sand, trace of gravel, shale fragments, reddish brown, moist, hard.		182.46 2.29					12.4		
			brown, moist, hard.			4	SS	41				
		~			1							
	<u>0</u>	HOLLOW STEM AUGER				_				1 124		
	POWER BORING	MAL				5	ss	32		13.4 O		
	R B(STE										
	OWE	NO.										
4	Ф	10L										
		-										
										9.8 O		
						6	SS	47				
6												
						_		40		9.3		
						7	SS	40				
	-		End of Borehole	11/X/	177.43 7.32	1						
			Note:									
8												
	_		GROUNDWATER ELEVATION)VIC		Щ						
						,						
			\overline{Y} SHALLOW/SINGLE INSTALLATION	N					IAL INSTALLATION	LOGGED	: BR	
			WATER LEVEL: m bgs		V	VAT	ER L	.EVE	L:	CHECKED	: CM	

RECORD OF BOREHOLE 1 Project No.: T18721 ORIGINATED BY: M.Z. CLIENT: Mattamy Willmott Limited March 1, 2018 DATE: LOCATION: COMPILED BY: M.Z. Milton, ON 83 Citation Dr, Unit 9, BOREHOLE TYPE: Solid Stem Augers DATUM: Geodetic CHECKED BY: H.S. Vaughan, Ontario, L4K 2Z6 **SOIL PROFILE SAMPLES** WATER CONTENT REMARKS AND DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 MONITORING GROUND WATER CONDITIONS SAMPLE NUMBER (%) **GRAIN SIZE** (cm) DEPTH SCALE (metres) PLOT WELL DISTRIBUTION 'N" VALUES ELEVATION (metres) DESCRIPTION RECOVERY (%) SHEAR STRENGTH kPa STRATA TYPE GR SA SI CL 40 60 80 100 5 15 25 35 184.7 Ground Surface dark mottled brown Silty Clay/Clayey Silt Fill some topsoil, some organic stains SS 33 1 13 184.3 some rootlets, damp 13 reddish brown 13 Silty Clay/Clayey Silt Till 2 SS 25 17 some sand, occ. oxidized fissures damp, very stiff 13 3 SS 28 28 2 March 9, 2018 Gradation Analysis March 16, 2018 13 S(4): 2 15 51 32 occ. shale fragments hard SS 25 40 3-13 5 SS 30 38 181.0 reddish brown ٥٠ Clayey Sandy Silt Till .0. 9 occ. silt seams, trace sand seams SS 6 41 67 occ. oxidized fissures damp, hard ٥٥ 180.2 9 reddish brown Silty Clay/Clayey Silt Till 7 SS 38 74 occ. gravel, occ. oxidized fissures damp, hard 5-Practical Auger 179.2 Refusal @ ~5.5m , α (° • Β., due to possible grey Clayey Sandy Silt Till cobble/boulder ٥° borehole moved 1m occ. oxidized fissures to the east and redamp, hard 6 drilled. ۰0° 10 SS 25 8 71 • Q ° , Q., ۰0° 177.7

				F	REC	OR	D OF B	ORE	НС	LE 1									
Project	No.: T	18721	CLIENT	:		Mat	tamy Willm	ott Lir	nited			(ORIGINA	ATED I	BY:	M.Z			
DATE:			LOCATI	ON:		Milt	on, ON					(COMPIL	ED BY	/:	M.Z		SHAD & ASS	OCIATES INC.
DATUM	: G	eodetic	BOREH	OLE	TYPE	: Soli	id Stem Au	gers					CHECKE	D BY	:	H.S		83 Citatio	n Dr, Unit 9, ntario, L4K 2Z6
		SOIL PROFILE				AMPL								MAT	ED (CONT	TENT	, augnun, o.	REMARKS ANI
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	"N"VALUES	GROUND WATER CONDITIONS	1	RESI 20 40 SHEAR	ISTANO 60	DE PLO 80 NGTH	100		(ª	%)	35	MONITORING WELL	GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	-	grey Silty Sand/Sandy Silt Till occ. gravel, occ. shale fragments	4 G*											10	0				
176.7	8 -	damp, very dense End of Borehole	4.64	9	SS	18	50/13cm												
	_ _ _	Cave-in Depth on Completion: None Groundwater Depth on Completion: Dry																	
	- - -	Measured Water Level in installed Monitoring Well on:																	
	9-	March 9, 2018: 2.8m March 16, 2018: 2.9m																	
	- - -													_					
	10																		
	- - -																		
	11-																		
	''																		
														-					
	12																		
	- - -																		
	_ _ _																		
	13																		
	- - - -																		
	=																		
	14																		

RECORD OF BOREHOLE 2 Project No.: T18721 ORIGINATED BY: M.Z. CLIENT: Mattamy Willmott Limited March 1, 2018 COMPILED BY: M.Z. DATE: LOCATION: Milton, ON 83 Citation Dr, Unit 9, BOREHOLE TYPE: Solid Stem Augers Geodetic DATUM: CHECKED BY: H.S. Vaughan, Ontario, L4K 2Z6 **SOIL PROFILE SAMPLES** WATER CONTENT REMARKS AND DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 MONITORING GROUND WATER CONDITIONS SAMPLE NUMBER (%) **GRAIN SIZE** (cm) DEPTH SCALE (metres) PLOT WELL DISTRIBUTION 'N" VALUES ELEVATION (metres) DESCRIPTION RECOVERY (%) STRATA I SHEAR STRENGTH kPa TYPE GR SA SI CL 40 60 80 100 5 15 25 35 185.4 Ground Surface dark mottled brown Silty Clay/Clayey Silt Fill some topsoil, some organic stains SS 41 1 16 185.0 some rootlets, damp 8 mottled reddish brown Compacted Silty Clay/Clayey Silt Fill damp, very stiff 15 SS 28 2 16 184.1 16 very stiff 3 SS 20 18 2reddish brown Silty Clay/Clayey Silt Till trace to some sand 15 occ. oxidized fissures SS 28 42 damp, hard 3occ. gravel, occ. shale fragments 13 5 SS 35 10 trace to some sand SS 6 35 88 10 SS 30 7 50 greyish brown 5 sandy silt till seams grey 6 occ. silty sand/sandy silt till SS 28 8 71 178.4

				F	REC	OR	D OF B	ORE	НО	LE	2									\wedge
Project	No.: <u>T</u> 1	18721	CLIENT:	;		Mat	tamy Willm	ott Liı	nited				ORI	GINA	TED I	BY:	M.Z			
DATE:		arch 1, 2018	LOCATI	ON:		Milt	on, ON						CO	MPILE	ED BY	/:	M.Z		SHAD & ASS	OCIATES INC.
DATUM		eodetic	BOREH	OLE	TYPE		id Stem Au						СНЕ	CKF	D BY	:	H.S		83 Citatio	n Dr, Unit 9, ntario, L4K 2Z6
		SOIL PROFILE				AMPL		J.=1.=	<u> </u>											
				8		_		œ		RF.	SISTA	NCF F	ETRA1		WAT		CON1 %)	ΓENT	MONITORING	REMARKS AND GRAIN SIZE
ELEVATION (mefres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES	GROUND WATER CONDITIONS	A	SHEA		RENG	T H kPa	•	5			35	WELL	DISTRIBUTION (%) GR SA SI CL
	- - - -	grey Clayey Sandy Silt Till damp, hard	- B				50/13cm								9					
177.6	8-	End of Borehole		9	SS	13	50/13011								0					
	- - -	Cave-in Depth on Completion: 7.2m Groundwater Depth on Completion: Dry	,																	
	_																			
	-																			
	9-																			
	- - -																			
	-																			
	10-																			
	- - -																			
	-																			
	11 -																			
	-																			
	- - -																			
	-																			
	12-																			
	_ _ _																			
	_																			
	13																			
	14																			

				F	REC	OR	D OF B	ORE	HOLE 3				
Project	No.: T1	18721	CLIENT	:		Mat	tamy Willn	nott Li	nited	ORIGINA	ATED BY: M.Z.		
DATE:		arch 1, 2018	LOCATI	ON:		Milt	on, ON			COMPIL	ED BY: M.Z.	SHAD & ASSO	OCIATES INC.
DATUM	: <u>G</u>	eodetic	BOREH	OLE	ГҮРЕ	: Sol	id Stem Au	igers		CHECKE	D BY: H.S.	83 Citation	n Dr, Unit 9, ntario, L4K 2Z6
		SOIL PROFILE			s	AMPI	-ES				WATER CONTENT		REMARKS AND
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES	GROUND WATER CONDITIONS	PYNAMIC CONE PI RESISTANCE 20 40 60 SHEAR STREN 20 40 60	E PLOT 80 100 IGTH kPa	(%) 5 15 25 35	MONITORING WELL	GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
185.8		Ground Surface									25		
185.4	0 _	dark mottled brown Silty Clay/Clayey Silt Fill some topsoil, some organic stains some rootlets, damp		1	SS	33	10				0		
	=	mottled reddish brown Compacted Silty Clay/Clayey Silt Fil damp, stiff	I 💮								0		
184.9	1-	brown, occ. reddish brown Silty Clay/Clayey Silt Till		2	SS	25	32				13		
	-	trace to some sand occ. oxidized fissures											
	-	damp, hard		3	SS	23	36				18		
	2										-		
	-										40		
	- -			4	SS	35	41				12		
]												
	3-			_	00						11	rch 9, 2018	
	-			5	SS	28	57				0	March 9,	
	- - -												
	4			6	SS	38	35				13		
181.4		grey											
	_ _ _ _	grey Sandy Silt Till some clay, occ. oxidized fissures damp, hard		7	SS	35	39				9		
	5	чатр, пагч											
180.3													
	=		. D.										
	6	grey Clayey Sandy Silt Till trace shale fragments	. O.	0									
	- - -	damp, hard	, O.		00	20	70						
	_		° ₽°	8	SS	30	79				9		
	=		. O.										
	7-		, O°										
			. D.										

					REC	OR	D OF B	ORE	HOLE 3				\wedge
Project	No.: T	18721	CLIEN	T:		Mat	tamy Willm	ott Liı	nited	ORIGINA	ATED BY: M.Z.		
DATE:	· M	larch 1, 2018	LOCA	TION:		Milt	on, ON			COMPIL	ED BY: M.Z.	SHAD & ASS	OCIATES INC.
DATUM	l: G	eodetic	BORE	HOLE	TYPE	: Soli	d Stem Au	gers		CHECKE	D BY: H.S.	83 Citatio	n Dr, Unit 9, ntario, L4K 2Z6
		SOIL PROFILE				SAMPL					WATER CONTENT	, a.u. g , c.	REMARKS AND
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER		RECOVERY (cm)	" N " VALUES	GROUND WATER CONDITIONS	PYNAMIC CONE PI RESISTANCI 20 40 60 SHEAR STREM	E PLOT 80 100	(%)	MONITORING WELL	GRAIN SIZE DISTRIBUTION (%)
ELE/	DEP.		STR		TYPE	REC	Z	GRO SON	20 40 60	80 100	5 15 25 35		GR SA SI CL
	-	grey	. Q	, ,							-		
177.7	8-	grey Clayey Sandy Silt Till damp, hard	• 0	No.	SS	30	71				10		
	-	End of Borehole Cave-in Depth on Completion: 7.3m											
	-	Groundwater Depth on Completion: Dry	'								-		
	-	Measured Water Level in installed Monitoring Well on:											
	9-	March 9, 2018: 3.7m March 16, 2018: 3.6m											
	_												
	-												
	10												
	-												
	-										-		
	-												
	11 -												
	_												
	-										-		
	12												
	-										-		
	-												
	13												
	-												
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	14 —												
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											1		

				F	REC	OR	D OF B	ORE	HOLE 4				
Project	No.:	T18721	CLIENT	:		Mat	tamy Willm	ott Lir	nited	ORIGIN <i>A</i>	ATED BY: M.Z.		
DATE:		March 1, 2018	LOCATI	ON:		Milt	on, ON			COMPIL	ED BY: M.Z.	SHAD & ASSO	OCIATES INC.
DATUM	l:	Geodetic	BOREH	OLE	TYPE	: Sol	id Stem Au	gers		CHECKE	D BY: H.S.	83 Citatio Vaughan, Or	n Dr, Unit 9, Itario, L4K 2Z6
		SOIL PROFILE			S	AMPI	LES				WATER CONTENT		REMARKS AND
TION es)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER		RECOVERY (cm)	N " VALUES	GROUND WATER CONDITIONS		ONE PENETRATION STANCE PLOT 60 80 100 STRENGTH kPa	(%)	MONITORING WELL	GRAIN SIZE DISTRIBUTION (%)
ELEVATION (metres)	DEPTH (metr		STRAT	SAMPI	TYPE	RECO		GROUI	20 40	60 80 100	5 15 25 35		GR SA SI CL
185.1		Ground Surface										-	
184.5	0	dark brown Silty Clay/Clayey Silt Fill some topsoil, damp		1	SS	38	8				16		
		occ. organic stains											
	1	trace to some sand		2	ss	30	22				15		
		occ. oxidized fissures damp, very stiff											
		-		3	ss	25	26				17		
	2		-										
		hard		4	ss	28	46				13		
	3	_									-	, 2018	
				5	SS	20	46				13	March 9, 2018	
181.4	_												
	4	reddish brown Clayey Sandy Silt Till occ. oxidized fissures damp, hard		6	SS	20	48				10		
			-										
		occ. shale fragments		7	ss	13	50/8cm				9		
	5	_									-		
	6	_									10		
				8	SS	15	78/23cm				10		
		=											
178.1	7	-											
			. D.										
		4	, 0		1								

				F	REC	OR	D OF B	ORE	HO	LE 4	ļ.							3	
Project	No.: T	18721	CLIENT				tamy Willm					(ORIGINA	ATED	BY:	M.Z			
DATE:		arch 1, 2018	LOCATI	ON:		Milt	ton, ON					(COMPIL	ED B	Υ:	M.Z		SHAD & ASS	OCIATES INC.
DATUM	: G	eodetic	BOREH	OLE	TYPE	: Sol	id Stem Au	gers				(CHECKE	ED BY	Y: .	H.S		83 Citatio	n Dr, Unit 9, ntario, L4K 2Z6
		SOIL PROFILE			s	AMPI	LES		DVN	A1410 (ONE I	SENET	DATION	WA	TER	CON.	TENT	J	REMARKS AND
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES	GROUND WATER CONDITIONS		RESI) 40 SHEAR	STANC 60 STRE	NGTH	100 kPa ▲		(%)		MONITORING WELL	GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
1777.1	11	Silty Sand/Sandy Silt Till damp, very dense End of Borehole Cave-in Depth on Completion: None Groundwater Depth on Completion: Dry Measured Water Level in installed Monitoring Well on: March 9, 2018: 3.6m March 16, 2018: 3.5m	.0.		SS SYMPLE STATE OF TABLE STATE	18	50/10cm	GRO	221			80		5	9	25	35		GR SA SI CL

				F	REC	OR	D OF B	ORF	HOLE 5		·	200
Project	No.: T	18721	CLIENT		\LU		tamy Willm			TED BY: M.Z.		\triangle
DATE:			LOCATI	ON:		Milt	on, ON		COMPILE	ED BY: M.Z.		
DATUM			BOREH	OLE	TYPE		d Stem Aug			D BY: H.S.	83 Citation	n Dr, Unit 9, stario, L4K 2Z6
		SOIL PROFILE				AMPL				WATER CONTENT	vaugnan, on	
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES	GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH kPa 20 40 60 80 100	(%) 5 15 25 35	MONITORING WELL	GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
186.6		Ground Surface									—	
185.9	- - - - -	dark brown Silty Clay/Clayey Silt Fill some topsoil, some organic stains damp		1	SS	20	14			23		
	1— -	reddish brown Silty Clay/Clayey Silt Till trace to some sand occ. oxidized fissures damp, hard		2	SS	23	38			14		
	- - - -	uanp, naru		3	SS	20	39			14		
	2— - - - - -			4	SS	30	56			13		
	3	occ. shale fragments		5	SS	35	81	_		12		
	- - - 4— - -	greyish reddish brown		6	SS	18	33	-		13	March 9, 2018	
	_ _ _	occ. clayey sandy silt till		7	SS	20	31			11		
	5— 5— ————————————————————————————————	seams/interbeddings		8	SS	25	68			12		
	7— - - - -	grey										

					DF(`OP	D OF B	∩PF	:HO	l F	5						Т		
Project	No.: T	18721	CLIEN				tamy Willm				3		ORIGINA	ATED I	BY: I	M.Z.			
DATE:		March 1, 2018	LOCA	ION:		Mil	ton, ON						COMPIL	ED BY	/: I	M.Z.			
DATUM		Geodetic	BORE	HOLE	TYPE		id Stem Au						CHECKE					83 Citation	n Dr, Unit 9, Itario, L4K 2Z6
		SOIL PROFILE				SAMP			<u> </u>									vaugilali, Ol	
				ı,		<u> </u>		er.		RES	SISTAN	ICE PL	TRATION OT 0 100	WAT	ER C	ONTE	ENT	MONITORING	REMARKS AND GRAIN SIZE
rion ss)	SCALE	DESCRIPTION	A PLOT	SAMPLE NUMBER		RECOVERY (cm)	N " VALUES	D WAT			R STR				•	,		WELL	DISTRIBUTION (%)
ELEVATION (metres)	DEPTH SCALE (metres)		STRATA PLOT	SAMPL	TYPE	RECOV) N	GROUND WATER CONDITIONS	A 2		0 60		100	5	15	25	35		GR SA SI CL
	-																		
178.7	-			9	SS	20	50/10cm							9					
	8-	End of Borehole																	
	-	Cave-in Depth on Completion: 7.3m Groundwater Depth on Completion: Dry																	
	-	Measured Water Level in installed Monitoring Well on:																	
	-	March 9, 2018: 4.2m March 16, 2018: 4.3m																	
	9- - -	- Waldin 10, 2010. 4.011																	
	-																		
	-																		
	10																		
	-																		
	-																		
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	11 -																		
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	13																		
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	14																		
	14 - -	-																	
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	-																		

RECORD OF BOREHOLE 6 Project No.: T18721 ORIGINATED BY: M.Z. CLIENT: Mattamy Willmott Limited February 28, 2018 COMPILED BY: M.Z. DATE: LOCATION: Milton, ON 83 Citation Dr, Unit 9, BOREHOLE TYPE: Solid Stem Augers Geodetic DATUM: CHECKED BY: H.S. Vaughan, Ontario, L4K 2Z6 **SOIL PROFILE SAMPLES** WATER CONTENT REMARKS AND DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 MONITORING GROUND WATER CONDITIONS SAMPLE NUMBER (%) **GRAIN SIZE** (cm) DEPTH SCALE (metres) WELL STRATA PLOT DISTRIBUTION 'N" VALUES ELEVATION (metres) DESCRIPTION RECOVERY (%) SHEAR STRENGTH kPa TYPE GR SA SI CL 40 60 80 100 5 15 25 35 187.2 Ground Surface dark mottled brown, occ. reddish brown 13 Silty Clay/Clayey Silt Fill SS 46 1 18 some topsoil, some organic stains occ. gravel, damp 15 SS 13 2 10 17 185.5 brown, occ. reddish brown Silty Clay/Clayey Silt Till 13 3 SS 35 37 some sand, occ. oxidized fissures 2damp, hard -----

SS | 15

6 SS

SS 20

8

20

5 SS 46

7 SS 35

4 G

46

52

52

49

79/28cm

February 28, 2018

reddish brown

occ.shale fragments

grey

greyish reddish brown

Silty Sand/Sandy Silt Till

occ. oxidzied fissures damp, very dense

3-

5-

6-

181.5

Gradation Analysis S(4): 2 18 47 33

Gradation Analysis S(8): 12 33 46 9

13

13

12

12

10

Project N DATE: DATUM:		18721		-					HOLE 6				225
DATE:			CLIENT	:			tamy Willn			ORIGINA	ATED BY: M.Z.		\triangle
DATUM:			LOCATI	ON:		Mili	ton, ON			COMPIL	ED BY: M.Z.		CIATES INC
			BOREH	OLE	TYPE		id Stem Au			CHECKE	ED BY: H.S.	83 Citatio	n Dr, Unit 9, ntario, L4K 2Z6
		SOIL PROFILE				AMP					WATER CONTENT	vaugnan, or	REMARKS AND
NC (CALE)	DESCRIPTION	PLOT	SAMPLE NUMBER		RY (cm)	UES	GROUND WATER CONDITIONS	DYNAMIC CONE PI RESISTANCE 20 40 60	E PLOT	(%)	MONITORING WELL	GRAIN SIZE DISTRIBUTION (%)
ELEVATION (metres)	DEPTH SCALE (metres)		STRATA PLOT	SAMPLE	TYPE	RECOVERY (cm)	" N " VALUES	GROUND	SHEAR STREN 20 40 60	IGTH kPa 80 100	5 15 25 35		GR SA SI CL
	-		* 0°								-		
179.2	- -		* 6.* * 6.*	9	ss	18	71				8		
	- - - - - 9— - - -	Cave-in Depth on Completion: 7.5m Groundwater Depth on Completion: 6.0m											
	10 — - - 10 — - - - -												
	 111 												
	12 — 										_		
	13 — 												
	- 14 — - - - - - -												

RECORD OF BOREHOLE 7 Project No.: T18721 ORIGINATED BY: M.Z. CLIENT: Mattamy Willmott Limited February 28, 2018 COMPILED BY: M.Z. DATE: LOCATION: Milton, ON 83 Citation Dr, Unit 9, BOREHOLE TYPE: Solid Stem Augers Geodetic DATUM: CHECKED BY: H.S. Vaughan, Ontario, L4K 2Z6 **SOIL PROFILE SAMPLES** WATER CONTENT REMARKS AND DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 MONITORING GROUND WATER CONDITIONS SAMPLE NUMBER (%) **GRAIN SIZE** (cm) DEPTH SCALE (metres) WELL STRATA PLOT DISTRIBUTION 'N" VALUES ELEVATION (metres) DESCRIPTION RECOVERY (%) SHEAR STRENGTH kPa TYPE GR SA SI CL 40 60 80 100 5 15 25 35 187.6 Ground Surface Granular Fill 187.5 dark brown Silty Clay/Clayey Silt Fill SS 25 1 4 20 some topsoil, some organic stains damp 186.9 brown, occ. reddish brown 14 Silty Clay/Clayey Silt Till 2 SS 35 25 some sand, occ. oxidized fissures damp, very stiff 14 hard 3 SS 25 32 2 -----Gradation Analysis S(4): 8 15 43 34 13 very stiff SS 30 28 3-12 hard 5 SS 28 48 11 SS 6 38 40

11

9

Gradation Analysis

S(8): 8 38 46 8

grey

Silty Sand/Sandy Silt Till

occ. oxidzied fissures moist, very dense

5-

6

181.9

180.3

SS 30

SS 30

8

70/28cm

80/28cm

February 28, 2018

)EC	· O D	D OF B	ADE	ш^		7								
Project	No.: T	18721	CLI	ENT:		KEU		D OF Botamy Willm				′		ORIGIN	ATED	BY:	: M.Z	<u>. </u>		
DATE:		ebruary 28, 2018		CATIO										COMPII					SHAD & ASSO	n Dr, Unit 9,
DATUM	:	Geodetic	BOI	REHO	DLE .			id Stem Au	gers					CHECK	ED B	/ :	H.S) <u>.</u>	Vaughan, Or	ntario, L4K 2Z6
		SOIL PROFILE				S	AMPI	LES						TRATION	WA	TER	CON	TENT		REMARKS AND
-	ALE			5	SAMPLE NUMBER		(cm)	B	GROUND WATER CONDITIONS	2	0 4	SISTAN 0 6	0 8	0 100		((%)		MONITORING WELL	GRAIN SIZE DISTRIBUTION
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION		STRATA PLOT	MPLE N	<u>س</u>	RECOVERY (cm)	" N " VALUES	OUND V	A		R STR		A						(%) GR SA SI CL
ELF (n				ST.	SA	TYPE	RE	2 :	88	2	0 4	0 6	0 8	0 100	5	15	25	35		
	-	grey Clayey Sandy Silt Till				00	00	50/13cm							9	3				
179.7	8-	occ. oxidized fissures damp, hard			9	SS	20	50/13cm												
	-	End of Borehole Cave-in Depth on Completion: 7.5m																		
	-	Groundwater Depth on Completion:7.3n	n																	
	- - -																			
	9-																			
	-																			
	-																			
	-																			
	10-																			
	-																			
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)FC	'nΡ	D OF BO)DE	HOLE 8			
Project	No.:	T18721	CLIEN.		\L		tamy Willmo			TED BY: M.Z.		\triangle
DATE:		March 2, 2018	LOCAT	ION:		Milt	on, ON		COMPILI	ED BY: M.Z.	SHAD & ASSO	
DATUM		Geodetic	BOREI	HOLE	TYPE	: Soli	d Stem Aug	ers	CHECKE	D BY: H.S.	83 Citation	n Dr, Unit 9, Itario, L4K 2Z6
		SOIL PROFILE		Τ		AMPL				WATER CONTENT	ruugiiuii, ci	REMARKS AND
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES	GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100	(%) 5 15 25 35	MONITORING WELL	GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
186.7		Ground Surface								45	+	
186.2	0	dark brown Sitty Clay/Clayey Sitt Fill some organic stains, some topsoil damp		1	SS	35	16			7		
	1	reddish brown Silty Clay/Clayey Silt Till trace to some sand occ. oxidized fissures		2	ss	30	31	-		12		
	'	damp, hard			33	30	31					
		- - - -		3	SS	30	47			12		
	2											
		-		4	ss	35	42			12		
	3			5	SS	30	56			12		
	4	very stiff			00	20		-		11		
		grey		6	SS	30	24					
		-		7	ss	38	30	-		14		
	5										18 - 18 - 18 - 18 - 18 - 18 - 18 - 18 -	
	6	- - - - - - - - - -		8	SS	10	50/10cm			9	∭ March 16, 20	
179.7	7											
			. O y O y									

)EC	·	D OF B	ODE			0									
Project	No.: T1	18721	CLIENT:		KEC		tamy Willm						ORIGINA	ATED	BY	′: M	.Z.			
DATE:		arch 2, 2018	LOCATI	ON.		Mile	on, ON						COMPIL	EN B	٧.	м	7			
					TVDE														83 Citation	Dr, Unit 9,
DATUM		eodetic SOIL PROFILE	BUKEH	JLE 		AMPI	id Stem Au _ES	gers					CHECKI	וא טב	r: 				Vaughan, Or	tario, L4K 2Z6
				8				œ		RF:	SISTAN	NCF PI	TRATION OT	WA		(%)	NTE	NT	MONITORING	REMARKS AND GRAIN SIZE
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES	GROUND WATER CONDITIONS	A	SHEA	R STR	RENGT	100 H kPa 0 100	5			25	35	WELL	DISTRIBUTION (%) GR SA SI CL
	-	grey Clayey Sandy Silt Till	. B.	}										8						
178.9	-	damp, hard End of Borehole	· 6.º		SS	10	50/13cm							0						
	8-	Cave-in Depth on Completion: 7.0m Groundwater Depth on Completion: Dry																		
		Measured Water Level in installed Monitoring Well on:																		
	- - -	March 9, 2018: Dry March 16, 2018: 6.4m																		
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	-																			
	10																			
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				F	REC	OR	D OF B	ORE	HOL	E 9				
Project	No.: <u>T1</u>	8721	CLIENT	:		Mat	tamy Willm	ott Lir	nited		ORIGINA	ATED BY: M.Z.		
DATE:	Ma	arch 2, 2018	LOCATI	ON:		Milt	on, ON				COMPIL	ED BY: M.Z.	SHAD & ASS	OCIATES INC.
DATUM	: Ge	eodetic	BOREH	OLE	TYPE	: Sol	id Stem Au	gers			CHECKE	ED BY: H.S.	83 Citatio	n Dr, Unit 9, ntario, L4K 2Z6
		SOIL PROFILE				AMPI						WATER CONTENT		REMARKS AND
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES	GROUND WATER CONDITIONS		RESISTAN 40 60 EAR STRI	PENETRATION CE PLOT) 80 100 ENGTH kPa 0 80 100	(%) 5 15 25 35	MONITORING WELL	GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
186.7	0	Ground Surface	****											
	- - - -	dark brown Silty Clay/Clayey Silt Fill some topsoil some organic stains, some rootlets damp		1	SS	35	9					25 °		
185.8	1-	reddish brown Silty Clay/Clayey Silt Till		2	SS	25	38					_ 14		
	- - -	trace to some sand occ. oxidized fissures damp, hard												
	2-			3	SS	20	53					12		
	- - - - -			4	SS	15	50/13cm					11	March 9, 2018	
	3-	greyish reddish brown										12		
	- - - -			5	SS	30	31					0		
	4-	grey very stiff		6	SS	35	25					11		
182.3	- - -		· C ·	ò										
	5-	brownish grey Sandy Silt Till trace to some clay damp, very dense	. D.		SS	28	59					9		
181.2	- - - -		. <u></u> . <u> </u>											
	6	brownish grey Clayey Silt Till occ. clayey sandy silt till interbeddings damp, hard	6	8	SS	35	95/23cm					8 0		
179.7	7-													

				F	REC	OR	D OF B	ORE	HOLE 9							
Project	No.: T	18721	CLIENT				tamy Willn				ORIGINA	TED	BY:	M.Z.		
DATE:		larch 2, 2018	LOCATI	ON:		Mili	ton, ON				COMPILI	ED B\	/ :	M.Z.		
DATUM:		eodetic	BOREH	OLF.	TYPE		id Stem Au				CHECKE				83 Citation	n Dr, Unit 9,
		SOIL PROFILE		<u> </u>		AMP									vaugnan, Or	ntario, L4K 2Z6
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES	GROUND WATER CONDITIONS	DYNAMIC CO RESIST 20 40 SHEAR S 20 40	TANCE PL 60 80 TRENGTI	OT) 100	-	(%	6)	MONITORING WELL	GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
		grey Sandy Silt Till	. O.			_	-									
178.9	-	trace to some clay, damp, very dense	. Q.	9	SS	15	50/5cm					8			النبية ﴿ النبية	
	8-	End of Borehole														
	_	Cave-in Depth on Completion: None Groundwater Depth on Completion: Dry														
	- - -	Measured Water Level in installed Monitoring Well on:														
	-	March 9, 2018: 2.9m March 16, 2018: 2.9m														
	9-	,														
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				F	REC	OR	D OF BO	RE	HOLE 10			79	
Project	No.: T	18721	CLIENT				tamy Willmo			ORIGINA	TED BY: M.Z.		
DATE:			LOCATI	ON:		Milt	on, ON			COMPILE	ED BY: <u>M.Z.</u>	SHAD & ASSO	CIATES INC
DATUM			BOREH	OLE	TYPE	: Soli	d Stem Aug	ers		CHECKE	D BY: H.S.	83 Citation	
		SOIL PROFILE				AMPL					WATER CONTENT	Tuugiiuii, eii	
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES	GROUND WATER CONDITIONS	PYNAMIC CONE PERESISTANCE 20 40 60 SHEAR STRENG 20 40 60	PLOT 80 100 GTH kPa	(%) 5 15 25 35	MONITORING WELL	GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
186.6	Λ-	Ground Surface										₩.	
	- 0 - - - -	dark brown Clayey Silt Fill some topsoil, some organic stains, some rootlets, damp to moist	9	1	SS	30	7				13		
185.9	1- 1-	brown Compacted Silty Clay/Clayey Silt Fill damp, stiff		2	SS	28	13				10		
185.2	-	- - 											
	-	trace organic stains reddish brown									15		
	2- 2-	Silty Clay/Clayey Silt Till trace to some sand occ. oxidized fissures damp, very stiff		3	SS	18	20				0		
	-										14	2018	
	- - - -	- hard - -		4	SS	23	40				0	March 16, 2018	
	3-			5	SS	30	48				13		
	-												
	4 - - - -			6	SS	28	42				16		
	-												
	- - - 5	grey		7	SS	30	90/28cm				11 0		
	- - - - - -												
	6-	occ. sandy silt till seams		8	SS	23	50/13cm				8		
	- - -												
179.6	7 - -	- -											
	-	-											

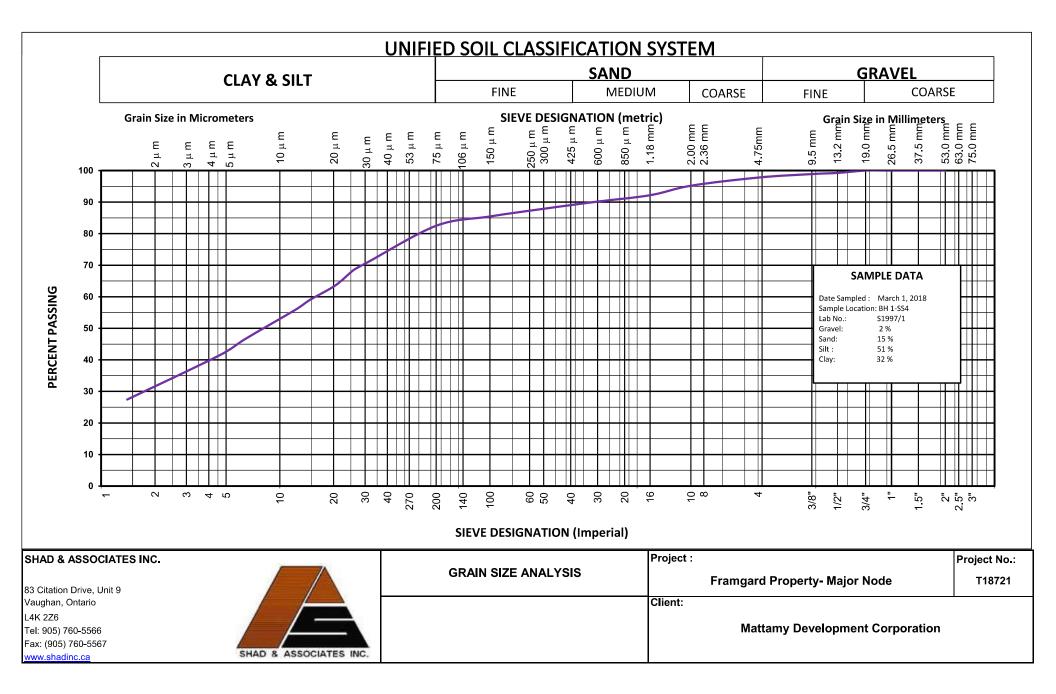
					REC	OR	D OF B	ORE	EHC	LE	10								
Project	No.: T	18721	CLIENT				tamy Willn				- 3		ORIGI	IATE	D B	Y: M	I.Z.		
DATE:			LOCAT	ION:		Mil	ton, ON						COMP	LED	BY:	M	ı.z.		
DATUM					TYPE		id Stem Au						CHEC					83 Citatio	n Dr, Unit 9,
D/(10)		SOIL PROFILE	BOILE			AMP		19010	T				011201						ntario, L4K 2Z6
				8				<u>~</u>		RE	SISTA	NCE F	ETRATIO	۱ w	ATE	R CC (%)	NTEN	MONITORING	REMARKS AND GRAIN SIZE
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES	GROUND WATER CONDITIONS	•	SHEA		RENG ⁻	TH kPa 30 100	5	i 1		25 3	WELL	DISTRIBUTION (%) GR SA SI CL
	- - -	grey Silty Sand/ Sandy Silt moist to wet, very dense														18			
178.6	8-	End of Borehole		9	SS	30	52												
	- - -	Cave-in Depth on Completion: 7.6m Groundwater Depth on Completion: Dry																	
	-	Measured Water Level in installed Monitoring Well on:																	
	9-	March 9, 2018: 2.9m March 16, 2018: 3.0m																	
	-																		
	-																		
	10-																		
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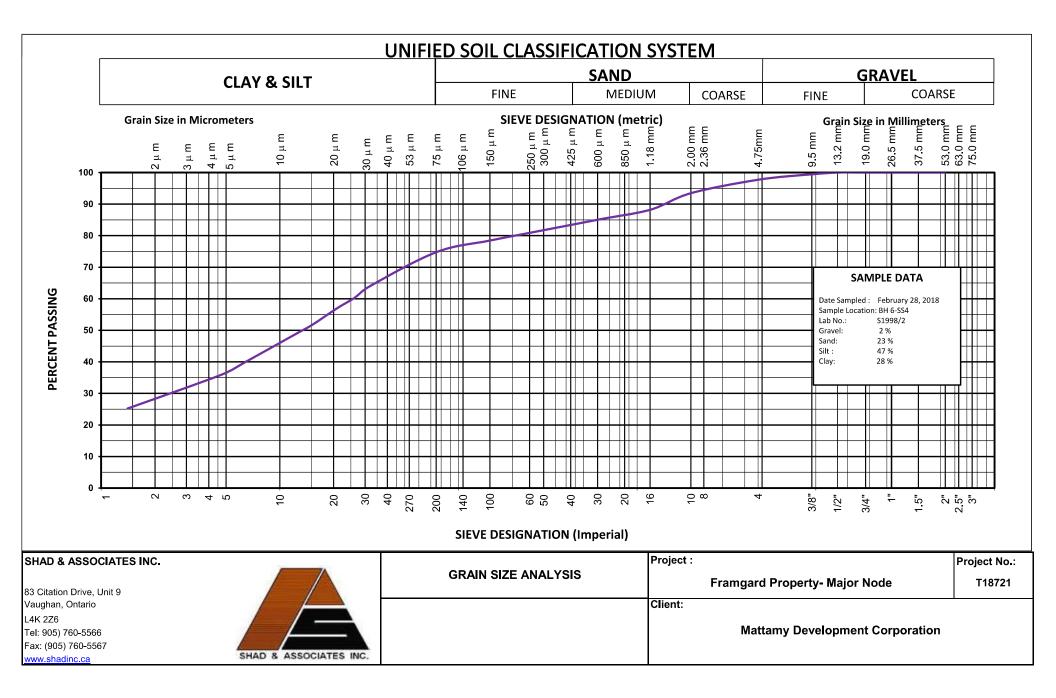
				F	REC	OR	D OF BO)RF	HOLE 11				Fact of
Project	No.: _T	18721	CLIENT		\LO		tamy Willm			ORIGINA	TED BY: M.Z.		\triangle
DATE:			LOCATI	ON:		Milt	on, ON			COMPILI	ED BY: M.Z.	SHAD & ASSO	OCIATES INC.
DATUM	: G	eodetic	BOREH	OLE	TYPE	: Soli	d Stem Aug	ers		CHECKE	D BY: H.S.	83 Citation	n Dr, Unit 9, Itario, L4K 2Z6
		SOIL PROFILE			S	AMPL	.ES				WATER CONTENT		DEMARKS AND
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES	GROUND WATER CONDITIONS	PYNAMIC CONE PI RESISTANCI 20 40 60 SHEAR STREM 20 40 60	E PLOT 80 100 NGTH kPa	(%) 5 15 25 35	MONITORING WELL	GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
186.4		Ground Surface					-						
185.9	0 <u> </u>	Topsoil	hhh	1	SS	35	6				33 0		
185.7	- - - -	mottled dark brown Silty Clay/Clayey Silt Fill some organic stains, damp									20		
185.3	1— 1— 1—	brown Compacted Silty Clay/Clayey Silt Fil damp, stiff	'	2	SS	35	16				13		
	- -	very stiff											
	- - - -	brown, occ. reddish brown Silty Clay/Clayey Silt Till trace to some sand occ. oxidized fissures		3	SS	28	34				13		
	2	damp,hard											
	- - - -			4	SS	30	41				12		
	3			5	SS	30	33				14		
	- -] 											
	4- - -	grey damp to moist, very stiff		6	SS	23	18				16		
	-												
	- - - -	hard		7	SS	28	37				8 0		
180.9	5 — - - - -												
	6-	grey Clayey Sandy Silt Till damp, hard	. D. . D. . D.								8		
			30,0,0,0,0,0,0,		SS	25	50/13cm				0		

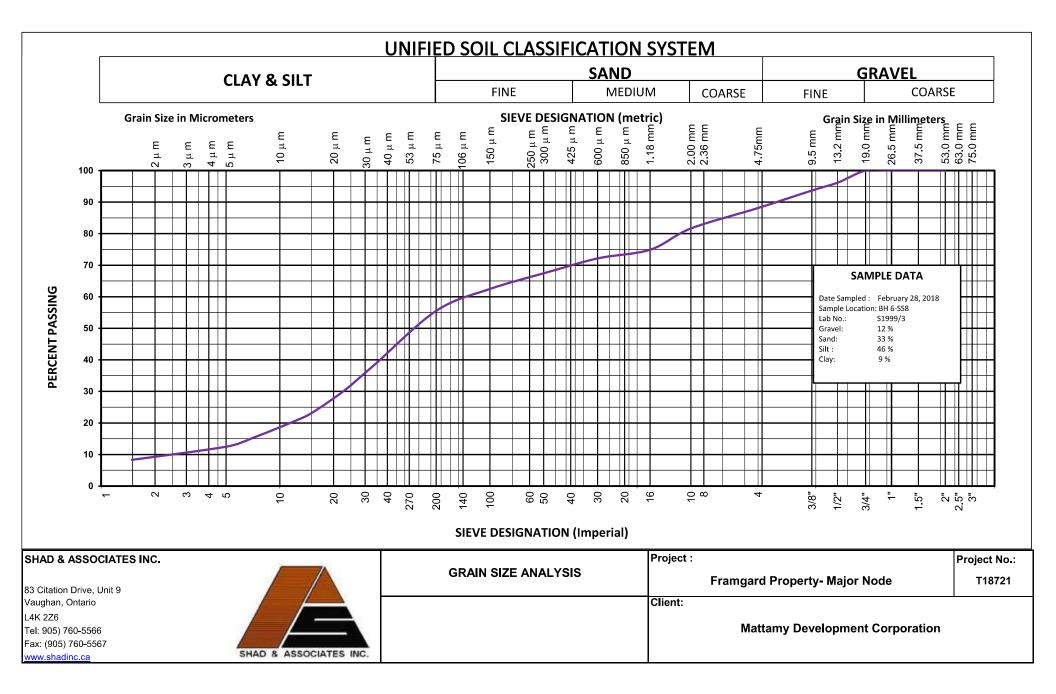
					RFC	:OR	D OF B	ORF	HOLE 11			20	Adm.
Project	No.:	T18721	CLIENT		`_		ttamy Willn			ORIGINA	ATED BY: M.Z.		
DATE:		March 2, 2018	LOCATI	ON:		Mili	ton, ON			COMPIL	ED BY: M.Z.		
DATUM		Geodetic			TYPF		id Stem Au				ED BY: H.S.	83 Citation	n Dr, Unit 9,
D/(10)	• .	SOIL PROFILE	BOILEII			AMP		90.0		OHEONE		vaugnan, Or	ntario, L4K 2Z6
				8		٦		- E:	DYNAMIC CONE I	CE PLOT	(%)	MONITORING	REMARKS AND GRAIN SIZE
NOI.	SCALE s)	DESCRIPTION	, PLOT	NOMB		ERY (cn	TUES	D WATE	20 40 60			WELL	DISTRIBUTION (%)
ELEVATION (metres)	DEPTH SCALE (metres)		STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES	GROUND WATER CONDITIONS	SHEAR STRE 20 40 60	A	5 15 25 35		GR SA SI CL
_		grey Clayey Sandy Silt Till	• G.			_	-				8		
178.6		damp, hard End of Borehole	• 0%	9	SS	13	50/13cm				0		
	8	Cave-in Depth on Completion: None											
		Groundwater Depth on Completion: Dry	′										
											_		
	9												
		_											
	10												
	10												
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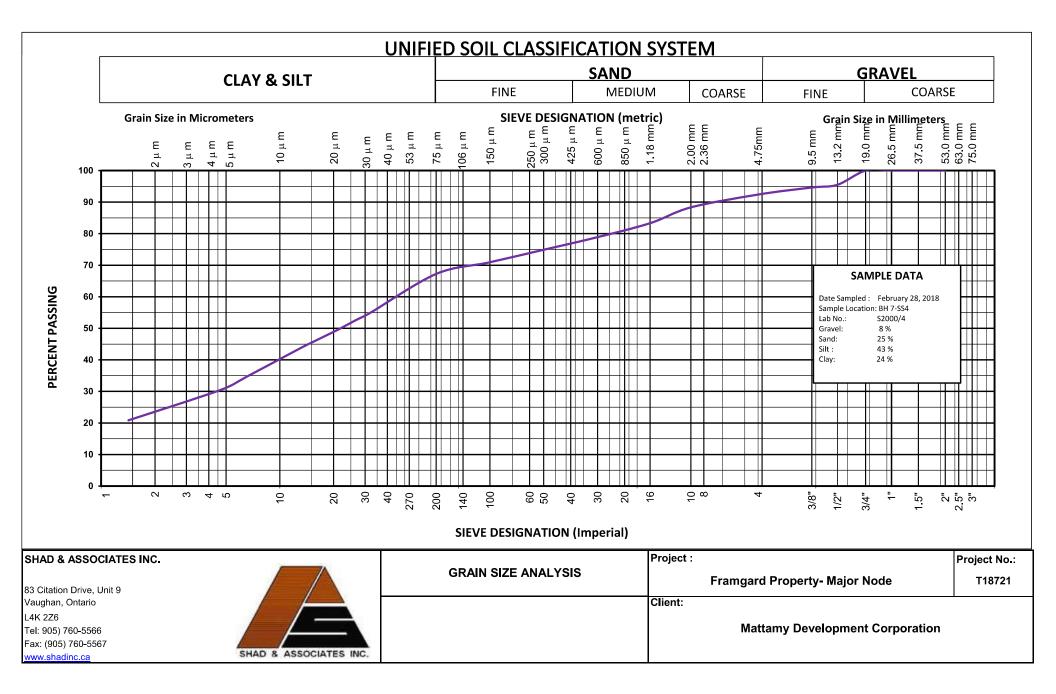
RECORD OF BOREHOLE 12 Project No.: T18721 ORIGINATED BY: M.Z. CLIENT: Mattamy Willmott Limited March 2, 2018 COMPILED BY: M.Z. DATE: LOCATION: Milton, ON 83 Citation Dr, Unit 9, BOREHOLE TYPE: Solid Stem Augers DATUM: Geodetic CHECKED BY: H.S. Vaughan, Ontario, L4K 2Z6 **SOIL PROFILE SAMPLES** WATER CONTENT REMARKS AND DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 MONITORING GROUND WATER CONDITIONS SAMPLE NUMBER (%) **GRAIN SIZE** (cm) DEPTH SCALE (metres) WELL STRATA PLOT DISTRIBUTION 'N" VALUES ELEVATION (metres) RECOVERY DESCRIPTION (%) SHEAR STRENGTH kPa TYPE GR SA SI CL 40 60 80 100 5 15 25 35 186.8 Ground Surface dark brown Silty Clay/Clayey Silt Fill 23 some topsoil, some organic stains some SS 1 38 10 rootlets, damp to moist 186.1 brown to reddish brown 13 Silty Clay/Clayey Silt Till 2 SS 30 38 trace to some sand some topsoil, occ. oxidized fissures damp, hard 12 occ. shale fragments 3 SS 35 48 2 11 SS 23 3-March 16, 2018 March 9, 201 12 5 SS 30 34 13 greyish reddish brown SS 6 35 30 10 SS 35 53 grey 5-6 8 50/13cm SS 8 20 occ. grave 179.8 ۰٥۰ ۰0°

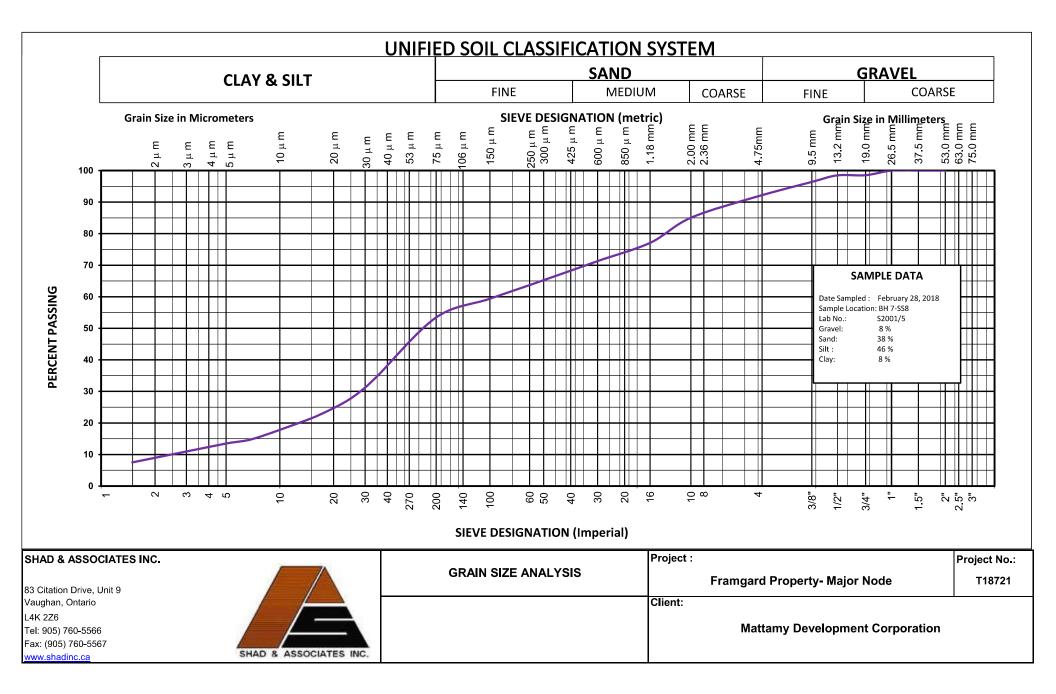
					REC	OR	D OF B	ORE	HOL	LE ·	12								79	
Project	No.: T	18721	CLIENT				ttamy Willn						ORIGIN	IATE	DВ	Y: N	1.Z.			
DATE:		larch 2, 2018	LOCATI	ON:		Mil	ton, ON						COMPI	LED	BY:	N	1.Z.			
DATUM		eodetic			TVDE		id Stem Au						CHECK						83 Citation	n Dr, Unit 9,
DATON		SOIL PROFILE	BOKLII			AMP		iyeis					CIILOI		٠١.	!!			Vaughan, Or	ntario, L4K 2Z6
				8				~		RES	SISTAN	NCE P	ETRATIOI Lot	1 N	ATE	R CC (%)		ENT	MONITORING	REMARKS AND GRAIN SIZE
ELEVATION (metres)	DEPTH SCALE (metres)	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	TYPE	RECOVERY (cm)	" N " VALUES	GROUND WATER CONDITIONS	20 S	SHEA		ENGT	30 100 FH kPa 30 100	5	5 1			35	WELL	DISTRIBUTION (%) GR SA SI CL
179.0	-	grey Silty Sand/ Sandy Silt Till damp, very dense	. D.	0	SS	10	50/13cm								6					
173.0	-	End of Borehole	¥ : 5 : 1	9	33	10	30/100111												<u></u>	
	8-	Cave-in Depth on Completion: 6.7m Groundwater Depth on Completion: Dry																		
	-	Measured Water Level in installed Monitoring Well on:																		
	-	March 9, 2018: 3.6m March 16, 2018: 3.6m																		
	9-																			
	- - -																			
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	10 —																			
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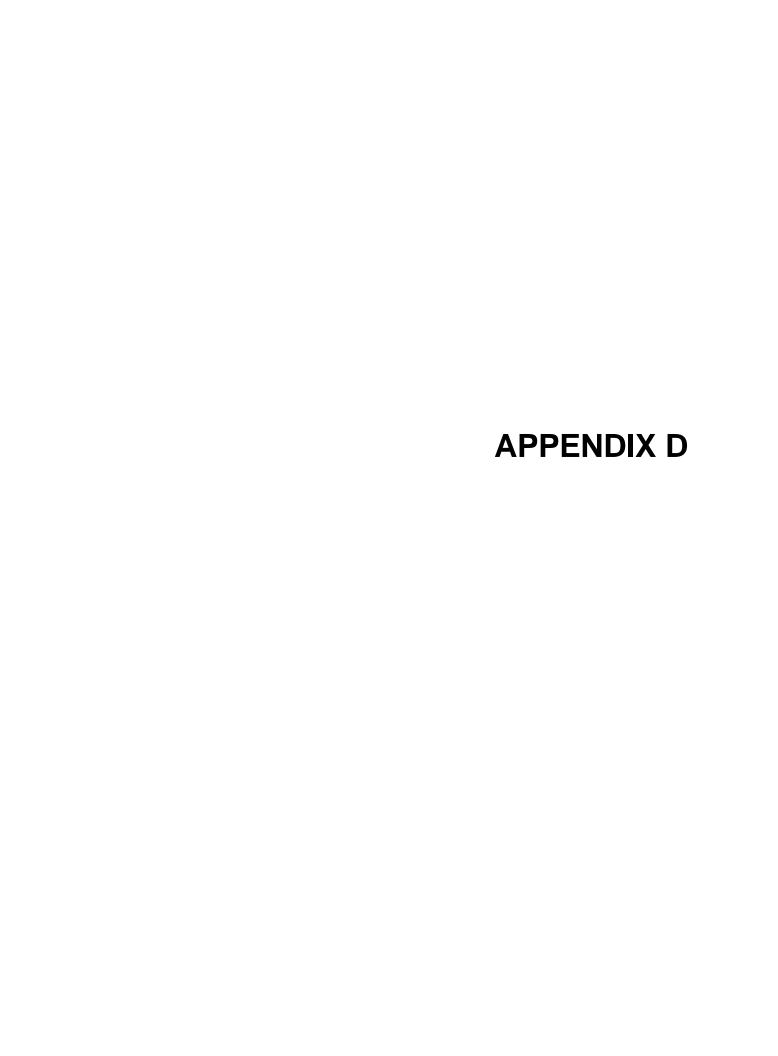












ALS Canada Ltd.



CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order : **WT2224508** Page : 1 of 5

Amendment : 1

Address

Client : McClymont & Rak Engineers Inc. Laboratory : Waterloo - Environmental

Contact : Richard Sukhu Account Manager : Emily Smith

: 111 Zenway Blvd. Unit 4 Address : 60 Northland Road, Unit 1

Waterloo, Ontario Canada N2V 2B8

 Telephone
 : 416 675 0160
 Telephone
 : +1 519 886 6910

 Project
 : 5820
 Date Samples Received
 : 08-Dec-2022 13:54

 PO
 : --- Date Analysis Commenced
 : 08-Dec-2022

C-O-C number : 20-1000498 Issue Date : 15-Mar-2023 16:31

Sampler : CLIENT Site : ----

Quote number : 2022 Price List

No. of samples received : 2
No. of samples analysed : 2

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:

Vaughan ON Canada L4H 3H9

- 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
Jeremy Gingras	Team Leader - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Organics, Waterloo, Ontario
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Jon Fisher	Department Manager - Inorganics	Metals, Waterloo, Ontario
Manuel TavaraTello	Supervisor - Semi-Volatile Extractions	Organics, Waterloo, Ontario
Ruby Sujeepan		Microbiology, 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.

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

Description
Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical
Conductivity.
Detection Limit Raised: Dilution required due to high concentration of test analyte(s).

<: less than.

Page

3 of 5 WT2224508 Amendment 1 Work Order:

Client McClymont & Rak Engineers Inc.

Project

Analytical Results

			Client sample ID	BH-10]			
Sub-Matrix: Groundwater (Matrix: Water)		S	ampling date/time	08-Dec-2022 09:57					
Analyte	Method	LOR	Unit	WT2224508-001		HALSUB SAN	HALSUB STM		
Physical Tests									
рН	E108	0.10	pH units	8.09		6 - 10 pH units	6.5 - 8.5 pH units	 	
Solids, total suspended [TSS]	E160	3.0	mg/L	35.6		350 mg/L		 	
Anions and Nutrients									
Fluoride	E235.F	0.020	mg/L	0.246	DLDS	10 mg/L		 	
Kjeldahl nitrogen, total [TKN]	E318	0.050	mg/L	0.259		100 mg/L		 	
Phosphorus, total	E372-U	0.0020	mg/L	0.0244		10 mg/L		 	
Sulfate (as SO4)	E235.SO4	0.30	mg/L	385	DLDS	1500 mg/L		 	
Cyanides									
Cyanide, strong acid dissociable (Total)	E333	0.0020	mg/L	<0.0020		2 mg/L		 	
Microbiological Tests									
Coliforms, Escherichia coli [E. coli]	E012A.EC	1	CFU/100mL	Not Detected			200 CFU/100mL	 	
Total Metals							0. 0, .00		
Aluminum, total	E420	0.0030	mg/L	0.514	DLHC	50 mg/L		 	
Antimony, total	E420	0.00010	mg/L	<0.00100	DLHC	5 mg/L		 	
Arsenic, total	E420	0.00010	mg/L	0.00555	DLHC	1 mg/L		 	
Beryllium, total	E420	0.000020	mg/L	<0.000200	DLHC	5 mg/L		 	
Cadmium, total	E420	0.0000050	mg/L	<0.0000500	DLHC	1 mg/L		 	
Chromium, total	E420	0.00050	mg/L	<0.00500	DLHC	3 mg/L		 	
Cobalt, total	E420	0.00010	mg/L	0.00144	DLHC	5 mg/L		 	
Copper, total	E420	0.00050	mg/L	<0.00500	DLHC	3 mg/L		 	
Iron, total	E420	0.010	mg/L	0.879	DLHC	50 mg/L		 	
Lead, total	E420	0.000050	mg/L	0.000546	DLHC	3 mg/L		 	
Manganese, total	E420	0.00010	mg/L	0.304	DLHC	5 mg/L		 	
Mercury, total	E508	0.0000050	mg/L	<0.0000050		0.05 mg/L		 	
Molybdenum, total	E420	0.000050	mg/L	0.00410	DLHC	5 mg/L		 	
Nickel, total	E420	0.00050	mg/L	<0.00500	DLHC	3 mg/L		 	
Selenium, total	E420	0.000050	mg/L	<0.000500	DLHC	5 mg/L		 	
Silver, total	E420	0.000010	mg/L	<0.000100	DLHC	5 mg/L		 	
Tin, total	E420	0.00010	mg/L	0.00173	DLHC	5 mg/L		 	

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Work Order : WT2224508 Amendment 1

Client : McClymont & Rak Engineers Inc.

Project : 5820



						_		_	
Analyte	Method	LOR	Unit	WT2224508-001	HALSUB	HALSUB			
				(Continued)	SAN	STM			
Total Metals - Continued									
Titanium, total	E420	0.00030	mg/L	0.0109 DLHC	5 mg/L		 		
Zinc, total	E420	0.0030	mg/L	<0.0300 DLHC	3 mg/L		 		
Aggregate Organics									
Biochemical oxygen demand [BOD]	E550	2.0	mg/L	3.4	300 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	0.0012	1 mg/L		 		
Volatile Organic Compounds	[Drycleaning]								
Dichloromethane	E611F	1.0	μg/L	<1.0	2000 μg/L		 		
Tetrachloroethylene	E611F	0.50	μg/L	<0.50	1000 μg/L		 		
Trichloroethylene	E611F	0.50	μg/L	<0.50	400 μg/L		 		
Benzene	E611F	0.50	μg/L	<0.50	10 μg/L		 		
Ethylbenzene	E611F	0.50	μg/L	<0.50	160 μg/L		 		
Toluene	E611F	0.50	μg/L	<0.50	16 μg/L		 		
Chloroform	E611F	0.50	μg/L	<0.50	40 μg/L		 		
Dichlorobenzene, 1,4-	E611F	0.50	μg/L	<0.50	80 μg/L		 		
Volatile Organic Compounds	Surrogates								
Bromofluorobenzene, 4-	E611F	1.0	%	93.8			 		
Difluorobenzene, 1,4-	E611F	1.0	%	101			 		

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

No Breaches Found

Key:

HALSUB Ontario Halton Sanitary Sewer By-law No. 02-03 (MAR, 2003)

SAN Halton Sanitary Sewer By-Law No. 02-03
STM Halton Storm Sewer By-Law No, 02-03

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Work Order : WT2224508 Amendment 1

Client : McClymont & Rak Engineers Inc.

Project : 582



Analytical Results

			Client sample ID	BH-10	1			
Sub-Matrix: Water		Sa	ampling date/time	09-Mar-2023	1			
(Matrix: Water)			, 0	08:00				
Analyte	Method	LOR	Unit	WT2224508-002	HALSUB			
					SAN			
Polycyclic Aromatic Hydroca	arbons							
Naphthalene	E641A	0.050	μg/L	<0.050	140 μg/L	 	 	
Chrysene-d12	E641A	0.1	%	97.2		 	 	
Naphthalene-d8	E641A	0.1	%	103		 	 	
Phenanthrene-d10	E641A	0.1	%	111		 	 	

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

No Breaches Found

Key:

HALSUB Ontario Halton Sanitary Sewer By-law No. 02-03 (MAR, 2003)

SAN Halton Sanitary Sewer By-Law No. 02-03



QUALITY CONTROL INTERPRETIVE REPORT

Work Order : **WT2224508** Page : 1 of 10

Amendment :1

Client : McClymont & Rak Engineers Inc. Laboratory : Waterloo - Environmental

Contact : Richard Sukhu Account Manager : Emily Smith

Address :111 Zenway Blvd. Unit 4 Address :60 Northland Road, Unit 1

Waterloo, Ontario Canada N2V 2B8

 Telephone
 :416 675 0160
 Telephone
 :+1 519 886 6910

 Project
 :5820
 Date Samples Received
 : 08-Dec-2022 13:54

 PO
 :--- Issue Date
 : 15-Mar-2023 15:19

C-O-C number : 20-1000498
Sampler : CLIENT
Site :----

Quote number : 2022 Price List

No. of samples received :2
No. of samples analysed :2

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.

Vaughan ON Canada L4H 3H9

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

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

Summary of Outliers Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- 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)

• No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

• No Quality Control Sample Frequency Outliers occur.

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Work Order : WT2224508 Amendment 1
Client : McClymont & Rak Engineers Inc.

Project : 5820

Matrix: Water

Analyte Group

Container / Client Sample ID(s)

Amber glass total (sulfuric acid)

BH-10



Eval

Evaluation: **x** = Holding time exceedance; ✓ = Within Holding Time

Analysis Date

16-Dec-2022

Analysis

Holding Times

Analysis Holding Time Compliance

Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)

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.

Sampling Date

Method

E318

Extraction / Preparation

Preparation

Holding Times

Eval

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.

			Date	Rec	Actual			Rec	Actual	
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-4d] BH-10	E550	08-Dec-2022					12-Dec-2022	4 days	4 days	4
Aggregate Organics : Mineral Oil & Grease by Gravimetry									1	
Amber glass (hydrochloric acid) BH-10	E567SG	08-Dec-2022	15-Dec-2022	28 days	7 days	4	15-Dec-2022	40 days	0 days	4
Aggregate Organics : Oil & Grease by Gravimetry										
Amber glass (hydrochloric acid) BH-10	E567	08-Dec-2022	15-Dec-2022	28 days	7 days	✓	15-Dec-2022	40 days	0 days	1
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) BH-10	E562	08-Dec-2022	14-Dec-2022				15-Dec-2022	28 days	7 days	√
Anions and Nutrients : Fluoride in Water by IC										
HDPE [ON MECP] BH-10	E235.F	08-Dec-2022	13-Dec-2022				13-Dec-2022	28 days	5 days	4
Anions and Nutrients : Sulfate in Water by IC									· · · · · ·	
HDPE [ON MECP] BH-10	E235.SO4	08-Dec-2022	13-Dec-2022				13-Dec-2022	28 days	5 days	1

08-Dec-2022

15-Dec-2022

✓

28 days 8 days

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Work Order : WT2224508 Amendment 1
Client : McClymont & Rak Engineers Inc.



Matrix: Water					Εν	/aluation: 🗴 =	Holding time exce	edance ; 🔻	= Within	Holding Tir
Analyte Group	Method	Sampling Date					Analys	is		
Container / Client Sample ID(s)			Preparation		g Times	Eval	Analysis Date		Times	Eval
			Date	Rec	Actual			Rec	Actual	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) BH-10	E372-U	08-Dec-2022	15-Dec-2022				16-Dec-2022	28 days	8 days	✓
Cyanides : Total Cyanide										
UV-inhibited HDPE - total (sodium hydroxide)								I		
BH-10	E333	08-Dec-2022	09-Dec-2022				09-Dec-2022	14 days	1 days	✓
Microbiological Tests : E. coli (MF-mFC-BCIG)										
Sterile HDPE (Sodium thiosulphate) [ON MECP] BH-10	E012A.EC	08-Dec-2022					10-Dec-2022	48 hrs	47 hrs	✓
Physical Tests : pH by Meter										
HDPE [ON MECP] BH-10	E108	08-Dec-2022	13-Dec-2022				14-Dec-2022	14 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE [ON MECP]										
BH-10	E160	08-Dec-2022					13-Dec-2022	7 days	5 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate) BH-10	E641A	09-Mar-2023	10-Mar-2023	105 days	92 days	✓	13-Mar-2023	40 days	3 days	✓
Total Metals : Total Mercury in Water by CVAAS				days	days					
Glass vial total (hydrochloric acid) [ON MECP]										
BH-10	E508	08-Dec-2022	14-Dec-2022				14-Dec-2022	28 days	6 days	✓
Total Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid) BH-10	E420	08-Dec-2022	08-Dec-2022				09-Dec-2022	180 days	1 days	✓
Volatile Organic Compounds : VOCs (Full List) by Headspace GC-MS										
Glass vial (sodium bisulfate) BH-10	E611F	08-Dec-2022	13-Dec-2022				13-Dec-2022	14 days	5 days	✓

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Work Order : WT2224508 Amendment 1
Client : McClymont & Rak Engineers Inc.

Project : 5820



Matrix: Water					Ev	/aluation: × =	Holding time excee	edance ; 🔻	/ = Within	Holding Time
Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation	Holding	Times	Eval	Analysis Date	Holding	g Times	Eval
			Date	Rec	Actual			Rec	Actual	
Volatile Organic Compounds [Drycleaning] : VOCs (Full List) by Headspace GC-M	S									
Glass vial (sodium bisulfate) BH-10	E611F	08-Dec-2022	13-Dec-2022				13-Dec-2022	14 days	5 days	✓
Volatile Organic Compounds [Fuels] : VOCs (Full List) by Headspace GC-MS										
Glass vial (sodium bisulfate) BH-10	E611F	08-Dec-2022	13-Dec-2022				13-Dec-2022	14 days	5 days	✓
Volatile Organic Compounds [THMs] : VOCs (Full List) by Headspace GC-MS										
Glass vial (sodium bisulfate) BH-10	E611F	08-Dec-2022	13-Dec-2022				13-Dec-2022	14 days	5 days	✓

Legend & Qualifier Definitions

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

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Work Order : WT2224508 Amendment 1
Client : McClymont & Rak Engineers Inc.

Project : 5820



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.

Quality Control Sample Type			Co	ount		Frequency (%)
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Biochemical Oxygen Demand - 5 day	E550	775463	1	16	6.2	5.0	√
E. coli (MF-mFC-BCIG)	E012A.EC	774372	1	10	10.0	5.0	√
Fluoride in Water by IC	E235.F	776533	1	10	10.0	5.0	√
pH by Meter	E108	776528	1	20	5.0	5.0	1
Phenols (4AAP) in Water by Colorimetry	E562	778198	1	19	5.2	5.0	1
Sulfate in Water by IC	E235.SO4	776531	1	11	9.0	5.0	✓
Total Cyanide	E333	773103	1	8	12.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	778196	1	16	6.2	5.0	✓
Total Mercury in Water by CVAAS	E508	777748	1	8	12.5	5.0	✓
Total metals in Water by CRC ICPMS	E420	772785	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	778197	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	775520	1	18	5.5	4.7	✓
VOCs (Full List) by Headspace GC-MS	E611F	776870	1	3	33.3	5.0	✓
Laboratory Control Samples (LCS)							
Biochemical Oxygen Demand - 5 day	E550	775463	1	16	6.2	5.0	1
Fluoride in Water by IC	E235.F	776533	1	10	10.0	5.0	✓
Mineral Oil & Grease by Gravimetry	E567SG	772961	1	11	9.0	5.0	✓
Oil & Grease by Gravimetry	E567	772960	1	13	7.6	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	859428	1	11	9.0	5.0	✓
pH by Meter	E108	776528	1	20	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	778198	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	776531	1	11	9.0	5.0	✓
Total Cyanide	E333	773103	1	8	12.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	778196	1	16	6.2	5.0	✓
Total Mercury in Water by CVAAS	E508	777748	1	8	12.5	5.0	✓
Total metals in Water by CRC ICPMS	E420	772785	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	778197	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	775520	1	18	5.5	4.7	✓
VOCs (Full List) by Headspace GC-MS	E611F	776870	1	3	33.3	5.0	✓
Method Blanks (MB)							
Biochemical Oxygen Demand - 5 day	E550	775463	1	16	6.2	5.0	✓
E. coli (MF-mFC-BCIG)	E012A.EC	774372	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	776533	1	10	10.0	5.0	✓
Mineral Oil & Grease by Gravimetry	E567SG	772961	1	11	9.0	5.0	✓
Oil & Grease by Gravimetry	E567	772960	1	13	7.6	5.0	1

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Work Order : WT2224508 Amendment 1
Client : McClymont & Rak Engineers Inc.



Matrix: Water	Evaluation: × = <i>QC frequency outside specification</i> ; ✓ = <i>QC frequency within specification</i> .										
Quality Control Sample Type			Co	ount		Frequency (%)					
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation				
Method Blanks (MB) - Continued											
PAHs by Hexane LVI GC-MS	E641A	859428	1	11	9.0	5.0	✓				
Phenols (4AAP) in Water by Colorimetry	E562	778198	1	19	5.2	5.0	✓				
Sulfate in Water by IC	E235.SO4	776531	1	11	9.0	5.0	✓				
Total Cyanide	E333	773103	1	8	12.5	5.0	✓				
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	778196	1	16	6.2	5.0	✓				
Total Mercury in Water by CVAAS	E508	777748	1	8	12.5	5.0	✓				
Total metals in Water by CRC ICPMS	E420	772785	1	20	5.0	5.0	✓				
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	778197	1	20	5.0	5.0	✓				
TSS by Gravimetry	E160	775520	1	18	5.5	4.7	✓				
VOCs (Full List) by Headspace GC-MS	E611F	776870	1	3	33.3	5.0	✓				
Matrix Spikes (MS)											
Fluoride in Water by IC	E235.F	776533	1	10	10.0	5.0	✓				
Phenols (4AAP) in Water by Colorimetry	E562	778198	1	19	5.2	5.0	✓				
Sulfate in Water by IC	E235.SO4	776531	1	11	9.0	5.0	✓				
Total Cyanide	E333	773103	1	8	12.5	5.0	✓				
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	778196	1	16	6.2	5.0	✓				
Total Mercury in Water by CVAAS	E508	777748	1	8	12.5	5.0	✓				
Total metals in Water by CRC ICPMS	E420	772785	1	20	5.0	5.0	✓				
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	778197	1	20	5.0	5.0	✓				
VOCs (Full List) by Headspace GC-MS	E611F	776870	1	3	33.3	5.0	✓				

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Work Order : WT2224508 Amendment 1
Client : McClymont & Rak Engineers Inc.

Project : 5820



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	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.
	Waterloo -			0 0
	Environmental			
pH by Meter	E108	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,
	Waterloo -			pH should be measured in the field within the recommended 15 minute hold time.
	Environmental			
TSS by Gravimetry	E160	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
	Waterloo -			filtered solids. Samples containing very high dissolved solid content (i.e. seawaters,
	Environmental			brackish waters) may produce a positive bias by this method. Alternate analysis
Floorida in Water boole		10/-4	EDA 200 4 (methods are available for these types of samples.
Fluoride in Water by IC	E235.F	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV
	Waterloo -			detection.
	Environmental			
Sulfate in Water by IC	E235.SO4	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV
Canato III Water by 10	L233.304	Water	Li 71 000.1 (mod)	detection.
	Waterloo -			detection.
	Environmental			
Total Kjeldahl Nitrogen by Fluorescence (Low	E318	Water	Method Fialab 100,	TKN in water is determined by automated continuous flow analysis with membrane
Level)			2018	diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde).
	Waterloo -			This method is approved under US EPA 40 CFR Part 136 (May 2021).
	Environmental			
Total Cyanide	E333	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.
	Waterloo -			
	Environmental			Method Limitation: High levels of thiocyanate (SCN) may cause positive interference (up
Tatal Planata and La Oalania at the (0.000	F070 II	Water	APHA 4500-P E (mod).	to 0.5% of SCN concentration).
Total Phosphorus by Colourimetry (0.002	E372-U	vvaler	APHA 4500-P E (11100).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated
mg/L)	Waterloo -			persulfate digestion of the sample.
	Environmental			
Total metals in Water by CRC ICPMS	E1WIOIIIIeIIIai	Water	EPA 200.2/6020B	Water samples are digested with nitric and hydrochloric acids, and analyzed by
	L720		(mod)	Collision/Reaction Cell ICPMS.
	Waterloo -		()	Complete Capital For Ho.
	Environmental			Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered
				by this method.

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Client : McClymont & Rak Engineers Inc.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Mercury in Water by CVAAS	E508	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
	Waterloo -			
	Environmental			
Biochemical Oxygen Demand - 5 day	E550	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.
	Waterloo -			
	Environmental			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	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
	Waterloo -			form a red complex which is measured colorimetrically.
	Environmental			· · · · · · · · · · · · · · · · · · ·
Oil & Grease by Gravimetry	E567	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.
	Waterloo -			
	Environmental			
Mineral Oil & Grease by Gravimetry	E567SG	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
	Waterloo -			Mineral Oil and Grease.
	Environmental			
VOCs (Full List) by Headspace GC-MS	E611F	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
	Waterloo -			headspace autosampler, causing VOCs to partition between the aqueous phase and
	Environmental			the headspace in accordance with Henry's law.
PAHs by Hexane LVI GC-MS	E641A	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
	Waterloo -			
	Environmental			
Animal & Vegetable Oil & Grease by Gravimetry	EC567A.SG	Water	APHA 5520 (mod)	Animal & vegetable oil and grease is calculated as follows: Oil & Grease (gravimetric) minus Mineral Oil & Grease (gravimetric)
	Waterloo -			
	Environmental			
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for TKN in water	EP318	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
	Waterloo -		()	analytical method as TKN. This method is unsuitable for samples containing high levels
	Environmental			of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Digestion for Total Phosphorus in water	EP372	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
	Waterloo -			
	Environmental			
	Littioillioilla	<u> </u>		

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Work Order : WT2224508 Amendment 1
Client : McClymont & Rak Engineers Inc.



Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Oil & Grease Extraction for Gravimetry	EP567	Water	BC MOE Lab Manual	The entire water sample is extracted with hexane by liquid-liquid extraction.
			(Oil & Grease) (mod)	
	Waterloo -			
	Environmental			
VOCs Preparation for Headspace Analysis	EP581	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
	Waterloo -			GC/MS-FID system.
	Environmental			
PHCs and PAHs Hexane Extraction	EP601	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are
				extracted using a hexane liquid-liquid extraction.
	Waterloo -			
	Environmental			

ALS Canada Ltd.



QUALITY CONTROL REPORT

Work Order :WT2224508

Amendment : 1

Client : McClymont & Rak Engineers Inc.

Contact : Richard Sukhu

Address :111 Zenway Blvd. Unit 4

Vaughan ON Canada L4H 3H9

Telephone

Project : 5820 PO : ____

C-O-C number : 20-1000498

Sampler : CLIENT 416 675 0160

Site :--

Quote number : 2022 Price List

No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 10

Laboratory : Waterloo - Environmental

Account Manager : Emily Smith

Address : 60 Northland Road, Unit 1

Waterloo, Ontario Canada N2V 2B8

Telephone :+1 519 886 6910
Date Samples Received :08-Dec-2022 13:54

Date Analysis Commenced : 08-Dec-2022

Issue Date : 15-Mar-2023 15:41

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	
Jeremy Gingras	Team Leader - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario	
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Waterloo Organics, Waterloo, Ontario	
Jon Fisher	Department Manager - Inorganics	Waterloo Inorganics, Waterloo, Ontario	
Jon Fisher	Department Manager - Inorganics	Waterloo Metals, Waterloo, Ontario	
Manuel TavaraTello	Supervisor - Semi-Volatile Extractions	Waterloo Organics, Waterloo, Ontario	
Ruby Sujeepan		Waterloo Microbiology, Waterloo, Ontario	
Sarah Birch	VOC Section Supervisor	Waterloo Organics, Waterloo, Ontario	

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Work Order: WT2224508 Amendment 1
Client: McClymont & Rak Engineers Inc.

Project : 5820



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.

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Work Order: WT2224508 Amendment 1
Client: McClymont & Rak Engineers Inc.

Project : 5820



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: 775520)										
WT2224429-001	Anonymous	Solids, total suspended [TSS]		E160	5.0	mg/L	218	234	7.09%	20%	
Physical Tests (QC	Lot: 776528)										
WT2224728-001	Anonymous	рН		E108	0.10	pH units	8.00	7.99	0.125%	4%	
Anions and Nutrien	ts (QC Lot: 776531)										
WT2224766-002	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	31.3	31.1	0.474%	20%	
Anions and Nutrien	ts (QC Lot: 776533)										
WT2224766-002	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.051	0.051	0.00003	Diff <2x LOR	
Anions and Nutrien	ts (QC Lot: 778196)										
WT2224280-002	Anonymous	Kjeldahl nitrogen, total [TKN]		E318	2.50	mg/L	68.6	70.7	3.04%	20%	
Anions and Nutrien	ts (QC Lot: 778197)										
WT2224280-002	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0200	mg/L	5.35	5.37	0.359%	20%	
Cyanides (QC Lot:	773103)										
WT2224459-002	Anonymous	Cyanide, strong acid dissociable (Total)		E333	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	
Microbiological Tes	ts (QC Lot: 774372)										
WT2224517-001	Anonymous	Coliforms, Escherichia coli [E. coli]		E012A.EC	1	CFU/100mL	<1	<1	0	Diff <2x LOR	
Total Metals (QC L	ot: 772785)										
WT2224434-001 Anony	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	<0.00010	<0.00010	0	Diff <2x LOR	
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00406	0.00416	2.46%	20%	
		Beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000081	0.0000065	0.0000016	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	0.00013	0.00012	0.0000008	Diff <2x LOR	
		Copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	
		Iron, total	7439-89-6	E420	0.010	mg/L	0.571	0.581	1.67%	20%	
		Lead, total	7439-92-1	E420	0.000050	mg/L	0.000132	0.000135	0.000003	Diff <2x LOR	
		Manganese, total	7439-96-5	E420	0.00010	mg/L	0.0672	0.0690	2.67%	20%	
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00240	0.00249	3.61%	20%	
		Nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	

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Work Order: WT2224508 Amendment 1
Client: McClymont & Rak Engineers Inc.



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 Lo	ot: 772785) - continued										
WT2224434-001	Anonymous	Selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	
		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 Lo	ot: 777748)										
WT2224508-001	BH-10	Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	
Aggregate Organics	(QC Lot: 775463)										
WT2224508-001	BH-10	Biochemical oxygen demand [BOD]		E550	3.0	mg/L	3.4	<3.0	12.8%	30%	
Aggregate Organics	(QC Lot: 778198)										
WT2224462-001	Anonymous	Phenols, total (4AAP)		E562	0.0010	mg/L	0.0015	<0.0010	0.0005	Diff <2x LOR	
Volatile Organic Co	mpounds (QC Lot: 7768	70)									
WT2224508-001	BH-10	Benzene	71-43-2	E611F	0.50	μg/L	<0.50	<0.50	0	Diff <2x LOR	
		Chloroform	67-66-3	E611F	0.50	μg/L	<0.50	<0.50	0	Diff <2x LOR	
		Dichlorobenzene, 1,4-	106-46-7	E611F	0.50	μg/L	<0.50	<0.50	0	Diff <2x LOR	
		Dichloromethane	75-09-2	E611F	1.0	μg/L	<1.0	<1.0	0	Diff <2x LOR	
		Ethylbenzene	100-41-4	E611F	0.50	μg/L	<0.50	<0.50	0	Diff <2x LOR	
		Tetrachloroethylene	127-18-4	E611F	0.50	μg/L	<0.50	<0.50	0	Diff <2x LOR	
		Toluene	108-88-3	E611F	0.50	μg/L	<0.50	<0.50	0	Diff <2x LOR	
		Trichloroethylene	79-01-6	E611F	0.50	μg/L	<0.50	<0.50	0	Diff <2x LOR	

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Work Order: WT2224508 Amendment 1
Client: McClymont & Rak Engineers Inc.

Project : 5820



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.

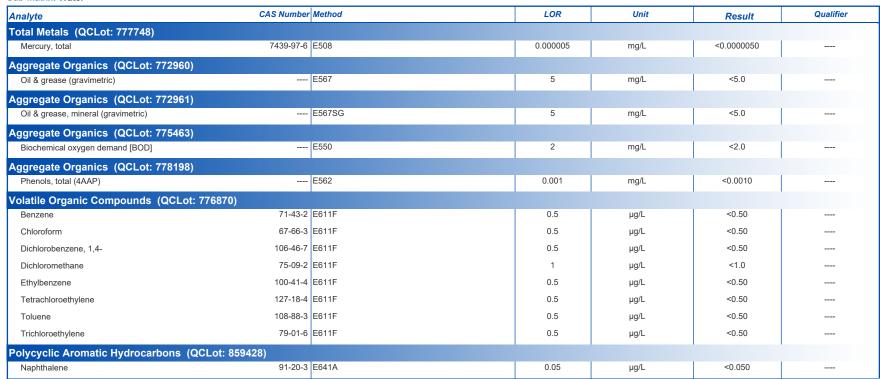
Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 775520)						
Solids, total suspended [TSS]		E160	3	mg/L	<3.0	
Anions and Nutrients (QCLot: 776531)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	
Anions and Nutrients (QCLot: 776533)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	
nions and Nutrients (QCLot: 778196)						
Kjeldahl nitrogen, total [TKN]		E318	0.05	mg/L	<0.050	
nions and Nutrients (QCLot: 778197)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	
Cyanides (QCLot: 773103)						
Cyanide, strong acid dissociable (Total)		E333	0.002	mg/L	<0.0020	
licrobiological Tests (QCLot: 774372)						
Coliforms, Escherichia coli [E. coli]		E012A.EC	1	CFU/100mL	<1	
otal Metals (QCLot: 772785)						
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	
Beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	
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	
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	
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	

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Work Order: WT2224508 Amendment 1
Client: McClymont & Rak Engineers Inc.







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Work Order: WT2224508 Amendment 1
Client: McClymont & Rak Engineers Inc.

Project : 5820



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 Co	entrol Sample (LCS)	Report	
					Spike	Recovery (%)	Recovery	Limits (%)	
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 775520)									
Solids, total suspended [TSS]		E160	3	mg/L	150 mg/L	100	85.0	115	
Physical Tests (QCLot: 776528)									
рН		E108		pH units	7 pH units	101	98.0	102	
Anions and Nutrients (QCLot: 776531)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	
Anions and Nutrients (QCLot: 776533)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	
Anions and Nutrients (QCLot: 778196)									
Kjeldahl nitrogen, total [TKN]		E318	0.05	mg/L	4 mg/L	110	75.0	125	
Anions and Nutrients (QCLot: 778197)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.845 mg/L	98.3	80.0	120	
Cyanides (QCLot: 773103)									
Cyanide, strong acid dissociable (Total)		E333	0.002	mg/L	0.25 mg/L	91.0	80.0	120	
Total Metals (QCLot: 772785)	7.00.00.5	E 100							
Aluminum, total	7429-90-5		0.003	mg/L	0.1 mg/L	96.7	80.0	120	
Antimony, total	7440-36-0		0.0001	mg/L	0.05 mg/L	99.0	80.0	120	
Arsenic, total	7440-38-2		0.0001	mg/L	0.05 mg/L	102	80.0	120	
Beryllium, total	7440-41-7		0.00002	mg/L	0.005 mg/L	93.7	80.0	120	
Cadmium, total	7440-43-9		0.000005	mg/L	0.005 mg/L	97.1	80.0	120	
Chromium, total	7440-47-3		0.0005	mg/L	0.0125 mg/L	95.6	80.0	120	
Cobalt, total	7440-48-4		0.0001	mg/L	0.0125 mg/L	96.5	80.0	120	
Copper, total	7440-50-8		0.0005	mg/L	0.0125 mg/L	95.6	80.0 80.0	120 120	
Iron, total	7439-89-6		0.01	mg/L	0.05 mg/L	94.5	80.0 80.0	120	
Lead, total	7439-92-1		0.00005	mg/L	0.025 mg/L	94.7			
Manganese, total	7439-96-5 7439-98-7		0.0001 0.00005	mg/L	0.0125 mg/L	96.7	80.0 80.0	120 120	
Molybdenum, total	7439-98-7 7440-02-0		0.0005	mg/L	0.0125 mg/L	96.4	80.0	120	
Nickel, total Selenium, total	7440-02-0 7782-49-2		0.0005	mg/L	0.025 mg/L	95.7	80.0	120	
· ·	7782-49-2 7440-22-4		0.00005	mg/L	0.05 mg/L	95.6	80.0	120	
Silver, total	7440-22-4 7440-31-5		0.0001	mg/L	0.005 mg/L	88.7	80.0	120	
Tin, total	/440-31-5	E42U	0.0001	mg/L	0.025 mg/L	94.9	OU.U	120	

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Work Order: WT2224508 Amendment 1
Client: McClymont & Rak Engineers Inc.



Sub-Matrix: Water						Laboratory Co	ntrol Sample (LCS)	Report	
					Spike	Recovery (%)	Recovery	Limits (%)	
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 772785) - continued									
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.0125 mg/L	90.9	80.0	120	
Zinc, total	7440-66-6	E420	0.003	mg/L	0.025 mg/L	97.8	80.0	120	
Total Metals (QCLot: 777748)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	99.0	80.0	120	
Aggregate Organics (QCLot: 772960)									
Oil & grease (gravimetric)		E567	5	mg/L	200 mg/L	98.0	70.0	130	
Aggregate Organics (QCLot: 772961)									
Oil & grease, mineral (gravimetric)		E567SG	5	mg/L	100 mg/L	85.7	70.0	130	
Aggregate Organics (QCLot: 775463)									
Biochemical oxygen demand [BOD]		E550	2	mg/L	198 mg/L	105	85.0	115	
Aggregate Organics (QCLot: 778198)									
Phenols, total (4AAP)		E562	0.001	mg/L	0.02 mg/L	105	85.0	115	
Volatile Organic Compounds (QCLot: 77687	70)								
Benzene	71-43-2	E611F	0.5	μg/L	100 μg/L	95.6	70.0	130	
Chloroform	67-66-3	E611F	0.5	μg/L	100 μg/L	90.5	70.0	130	
Dichlorobenzene, 1,4-	106-46-7	E611F	0.5	μg/L	100 μg/L	96.4	70.0	130	
Dichloromethane	75-09-2	E611F	1	μg/L	100 μg/L	102	70.0	130	
Ethylbenzene	100-41-4	E611F	0.5	μg/L	100 μg/L	92.6	70.0	130	
Tetrachloroethylene	127-18-4	E611F	0.5	μg/L	100 μg/L	93.2	70.0	130	
Toluene	108-88-3	E611F	0.5	μg/L	100 μg/L	99.0	70.0	130	
Trichloroethylene	79-01-6	E611F	0.5	μg/L	100 μg/L	94.9	70.0	130	
Polycyclic Aromatic Hydrocarbons (QCLot:	859428)								
Naphthalene	91-20-3	E641A	0.05	μg/L	0.5263 μg/L	76.1	50.0	140	

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Work Order: WT2224508 Amendment 1
Client: McClymont & Rak Engineers Inc.

Project : 5820



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			-	illiou, buonground lover	TX opino tovoi.		Matrix Spike	e (MS) Report		
					Spi	ike	Recovery (%)	Recovery	Limits (%)	
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutri	ents (QCLot: 776531)									
WT2224766-002	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	96.7 mg/L	100 mg/L	96.7	75.0	125	
Anions and Nutri	ents (QCLot: 776533)									
WT2224766-002	Anonymous	Fluoride	16984-48-8	E235.F	0.956 mg/L	1 mg/L	95.6	75.0	125	
Anions and Nutri	ents (QCLot: 778196)									
WT2224280-002	Anonymous	Kjeldahl nitrogen, total [TKN]		E318	ND mg/L	2.5 mg/L	ND	70.0	130	
Anions and Nutri	ents (QCLot: 778197)									
WT2224280-002	Anonymous	Phosphorus, total	7723-14-0	E372-U	ND mg/L	0.1 mg/L	ND	70.0	130	
Cyanides (QCLo	t: 773103)									
WT2224459-002	Anonymous	Cyanide, strong acid dissociable (Total)		E333	0.232 mg/L	0.25 mg/L	92.6	75.0	125	
Total Metals (QC	Lot: 772785)									
WT2224480-001	Anonymous	Aluminum, total	7429-90-5	E420	ND mg/L	0.1 mg/L	ND	70.0	130	
		Antimony, total	7440-36-0	E420	0.0486 mg/L	0.05 mg/L	97.2	70.0	130	
		Arsenic, total	7440-38-2	E420	0.0504 mg/L	0.05 mg/L	101	70.0	130	
		Beryllium, total	7440-41-7	E420	0.00491 mg/L	0.005 mg/L	98.3	70.0	130	
		Cadmium, total	7440-43-9	E420	0.00480 mg/L	0.005 mg/L	96.1	70.0	130	
		Chromium, total	7440-47-3	E420	0.0127 mg/L	0.0125 mg/L	102	70.0	130	
		Cobalt, total	7440-48-4	E420	0.0120 mg/L	0.0125 mg/L	96.1	70.0	130	
		Copper, total	7440-50-8	E420	0.0113 mg/L	0.0125 mg/L	90.8	70.0	130	
		Iron, total	7439-89-6	E420	ND mg/L	0.05 mg/L	ND	70.0	130	
		Lead, total	7439-92-1	E420	0.0239 mg/L	0.025 mg/L	95.7	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	0.0122 mg/L	0.0125 mg/L	97.6	70.0	130	
		Nickel, total	7440-02-0	E420	0.0232 mg/L	0.025 mg/L	92.8	70.0	130	
		Selenium, total	7782-49-2	E420	0.0494 mg/L	0.05 mg/L	98.8	70.0	130	
		Silver, total	7440-22-4	E420	0.00456 mg/L	0.005 mg/L	91.1	70.0	130	
		Tin, total	7440-31-5	E420	0.0235 mg/L	0.025 mg/L	94.0	70.0	130	
		Titanium, total	7440-32-6	E420	ND mg/L	0.0125 mg/L	ND	70.0	130	
		Zinc, total	7440-66-6	E420	0.0228 mg/L	0.025 mg/L	91.0	70.0	130	
Total Metals (QC	Lot: 777748)									
WT2224854-001	Anonymous	Mercury, total	7439-97-6	E508	0.0000953 mg/L	0.0001 mg/L	95.3	70.0	130	

Page : 10 of 10

Work Order: WT2224508 Amendment 1
Client: McClymont & Rak Engineers Inc.



Sub-Matrix: Water							Matrix Spil	ke (MS) Report		
					Spi	ke	Recovery (%)	Recovery	Limits (%)	
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Aggregate Organ	ics (QCLot: 778198)									
WT2224462-001	Anonymous	Phenols, total (4AAP)		E562	0.0203 mg/L	0.02 mg/L	102	75.0	125	
Volatile Organic (Compounds (QCLot: 77	(6870)								
WT2224508-001	BH-10	Benzene	71-43-2	E611F	96.8 μg/L	100 μg/L	96.8	60.0	140	
		Chloroform	67-66-3	E611F	94.8 μg/L	100 μg/L	94.8	60.0	140	
		Dichlorobenzene, 1,4-	106-46-7	E611F	101 μg/L	100 μg/L	101	60.0	140	
		Dichloromethane	75-09-2	E611F	105 μg/L	100 μg/L	105	60.0	140	
		Ethylbenzene	100-41-4	E611F	94.1 μg/L	100 μg/L	94.1	60.0	140	
		Tetrachloroethylene	127-18-4	E611F	91.2 μg/L	100 μg/L	91.2	60.0	140	
		Toluene	108-88-3	E611F	101 μg/L	100 μg/L	101	60.0	140	
		Trichloroethylene	79-01-6	E611F	94.2 μg/L	100 μg/L	94.2	60.0	140	



Canada Toll Free: 1 800 668 9878

SAMPLE RECEIPT DETAILS (ALS use only) ICE ICE PACK ROZEN COOLING INITIATES ed on Sample Receipt Notification: YES NO YES NA Sample Custody Seals Intact: YES YERATURES *C Seals Intact: YES YERATURES *C Seals Intact: YES YERATURES *C Seals Intact: YES YERATURES *C YES YES YERATURES *C YES YES YES NA Sample Custody Seals Intact: YES YES YES YES YES YES	FINAL SH	1	100000000000000000000000000000000000000	1					
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NEFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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

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

Canada Toll Free: 1 800 668 9878

Report To

www.alsglobal.com

Company:

McCh mant & Rak

Contact and company name below will appear on the final report

Phone: Contact:

675-0160

Sukhu

Merge QG/QCI Reports with COA X YES IN NO IN NA

Compare Results to Criteria on Report - provide details below if box checked

MX PEF □ EXCEL □ EDO (DIGITAL)
WITH COA MX YES □ NO □ NA

Select Report Format:

Reports / Recipients

Company address below will appear on the final report

Street

ZENWAY VAUGHAN

Email 2

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Select Distribution: mail 1 or Fax

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☐ MAIL ☐ FAX

Postal Code:

City/Province:



COC Number: 2(

Page

Work Order Reference
WT2224508

Waterloo Environmental Division

Telephone : +1 519 886 6910	amay apply to rush requests on weekends, statutory holidays and non-ro.
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	2 day [P2] if received by 3pm M-F - 50% rush surcharge minimun
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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

coc Number: 20 - 887691

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ALS Canada Ltd.



CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order : **WT2224510** Page : 1 of 5

Amendment : 1

Address

Site

Client : McClymont & Rak Engineers Inc. Laboratory : Waterloo - Environmental

Contact : Richard Sukhu Account Manager : Emily Smith

: 111 Zenway Blvd. Unit 4 Address : 60 Northland Road, Unit 1

Waterloo, Ontario Canada N2V 2B8

: 15-Mar-2023 15:19

 Telephone
 : 416 675 0160
 Telephone
 : +1 519 886 6910

 Project
 : 5820
 Date Samples Received
 : 08-Dec-2022 13:54

PO : ---- Date Analysis Commenced : 08-Dec-2022

Quote number : 2022 Price List

No. of samples received : 2
No. of samples analysed : 2

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:

Vaughan ON Canada L4H 3H9

- 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
Jeremy Gingras	Team Leader - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Organics, Waterloo, Ontario
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Jon Fisher	Department Manager - Inorganics	Metals, Waterloo, Ontario
Manuel TavaraTello	Supervisor - Semi-Volatile Extractions	Organics, Waterloo, Ontario
Ruby Sujeepan		Microbiology, 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.

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).
DLQ	Detection Limit raised due to co-eluting interference. Mass Spectrometry qualifier ion
	ratio did not meet acceptance criteria.

<: less than.

Page

3 of 5 WT2224510 Amendment 1 Work Order:

Client McClymont & Rak Engineers Inc.

Project

Analytical Results

•			Client sample ID	BH-1					
Sub-Matrix: Groundwater (Matrix: Water)		S	ampling date/time	08-Dec-2022 09:45					
Analyte	Method	LOR	Unit	WT2224510-001		HALSUB SAN	HALSUB STM		
Physical Tests									
рН	E108	0.10	pH units	8.22		6 - 10 pH units	6.5 - 8.5 pH units	 	
Solids, total suspended [TSS]	E160	3.0	mg/L	11.8		350 mg/L		 	
Anions and Nutrients									
Fluoride	E235.F	0.020	mg/L	0.182	DLDS	10 mg/L		 	
Kjeldahl nitrogen, total [TKN]	E318	0.050	mg/L	0.112		100 mg/L		 	
Phosphorus, total	E372-U	0.0020	mg/L	0.0167		10 mg/L		 	
Sulfate (as SO4)	E235.SO4	0.30	mg/L	305	DLDS	1500 mg/L		 	
Cyanides									
Cyanide, strong acid dissociable (Total)	E333	0.0020	mg/L	<0.0020		2 mg/L		 	
Microbiological Tests									
Coliforms, Escherichia coli [E. coli]	E012A.EC	1	CFU/100mL	Not Detected			200 CFU/100mL	 	
Total Metals							0.07.002		
Aluminum, total	E420	0.0030	mg/L	0.387	DLHC	50 mg/L		 	
Antimony, total	E420	0.00010	mg/L	<0.00100	DLHC	5 mg/L		 	
Arsenic, total	E420	0.00010	mg/L	0.00461	DLHC	1 mg/L		 	
Beryllium, total	E420	0.000020	mg/L	<0.000200	DLHC	5 mg/L		 	
Cadmium, total	E420	0.0000050	mg/L	<0.0000500	DLHC	1 mg/L		 	
Chromium, total	E420	0.00050	mg/L	<0.00500	DLHC	3 mg/L		 	
Cobalt, total	E420	0.00010	mg/L	0.00108	DLHC	5 mg/L		 	
Copper, total	E420	0.00050	mg/L	<0.00500	DLHC	3 mg/L		 	
Iron, total	E420	0.010	mg/L	0.777	DLHC	50 mg/L		 	
Lead, total	E420	0.000050	mg/L	<0.000500	DLHC	3 mg/L		 	
Manganese, total	E420	0.00010	mg/L	0.510	DLHC	5 mg/L		 	
Mercury, total	E508	0.0000050	mg/L	<0.0000050		0.05 mg/L		 	
Molybdenum, total	E420	0.000050	mg/L	0.00532	DLHC	5 mg/L		 	
Nickel, total	E420	0.00050	mg/L	<0.00500	DLHC	3 mg/L		 	
Selenium, total	E420	0.000050	mg/L	<0.000500	DLHC	5 mg/L		 	
Silver, total	E420	0.000010	mg/L	<0.000100	DLHC	5 mg/L		 	
Tin, total	E420	0.00010	mg/L	0.00198	DLHC	5 mg/L		 	

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Work Order : WT2224510 Amendment 1

Client : McClymont & Rak Engineers Inc.

Project : 5820



Analyte	Method	LOR	Unit	WT2224510-001		HALSUB	HALSUB		
				(Continued)		SAN	STM		
Total Metals - Continued									
Titanium, total	E420	0.00030	mg/L	0.00848	DLHC	5 mg/L		 	
Zinc, total	E420	0.0030	mg/L	<0.0300	DLHC	3 mg/L		 	
Aggregate Organics									
Biochemical oxygen demand [BOD]	E550	2.0	mg/L	<3.0	BODL	300 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	<0.0010		1 mg/L		 	
Volatile Organic Compounds	[Drycleaning]								
Dichloromethane	E611F	1.0	μg/L	<1.0		2000 μg/L		 	
Tetrachloroethylene	E611F	0.50	μg/L	<0.50		1000 μg/L		 	
Trichloroethylene	E611F	0.50	μg/L	<4.00	DLQ	400 μg/L		 	
Benzene	E611F	0.50	μg/L	<0.50		10 μg/L		 	
Ethylbenzene	E611F	0.50	μg/L	<0.50		160 μg/L		 	
Toluene	E611F	0.50	μg/L	<0.50		16 μg/L		 	
Chloroform	E611F	0.50	μg/L	<0.50		40 μg/L		 	
Dichlorobenzene, 1,4-	E611F	0.50	μg/L	<0.50		80 μg/L		 	
Volatile Organic Compounds	Surrogates								
Bromofluorobenzene, 4-	E611F	1.0	%	93.2				 	
Difluorobenzene, 1,4-	E611F	1.0	%	100				 	

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

No Breaches Found

Key:

HALSUB Ontario Halton Sanitary Sewer By-law No. 02-03 (MAR, 2003)

SAN Halton Sanitary Sewer By-Law No. 02-03
STM Halton Storm Sewer By-Law No, 02-03

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Client : McClymont & Rak Engineers Inc.

Project : 582



Analytical Results

			Client sample ID	BH-1				
Sub-Matrix: Water		Sa	ampling date/time	09-Mar-2023				
(Matrix: Water)			, 3	08:00				
Analyte	Method	LOR	Unit	WT2224510-002	HALSUB			
					SAN			
Polycyclic Aromatic Hydroca	arbons							
Naphthalene	E641A	0.050	μg/L	<0.050	140 μg/L	 	 	
Chrysene-d12	E641A	0.1	%	92.6		 	 	
Naphthalene-d8	E641A	0.1	%	97.4		 	 	
Phenanthrene-d10	E641A	0.1	%	105		 	 	

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

No Breaches Found

Key:

HALSUB Ontario Halton Sanitary Sewer By-law No. 02-03 (MAR, 2003)

SAN Halton Sanitary Sewer By-Law No. 02-03



QUALITY CONTROL INTERPRETIVE REPORT

Work Order : **WT2224510** Page : 1 of 10

Amendment :1

Client : McClymont & Rak Engineers Inc. Laboratory : Waterloo - Environmental

Contact : Richard Sukhu Account Manager : Emily Smith

Address :111 Zenway Blvd. Unit 4 Address :60 Northland Road, Unit 1

Waterloo, Ontario Canada N2V 2B8

 Telephone
 :416 675 0160
 Telephone
 :+1 519 886 6910

 Project
 :5820
 Date Samples Received
 : 08-Dec-2022 13:54

 PO
 :--- Issue Date
 : 15-Mar-2023 16:17

C-O-C number : 20-1000499
Sampler : CLIENT
Site :----

Quote number : 2022 Price List

No. of samples received :2
No. of samples analysed :2

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.

Vaughan ON Canada L4H 3H9

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

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

Summary of Outliers Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- 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)

• No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

• No Quality Control Sample Frequency Outliers occur.

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Work Order : WT2224510 Amendment 1
Client : McClymont & Rak Engineers Inc.

Project : 5820



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					Ev	/aluation: 🗴 =	Holding time exce	edance ; 🛚	/ = Within	Holding Tim
Analyte Group	Method	Sampling Date	Ext	raction / Pr	eparation			Analys	sis	
Container / Client Sample ID(s)			Preparation	Holding	g Times	Eval	Analysis Date	Holding	g Times	Eval
			Date	Rec	Actual			Rec	Actual	
Aggregate Organics : Biochemical Oxygen Demand - 5 day										
HDPE [BOD HT-4d]										
BH-1	E550	08-Dec-2022					12-Dec-2022	4 days	4 days	✓
Aggregate Organics : Mineral Oil & Grease by Gravimetry										
Amber glass (hydrochloric acid)										
BH-1	E567SG	08-Dec-2022	15-Dec-2022	28	7 days	✓	15-Dec-2022	40 days	0 days	✓
				days						
Aggregate Organics : Oil & Grease by Gravimetry										
Amber glass (hydrochloric acid)										
BH-1	E567	08-Dec-2022	15-Dec-2022	28	7 days	✓	15-Dec-2022	40 days	0 days	✓
				days						
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) [ON MECP]	F500	00 D 0000	44.50000				45 D 0000	00.1	7 1	1
BH-1	E562	08-Dec-2022	14-Dec-2022				15-Dec-2022	28 days	/ days	✓
Anions and Nutrients : Fluoride in Water by IC				ı						
HDPE [ON MECP] BH-1	E235.F	08-Dec-2022	13-Dec-2022				13-Dec-2022	20 days	E dovo	1
BH-1	E233.F	06-Dec-2022	13-Dec-2022				13-Dec-2022	28 days	5 days	•
Anions and Nutrients : Sulfate in Water by IC										
HDPE [ON MECP] BH-1	E235.SO4	08-Dec-2022	13-Dec-2022				13-Dec-2022	28 days	5 days	1
ויוט	L233.304	00-060-2022	13-060-2022				13-060-2022	20 days	Juays	•
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid) [ON MECP] BH-1	E318	08-Dec-2022	15-Dec-2022				16-Dec-2022	28 days	8 days	1
DIF1	2010	00-060-2022	10-060-2022				10-060-2022	20 days	Juays	•

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Client : McClymont & Rak Engineers Inc.



atrix: Water					Εν	/aluation: 🗴 =	Holding time exce	edance ; 🔻	= Within	Holding Ti
Analyte Group	Method	Sampling Date	Ex	traction / Pr	eparation			Analys	is	
Container / Client Sample ID(s)			Preparation	Holding	g Times	Eval	Analysis Date	Holding	Times	Eval
			Date	Rec	Actual			Rec	Actual	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) [ON MECP]										
BH-1	E372-U	08-Dec-2022	15-Dec-2022				16-Dec-2022	28 days	8 days	✓
Cyanides : Total Cyanide										
UV-inhibited HDPE - total (sodium hydroxide)										
BH-1	E333	08-Dec-2022	09-Dec-2022				09-Dec-2022	14 days	1 days	✓
Microbiological Tests : E. coli (MF-mFC-BCIG)										
Sterile HDPE (Sodium thiosulphate) [ON MECP]										
BH-1	E012A.EC	08-Dec-2022					10-Dec-2022	48 hrs	47 hrs	✓
Physical Tests : pH by Meter										
HDPE [ON MECP]										
BH-1	E108	08-Dec-2022	13-Dec-2022				14-Dec-2022	14 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE [ON MECP]										
BH-1	E160	08-Dec-2022					13-Dec-2022	7 days	5 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate)										
BH-1	E641A	09-Mar-2023	10-Mar-2023	105	92	✓	13-Mar-2023	40 days	3 days	✓
				days	days					
otal Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid)										
BH-1	E508	08-Dec-2022	09-Dec-2022				09-Dec-2022	28 days	1 days	✓
otal Metals : Total metals in Water by CRC ICPMS										
HDPE total (nitric acid)										
BH-1	E420	08-Dec-2022	08-Dec-2022				09-Dec-2022	180	1 days	✓
								days		
/olatile Organic Compounds : VOCs (Full List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
BH-1	E611F	08-Dec-2022	13-Dec-2022				13-Dec-2022	14 days	5 days	✓

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Client : McClymont & Rak Engineers Inc.

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Matrix: Water					E	/aluation: ≭ =	Holding time excee	edance ; 🔻	/ = Within	Holding Time
Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation	Holding	g Times	Eval	Analysis Date	Holding	g Times	Eval
			Date	Rec	Actual			Rec	Actual	
Volatile Organic Compounds [Drycleaning] : VOCs (Full List) by Headspace GC-MS	8									
Glass vial (sodium bisulfate) BH-1	E611F	08-Dec-2022	13-Dec-2022				13-Dec-2022	14 days	5 days	✓
Volatile Organic Compounds [Fuels] : VOCs (Full List) by Headspace GC-MS										
Glass vial (sodium bisulfate) BH-1	E611F	08-Dec-2022	13-Dec-2022				13-Dec-2022	14 days	5 days	✓
Volatile Organic Compounds [THMs] : VOCs (Full List) by Headspace GC-MS										
Glass vial (sodium bisulfate) BH-1	E611F	08-Dec-2022	13-Dec-2022				13-Dec-2022	14 days	5 days	✓

Legend & Qualifier Definitions

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

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Work Order : WT2224510 Amendment 1
Client : McClymont & Rak Engineers Inc.

Project : 5820



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.

Quality Control Sample Type			Co	ount)	
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Frequency (%) Expected	Evaluation
Laboratory Duplicates (DUP)							
Biochemical Oxygen Demand - 5 day	E550	775463	1	16	6.2	5.0	√
E. coli (MF-mFC-BCIG)	E012A.EC	774372	1	10	10.0	5.0	√
Fluoride in Water by IC	E235.F	776533	1	10	10.0	5.0	√
pH by Meter	E108	776528	1	20	5.0	5.0	1
Phenols (4AAP) in Water by Colorimetry	E562	778198	1	19	5.2	5.0	1
Sulfate in Water by IC	E235.SO4	776531	1	11	9.0	5.0	✓
Total Cyanide	E333	773103	1	8	12.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	778196	1	16	6.2	5.0	✓
Total Mercury in Water by CVAAS	E508	773013	1	5	20.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	772785	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	778197	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	775520	1	18	5.5	4.7	✓
VOCs (Full List) by Headspace GC-MS	E611F	776870	1	3	33.3	5.0	✓
Laboratory Control Samples (LCS)							
Biochemical Oxygen Demand - 5 day	E550	775463	1	16	6.2	5.0	1
Fluoride in Water by IC	E235.F	776533	1	10	10.0	5.0	✓
Mineral Oil & Grease by Gravimetry	E567SG	772961	1	11	9.0	5.0	✓
Oil & Grease by Gravimetry	E567	772960	1	13	7.6	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	859428	1	11	9.0	5.0	✓
pH by Meter	E108	776528	1	20	5.0	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	778198	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	776531	1	11	9.0	5.0	✓
Total Cyanide	E333	773103	1	8	12.5	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	778196	1	16	6.2	5.0	✓
Total Mercury in Water by CVAAS	E508	773013	1	5	20.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	772785	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	778197	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	775520	1	18	5.5	4.7	✓
VOCs (Full List) by Headspace GC-MS	E611F	776870	1	3	33.3	5.0	✓
Method Blanks (MB)							
Biochemical Oxygen Demand - 5 day	E550	775463	1	16	6.2	5.0	✓
E. coli (MF-mFC-BCIG)	E012A.EC	774372	1	10	10.0	5.0	✓
Fluoride in Water by IC	E235.F	776533	1	10	10.0	5.0	✓
Mineral Oil & Grease by Gravimetry	E567SG	772961	1	11	9.0	5.0	✓
Oil & Grease by Gravimetry	E567	772960	1	13	7.6	5.0	✓

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Work Order : WT2224510 Amendment 1
Client : McClymont & Rak Engineers Inc.



Matrix: Water	Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification										
Quality Control Sample Type			Co	ount		Frequency (%)					
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation				
Method Blanks (MB) - Continued											
PAHs by Hexane LVI GC-MS	E641A	859428	1	11	9.0	5.0	✓				
Phenols (4AAP) in Water by Colorimetry	E562	778198	1	19	5.2	5.0	✓				
Sulfate in Water by IC	E235.SO4	776531	1	11	9.0	5.0	✓				
Total Cyanide	E333	773103	1	8	12.5	5.0	✓				
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	778196	1	16	6.2	5.0	✓				
Total Mercury in Water by CVAAS	E508	773013	1	5	20.0	5.0	✓				
Total metals in Water by CRC ICPMS	E420	772785	1	20	5.0	5.0	✓				
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	778197	1	20	5.0	5.0	✓				
TSS by Gravimetry	E160	775520	1	18	5.5	4.7	✓				
VOCs (Full List) by Headspace GC-MS	E611F	776870	1	3	33.3	5.0	✓				
Matrix Spikes (MS)											
Fluoride in Water by IC	E235.F	776533	1	10	10.0	5.0	✓				
Phenols (4AAP) in Water by Colorimetry	E562	778198	1	19	5.2	5.0	✓				
Sulfate in Water by IC	E235.SO4	776531	1	11	9.0	5.0	✓				
Total Cyanide	E333	773103	1	8	12.5	5.0	✓				
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	778196	1	16	6.2	5.0	✓				
Total Mercury in Water by CVAAS	E508	773013	1	5	20.0	5.0	✓				
Total metals in Water by CRC ICPMS	E420	772785	1	20	5.0	5.0	✓				
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	778197	1	20	5.0	5.0	✓				
VOCs (Full List) by Headspace GC-MS	E611F	776870	1	3	33.3	5.0	√				

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Work Order : WT2224510 Amendment 1
Client : McClymont & Rak Engineers Inc.

Project : 5820



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	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.
	Waterloo -			
	Environmental			
pH by Meter	E108	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,
	Waterloo -			pH should be measured in the field within the recommended 15 minute hold time.
	Environmental			pri dilodia de inicadarea in die ilota maini die recommendea re minate nota dilie.
TSS by Gravimetry	E160	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
	Waterloo -			filtered solids. Samples containing very high dissolved solid content (i.e. seawaters,
	Environmental			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	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
	Waterloo -			45.55.55.11
	Environmental			
Sulfate in Water by IC	E235.SO4	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and /or UV detection.
	Waterloo -			
	Environmental			
Total Kjeldahl Nitrogen by Fluorescence (Low	E318	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).
Level)	Waterloo -		2010	This method is approved under US EPA 40 CFR Part 136 (May 2021).
	Environmental			This method is approved under 03 EFA 40 CFK Fait 130 (May 2021).
Total Cyanide	E333	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.
	Waterloo -			
	Environmental			Method Limitation: High levels of thiocyanate (SCN) may cause positive interference (up to 0.5% of SCN concentration).
Total Phosphorus by Colourimetry (0.002	E372-U	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
mg/L)	Waterloo -			persunate digestion of the sample.
	Environmental			
Total metals in Water by CRC ICPMS	E420	Water	EPA 200.2/6020B	Water samples are digested with nitric and hydrochloric acids, and analyzed by
	Waterloo -		(mod)	Collision/Reaction Cell ICPMS.
	Environmental			Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered
	Environmental			` '
				by this method.

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Client : McClymont & Rak Engineers Inc.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Mercury in Water by CVAAS	E508	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction
				with stannous chloride, and analyzed by CVAAS
	Waterloo -			
B: 1 : 10 B 1 5 1	Environmental	10/	4 D 1 1 4 5 0 1 0 D (1)	
Biochemical Oxygen Demand - 5 day	E550	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.
	Waterloo -			
	Environmental			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	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
	Waterloo -			form a red complex which is measured colorimetrically.
	Environmental			, ,
Oil & Grease by Gravimetry	E567	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.
	Waterloo -			
	Environmental			
Mineral Oil & Grease by Gravimetry	E567SG	Water	BC MOE Lab Manual	The entire water sample is extracted with hexane, followed by silica gel treatment after
			(Oil & Grease) (mod)	which the extract is evaporated to dryness. The residue is then weighed to determine
	Waterloo -			Mineral Oil and Grease.
V00- (5-III - 1) I - II - I - I - I - I - I - I - I - I	Environmental	10/	EDA 0000D (*** **)	
VOCs (Full List) by Headspace GC-MS	E611F	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
	Waterloo -			headspace autosampler, causing VOCs to partition between the aqueous phase and
	Environmental			the headspace in accordance with Henry's law.
PAHs by Hexane LVI GC-MS	E641A	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
	Waterloo -			
	Environmental			
Animal & Vegetable Oil & Grease by Gravimetry	EC567A.SG	Water	APHA 5520 (mod)	Animal & vegetable oil and grease is calculated as follows: Oil & Grease (gravimetric) minus Mineral Oil & Grease (gravimetric)
	Waterloo -			
	Environmental			
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for TKN in water	EP318	Water	APHA 4500-Norg D	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst,
			(mod)	which converts organic nitrogen sources to Ammonia, which is then quantified by the
	Waterloo -			analytical method as TKN. This method is unsuitable for samples containing high levels
	Environmental			of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Digestion for Total Phosphorus in water	EP372	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
	Waterloo -			
I .	Environmental		T. Control of the Con	

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Work Order : WT2224510 Amendment 1
Client : McClymont & Rak Engineers Inc.



Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Oil & Grease Extraction for Gravimetry	EP567	Water	BC MOE Lab Manual	The entire water sample is extracted with hexane by liquid-liquid extraction.
			(Oil & Grease) (mod)	
	Waterloo -		, , , ,	
	Environmental			
VOCs Preparation for Headspace Analysis	EP581	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
	Waterloo -			GC/MS-FID system.
	Environmental			
PHCs and PAHs Hexane Extraction	EP601	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are
				extracted using a hexane liquid-liquid extraction.
	Waterloo -			
	Environmental			

ALS Canada Ltd.



QUALITY CONTROL REPORT

Work Order :WT2224510

Amendment : 1

Client : McClymont & Rak Engineers Inc.

Contact : Richard Sukhu

Address :111 Zenway Blvd. Unit 4

Vaughan ON Canada L4H 3H9

Telephone

Project : 5820 PO : ____

C-O-C number : 20-1000499

Sampler : CLIENT 416 675 0160

Site :--

Quote number : 2022 Price List

No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 10

Laboratory : Waterloo - Environmental

Account Manager : Emily Smith

Address : 60 Northland Road, Unit 1

Waterloo, Ontario Canada N2V 2B8

Telephone :+1 519 886 6910
Date Samples Received :08-Dec-2022 13:54

Date Analysis Commenced : 08-Dec-2022

Issue Date : 15-Mar-2023 15:42

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	
Jeremy Gingras	Team Leader - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario	
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Waterloo Organics, Waterloo, Ontario	
Jon Fisher	Department Manager - Inorganics	Waterloo Inorganics, Waterloo, Ontario	
Jon Fisher	Department Manager - Inorganics	Waterloo Metals, Waterloo, Ontario	
Manuel TavaraTello	Supervisor - Semi-Volatile Extractions	Waterloo Organics, Waterloo, Ontario	
Ruby Sujeepan		Waterloo Microbiology, Waterloo, Ontario	
Sarah Birch	VOC Section Supervisor	Waterloo Organics, Waterloo, Ontario	

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Work Order: WT2224510 Amendment 1
Client: McClymont & Rak Engineers Inc.

Project : 5820



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.

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Work Order: WT2224510 Amendment 1
Client: McClymont & Rak Engineers Inc.

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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	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier		
Physical Tests (Q0	C Lot: 775520)										
WT2224429-001	Anonymous	Solids, total suspended [TSS]		E160	5.0	mg/L	218	234	7.09%	20%	
Physical Tests (Q0	C Lot: 776528)										
WT2224728-001	Anonymous	pH		E108	0.10	pH units	8.00	7.99	0.125%	4%	
Anions and Nutrier	nts (QC Lot: 776531)										
WT2224766-002	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	31.3	31.1	0.474%	20%	
Anions and Nutrier	nts (QC Lot: 776533)										
WT2224766-002	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.051	0.051	0.00003	Diff <2x LOR	
Anions and Nutrier	nts (QC Lot: 778196)										
WT2224280-002	Anonymous	Kjeldahl nitrogen, total [TKN]		E318	2.50	mg/L	68.6	70.7	3.04%	20%	
Anions and Nutrier	nts (QC Lot: 778197)										
WT2224280-002	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0200	mg/L	5.35	5.37	0.359%	20%	
Cyanides (QC Lot:	773103)										
WT2224459-002	Anonymous	Cyanide, strong acid dissociable		E333	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	
Misyahialawiasi Ta	sts (QC Lot: 774372)	(Total)									
WT2224517-001	Anonymous	Coliforms, Escherichia coli [E. coli]		E012A.EC	1	CFU/100mL	<1	<1	0	Diff <2x LOR	
Total Metals (QC L	ot: 772795)										
WT2224434-001	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	<0.00010	<0.00010	0	Diff <2x LOR	
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00406	0.00416	2.46%	20%	
		Beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000081	0.0000065	0.0000016	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	0.00013	0.00012	0.0000008	Diff <2x LOR	
		Copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	
		Iron, total	7439-89-6	E420	0.010	mg/L	0.571	0.581	1.67%	20%	
		Lead, total	7439-92-1	E420	0.000050	mg/L	0.000132	0.000135	0.000003	Diff <2x LOR	
		Manganese, total	7439-96-5	E420	0.00010	mg/L	0.0672	0.0690	2.67%	20%	
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00240	0.00249	3.61%	20%	

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Work Order: WT2224510 Amendment 1
Client: McClymont & Rak Engineers Inc.



Sub-Matrix: Water		Laboratory Duplicate (DUP) Report									
Laboratory sample ID	Client sample ID	ient sample ID Analyte CAS Number Method					Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC L	ot: 772785) - continued										
WT2224434-001	Anonymous	Selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	
		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 L	ot: 773013)										
WT2224505-001	Anonymous	Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	
Aggregate Organic	s (QC Lot: 775463)										
WT2224508-001	Anonymous	Biochemical oxygen demand [BOD]		E550	3.0	mg/L	3.4	<3.0	12.8%	30%	
Aggregate Organic	s (QC Lot: 778198)										
WT2224462-001	Anonymous	Phenols, total (4AAP)		E562	0.0010	mg/L	0.0015	<0.0010	0.0005	Diff <2x LOR	
Volatile Organic Co	mpounds (QC Lot: 7768	70)									
WT2224508-001	Anonymous	Benzene	71-43-2	E611F	0.50	μg/L	<0.50	<0.50	0	Diff <2x LOR	
		Chloroform	67-66-3	E611F	0.50	μg/L	<0.50	<0.50	0	Diff <2x LOR	
		Dichlorobenzene, 1,4-	106-46-7	E611F	0.50	μg/L	<0.50	<0.50	0	Diff <2x LOR	
		Dichloromethane	75-09-2	E611F	1.0	μg/L	<1.0	<1.0	0	Diff <2x LOR	
		Ethylbenzene	100-41-4	E611F	0.50	μg/L	<0.50	<0.50	0	Diff <2x LOR	
		Tetrachloroethylene	127-18-4	E611F	0.50	μg/L	<0.50	<0.50	0	Diff <2x LOR	
		Toluene	108-88-3	E611F	0.50	μg/L	<0.50	<0.50	0	Diff <2x LOR	
		Trichloroethylene	79-01-6	E611F	0.50	μg/L	<0.50	<0.50	0	Diff <2x LOR	

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Work Order: WT2224510 Amendment 1
Client: McClymont & Rak Engineers Inc.

Project : 5820



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

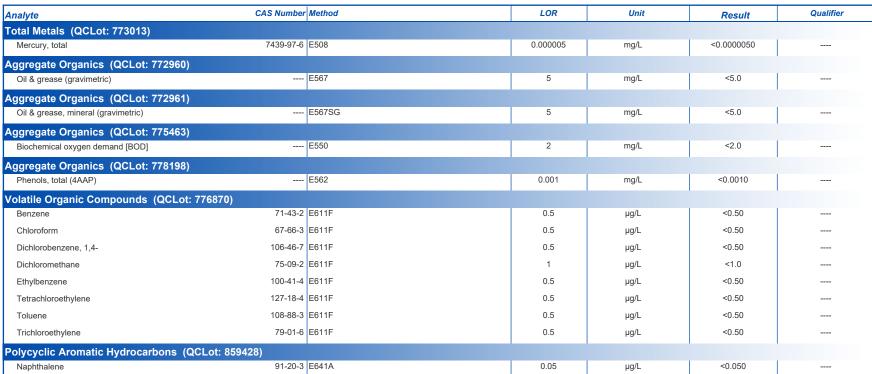
Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 775520)						
Solids, total suspended [TSS]		E160	3	mg/L	<3.0	
Anions and Nutrients (QCLot: 776531)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	
Anions and Nutrients (QCLot: 776533)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	
nions and Nutrients (QCLot: 778196)						
Kjeldahl nitrogen, total [TKN]		E318	0.05	mg/L	<0.050	
nions and Nutrients (QCLot: 778197)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	
Syanides (QCLot: 773103)						
Cyanide, strong acid dissociable (Total)		E333	0.002	mg/L	<0.0020	
Microbiological Tests (QCLot: 774372)						
Coliforms, Escherichia coli [E. coli]		E012A.EC	1	CFU/100mL	<1	
otal Metals (QCLot: 772785)						
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	
Beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	
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	
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	
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	

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Work Order: WT2224510 Amendment 1
Client: McClymont & Rak Engineers Inc.

Project : 5820

Sub-Matrix: Water





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Work Order: WT2224510 Amendment 1
Client: McClymont & Rak Engineers Inc.

Project : 5820



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: 775520)										
Solids, total suspended [TSS]		E160	3	mg/L	150 mg/L	100	85.0	115		
Physical Tests (QCLot: 776528)										
рН		E108		pH units	7 pH units	101	98.0	102		
Anions and Nutrients (QCLot: 776531)										
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110		
Anions and Nutrients (QCLot: 776533)										
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110		
Anions and Nutrients (QCLot: 778196)										
Kjeldahl nitrogen, total [TKN]		E318	0.05	mg/L	4 mg/L	110	75.0	125		
Anions and Nutrients (QCLot: 778197)										
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.845 mg/L	98.3	80.0	120		
Cyanides (QCLot: 773103)										
Cyanide, strong acid dissociable (Total)		E333	0.002	mg/L	0.25 mg/L	91.0	80.0	120		
Total Metals (QCLot: 772785)	7.00.00.5	E 100								
Aluminum, total	7429-90-5		0.003	mg/L	0.1 mg/L	96.7	80.0	120		
Antimony, total	7440-36-0		0.0001	mg/L	0.05 mg/L	99.0	80.0	120		
Arsenic, total	7440-38-2		0.0001	mg/L	0.05 mg/L	102	80.0	120		
Beryllium, total	7440-41-7		0.00002	mg/L	0.005 mg/L	93.7	80.0	120		
Cadmium, total	7440-43-9		0.000005	mg/L	0.005 mg/L	97.1	80.0	120		
Chromium, total	7440-47-3		0.0005	mg/L	0.0125 mg/L	95.6	80.0	120		
Cobalt, total	7440-48-4		0.0001	mg/L	0.0125 mg/L	96.5	80.0	120		
Copper, total	7440-50-8		0.0005	mg/L	0.0125 mg/L	95.6	80.0 80.0	120 120		
Iron, total	7439-89-6		0.01	mg/L	0.05 mg/L	94.5	80.0 80.0	120		
Lead, total	7439-92-1		0.00005	mg/L	0.025 mg/L	94.7				
Manganese, total	7439-96-5 7439-98-7		0.0001 0.00005	mg/L	0.0125 mg/L	96.7	80.0 80.0	120 120		
Molybdenum, total	7439-98-7 7440-02-0		0.0005	mg/L	0.0125 mg/L	96.4	80.0	120		
Nickel, total Selenium, total	7440-02-0 7782-49-2		0.0005	mg/L	0.025 mg/L	95.7	80.0	120		
· ·	7782-49-2 7440-22-4		0.00005	mg/L	0.05 mg/L	95.6	80.0	120		
Silver, total	7440-22-4 7440-31-5		0.00001	mg/L	0.005 mg/L	88.7	80.0	120		
Tin, total	/440-31-5	E42U	0.0001	mg/L	0.025 mg/L	94.9	OU.U	120		

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Work Order: WT2224510 Amendment 1
Client: McClymont & Rak Engineers Inc.



Sub-Matrix: Water		Laboratory Control Sample (LCS) Report								
					Spike	Recovery (%)	Recovery	Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier	
Total Metals (QCLot: 772785) - continued										
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.0125 mg/L	90.9	80.0	120		
Zinc, total	7440-66-6	E420	0.003	mg/L	0.025 mg/L	97.8	0.08	120		
Total Metals (QCLot: 773013)										
Mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	102	80.0	120		
Aggregate Organics (QCLot: 772960)		E507			"		70.0	100		
Oil & grease (gravimetric)		E567	5	mg/L	200 mg/L	98.0	70.0	130		
Aggregate Organics (QCLot: 772961)		550700								
Oil & grease, mineral (gravimetric)		E567SG	5	mg/L	100 mg/L	85.7	70.0	130		
Aggregate Organics (QCLot: 775463)										
Biochemical oxygen demand [BOD]		E550	2	mg/L	198 mg/L	105	85.0	115		
Aggregate Organics (QCLot: 778198)										
Phenols, total (4AAP)		E562	0.001	mg/L	0.02 mg/L	105	85.0	115		
V - ("	-0)									
Volatile Organic Compounds (QCLot: 7768 Benzene	70) 71-43-2	F611F	0.5	μg/L	100 μg/L	95.6	70.0	130		
Chloroform	67-66-3		0.5	μg/L	100 μg/L	90.5	70.0	130		
Dichlorobenzene. 1.4-	106-46-7		0.5	μg/L	100 μg/L	96.4	70.0	130		
Dichloromethane	75-09-2		1	μg/L	100 μg/L	102	70.0	130		
Ethylbenzene	100-41-4	E611F	0.5	μg/L	100 μg/L	92.6	70.0	130		
Tetrachloroethylene	127-18-4	E611F	0.5	μg/L	100 µg/L	93.2	70.0	130		
Toluene	108-88-3		0.5	μg/L	100 μg/L	99.0	70.0	130		
Trichloroethylene	79-01-6	E611F	0.5	μg/L	100 μg/L	94.9	70.0	130		
Polycyclic Aromatic Hydrocarbons (QCLot										
Naphthalene	91-20-3	E641A	0.05	μg/L	0.5263 μg/L	76.1	50.0	140		

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Work Order: WT2224510 Amendment 1
Client: McClymont & Rak Engineers Inc.

Project : 5820



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									
					Sp	ike	Recovery (%)	Recovery	Limits (%)			
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier		
Anions and Nutri	ents (QCLot: 776531)											
WT2224766-002	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	96.7 mg/L	100 mg/L	96.7	75.0	125			
Anions and Nutri	ents (QCLot: 776533)											
WT2224766-002	Anonymous	Fluoride	16984-48-8	E235.F	0.956 mg/L	1 mg/L	95.6	75.0	125			
Anions and Nutri	ents (QCLot: 778196)											
WT2224280-002	Anonymous	Kjeldahl nitrogen, total [TKN]		E318	ND mg/L	2.5 mg/L	ND	70.0	130			
Anions and Nutri	ents (QCLot: 778197)											
WT2224280-002	Anonymous	Phosphorus, total	7723-14-0	E372-U	ND mg/L	0.1 mg/L	ND	70.0	130			
Cyanides (QCLo	t: 773103)											
WT2224459-002	Anonymous	Cyanide, strong acid dissociable (Total)		E333	0.232 mg/L	0.25 mg/L	92.6	75.0	125			
Total Metals (QC	Cl of: 772785)				0.202g/2	0.20 mg/2	02.0	7 0.0	120			
WT2224480-001	Anonymous	Aluminum, total	7429-90-5	E420	ND mg/L	0.1 mg/L	ND	70.0	130			
VV 12224400-00 1	raionymodo	Antimony, total	7429-90-3	E420	0.0486 mg/L	0.1 mg/L 0.05 mg/L	97.2	70.0	130			
		Arsenic, total	7440-38-2	E420	0.0504 mg/L	0.05 mg/L	101	70.0	130			
		Beryllium, total	7440-41-7	E420	0.00491 mg/L	0.005 mg/L	98.3	70.0	130			
		Cadmium, total	7440-43-9	E420	0.00480 mg/L	0.005 mg/L	96.1	70.0	130			
		Chromium, total	7440-47-3	E420	0.0127 mg/L	0.0125 mg/L	102	70.0	130			
		Cobalt, total	7440-48-4	E420	0.0120 mg/L	0.0125 mg/L	96.1	70.0	130			
		Copper, total	7440-50-8	E420	0.0113 mg/L	0.0125 mg/L	90.8	70.0	130			
		Iron, total	7439-89-6	E420	ND mg/L	0.05 mg/L	ND	70.0	130			
		Lead, total	7439-92-1	E420	0.0239 mg/L	0.025 mg/L	95.7	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	0.0122 mg/L	0.0125 mg/L	97.6	70.0	130			
		Nickel, total	7440-02-0	E420	0.0232 mg/L	0.025 mg/L	92.8	70.0	130			
		Selenium, total	7782-49-2	E420	0.0494 mg/L	0.05 mg/L	98.8	70.0	130			
		Silver, total	7440-22-4	E420	0.00456 mg/L	0.005 mg/L	91.1	70.0	130			
		Tin, total	7440-31-5	E420	0.0235 mg/L	0.025 mg/L	94.0	70.0	130			
		Titanium, total	7440-32-6	E420	ND mg/L	0.0125 mg/L	ND	70.0	130			
	V	Zinc, total	7440-66-6	E420	0.0228 mg/L	0.025 mg/L	91.0	70.0	130			
Total Metals (QC												
WT2224507-001	Anonymous	Mercury, total	7439-97-6	E508	0.0000909 mg/L	0.0001 mg/L	90.9	70.0	130			

Page : 10 of 10

Work Order: WT2224510 Amendment 1
Client: McClymont & Rak Engineers Inc.



Sub-Matrix: Water			Matrix Spike (MS) Report								
					Spi	ke	Recovery (%)	Recovery	Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier	
Aggregate Organ	ics (QCLot: 778198)										
WT2224462-001	Anonymous	Phenols, total (4AAP)		E562	0.0203 mg/L	0.02 mg/L	102	75.0	125		
Volatile Organic (Compounds (QCLot: 77	6870)									
WT2224508-001	Anonymous	Benzene	71-43-2	E611F	96.8 μg/L	100 μg/L	96.8	60.0	140		
		Chloroform	67-66-3	E611F	94.8 μg/L	100 μg/L	94.8	60.0	140		
		Dichlorobenzene, 1,4-	106-46-7	E611F	101 μg/L	100 μg/L	101	60.0	140		
		Dichloromethane	75-09-2	E611F	105 μg/L	100 μg/L	105	60.0	140		
		Ethylbenzene	100-41-4	E611F	94.1 μg/L	100 μg/L	94.1	60.0	140		
		Tetrachloroethylene	127-18-4	E611F	91.2 μg/L	100 μg/L	91.2	60.0	140		
		Toluene	108-88-3	E611F	101 μg/L	100 μg/L	101	60.0	140		
		Trichloroethylene	79-01-6	E611F	94.2 μg/L	100 μg/L	94.2	60.0	140		



Canada Toll Free: 1 800 668 9878

coc Number: 20 - 1000499

minimum		Page ()
Work Order Reference	Environmental Division	or ()

Turnaround Time (TAT) Requested

Telephone: +1 519 886 6910	Indicate Filtered (F), Preserved (P) or Filtered an	
	Analysis Re	
	For all tests with rush TATs requested, please o	
	Date and Time Required for all E&P TATS:	
	Same day [52] If received by 10am M-S - 200% rush surcharge. Additi may apply to rush requests on weekends, statutory hoticays and non-rou	
	1 day (E) if received by 3pm M-F - 100% rush surcharge minimum	П
	2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum	m
> ハハハ4ひ つ	3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum	П
Cluer Hererone	☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum	\Box
Work Order	(A) Routine [R] if received by 3pm M-F - no surcharges apply	13

Telephone: +1 519 886 6910

Company:

invoice To

Same as Report To Copy of Invoice with Report

ON TO SOUTO

Select Invoice Distribution:

Invoice Recipients

Email 3 Email 2

Email 1 or Fax

rsua hux@mcarak.com.

DEMAIL | MAIL |

FAX

Street:

City/Province

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Email 1 or Fax PSW/2 hull @mcCCCCk. Com

Select Distribution:

Compare Results to Criteria on Report - provide details below if box checked

☐ MAJL ☐ FAX

ostal Code:

Phone:

Company address below will appear on the final report

Company: Report To

HCCHARALY & Korked EVBS Contact and company name below will appear on the final report

Select Report Format:

Reports / Recipients

Merge QC/QCI Reports with COA

WITH COA COUYES CO NO CONGINAL)

Contact:

Failure to complete at	REFER TO BACK	Released by:		□ YES	Are samples for h	☐ ĕ	Are samples taker	Drinkin				550									(ALS use only)	Al S Samnio #	ALS Lab Worl	LSD:	PO / AFE:	Job #:	ALS Account # / Quote #.		Contact
Feilure to complete all portions of this form may delay enalysis. 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 now water samples are baken from a Regulated Drinking Water Division on the property of the white - report copy.	REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION	Date:	SHIPMENT RELEASE (client use)	S (24. 80	Are samples for human consumption/ use?	5 78	- 2	Drinking Water (DW) Samples' (client use)											;	BH - 1	(This description will appear on the report)	Sample identification and/or Coordinates	ALS Lab Work Order # (ALS use only):			5820	Quote #:	Project Information	
m LEGIBLY. By the use of	MATION	Time:						Notes / Spec													ear on the report)	d/or Coordinates							
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viedges end egrees with t	HW		INITIAL SHIPMENT					t evaluation by selecting (Excel COC only)											,	80ec 202	(dd-mmm-yy)	Date			1777			Oil and Gas Required Fields (client use)	
18 Terms and Conditions	WHITE - LABORATORY COPY	Date:	INITIAL SHIPMENT RECEPTION (ALS use only)					j from drop-down be												34:45		Time	Sampler:		SAME POWER AND ADDRESS OF THE SAME PARTY OF THE	Routing Code:	PO#	Fields (client use)	
as specified on the back	OPY YELLOW - CLIENT COPY					O	<u>0</u>													SE)	Sample Type		BER		= ^			A IIA	
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1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

N-466; B-338; GC-207; NW-169; OR-136; L-288; M-501; OGG-301.

COC Number
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San Carlotte

Canada Toll Free: 1 800 668 9878

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Street:

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nvoice to

Capy of Invoice with Report Same as Report To

DZ, ă YES **E** §

Email 1 or Fax Select Invoice Distribution:

Email 2

Oil and Gas Required Fields (client use)

Routing Code:

NUMBER OF CONTAINERS

Hutten Region Santay + Storm Sener *Naph thalene

Email 3

Invoice Recipients ☐ EMAIL ☐ MAIL

FAX

Email 2

Email 1 or Fax & Suche Come Crock. Com

Compare Results to Criteria on Report - provide details below if box checked

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☐ MAIL ☐ FAX

4 day [P4] if received by 3pm M-F - 20% rush surchs
3 day [P3] if received by 3pm M-F - 25% rush surchs
2 day [P2] if received by 3pm M-F - 50% rush surchs
1 t day [E] if received by 3pm M-F - 100% rush surchs

Routine [R] if received by 3pm M-F - no surcharges ar

Turnaround Time (TAT) Requested

Same day [EZ] if received by 10am M-S - 200% rush some apply to rush requests on weekends, statutory holids

hate and Time Required for all EAP TATE.

For all tests with rush TATs requ

Select Distribution:

Job #:

522

ALS Account # / Quote #:

Project Information

Contact: Company:

PO/AFE

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ALS Lab Work Order # (ALS use only):

(ALS use only) ALS Sample#

Sample Identification and/or Coordinates (This description will appear on the report)

ALS Contact

09-MAR-33 (dd-mmm-yy)

00.00 Time (hh:mm)

Date

Sample Type Sign

Requisitioner Wajor/Minor Code: AFE/Cost Center:

ocation:

Phone:

Company address below will appear on the final report

Contact: Company: Report To

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Select Report Format:

Merge QC/QCI Reports with COA

With COA MY YES 12 NO 12 NA

Reports / Recipients

Contact and company name below will appear on the final report

HPRD

www.alsglobal.com

Indicate Filtered (F), Preserved (P

SAMPLES ON HO

EXTENDED STORAGE REQ! SUSPECTED HAZARD (see notes)

ubmission Comments identified on Sample Receipt Notification. SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method:

Deoler Custody Seals Intact

COOLING INTERIOR □ Š

FINAL SHIPMENT RECEPTION (ALS use only 0.4

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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 write - report copy, If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form. REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Are samples for human consumption/ use?

ON XS SEA, NO

SHIPMENT RELEASE (client use)

3/9/122

Time:

Received by

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by

Released by:

Are samples taken from a Regulated DW System?

□ Yés XX No

actionne WT2224510

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Drinking Water (DW) Samples (client use)