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G5671

SEPTEMBER 2020

**PRELIMINARY
GEOHYDROLOGY ASSESSMENT
55 DUNLOP STREET WEST
BARRIE, ONTARIO**

DISTRIBUTION:

1 COPY (electronic)	BARRIE WATERFRONT DEVELOPMENTS
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PREPARED FOR:

BARRIE WATERFRONT DEVELOPMENTS
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TORONTO, ONTARIO
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1.0 INTRODUCTION

Barrie Waterfront Developments (the Client), intends to redevelop the property located at 55 Dunlop Street West, Barrie, Ontario, L4N 1A4, (hereafter referred to as 'the Site'). MCR was retained to evaluate the requirements for temporary dewatering and permanent drainage for the proposed redevelopment.

1.1 SCOPE OF WORK

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

- Hydrogeological conditions of the Site, including the groundwater and phreatic surface, subsurface elevations and flow patterns and the interaction with the design and construction of the proposed development.
- Review the available background information for the Site obtained from Sarafinchin Consulting Engineers and MCR's files, City of Barrie, 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 for the Private Water Drainage System (PWDS) of the proposed building.
- Assess the permitting requirements for both dewatering and discharge with the Ministry of Environment, Conservation and Parks (MECP) and the City of Barrie, respectively.
- Summarize the findings in a Geohydrology Assessment Report.

1.2 SITE DESCRIPTION

The Site is located on the south side of Dunlop Street West, between Maple Avenue and Mary Street, in a mixed use residential/commercial area of the City of Barrie. The Site is rectangular in shape, with an area of approximately 5,250 m².

The Site is bounded by Dunlop Street West to the north, Maple Avenue to the east, a bus station to the south and Mary Street to the west. The Site is occupied by several low-rise commercial/industrial buildings. Two small parking lots are located in the northwest and south west corners, respectively.

According to the Survey Plan by Rudy Mak Surveying Ltd. (Appendix A), the Site is legally described as: All of Lots 5, 6 and 46, East Side of Mary Street, and All of Lots 39 and 40 and Part of Lot 41, West Side of John Street (Now Maple Avenue), Registered Plan 115, City of Barrie, County of Simcoe.

1.3 PROPOSED DEVELOPMENT

Based on the architectural drawings (Appendix B), the proposed residential development includes two thirty-two [32] storey buildings in the eastern and western portion of the Site, with no below grade levels.

The design grades are not confirmed at this stage. Accordingly, our comments are preliminary, and our recommendations might be revised when the proposed Site/Foundation Plan becomes available. However, for the purpose of this preliminary report, the ground finished floor elevation (FFE) is expected to be at 223.5 meters above sea level (masl) at the west tower and 224.0 masl at the east tower.

Presently, it is assumed that the proposed building structure will be supported by deep foundations embedded in very dense till. The size of the shoring plan layout was assumed to cover approximately 84 m by 60 m.

A sub-floor Private Water Drainage System (PWDS) with perimeter weeping tile will not be required, given that there is no basement or below-grade parking proposed. The type of shoring system to be used for excavation support and temporary dewatering should be confirmed.

1.4 PROPERTY OWNERSHIP

The property is owned by Barrie Waterfront Developments. The Client is represented by Mr. Gary Silverberg with the following contact information:

Barrie Waterfront Developments
8 Dovercourt Road
Toronto, Ontario
M6J 0B6

Mr. Gary Silverberg

1.5 REVIEW OF PREVIOUS REPORTS

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

- MCR Report titled, *Preliminary Geotechnical Report Proposed Residential Development, 55 Dunlop Street West, Barrie, Ontario*, prepared for Barrie Waterfront Developments, dated August 2020.
- Sarafinchin Consulting Engineers report titled, *Preliminary Geotechnical Investigation, Proposed Multi-Storey Development, Dunlop Street West and Mary Street, Barrie, Ontario*, prepared for Barrie Waterfront Developments, dated April 16, 2018.

2.0 HYDROGEOLOGICAL CONDITIONS

2.1 PHYSICAL SETTING

The Site is located in the central portion of downtown Barrie and is situated in a mixed-use residential and commercial area. The nearest major intersection is Dunlop Street West/East and Bayfield Street, located 155 m north east of the Site.

The Site is located within the Lake Simcoe watershed and the Lake is approximately 260 m south east of the Site.

The Site is located at an average geodetic elevation of approximately 225 m (740 ft). The topography across the Site is generally flat with a gentle slope towards the southeast.

The Site is bounded by the following properties/features:

North	Dunlop Street West
South	Bus station
East	Maple Avenue
West	Mary Street

2.2 TOPOGRAPHY

According to the Topographic Map 30 M/11, 9th Edition, published by Government of Canada: Natural Resources Canada; Earth Sciences Sector, Canada Centre for Mapping and Earth Observation, on July 19, 2013, the ground surface at the Site is undulating with the surrounding area sloping gently to the east towards Simcoe Lake.

2.3 REGIONAL GEOLOGY AND HYDROGEOLOGY

According to the geological map entitled "Quaternary Geology of Ontario, Southern Sheet" Map 2556, published by the Ontario Ministry of Development and Mines, dated 1991, the overburden in the study area consists sand, gravelly sand and gravel, nearshore and beach deposits. The groundwater typically tends to flow towards east, towards Lake Simcoe.

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.

2.4 LOCAL GEOLOGY AND HYDROGEOLOGY

On a local scale, geological conditions and hydrogeology are similar to the ones at a regional scale. Local groundwater flow might be influenced by nearby subsurface water bodies, subsurface utilities, or structures as well as by historical fill/redevelopment works, and can be best confirmed through long-term monitoring. The groundwater table was encountered at a depth ranging from 1.10 to 3.30 mbgs. The interpreted local direction of hydraulic movement across the Site is inferred to be to the south-east.

3.0 SCOPE OF INVESTIGATION

3.1 OVERVIEW OF SITE INVESTIGATION

- Previous field investigations consisted of three borehole/dynamic penetration tests (BH 1 to BH 3), advanced by Sarafinchin Consulting Engineers (SCE) in March 2018.
- The boreholes were advanced to depths ranging from 13.7 to 19.8 m and wells were installed in Boreholes 1 to 3 for long-term groundwater monitoring.
- One exploratory borehole (BH 101) was drilled by MCR in July 2020. The borehole was advanced to a depth of 35.05 using mud drilling method, followed by the methodology prescribed by the City of Barrie.
- A monitoring well was installed in Borehole 101 for long-term groundwater monitoring.
- In order to improve our understanding of foundation conditions at depth for the east tower, another borehole (BH 102) will need to be drilled. The borehole will be drilled straight to a depth of 10.0 m and advanced to a depth of 40.0 m.
- The borehole locations are shown on Drawing No. 1. Borehole logs are illustrated in Appendix C.
- Groundwater samples were collected from BH 101 for chemical analysis of the Regional City of Barrie Sewers By-Law criteria.

3.2 MONITORING WELL INSTALLATION

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

Borehole elevations referred to in this report are metric and geodetic and are referenced to the Site Survey Plan which was provided by Rudy Mak Surveying Ltd. All borehole elevations are presented in Appendix C.

3.4 GROUNDWATER SAMPLING

All groundwater sampling activities conducted by MCR staff were compliant with Ontario Regulation (O.Reg.) 153/04, as amended to O.Reg. 511/09 in July 2011.

Groundwater samples were obtained at least 24 hours post-development, under static conditions, utilizing clear PVC bailers. All samples were transferred into appropriate containers. The samples submitted for analysis of VOC were collected with zero headspace. No samples were field filtered prior to laboratory analysis, in accordance with the standard.

3.5 GROUNDWATER ANALYSIS

All groundwater samples were submitted for chemical analysis to ALS Laboratory Group (ALS) of Richmond Hill, Ontario, certified by the Canadian Association for Laboratory Accreditation (CALA). The Certificate of Analysis will be included in Appendix D. The contact information for the laboratory used is provided below:

ALS Laboratory Group

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

The groundwater sample will be submitted for bulk chemical analysis for the criteria provided in *The City of Barrie, Sewers By-Law No. 2012-172*. The results of chemical analysis will be compared to the criteria provided in the *Guideline Limits for Sanitary & Combined Sewers Discharge and Guideline 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

Ground surface elevation at the boreholes ranged from 222.90 masl (BH 1) and 223.80 masl (BH 3). Based on the investigation, the geologic formations intersected by the twelve boreholes are illustrated on the Borehole Logs (Appendix C) and include the following (from surface to depth):

Asphalt and Granular Fill: An asphalt cover, approximately 25 to 75 mm in thickness, was found at the ground surface in Boreholes 1 and 3 by SCE only. The asphalt cover was underlain by a layer of granular fill (gravel and sand), variable in thickness, predominantly within the range of 150 to 350 mm.

Fill: A fill layer was present in the SCE boreholes only, consisting of various mixtures of clay, silt, sand and gravel was detected below the asphalt and below the upper granular fill at all boreholes. The fill layer extended to a depth of approximately 0.5 to 3.0 m. The predominantly brown, moist, loose to compact/firm to very stiff, fill also contained trace to some organics and rootlets.

For the purpose of offsite disposal, the type/quantity and extent of the existing fill should be explored by further borehole and test pit investigation.

Silty Sand: A compact to dense silty sand layer was found at the ground surface with asphalt pieces and gravel and the deposit extends to a depth of about 7 m, where it is underlain by a soft 1.5 m thick silty clay layer. The silty sand deposit extends to a depth of about 11.5 m below grade.

Sandy Silt Till: the very dense grey wet glacial till, varying from clayey silt to sandy silt, was encountered below the upper sedimentary deposits. The clayey silt (till) formation alternated with silty clay (till) while some of the sandy silt strata alternated with silty sand (till). The sandy silt matrix till extended to a depth of the borehole at a depth of about 35.0 m

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

Groundwater: The groundwater level was not measured upon completion of drilling by MCR due to the use of mud drilling technique.

On March 28, 2018, groundwater levels were measured at depths ranging from 1.10 to 2.0 m in boreholes 1 and 2. On April 4, 2018, groundwater levels were measured at depths ranging from 1.80 to 3.30 m in boreholes 1 to 3.

On July 28, 2020, the groundwater was measured at a depth of 1.86 m in borehole 101. All groundwater levels are presented in Table 1.

4.2 GROUNDWATER LEVEL MONITORING

All groundwater measurement data is presented in the enclosed Table 1. It should be noted that groundwater levels are subject to seasonal fluctuations. All groundwater levels were measured manually with an electric water level meter and with respect to geodetic borehole elevations. 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 – 2020 rounds of water table elevation measurements, since this event provided water table elevations from the majority of the monitoring wells. The interpreted local direction of hydraulic movement across the Site is inferred to the south east.

4.3 GROUNDWATER QUALITY

The groundwater sample collected from BH 101 in July 2020 was analyzed for the City of Barrie Sewers By-Law criteria. The results of chemical analysis (Table 2) indicated the sample exceeds the *Guideline Limits for Sanitary & Combined Sewers Discharge* for Chloride (2240 mg/L vs. 1500 mg/L). The sample complies with the *Guideline Limits for Storm Sewer Discharge* for all parameters analyzed.

4.4 GROUNDWATER DISCHARGE ASSESSMENT

Presently, the groundwater onsite can be discharged to the City sanitary or combined sewer system with filtration or treatment for chloride. A filtration or

treatment system for chlorine would potentially be required prior to discharging to the storm sewer system. A dewatering contractor will need be approached to explore the possibility of treatment if discharge to the sanitary or storm sewer is required.

5.0 REVIEW AND EVALUATION

5.1 TEMPORARY DEWATERING ASSESSMENT

The excavation for the proposed grade beam system will extend into native soils. The grade beam system is assumed to be at an approximate elevation of 222.5 masl. The proposed buildings will be supported by slurry drilled caissons founded at a depth of 32.00 m below existing grades, at or below an elevation of 191.5 m. Subject to confirmation during installations of a test caisson.

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

For the proposed excavation, groundwater is required to be drawn down 1 m below the underside of the grade beam system, i.e. to an elevation of 221.5 masl. The average ground water level recorded in the monitoring wells is at an elevation of 221.03 masl (Table 3). Given that the grade beam system elevation would be about 1.50 m above the groundwater table, it is in our opinion that positive construction dewatering might be required for localized areas of the exposed sub-grade/elevator shaft. The shoring plan was assumed to cover 84 m by 60 m.

5.1.1 Numerical Analysis

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

Although dewatering will be localized, the occurrence of storm events during the excavation works is unavoidable and significant seepage influx could be generated within the precinct on storms greater than 15 mm in 24 hours. Therefore, as a precautionary measure, along with preparing for directing, sump-collecting and pumping the excess storm water from the Site, we recommend applying with the City of Barrie for a temporary discharge permit.

Assuming a rainfall event of 15 mm over a 24 hour period, about 76 m³/day (14 USG/min) of water may need to be discharged into the municipal sewer system from the Site, during construction.

5.2 PERMANENT FOUNDATION DRAIN FLOW RATES

For the proposed redevelopment, it is assumed that the FFE-GF will range from approximately 223.5 to 224.0 masl.

There is no basement or below-grade parking proposed for the two towers. The only slab for the proposed construction is at the existing ground level. Under those conditions, a sub-floor Private Water Drainage System (PWDS) is not necessary and, therefore, not required for the development. Therefore, there will not be any permanent drainage.

5.3 MECP PERMIT TO TAKE WATER REQUIREMENT

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

The anticipated temporary dewatering discharge rate was calculated at approximately 76 m³/day. Therefore, a limited PTTW application will be required to be applied for with the MECP.

There is no basement or below-grade parking proposed for the development. The only slab for the proposed construction is at the existing ground level. Under these conditions, a PWDS will not be necessary and a PTTW from the MECP will not be required.

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 MUNICIPALITY'S DISCHARGE PERMIT REQUIREMENTS

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

The sample collected in July 2020 indicates that the groundwater can be discharged to the Municipal sanitary or combined sewer system with filtration or treatment for chloride. A filtration or treatment system for chlorine would potentially be required prior to discharging to the storm sewer system.

A dewatering contractor will need to be approached to explore the possibility of treatment if discharge to the sanitary or storm sewer is required. An updated groundwater sample should be collected during a pumping test to confirm the current groundwater quality. A short-term temporary discharge permit must be applied for construction dewatering with the Municipality.

5.5 ENVIRONMENTAL PROTECTION

The Site is located within the Lake Simcoe watershed and the Lake is approximately 260 m east of the Site. The Site is located within the Lake Simcoe Region Conservation Authority (LSRCA) regulated area and there are potential potable groundwater issuers in the vicinity of the Site. Therefore, the Site is in a potable groundwater region defined in Sections 35 to 37 of O.Reg. 153/04. A door to door well survey may need to be completed by others if required.

The proposed redevelopment plan will involve removal of the overburden to a depth of approximately 1 – 2 m. The extracted water can be discharged to the City

sanitary or combined sewer system with no additional filtration or treatment. A filtration or treatment system for chlorine would potentially be required prior to discharging to the storm sewer system. Updated groundwater monitoring will be conducted by the dewatering contractor prior to and during construction activities to ensure that no additional adverse groundwater impacts are identified throughout the project's construction.

6.0 CONCLUSIONS AND RECOMMENDATIONS

MCR was retained to conduct a Geohydrology Assessment for the Site in relation to the proposed redevelopment. The Site is occupied by several low-rise commercial/industrial buildings. Two small parking lots are located in the northwest and southwest corners, respectively.

Based on the architectural drawings (Appendix B), the proposed residential development includes two thirty-two [32] storey buildings in the eastern and western portion of the Site, with no below grade levels.

The design grades are not confirmed at this stage. Accordingly, our comments are preliminary, and our recommendations might be revised when the proposed Site/Foundation Plan becomes available. However, for the purpose of this preliminary report, the ground finished floor elevation (FFE) is expected to be at 223.5 meters above sea level (masl) at the west tower and 224.0 masl at the east tower.

Presently, it is assumed that the proposed building structure will be supported by deep foundations embedded in very dense till. The size of the shoring plan layout was assumed to cover approximately 84 m by 60 m.

A sub-floor Private Water Drainage System (PWDS) with perimeter weeping tile will not be required, given that there is no basement or below-grade parking proposed. The type of shoring system to be used for excavation support and temporary dewatering should be confirmed.

The excavation for the proposed grade beam system will extend into native soils. The grade beam system is assumed to be at an approximate elevation of 222.5 masl. The proposed buildings will be supported by slurry drilled caissons founded at a depth of 32.00 m below existing grades, at or below an elevation of 191.5 m. Subject to confirmation during installations of a test caisson.

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

For the proposed excavation, groundwater is required to be drawn down 1 m below the underside of the grade beam system, i.e. to an elevation of 221.5 masl. The average ground water level recorded in the monitoring wells is at an elevation of 221.03 masl (Table 3). Given that the grade beam system elevation would be about 1.50 m above the groundwater table, it is in our opinion that positive construction dewatering might be required for localized areas of the exposed sub-grade/elevator shaft.

The anticipated temporary dewatering discharge rate was calculated at approximately 76 m³/day. 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 Municipality.

There is no basement or below-grade parking proposed for the development. The only slab for the proposed construction is at the existing ground level. Under those conditions, a PWDS is not necessary and, therefore, not required.

Presently, the groundwater onsite can be discharged to the City sanitary or combined sewer system with filtration or treatment for chloride. A filtration or treatment system for chlorine would potentially be required prior to discharging to the storm sewer system. A dewatering contractor will need be approached to explore the possibility of treatment if discharge to the sanitary or storm sewer is required.

It is recommended that applications to Municipality for discharge permits be applied for at least four 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*. April 15, 2011.
2. Ontario Ministry of Northern Development and Mines. *Quaternary Geology of Ontario - Southern Sheet*, Map 2556, 1991.
3. Ontario Ministry of Northern Development and Mines. *Bedrock Geology of Ontario - Southern Sheet*, Map 2544, 1991.
4. D.K. Todd, *Groundwater Hydrology*, 2nd Edition, John Wiley & Sons, New York, 1980.
5. L.W. Mays, *Water Resources Engineering*, 1st Edition, John Wiley & Sons, New York, 2001.
6. R.F. Craig, *Soil Mechanics*, 7th Edition, Spon Press, London, 2004.
7. MCR Report titled, *Preliminary Geotechnical Report Proposed Residential Development, 55 Dunlop Street West, Barrie, Ontario*, prepared for Barrie Waterfront Developments, dated August 2020.
8. Sarafinchin Consulting Engineers report titled, *Preliminary Geotechnical Investigation, Proposed Multi-Storey Development, Dunlop Street West and Mary Street, Barrie, Ontario*, prepared for Barrie Waterfront Developments, dated April 16, 2018.

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.



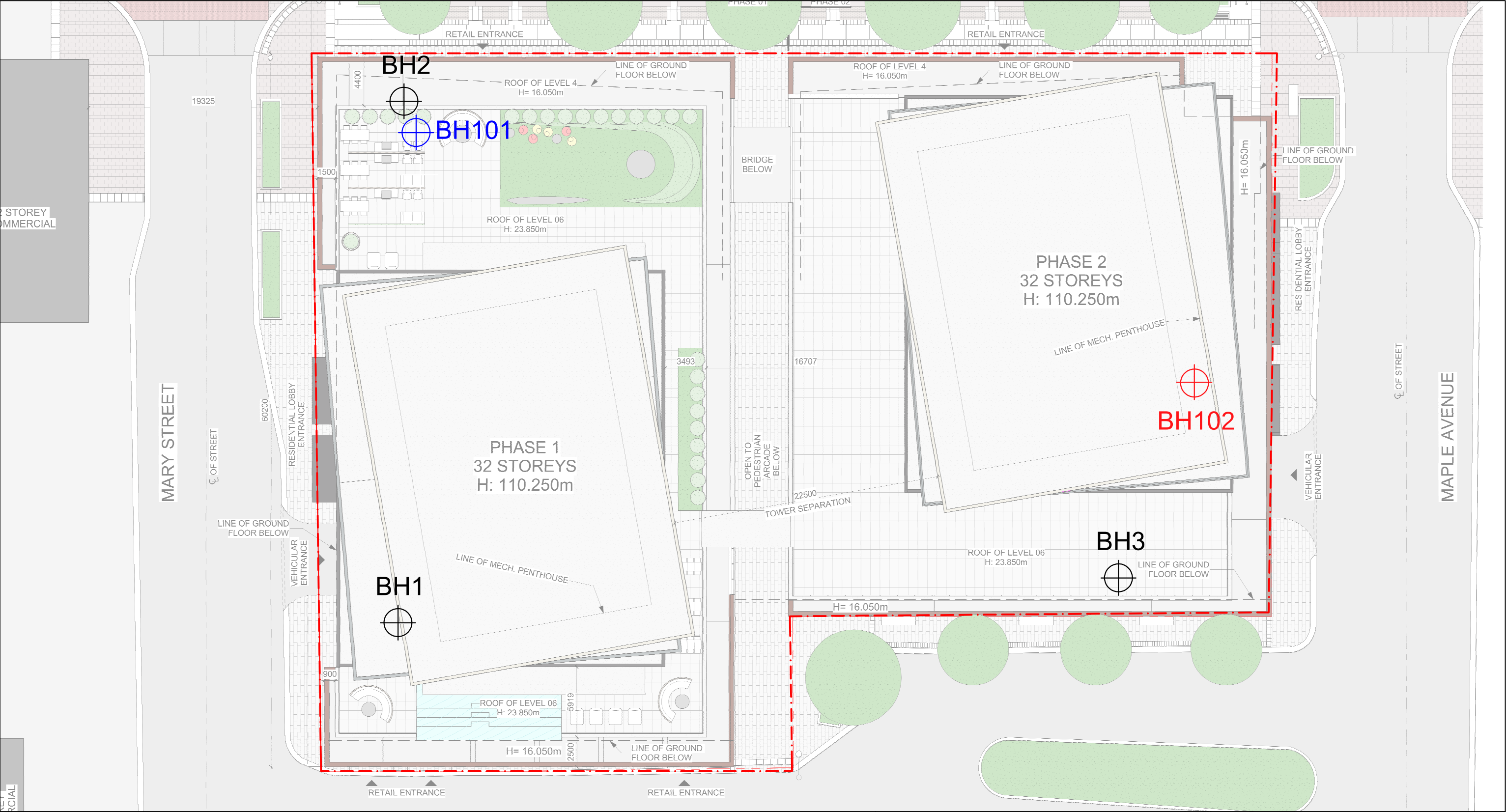
Prepared By:
Richard Sukhu, B.Eng.



Reviewed By:
Lad Rak, P.Eng., M.Eng., QP_{ESA}

Date of Issue: September 3, 2020

FIGURES



LEGEND:

- PROPERTY BOUNDARY
- ⊕ MONITORING WELL INSTALLED BY SARAFINCHIN, MARCH 2018
- ⊕ BOREHOLE AND MONITORING WELL INSTALLED BY MCR, JULY 2020
- ⊕ PROPOSED SUPPLEMENTARY BOREHOLE AND MONITORING WELL

PROJECT NORTH

TRUE NORTH

0 1 5 10 20

SCALE (m)

McCLYMONT & RAK
ENGINEERS, INC.
GEO-ENVIRONMENTAL CONSULTANTS

55 DUNLOP STREET WEST, BARRIE, ONTARIO

**BOREHOLE
LOCATION PLAN**

Project No. G5671	Date JULY 2020	Drawing No. 1
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Drawing Notes: Image drafted from property survey, Toronto Maps, Google Maps, and site inspections. Not for construction purposes.

TABLES

McCLYMONT AND RAK ENGINEERS INC.
GEO-ENVIRONMENTAL CONSULTANTS

TABLE 1
CONSTRUCTION DETAILS AND ELEVATION OF MONITORING WELLS

MONITORING WELL ID	GROUND SURFACE ELEVATION (masl)	WATER LEVEL (mbgs)	GROUNDWATER ELEVATION (masl)	DATE OF MEASUREMENT (mm/dd/yyyy)	DEPTH OF WELL (mbgs)	DEPTH OF BENTONITE (mbgs)	LENGTH OF SCREEN (m)	INSIDE DIAMETER OF PIPE (mm)	TOP OF MONITORING WELL
Boreholes by MCR									
BH 101	223.28	-	-	7/24/2020	6.10	2.44	3.05	50	FLUSH MOUNT
		1.86	221.42	7/28/2020					
Boreholes by Sarafinchin Counsulting Engineers									
BH 1	222.90	1.10	221.80	3/28/2018	6.10	2.40	3.05	50	PROTECTIVE METAL CASING
		1.80	221.10	4/4/2018					
BH 2	223.20	2.00	221.20	3/28/2018	4.60	2.40	3.05	50	PROTECTIVE METAL CASING
		2.10	221.10	4/4/2018					
BH 3	223.80	-	-	3/28/2018	4.60	2.40	3.05	50	PROTECTIVE METAL CASING
		3.30	220.50	4/4/2018					
Min	222.90	1.10	220.50	-	4.60	-	-	-	-
Max	223.80	3.30	221.80	-	6.10	-	-	-	-
Average	223.30	2.03	221.19	-	5.35	-	-	-	-

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 - CITY OF BARRIE SEWERS BY-LAW DISCHARGE CRITERIA (By-Law 2012-172)

MCR JOB#: GE5671

SITE ADDRESS: 55 Dunlop Street West, Barrie, ON

PARAMETER	UNITS	LIMITS FOR STORM SEWER DISCHARGE	LIMITS FOR SANITARY & COMBINED SEWERS DISCHARGE	BH 101
				30-Jul-20
pH	pH Units	6.0 - 9.5	6.0 - 9.5	7.86
Total Suspended Solids	mg/L	15	350	<3.0
Chloride (Cl)	mg/L	-	1500	2240.0
Fluoride (F-)	mg/L	-	10	<0.40
Total Kjeldahl Nitrogen (TKN)	mg/L	-	100	0.21
Total Phosphorus (P)	mg/L	-	10	0.0195
Sulphate (SO4)	mg/L	-	1500	76.9000
Sulphide (H2S)	mg/L	-	1	<0.019
Total Cyanide (CN)	mg/L	-	1.2	0.0089
Total Aluminum (Al)	mg/L	-	50	0.761
Total Antimony (Sb)	mg/L	-	5	<0.0010
Total Arsenic (As)	mg/L	-	1	<0.0010
Total Barium (Ba)	mg/L	-	5	0.415
Total Bismuth (Bi)	mg/L	-	5	<0.00050
Total Cadmium (Cd)	mg/L	0.001	0.7	<0.000050
Total Chromium (Cr)	mg/L	0.08	4	<0.0050
Total Cobalt (Co)	mg/L	-	5	<0.0010
Total Copper (Cu)	mg/L	0.01	2	<0.0050
Iron (Fe)	mg/L	-	50	0.74
Total Lead (Pb)	mg/L	0.05	1	<0.00050
Total Manganese (Mn)	mg/L	-	5	0.057
Total Mercury (Hg)	mg/L	-	0.01	<0.0000050
Total Molybdenum (Mo)	mg/L	-	5	0.0056
Total Nickel (Ni)	mg/L	0.05	2	<0.0050
Total Selenium (Se)	mg/L	-	1	0.00207
Total Silver (Ag)	mg/L	-	5	<0.00050
Total Tin (Sn)	mg/L	-	5	<0.0010
Total Vanadium (V)	mg/L	-	5	<0.0050
Total Zinc (Zn)	mg/L	0.04	2	<0.030
Biological Oxygen Demand	mg/L	15	300	<3.0
Chemical Oxygen Demand	mg/L	-	600	49
Total Oil & Grease (Animal/Vegetable)	mg/L	-	150	<5.0
Total Oil & Grease Mineral/Synthetic	mg/L	-	15	<2.5
Phenols-4AAP	mg/L	-	1	<0.0010
Benzene	µg/L	-	10	<0.50
Chloroform	µg/L	-	40	
1,2-Dichlorobenzene	µg/L	-	50	<0.50
1,4-Dichlorobenzene	µg/L	-	80	<0.50
Dichloromethane (Methylene Chloride)	µg/L	-	2000	<2.0
Ethylbenzene	µg/L	-	160	<0.50
1,1,2,2-Tetrachloroethane	µg/L	-	1400	<0.50
Tetrachloroethylene	µg/L	-	1000	<0.50
Toluene	µg/L	-	16	<0.40
Trichloroethylene	µg/L	-	400	<0.50
Xylene (Total)	µg/L	-	1400	<0.50
Total PAHs (18 PAHs)	µg/L	-	5	<0.095

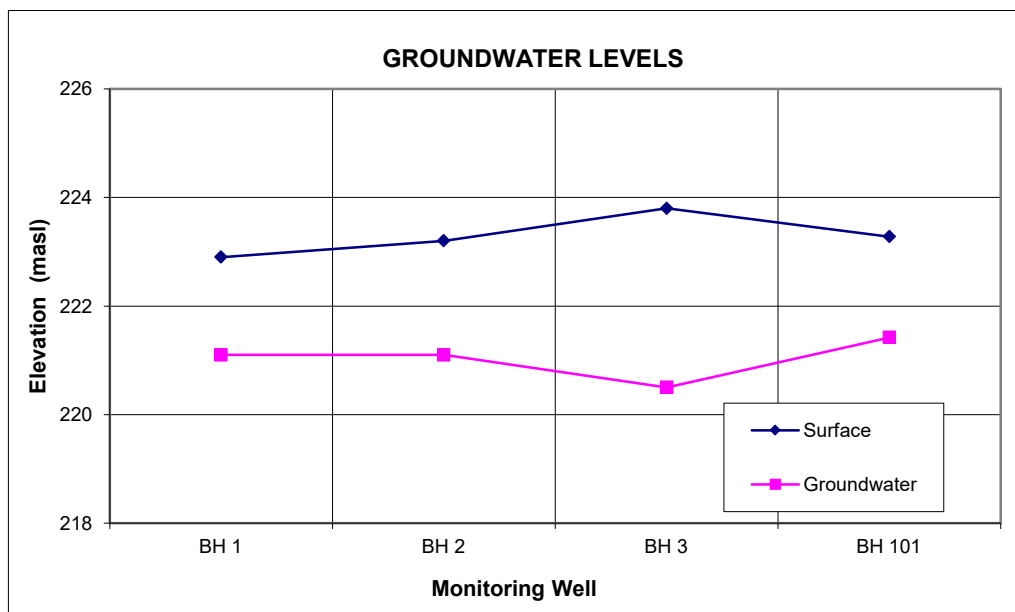
BOLD	Exceeds Criteria - Table 1 Sanitary and Combined Sewer
BOLD	Non-Detect Exceeds Criteria - Table 1 Sanitary and Combined Sewer
BOLD	Exceeds Criteria - Table 2 Storm Sewer Criteria
BOLD	Non-Detect Exceeds Criteria - Table 2 Storm Sewer Criteria

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

Project: Proposed Residential Development
 Location: 55 Dunlop Street West, Barrie, ON
 Date: August-20
 Project #: G5671

TABLE 3
GROUNDWATER MONITORING DATA

Borehole Number	Surface Elevation (masl)	Water Level Depth (mbgs)	Water Level Elevation (masl)	Monitoring Date (mm/dd/yyyy)	NOTES
BH 1	222.90	1.80	221.10	4/4/2018	
BH 2	223.20	2.10	221.10	4/4/2018	
BH 3	223.80	3.30	220.50	4/4/2018	
BH 101	223.28	1.86	221.42	7/28/2020	
Average	223.30	2.27	221.03		
Max			221.42		



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

Project: Proposed Residential Development
 Location: 55 Dunlop Street West, Barrie, ON
 Date: August-20
 Project #: G5671

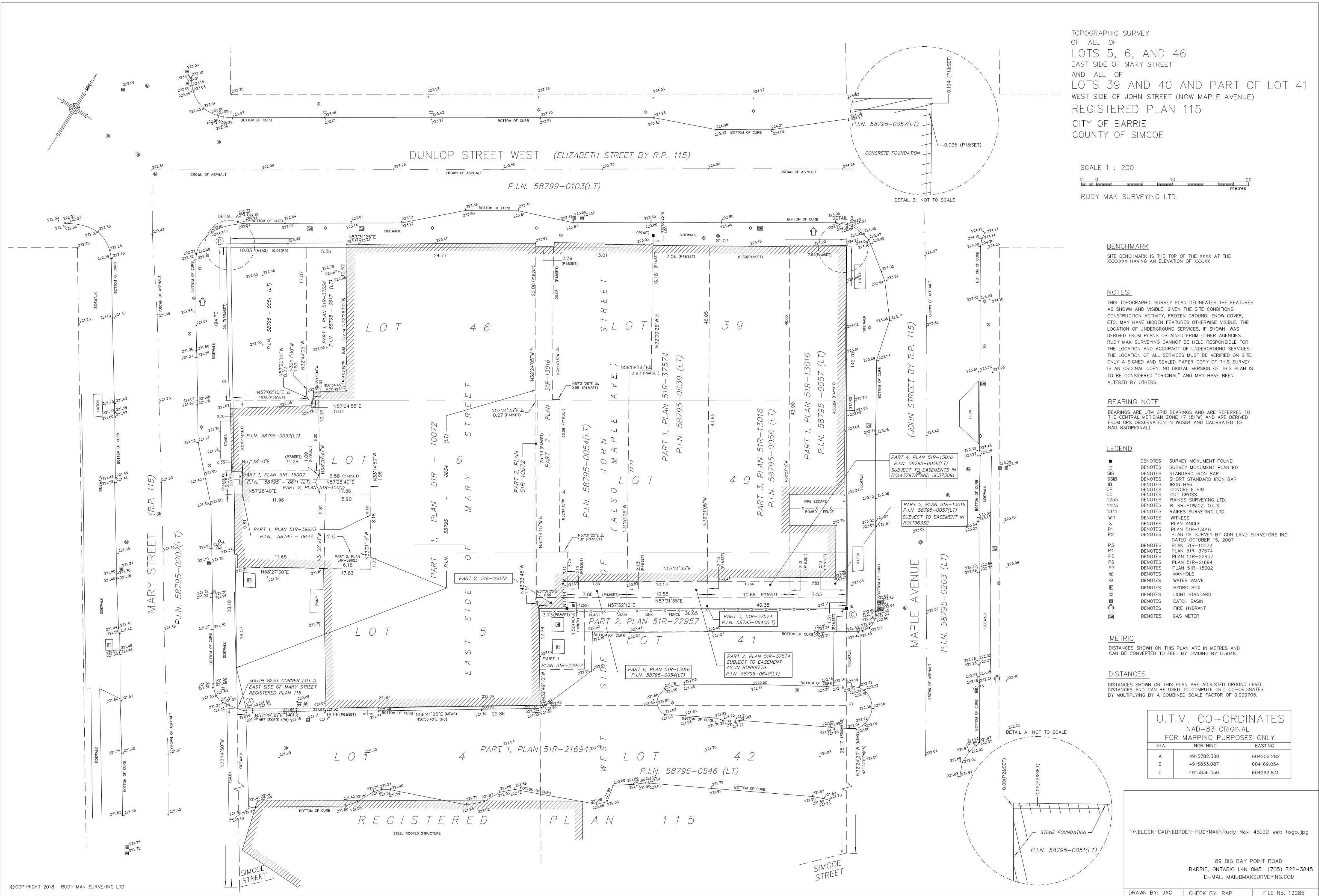
TABLE 4
DISCHARGE ESTIMATION OF CONSTRUCTION DEWATERING

Site Parameters	Units
Groundwater level	221.03 (m)
Required groundwater level at or below	222.50 (m)
Length of Site X	84.00 (m)
Width of Site W	60.00 (m)
Area of Site (A)	5040.00 (m ²)
Assumed 25 mm rain event (R)	15.00 (mm)

$$Q=A*R$$

Estimated discharge of dewatering	75.60 (m ³ /day)
	14 (USG/min)

APPENDIX A



TOPOGRAPHIC SURVEY
OF ALL OF
LOTS 5, 6, AND 46
EAST SIDE OF MARY STREET
AND ALL OF
LOTS 39 AND 40 AND PART OF LOT 41
WEST SIDE OF JOHN STREET (NOW MAPLE AVENUE)
REGISTERED PLAN 115
CITY OF BARRIE
COUNTY OF SIMCOE

SCALE 1 : 200
RUDY MAK SURVEYING LTD.

BENCHMARK
SITE BENCHMARK IS THE TOP OF THE XXXX AT THE
XXXXXX HAVING AN ELEVATION OF XXX.XX

NOTES:
THIS TOPOGRAPHIC SURVEY PLAN DELINEATES THE FEATURES
AS SHOWN AND VISIBLE, GIVEN THE SITE CONDITIONS.
CONSTRUCTION ACTIVITY, FROZEN GROUND, SNOW COVER,
ETC. MAY HAVE HIDDEN FEATURES OTHERWISE VISIBLE. THE
LOCATION OF UNDERGROUND SERVICES, IF SHOWN, WAS
DERIVED FROM PLANS OBTAINED FROM OTHER AGENCIES.
RUDY MAK SURVEYING CANNOT BE HELD RESPONSIBLE FOR
THE LOCATION AND ACCURACY OF UNDERGROUND SERVICES.
THE LOCATION OF ALL SERVICES MUST BE VERIFIED ON SITE.
ONLY A SIGNED AND SEALED PAPER COPY OF THIS SURVEY
IS AN ORIGINAL COPY. NO DIGITAL VERSION OF THIS PLAN IS
TO BE CONSIDERED "ORIGINAL" AND MAY HAVE BEEN
ALTERED BY OTHERS.

BEARING NOTE
BEARINGS ARE UTM GRID BEARINGS AND ARE REFERRED TO
THE CENTRAL MERIDIAN ZONE 17 (81W) AND ARE DERIVED
FROM GPS OBSERVATION IN WGS84 AND CALIBRATED TO
NAD 83 (ORIGINAL).

LEGEND
■ DENOTES SURVEY MONUMENT FOUND
□ DENOTES SURVEY MONUMENT PLANTED
SIB DENOTES STANDARD IRON BAR
SSIB DENOTES SHORT STANDARD IRON BAR
IB DENOTES IRON BAR
CP DENOTES CONCRETE PIN
CO DENOTES CUT CROSS
1255 DENOTES RAKES SURVEYING LTD.
1423 DENOTES R. KRUPOWICZ, O.L.S.
1841 DENOTES RAKES SURVEYING LTD.
WT DENOTES WITNESS
A DENOTES PLAN ANGLE
P1 DENOTES PLAN 51R-13016
P2 DENOTES PLAN OF SURVEY BY CDN LAND SURVEYORS INC.
DATED OCTOBER 15, 2007
P3 DENOTES PLAN 51R-10072
P4 DENOTES PLAN 51R-37574
P5 DENOTES PLAN 51R-22957
P6 DENOTES PLAN 51R-21694
P7 DENOTES PLAN 51R-15002
○ DENOTES MANHOLE
○ DENOTES WATER VALVE
□ DENOTES HYDRO BOX
○ DENOTES LIGHT STANDARD
□ DENOTES CATCH BASIN
□ DENOTES FIRE HYDRANT
○ DENOTES GAS METER

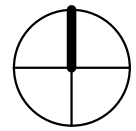
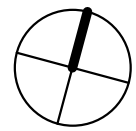
METRIC:
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND
CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

DISTANCES
DISTANCES SHOWN ON THIS PLAN ARE ADJUSTED GROUND LEVEL
DISTANCES AND CAN BE USED TO COMPUTE GRID CO-ORDINATES
BY MULTIPLYING BY A COMBINED SCALE FACTOR OF 0.999705.

U.T.M. CO-ORDINATES NAD-83 ORIGINAL FOR MAPPING PURPOSES ONLY		
STA	NORTHING	EASTING
A	4915782.380	604202.282
B	4915833.087	604169.054
C	4915836.450	604262.831

T:\BLCKD-CAD\BORDER-RUDYMAK\Rudy Mak 45132 web logo.jpg
89 BIG BAY POINT ROAD
BARRIE, ONTARIO L4N 8M5 (705) 722-3845
E-MAIL MAIL@MAKSURVEYING.COM
DRAWN BY: JAC CHECK BY: RAP FILE NO. 13285

- General Notes
1. ALL DIMENSIONS IN MILLIMETRES.
 2. VERIFY ALL DIMENSIONS.
 3. DO NOT SCALE DRAWINGS.
 4. CHECK DRAWINGS AGAINST SPECIFICATIONS.
 5. USE THE LATEST REVISED DRAWINGS ONLY.
 6. REPORT ANY DISCREPANCIES, DISCOVERED ERRORS, OR OMISSIONS, TO THE ARCHITECT BEFORE PROCEEDING.
 7. DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF THE ARCHITECT, AND MUST BE RETURNED UPON COMPLETION OF WORK.



True North Project North

9 Issued for Pre-Consultation Feb. 21/2020
8 Issued for Coordination Feb. 07/2020
7 Re-Issued for Rezoning Oct. 09/2019

No. Issue Date

Oleson Worland
architect

scott shields
architects
317 King Street West 2nd Floor, Toronto, ON,
MSV 1J5 | t.416.924.2173 | f.416.924.7398

Project
**BARRIE
WATERFRONT
DEVELOPMENTS**

Address
55 Dunlop St. W.

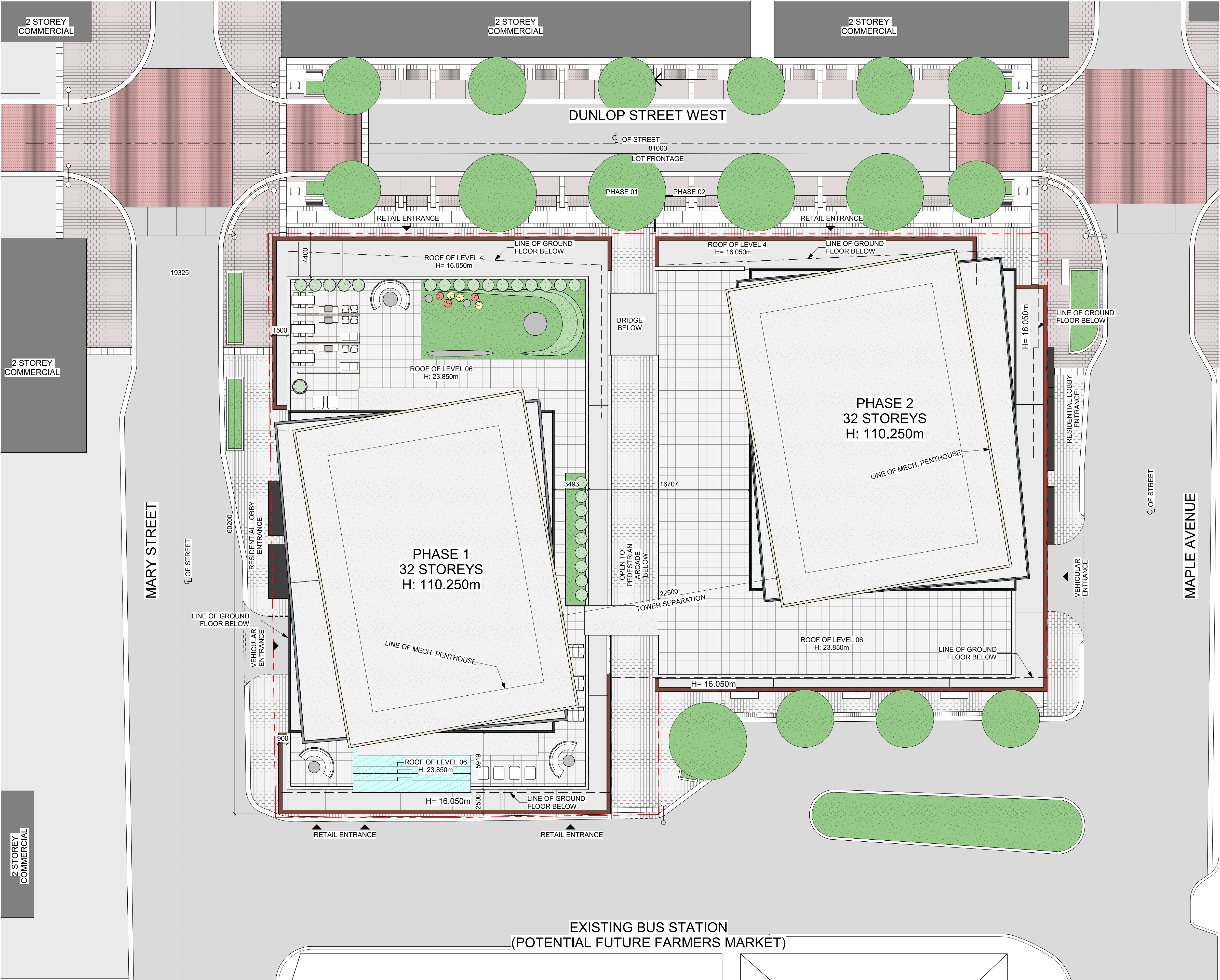
Drawing
SURVEY

Project number 24601
Date Apr. 30, 2019
Drawn by Author
Checked by Checker

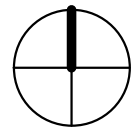
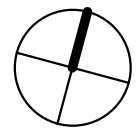
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Scale

APPENDIX B



- General Notes
1. ALL DIMENSIONS IN MILLIMETRES.
 2. VERIFY ALL DIMENSIONS.
 3. DO NOT SCALE DRAWINGS.
 4. CHECK DRAWINGS AGAINST SPECIFICATIONS.
 5. USE THE LATEST REVISED DRAWINGS ONLY.
 6. REPORT ANY DISCREPANCIES, DISCOVERED ERRORS, OR OMISSIONS, TO THE ARCHITECT BEFORE PROCEEDING.
 7. DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF THE ARCHITECT, AND MUST BE RETURNED UPON COMPLETION OF WORK.



True North Project North

Zoning Matrix		
	Permitted	Proposed
Zoning Category	Central Area Commercial C1-1	Central Area Commercial C1-1
Lot Area	4,348.33 sq. m.	4,348.33 sq. m.
Uses	Commercial, Residential	Commercial, Residential
Building Height	45m	West Tower (Phase 01) 110.250m East Tower (Phase 02) 110.250m
Lot Coverage	-	94%
Total Unit Count		495
Live / Work Units		2
Hotel Units		92
Smallest Allowable Unit Size	35 m² + 10 m²/bedroom	47.54 m²
Parking Requirements	1 Parking space/Residential unit, not required for Commercial use	7 Parking space/Residential unit Residential Parking Provided: 538 Non-Res. Parking Provided: 0 Total Parking Provided: 538
Gross Floor Area (total)	600% Lot Area	Total Zoning Area (TZA): 38164.62 sq. m. Residential TZA: 34,653.64 sq. m. Live / Work TZA: 136 sq. m. Hotel TZA: 5,206.48 sq. m. Comm./Retail TZA: 1,852.97 sq. m.
F.S.I.	6.0x	8.99 x
Landscape Buffer Requirements	continuous, min. width of 3m	Urban streetscape
Loading Spaces	1	4
Total Lot Frontage		80.89 m
Setbacks		
	Phase 01	Phase 02
Minimum Front Yard Setback to Tower	16.66 m	1.18 m
Minimum Interior Side Yard Setback	7.55 m	7.92 m
Minimum Rear Yard Setback to Tower	6.55 m	9.09 m

	Issued for	Feb.
	Pre-Consultation	21/2020
8	Issued for Coordination	Feb. 07/2020
7	Re-Issued for Rezoning	Oct. 09/2019
No.	Issue	Date

Oleson Worland
architect

scott shields
architects

317 King Street West 2nd Floor, Toronto, ON,
M5V 1J5 | t. 416.924.2173 | f. 416.924.7398

Project

BARRIE
WATERFRONT
DEVELOPMENTS

Address

55 Dunlop St. W.

Drawing

SITE PLAN

Project number 24601

Date Apr. 30, 2019

Drawn by Author

Checked by Checker

A0.2

Scale

APPENDIX C

MCR LOG ENVIRONMENTAL 5671.GPJ 7/29/20

RECORD OF BOREHOLE 101

PROJECT : GE5671
 LOCATION : 55 DUNLOP STREET WEST, BARRIE, ONTARIO
 STARTED : July 20, 2020
 COMPLETED : July 24, 2020

**MC CLYMONT & RAK
 ENGINEERS, INC.**

SHEET 2 OF 1
 DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE		SAMPLES			ORGANIC VAPOUR READINGS (ppm)				SHEAR STRENGTH: Cu, KPa				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	nat V -  rem V -  O -  U - 				nat V -  rem V -  O -  U - 					
								% LEL - (hexane) 				WATER CONTENT, PERCENT					
		GROUND SURFACE		223.28													
		SILTY SAND: trace gravel, grey, wet.			14	SS	49										
22																	
					15	SS	72										
24					16	SS	19										
					17	SS	>100										
26																	
		PMT5 at elevation 196.74 m asl.			18	SS	>100										
28		SANDY SILT TILL: trace gravel and clay, grey, wet.		195.85 27.43	19	SS	>100										
		PMT6 at elevation 195.29 m asl.															
30																	
					20	SS	71										
32		PMT7 at elevation 192.01 m asl.															
34		PMT8 at elevation 189.19 m asl.			21	SS	>100										
36		End of Borehole		188.23 35.05											188.23		
38		Note: 1) Soil samples were screened using a RKI Eagle gas meter with methane response mode off. 2) Monitoring well was installed 1.5m east of the borehole, straight drilling and using hollow stem augers. 3) Water level was measured at 1.86 m bgs on July 28, 2020.															

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
 WATER LEVEL: 1.86 m bgs

▼ DEEP/DUAL INSTALLATION
 WATER LEVEL:

LOGGED : MH
 CHECKED : NS

Project No.: T1979

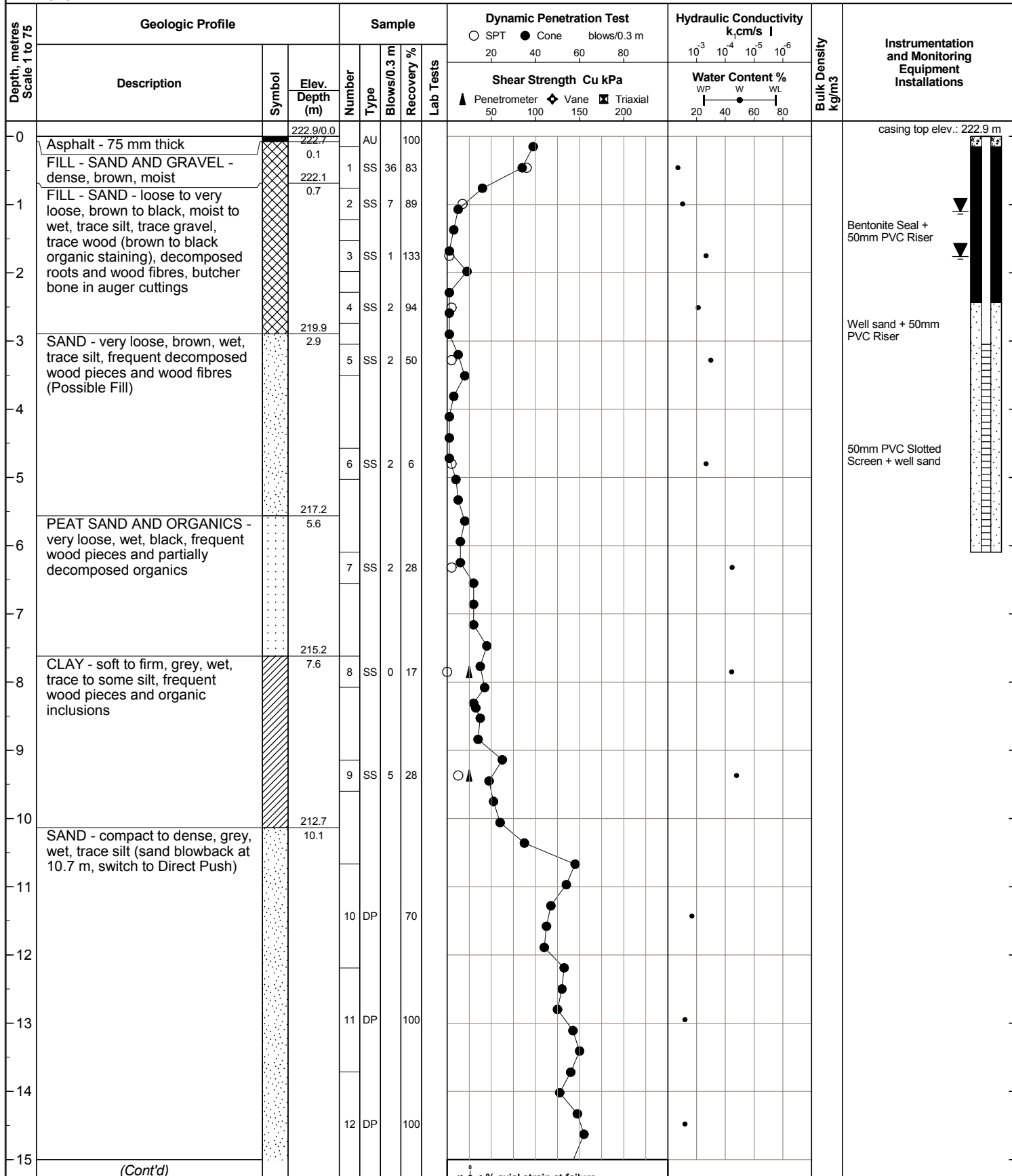
Project: Proposed Multi-Storey Development, Barrie

Location: Dunlop St. West and Mary St., Barrie, Ontario

Client:

BOREHOLE LOG BH1

Figure No. 3a

SARAFINCHIN
Consulting Engineers

Project No.: T1979

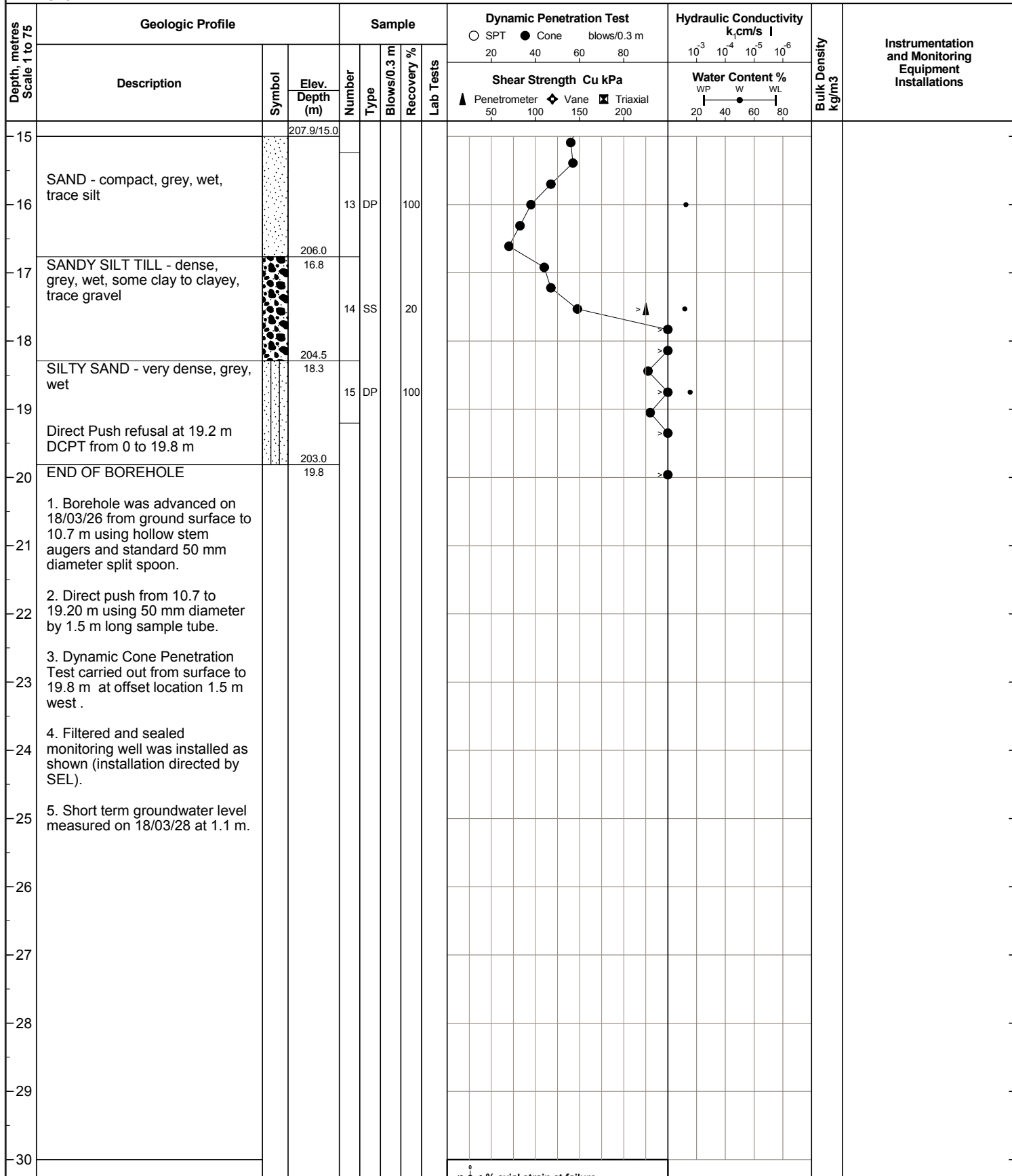
Project: Proposed Multi-Storey Development, Barrie

Location: Dunlop St. West and Mary St., Barrie, Ontario

Client:

BOREHOLE LOG BH1

Figure No. 3b

SARAFINCHIN
Consulting Engineers

Fieldwork Date: 18/03/26

Datum: Local Geodetic

Equipment: Geoprobe 6620DT

Survey Coordinates:

Vertical: 222.9 m

Horizontal: Refer to Figure 2

Sheet: 2 of 2

Logged: VB

Checked: SJ

Project No.: T1979

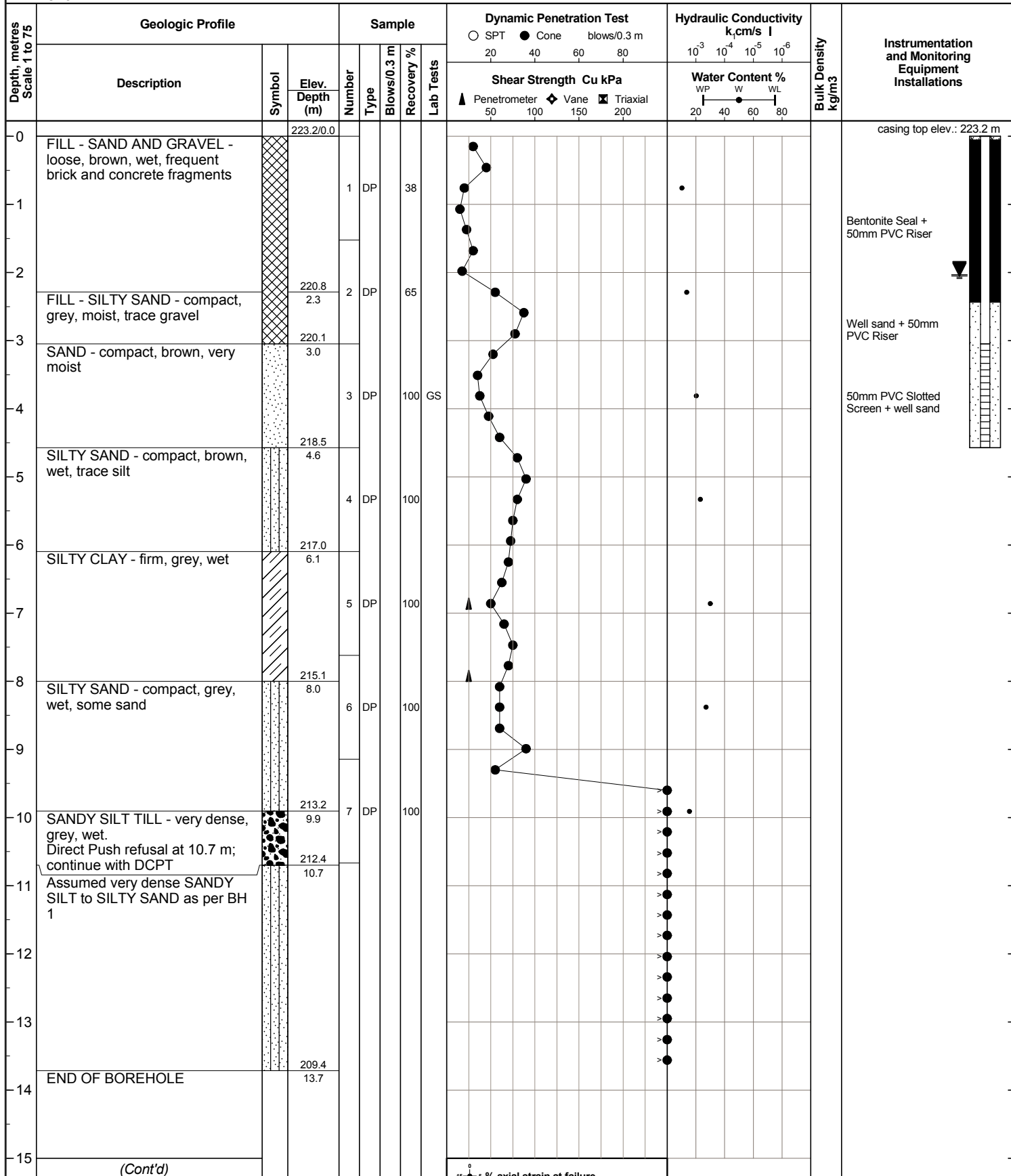
Project: Proposed Multi-Storey Development, Barrie

Location: Dunlop St. West and Mary St., Barrie, Ontario

Client:

BOREHOLE LOG BH2

Figure No. 4a

SARAFINCHIN
Consulting Engineers

Fieldwork Date: 18/03/27

Datum: Local Geodetic

Equipment: Geoprobe 6620DT

Survey Coordinates:

Vertical: 223.2 m

Horizontal: Refer to Figure 2

Sheet: 1 of 2

Logged: VB

Checked: SJ

Project No.: T1979

Project: Proposed Multi-Storey Development, Barrie

Location: Dunlop St. West and Mary St., Barrie, Ontario

Client:

BOREHOLE LOG BH2**SARAFINCHIN**
Consulting Engineers

Figure No. 4b

Depth, metres Scale 1 to 75	Geologic Profile		Sample				Dynamic Penetration Test		Hydraulic Conductivity		Bulk Density kg/m ³	Instrumentation and Monitoring Equipment Installations	
	Description	Symbol	Elev. Depth (m)	Number	Type	Blows/0.3 m	Recovery %	Lab Tests	k _{cm/s} l				
									Penetrometer	Vane			Triaxial
15	1. Borehole was advanced on 18/03/27 from ground surface to 10.7 m using direct pushing method with standard 50 mm diameter by 1.5 m long sample tube. 2. Dynamic Cone Penetration Test carried out from 10.7 to 13.7 m and from surface to 10.7 at 1.5 m at offset location 1.5 m east. 4. Filtered and sealed monitoring well was installed as shown (installation directed by SEL). 5. Short term groundwater level measured on 18/03/28 at 2.0 m.		208.2/15.0										
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													

0
 15 5 % axial strain at failure
 10

Fieldwork Date: 18/03/27

Datum: Local Geodetic

Equipment: Geoprobe 6620DT

Survey Coordinates:

Vertical: 223.2 m

Horizontal: Refer to Figure 2

Sheet: 2 of 2

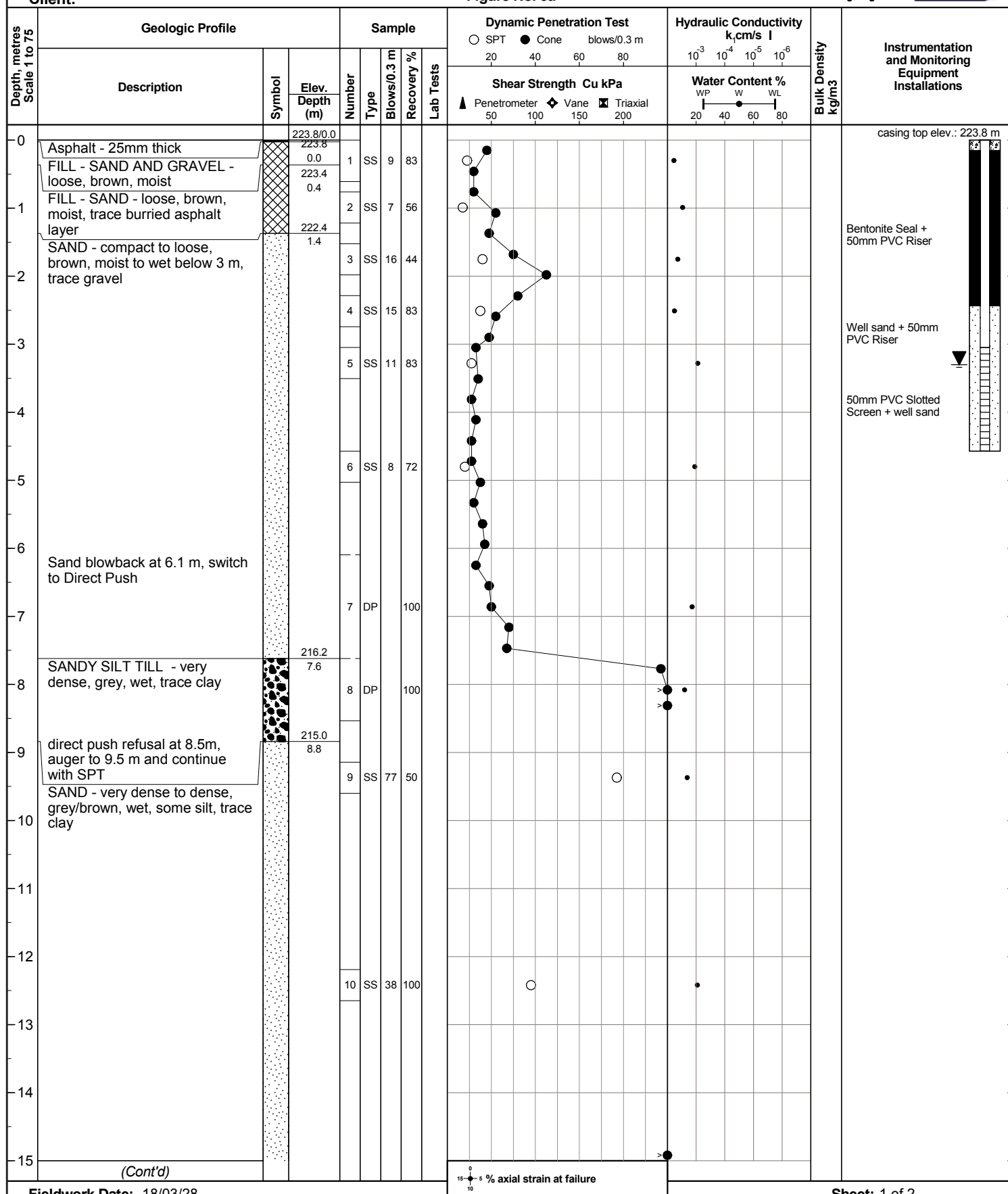
Logged: VB

Checked: SJ

Client:

Figure No. 5a

Consulting Engineers



Equipment: Geoprobe 6620DT

Horizontal: Refer to Figure 2

Checked: SJ

Project No.: T1979

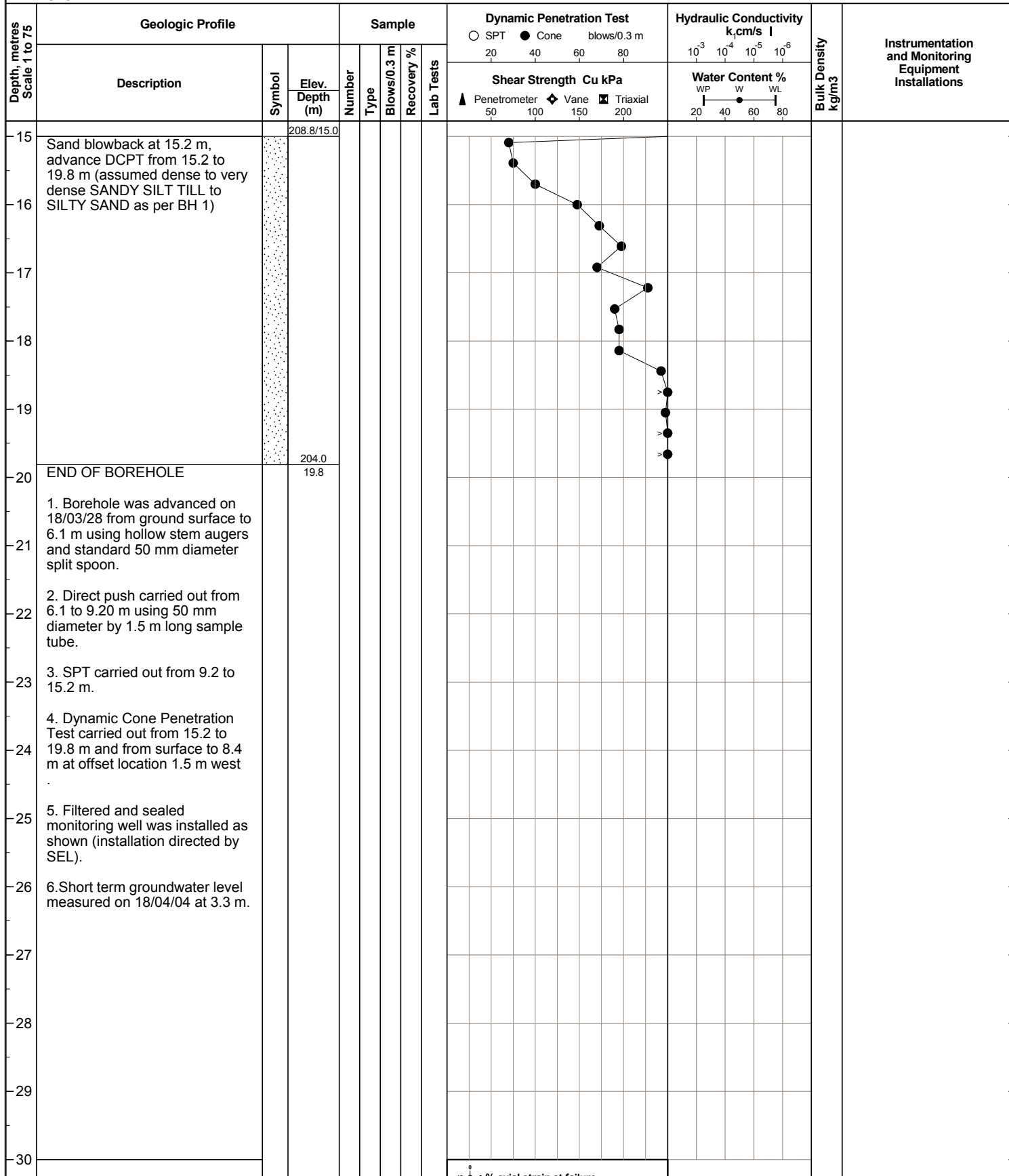
Project: Proposed Multi-Storey Development, Barrie

Location: Dunlop St. West and Mary St., Barrie, Ontario

Client:

BOREHOLE LOG BH3

Figure No. 5b

SARAFINCHIN
Consulting Engineers

Fieldwork Date: 18/03/28

Datum: Local Geodetic

Equipment: Geoprobe 6620DT

Survey Coordinates:

Vertical: 223.8 m

Horizontal: Refer to Figure 2

Sheet: 2 of 2

Logged: VB

Checked: SJ

APPENDIX D



MCCLYMONT & RAK ENG. INC
ATTN: VICTOR
111 ZENWAY BLVD.
UNIT 4
VAUGHAN ON L4H 3H9

Date Received: 30-JUL-20
Report Date: 12-AUG-20 13:38 (MT)
Version: FINAL

Client Phone: 416-675-0160

Certificate of Analysis

Lab Work Order #: L2482108
Project P.O. #: NOT SUBMITTED
Job Reference: 5671
C of C Numbers: 17-624302
Legal Site Desc:

Emily Smith
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 95 West Beaver Creek Road, Unit 1, Richmond Hill, ON L4B 1H2 Canada | Phone: +1 905 881 9887 | Fax: +1 905 881 8062
ALS CANADA LTD Part of the ALS Group An ALS Limited Company



ANALYTICAL REPORT

Summary of Guideline Exceedances

Guideline		Client ID	Grouping	Analyte	Result	Guideline Limit	Unit
ALS ID							
Ontario Sewer Use Bylaws - Barrie Sanitary Sewer (2012-172)							
L2482108-1	BH101		Anions and Nutrients	Chloride (Cl)	2240	1500	mg/L
Ontario Sewer Use Bylaws - Barrie Storm Sewer (2012-172)							
(No parameter exceedances)							

* Please refer to the Reference Information section for an explanation of any qualifiers noted.



ANALYTICAL REPORT

Physical Tests - WATER

					Lab ID	L2482108-1
					Sample Date	30-JUL-20
					Sample ID	BH101
					Guide Limits	
Analyte		Unit	#1	#2		
pH		pH units	6.0-9.5	6.0-9.5	7.86	
Total Suspended Solids		mg/L	350	15	<3.0	

Guide Limit #1: Barrie Sanitary Sewer (2012-172)

Guide Limit #2: Barrie Storm Sewer (2012-172)

 Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

 Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

Anions and Nutrients - WATER

		Lab ID	L2482108-1		
		Sample Date	30-JUL-20		
		Sample ID	BH101		
		Guide Limits			
Analyte	Unit	#1	#2		
Chloride (Cl)	mg/L	1500	-	2240	^{D.L.D.S}
Fluoride (F)	mg/L	10	-	<0.40	^{D.L.D.S}
Total Kjeldahl Nitrogen	mg/L	100	-	0.21	
Phosphorus, Total	mg/L	10	-	0.0195	
Sulfate (SO4)	mg/L	1500	-	76.9	^{D.L.D.S}
Sulphide (as S)	mg/L	-	-	<0.018	
Sulphide (as H2S)	mg/L	1	-	<0.019	

Guide Limit #1: Barrie Sanitary Sewer (2012-172)

Guide Limit #2: Barrie Storm Sewer (2012-172)

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.



ANALYTICAL REPORT

Cyanides - WATER

Lab ID L2482108-1
Sample Date 30-JUL-20
Sample ID BH101

Guide Limits
#1 #2

Analyte

Unit

Analyte	Unit	#1	#2	Result
Cyanide, Total	mg/L	1.2	-	0.0089

mg/L

1.2

-

0.0089

Guide Limit #1: Barrie Sanitary Sewer (2012-172)

Guide Limit #2: Barrie Storm Sewer (2012-172)

 Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

 Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.



ANALYTICAL REPORT

Total Metals - WATER

		Lab ID		L2482108-1
		Sample Date		30-JUL-20
		Sample ID		BH101
		Guide Limits		
Analyte	Unit	#1	#2	
Aluminum (Al)-Total	mg/L	50	-	0.761 ^{DLHC}
Antimony (Sb)-Total	mg/L	5	-	<0.0010 ^{DLHC}
Arsenic (As)-Total	mg/L	1	-	<0.0010 ^{DLHC}
Barium (Ba)-Total	mg/L	5	-	0.415 ^{DLHC}
Bismuth (Bi)-Total	mg/L	5	-	<0.00050 ^{DLHC}
Cadmium (Cd)-Total	mg/L	0.7	0.001	<0.000050 ^{DLHC}
Chromium (Cr)-Total	mg/L	2	0.08	<0.0050 ^{DLHC}
Cobalt (Co)-Total	mg/L	5.0	-	<0.0010 ^{DLHC}
Copper (Cu)-Total	mg/L	2.0	0.01	<0.0050 ^{DLHC}
Iron (Fe)-Total	mg/L	50	-	0.74 ^{DLHC}
Lead (Pb)-Total	mg/L	0.7	0.05	<0.00050 ^{DLHC}
Manganese (Mn)-Total	mg/L	5	-	0.0568 ^{DLHC}
Mercury (Hg)-Total	mg/L	0.01	-	<0.0000050
Molybdenum (Mo)-Total	mg/L	5	-	0.00562 ^{DLHC}
Nickel (Ni)-Total	mg/L	2	0.05	<0.0050 ^{DLHC}
Selenium (Se)-Total	mg/L	1.0	-	0.00207 ^{DLHC}
Silver (Ag)-Total	mg/L	0.4	-	<0.00050 ^{DLHC}
Tin (Sn)-Total	mg/L	5	-	<0.0010 ^{DLHC}
Titanium (Ti)-Total	mg/L	-	-	0.0420 ^{DLHC}
Vanadium (V)-Total	mg/L	5.0	-	<0.0050 ^{DLHC}
Zinc (Zn)-Total	mg/L	2.0	0.04	<0.030 ^{DLHC}

Guide Limit #1: Barrie Sanitary Sewer (2012-172)

Guide Limit #2: Barrie Storm Sewer (2012-172)

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.



ANALYTICAL REPORT

Aggregate Organics - WATER

		Lab ID	L2482108-1		
		Sample Date	30-JUL-20		
		Sample ID	BH101		
Analyte	Unit	Guide Limits			
		#1	#2		
BOD	mg/L	300	15	<3.0 ^{BODL}	
COD	mg/L	600	-	49	
Oil and Grease, Total	mg/L	-	-	<5.0	
Animal/Veg Oil & Grease	mg/L	150	-	<5.0	
Mineral Oil and Grease	mg/L	15	-	<2.5	
Phenols (4AAP)	mg/L	0.1	-	<0.0010	

Guide Limit #1: Barrie Sanitary Sewer (2012-172)

Guide Limit #2: Barrie Storm Sewer (2012-172)

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ANALYTICAL REPORT

Volatile Organic Compounds - WATER

		Lab ID	L2482108-1	
		Sample Date	30-JUL-20	
		Sample ID	BH101	
		Guide Limits		
Analyte	Unit	#1	#2	
Acetone	ug/L	-	-	<20
Benzene	ug/L	10	-	<0.50
Bromodichloromethane	ug/L	-	-	<1.0
Bromoform	ug/L	-	-	<1.0
Bromomethane	ug/L	-	-	<0.50
Carbon Disulfide	ug/L	-	-	<1.0
Carbon tetrachloride	ug/L	-	-	<0.20
Chlorobenzene	ug/L	-	-	<0.50
Dibromochloromethane	ug/L	-	-	<1.0
Chloroethane	ug/L	-	-	<1.0
Chloroform	ug/L	-	-	1.4
Chloromethane	ug/L	-	-	<1.0
1,2-Dibromoethane	ug/L	-	-	<0.20
1,2-Dichlorobenzene	ug/L	50	-	<0.50
1,3-Dichlorobenzene	ug/L	-	-	<0.50
1,4-Dichlorobenzene	ug/L	80	-	<0.50
Dichlorodifluoromethane	ug/L	-	-	<1.0
1,1-Dichloroethane	ug/L	-	-	<0.50
1,2-Dichloroethane	ug/L	-	-	<0.50
1,1-Dichloroethylene	ug/L	-	-	<0.50
cis-1,2-Dichloroethylene	ug/L	-	-	<0.50
trans-1,2-Dichloroethylene	ug/L	-	-	<0.50
Dichloromethane	ug/L	90	-	<2.0
1,2-Dichloropropane	ug/L	-	-	<0.50
cis-1,3-Dichloropropene	ug/L	-	-	<0.30
trans-1,3-Dichloropropene	ug/L	-	-	<0.30
Ethylbenzene	ug/L	60	-	<0.50
n-Hexane	ug/L	-	-	<0.50
2-Hexanone	ug/L	-	-	<20
Methyl Ethyl Ketone	ug/L	-	-	<20

Guide Limit #1: Barrie Sanitary Sewer (2012-172)

Guide Limit #2: Barrie Storm Sewer (2012-172)

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ANALYTICAL REPORT

Volatile Organic Compounds - WATER

		Lab ID	L2482108-1	
		Sample Date	30-JUL-20	
		Sample ID	BH101	
		Guide Limits		
Analyte	Unit	#1	#2	
Methyl Isobutyl Ketone	ug/L	-	-	<20
MTBE	ug/L	-	-	<0.50
Styrene	ug/L	-	-	<0.50
1,1,1,2-Tetrachloroethane	ug/L	-	-	<0.50
1,1,2,2-Tetrachloroethane	ug/L	60	-	<0.50
Tetrachloroethylene	ug/L	60	-	<0.50
Toluene	ug/L	20	-	<0.40
1,1,1-Trichloroethane	ug/L	-	-	<0.50
1,1,2-Trichloroethane	ug/L	-	-	<0.50
Trichloroethylene	ug/L	50	-	<0.50
Trichlorofluoromethane	ug/L	-	-	<1.0
Vinyl chloride	ug/L	-	-	<0.50
o-Xylene	ug/L	-	-	<0.30
m+p-Xylenes	ug/L	-	-	<0.40
Xylenes (Total)	ug/L	300	-	<0.50
Surrogate: 4-Bromofluorobenzene	%	-	-	91.6
Surrogate: 1,4-Difluorobenzene	%	-	-	102.0

Guide Limit #1: Barrie Sanitary Sewer (2012-172)

Guide Limit #2: Barrie Storm Sewer (2012-172)

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

ANALYTICAL REPORT

Polycyclic Aromatic Hydrocarbons - WATER

		Lab ID	L2482108-1	
		Sample Date	30-JUL-20	
		Sample ID	BH101	
		Guide Limits		
Analyte	Unit	#1	#2	
Acenaphthene	ug/L	-	-	<0.020
Acenaphthylene	ug/L	-	-	<0.020
Anthracene	ug/L	-	-	<0.020
Benzo(a)anthracene	ug/L	-	-	<0.020
Benzo(a)pyrene	ug/L	-	-	<0.010
Benzo(b)fluoranthene	ug/L	-	-	<0.020
Benzo(g,h,i)perylene	ug/L	-	-	<0.020
Benzo(k)fluoranthene	ug/L	-	-	<0.020
Chrysene	ug/L	-	-	<0.020
Dibenzo(ah)anthracene	ug/L	-	-	<0.020
Fluoranthene	ug/L	-	-	<0.020
Fluorene	ug/L	-	-	<0.020
Indeno(1,2,3-cd)pyrene	ug/L	-	-	<0.020
1-Methylnaphthalene	ug/L	-	-	<0.020
2-Methylnaphthalene	ug/L	-	-	<0.020
Naphthalene	ug/L	-	-	<0.050
Phenanthrene	ug/L	-	-	<0.020
Pyrene	ug/L	-	-	<0.020
Surrogate: d10-Acenaphthene	%	-	-	95.2
Surrogate: d12-Chrysene	%	-	-	85.6
Surrogate: d8-Naphthalene	%	-	-	96.4
Surrogate: d10-Phenanthrene	%	-	-	93.5
Total PAHs	ug/L	5	-	<0.095

Guide Limit #1: Barrie Sanitary Sewer (2012-172)

Guide Limit #2: Barrie Storm Sewer (2012-172)

 Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

 Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.



ANALYTICAL REPORT

Organochlorine Pesticides - WATER

		Lab ID	L2482108-1		
		Sample Date	30-JUL-20		
		Sample ID	BH101		
		Guide Limits			
Analyte	Unit	#1	#2		
Hexachlorobenzene	ug/L	0.1	-	<0.0080	
Surrogate: Tetrachloro-m-xylene	%	-	-	86.6	

Guide Limit #1: Barrie Sanitary Sewer (2012-172)

Guide Limit #2: Barrie Storm Sewer (2012-172)

- Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
- Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Reference Information

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Job Reference: 5671
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Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
BODL	Limit of Reporting for BOD was increased to account for the largest volume of sample tested.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
BOD-WT	Water	BOD	APHA 5210 B
This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.			
CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
CN-TOT-WT	Water	Cyanide, Total	ISO 14403-2
Total cyanide is determined by the combination of UV digestion and distillation. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.			
When using this method, high levels of thiocyanate in samples can cause false positives at ~1-2% of the thiocyanate concentration. For samples with detectable cyanide analyzed by this method, ALS recommends analysis for thiocyanate to check for this potential interference			
COD-T-WT	Water	Chemical Oxygen Demand	APHA 5220 D
This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colourimetric method.			
EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.			
F-IC-N-WT	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
OCP-ROUTINE-WT	Water	Pesticides, Organochlorine in Water	SW846 8270

Reference Information

L2482108 CONT'D....
Job Reference: 5671
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Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
Samples are extracted using a solvent mixture and the resulting extracts are analyzed on GC/MSD			
OGG-SPEC-CALC-WT	Water	Speciated Oil and Grease A/V Calc	CALCULATION
Sample is extracted with hexane, sample speciation into mineral and animal/vegetable fractions is achieved via silica gel separation and is then determined gravimetrically.			
OGG-SPEC-WT	Water	Speciated Oil and Grease-Gravimetric	APHA 5520 B
The procedure involves an extraction of the entire water sample with hexane. Sample speciation into mineral and animal/vegetable fractions is achieved via silica gel separation and is then determined gravimetrically.			
P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is deteremined colourimetrically after persulphate digestion of the sample.			
PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).			
PAH-SUM-CALC-WT	Water	TOTAL PAH's	CALCULATION
Total PAH represents the sum of all PAH analytes reported for a given sample. Note that regulatory agencies and criteria differ in their definitions of Total PAH in terms of the individual PAH analytes to be included.			
PH-WT	Water	pH	APHA 4500 H-Electrode
Water samples are analyzed directly by a calibrated pH meter.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days			
PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066
An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.			
S2-T>H2S-CALC-WT	Water	Total Sulphide Calculated as H2S	Calculation
This calculation converts Total Sulphide as (S2-) and reports it as Total Sulphide as (H2S). Total Sulphide as (S2-) is determined using procedures adapted from APHA 4500-S2 "Sulphide".			
SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TSS-WT	Water	Suspended solids	APHA 2540 D-Gravimetric
A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104–1°C for a minimum of four hours or until a constant weight is achieved.			
SULPHIDE-WT	Water	Sulphide (as S)	APHA 4500S2D

Reference Information

L2482108 CONT'D....
Job Reference: 5671
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Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
This analysis is carried out using procedures adapted from APHA Method 4500-S2-D "Methylene Blue Method". Sulphide is determined colourmetrically.			
TKN-WT	Water	Total Kjeldahl Nitrogen	APHA 4500-Norg D
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 Celsius with analysis using an automated colorimetric method.			
VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260
Aqueous samples are analyzed by headspace-GC/MS.			
XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
Total xylenes represents the sum of o-xylene and m&p-xylene.			

**ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody Numbers:

17-624302

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg ww - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

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. Guideline limits 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.



Quality Control Report

Workorder: L2482108

Report Date: 12-AUG-20

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Client: MCCLYMONT & RAK ENG. INC
111 ZENWAY BLVD. UNIT 4
VAUGHAN ON L4H 3H9

Contact: VICTOR

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-WT		Water						
Batch	R5174864							
WG3376292-4	DUP	L2482549-8						
Fluoride (F)		0.034	0.035		mg/L	0.9	20	04-AUG-20
WG3376292-2	LCS							
Fluoride (F)			104.8		%		90-110	04-AUG-20
WG3376292-1	MB							
Fluoride (F)			<0.020		mg/L		0.02	04-AUG-20
WG3376292-5	MS	L2482549-8						
Fluoride (F)			102.2		%		75-125	04-AUG-20
HG-T-CVAA-WT		Water						
Batch	R5172876							
WG3374475-3	DUP	L2481792-1						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	31-JUL-20
WG3374475-2	LCS							
Mercury (Hg)-Total			105.0		%		80-120	31-JUL-20
WG3374475-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	31-JUL-20
WG3374475-4	MS	L2481792-2						
Mercury (Hg)-Total			99.9		%		70-130	31-JUL-20
MET-T-CCMS-WT		Water						
Batch	R5172712							
WG3374237-4	DUP	WG3374237-3						
Aluminum (Al)-Total		0.0125	0.0135		mg/L	7.5	20	31-JUL-20
Antimony (Sb)-Total		0.00048	0.00046		mg/L	4.4	20	31-JUL-20
Arsenic (As)-Total		0.00077	0.00076		mg/L	0.8	20	31-JUL-20
Barium (Ba)-Total		0.105	0.101		mg/L	3.9	20	31-JUL-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	31-JUL-20
Cadmium (Cd)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	31-JUL-20
Chromium (Cr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	31-JUL-20
Cobalt (Co)-Total		0.00044	0.00041		mg/L	6.5	20	31-JUL-20
Copper (Cu)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	31-JUL-20
Iron (Fe)-Total		0.181	0.182		mg/L	0.4	20	31-JUL-20
Lead (Pb)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	31-JUL-20
Manganese (Mn)-Total		0.0373	0.0350		mg/L	6.3	20	31-JUL-20
Molybdenum (Mo)-Total		0.00532	0.00515		mg/L	3.3	20	31-JUL-20
Nickel (Ni)-Total		0.00247	0.00232		mg/L	6.1	20	31-JUL-20
Selenium (Se)-Total		0.000158	0.000164		mg/L	3.6	20	31-JUL-20



Quality Control Report

Workorder: L2482108

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Client: MCCLYMONT & RAK ENG. INC
111 ZENWAY BLVD. UNIT 4
VAUGHAN ON L4H 3H9

Contact: VICTOR

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5172712							
WG3374237-4 DUP		WG3374237-3						
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	31-JUL-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	31-JUL-20
Titanium (Ti)-Total		0.00042	0.00042		mg/L	1.4	20	31-JUL-20
Vanadium (V)-Total		0.00055	0.00053		mg/L	4.1	20	31-JUL-20
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	31-JUL-20
WG3374237-2 LCS								
Aluminum (Al)-Total			100.3		%		80-120	31-JUL-20
Antimony (Sb)-Total			98.5		%		80-120	31-JUL-20
Arsenic (As)-Total			99.6		%		80-120	31-JUL-20
Barium (Ba)-Total			97.7		%		80-120	31-JUL-20
Bismuth (Bi)-Total			94.2		%		80-120	31-JUL-20
Cadmium (Cd)-Total			96.5		%		80-120	31-JUL-20
Chromium (Cr)-Total			97.1		%		80-120	31-JUL-20
Cobalt (Co)-Total			94.9		%		80-120	31-JUL-20
Copper (Cu)-Total			94.7		%		80-120	31-JUL-20
Iron (Fe)-Total			92.7		%		80-120	31-JUL-20
Lead (Pb)-Total			96.9		%		80-120	31-JUL-20
Manganese (Mn)-Total			98.8		%		80-120	31-JUL-20
Molybdenum (Mo)-Total			96.4		%		80-120	31-JUL-20
Nickel (Ni)-Total			96.1		%		80-120	31-JUL-20
Selenium (Se)-Total			97.0		%		80-120	31-JUL-20
Silver (Ag)-Total			99.0		%		80-120	31-JUL-20
Tin (Sn)-Total			94.6		%		80-120	31-JUL-20
Titanium (Ti)-Total			93.5		%		80-120	31-JUL-20
Vanadium (V)-Total			98.0		%		80-120	31-JUL-20
Zinc (Zn)-Total			93.2		%		80-120	31-JUL-20
WG3374237-1 MB								
Aluminum (Al)-Total			<0.0050		mg/L		0.005	31-JUL-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	31-JUL-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	31-JUL-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	31-JUL-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	31-JUL-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	31-JUL-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	31-JUL-20



Quality Control Report

Workorder: L2482108

Report Date: 12-AUG-20

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Client: MCCLYMONT & RAK ENG. INC
111 ZENWAY BLVD. UNIT 4
VAUGHAN ON L4H 3H9

Contact: VICTOR

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5172712							
WG3374237-1 MB								
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	31-JUL-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	31-JUL-20
Iron (Fe)-Total			<0.010		mg/L		0.01	31-JUL-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	31-JUL-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	31-JUL-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	31-JUL-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	31-JUL-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	31-JUL-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	31-JUL-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	31-JUL-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	31-JUL-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	31-JUL-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	31-JUL-20
WG3374237-5 MS		WG3374237-3						
Aluminum (Al)-Total			93.4		%		70-130	31-JUL-20
Antimony (Sb)-Total			94.8		%		70-130	31-JUL-20
Arsenic (As)-Total			96.3		%		70-130	31-JUL-20
Barium (Ba)-Total			N/A	MS-B	%		-	31-JUL-20
Bismuth (Bi)-Total			85.8		%		70-130	31-JUL-20
Cadmium (Cd)-Total			91.8		%		70-130	31-JUL-20
Chromium (Cr)-Total			92.3		%		70-130	31-JUL-20
Cobalt (Co)-Total			90.7		%		70-130	31-JUL-20
Copper (Cu)-Total			88.7		%		70-130	31-JUL-20
Iron (Fe)-Total			N/A	MS-B	%		-	31-JUL-20
Lead (Pb)-Total			90.6		%		70-130	31-JUL-20
Manganese (Mn)-Total			N/A	MS-B	%		-	31-JUL-20
Molybdenum (Mo)-Total			95.3		%		70-130	31-JUL-20
Nickel (Ni)-Total			89.5		%		70-130	31-JUL-20
Selenium (Se)-Total			93.2		%		70-130	31-JUL-20
Silver (Ag)-Total			91.6		%		70-130	31-JUL-20
Tin (Sn)-Total			94.2		%		70-130	31-JUL-20
Titanium (Ti)-Total			93.7		%		70-130	31-JUL-20
Vanadium (V)-Total			98.0		%		70-130	31-JUL-20
Zinc (Zn)-Total			82.5		%		70-130	31-JUL-20



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Client: MCCLYMONT & RAK ENG. INC
111 ZENWAY BLVD. UNIT 4
VAUGHAN ON L4H 3H9

Contact: VICTOR

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
OCP-ROUTINE-WT		Water						
Batch	R5176051							
WG3375619-2	LCS							
Hexachlorobenzene			94.2		%		50-150	07-AUG-20
WG3375619-1	MB							
Hexachlorobenzene			<0.0080		ug/L		0.008	07-AUG-20
Surrogate: Tetrachloro-m-xylene			90.4		%		40-130	07-AUG-20
OGG-SPEC-WT		Water						
Batch	R5174001							
WG3375473-2	LCS							
Oil and Grease, Total			89.0		%		70-130	04-AUG-20
Mineral Oil and Grease			84.2		%		70-130	04-AUG-20
WG3375473-1	MB							
Oil and Grease, Total			<5.0		mg/L		5	04-AUG-20
Mineral Oil and Grease			<2.5		mg/L		2.5	04-AUG-20
P-T-COL-WT		Water						
Batch	R5173884							
WG3374274-3	DUP	L2481720-2						
Phosphorus, Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	04-AUG-20
WG3374274-2	LCS							
Phosphorus, Total			98.1		%		80-120	04-AUG-20
WG3374274-1	MB							
Phosphorus, Total			<0.0030		mg/L		0.003	04-AUG-20
WG3374274-4	MS	L2481720-2						
Phosphorus, Total			95.7		%		70-130	04-AUG-20
PAH-511-WT		Water						
Batch	R5174535							
WG3376042-2	LCS							
1-Methylnaphthalene			101.4		%		50-140	05-AUG-20
2-Methylnaphthalene			102.7		%		50-140	05-AUG-20
Acenaphthene			118.1		%		50-140	05-AUG-20
Acenaphthylene			111.4		%		50-140	05-AUG-20
Anthracene			122.0		%		50-140	05-AUG-20
Benzo(a)anthracene			135.4		%		50-140	05-AUG-20
Benzo(a)pyrene			107.0		%		50-140	05-AUG-20
Benzo(b)fluoranthene			125.0		%		50-140	05-AUG-20
Benzo(g,h,i)perylene			123.6		%		50-140	05-AUG-20
Benzo(k)fluoranthene			125.0		%		50-140	05-AUG-20



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Client: MCCLYMONT & RAK ENG. INC
111 ZENWAY BLVD. UNIT 4
VAUGHAN ON L4H 3H9

Contact: VICTOR

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT		Water						
Batch	R5174535							
WG3376042-2	LCS							
Chrysene			134.4		%		50-140	05-AUG-20
Dibenzo(ah)anthracene			120.6		%		50-140	05-AUG-20
Fluoranthene			119.6		%		50-140	05-AUG-20
Fluorene			115.0		%		50-140	05-AUG-20
Indeno(1,2,3-cd)pyrene			131.4		%		50-140	05-AUG-20
Naphthalene			108.6		%		50-140	05-AUG-20
Phenanthrene			119.3		%		50-140	05-AUG-20
Pyrene			124.4		%		50-140	05-AUG-20
WG3376042-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	05-AUG-20
2-Methylnaphthalene			<0.020		ug/L		0.02	05-AUG-20
Acenaphthene			<0.020		ug/L		0.02	05-AUG-20
Acenaphthylene			<0.020		ug/L		0.02	05-AUG-20
Anthracene			<0.020		ug/L		0.02	05-AUG-20
Benzo(a)anthracene			<0.020		ug/L		0.02	05-AUG-20
Benzo(a)pyrene			<0.010		ug/L		0.01	05-AUG-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	05-AUG-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	05-AUG-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	05-AUG-20
Chrysene			<0.020		ug/L		0.02	05-AUG-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	05-AUG-20
Fluoranthene			<0.020		ug/L		0.02	05-AUG-20
Fluorene			<0.020		ug/L		0.02	05-AUG-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	05-AUG-20
Naphthalene			<0.050		ug/L		0.05	05-AUG-20
Phenanthrene			<0.020		ug/L		0.02	05-AUG-20
Pyrene			<0.020		ug/L		0.02	05-AUG-20
Surrogate: d8-Naphthalene			92.6		%		60-140	05-AUG-20
Surrogate: d10-Phenanthrene			96.8		%		60-140	05-AUG-20
Surrogate: d12-Chrysene			99.5		%		60-140	05-AUG-20
Surrogate: d10-Acenaphthene			93.4		%		60-140	05-AUG-20

PH-WT **Water**



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Client: MCCLYMONT & RAK ENG. INC
111 ZENWAY BLVD. UNIT 4
VAUGHAN ON L4H 3H9

Contact: VICTOR

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SULPHIDE-WT		Water						
Batch	R5174522							
WG3376415-2	LCS							
Sulphide (as S)			112.5		%		75-125	05-AUG-20
WG3376415-1	MB							
Sulphide (as S)			<0.018		mg/L		0.018	05-AUG-20
WG3376415-4	MS	WG3376415-5						
Sulphide (as S)			85.0		%		65-135	05-AUG-20
TKN-WT		Water						
Batch	R5174133							
WG3374273-3	DUP	L2481850-2						
Total Kjeldahl Nitrogen		1.55	1.36		mg/L	13	20	04-AUG-20
WG3374273-2	LCS							
Total Kjeldahl Nitrogen			100.2		%		75-125	04-AUG-20
WG3374273-1	MB							
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	04-AUG-20
WG3374273-4	MS	L2481850-2						
Total Kjeldahl Nitrogen			103.5		%		70-130	04-AUG-20
VOC-ROU-HS-WT		Water						
Batch	R5175186							
WG3376824-4	DUP	WG3376824-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	06-AUG-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
2-Hexanone		<20	<20	RPD-NA	ug/L	N/A	30	06-AUG-20
Acetone		<20	<20	RPD-NA	ug/L	N/A	30	06-AUG-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
Bromodichloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	06-AUG-20



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111 ZENWAY BLVD. UNIT 4
VAUGHAN ON L4H 3H9

Contact: VICTOR

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R5175186							
WG3376824-4	DUP	WG3376824-3						
Bromoform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	06-AUG-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
Carbon Disulfide		<1.0	<1.0	RPD-NA	ug/L	N/A	30	06-AUG-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	06-AUG-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
Chloroethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	06-AUG-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	06-AUG-20
Chloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	06-AUG-20
cis-1,2-Dichloroethylene		0.58	0.64		ug/L	9.8	30	06-AUG-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	06-AUG-20
Dibromochloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	06-AUG-20
Dichlorodifluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	06-AUG-20
Dichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	06-AUG-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	06-AUG-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	06-AUG-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	06-AUG-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
MTBE		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	06-AUG-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
Toluene		<0.40	<0.40	RPD-NA	ug/L	N/A	30	06-AUG-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	06-AUG-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
Trichlorofluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	06-AUG-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-AUG-20
WG3376824-1	LCS							
1,1,1,2-Tetrachloroethane			95.1		%		70-130	06-AUG-20
1,1,2,2-Tetrachloroethane			77.7		%		70-130	06-AUG-20
1,1,1-Trichloroethane			99.7		%		70-130	06-AUG-20
1,1,2-Trichloroethane			86.0		%		70-130	06-AUG-20



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Client: MCCLYMONT & RAK ENG. INC
111 ZENWAY BLVD. UNIT 4
VAUGHAN ON L4H 3H9

Contact: VICTOR

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R5175186							
WG3376824-1	LCS							
1,2-Dibromoethane			83.4		%		70-130	06-AUG-20
1,1-Dichloroethane			98.1		%		70-130	06-AUG-20
1,1-Dichloroethylene			103.7		%		70-130	06-AUG-20
1,2-Dichlorobenzene			101.5		%		70-130	06-AUG-20
1,2-Dichloroethane			85.6		%		70-130	06-AUG-20
1,2-Dichloropropane			92.5		%		70-130	06-AUG-20
1,3-Dichlorobenzene			108.5		%		70-130	06-AUG-20
1,4-Dichlorobenzene			106.8		%		70-130	06-AUG-20
2-Hexanone			81.6		%		60-140	06-AUG-20
Acetone			88.9		%		60-140	06-AUG-20
Benzene			96.0		%		70-130	06-AUG-20
Bromodichloromethane			105.0		%		70-130	06-AUG-20
Bromoform			83.2		%		70-130	06-AUG-20
Bromomethane			123.3		%		60-140	06-AUG-20
Carbon Disulfide			101.9		%		70-130	06-AUG-20
Carbon tetrachloride			101.4		%		70-130	06-AUG-20
Chlorobenzene			95.5		%		70-130	06-AUG-20
Chloroethane			109.8		%		70-130	06-AUG-20
Chloroform			97.1		%		70-130	06-AUG-20
Chloromethane			120.2		%		60-140	06-AUG-20
cis-1,2-Dichloroethylene			92.9		%		70-130	06-AUG-20
cis-1,3-Dichloropropene			95.0		%		70-130	06-AUG-20
Dibromochloromethane			84.5		%		70-130	06-AUG-20
Dichlorodifluoromethane			80.5		%		50-140	06-AUG-20
Dichloromethane			96.8		%		70-130	06-AUG-20
Ethylbenzene			107.4		%		70-130	06-AUG-20
m+p-Xylenes			107.0		%		70-130	06-AUG-20
Methyl Ethyl Ketone			87.5		%		60-140	06-AUG-20
Methyl Isobutyl Ketone			83.2		%		50-150	06-AUG-20
n-Hexane			101.1		%		70-130	06-AUG-20
MTBE			103.5		%		70-130	06-AUG-20
o-Xylene			105.3		%		70-130	06-AUG-20
Styrene			100.3		%		70-130	06-AUG-20



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Client: MCCLYMONT & RAK ENG. INC
111 ZENWAY BLVD. UNIT 4
VAUGHAN ON L4H 3H9

Contact: VICTOR

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R5175186							
WG3376824-1	LCS							
Tetrachloroethylene			103.2		%		70-130	06-AUG-20
Toluene			105.3		%		70-130	06-AUG-20
trans-1,2-Dichloroethylene			104.0		%		70-130	06-AUG-20
trans-1,3-Dichloropropene			100.0		%		70-130	06-AUG-20
Trichloroethylene			99.7		%		70-130	06-AUG-20
Trichlorofluoromethane			101.8		%		60-140	06-AUG-20
Vinyl chloride			103.3		%		60-140	06-AUG-20
WG3376824-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	06-AUG-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	06-AUG-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	06-AUG-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	06-AUG-20
1,2-Dibromoethane			<0.20		ug/L		0.2	06-AUG-20
1,1-Dichloroethane			<0.50		ug/L		0.5	06-AUG-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	06-AUG-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	06-AUG-20
1,2-Dichloroethane			<0.50		ug/L		0.5	06-AUG-20
1,2-Dichloropropane			<0.50		ug/L		0.5	06-AUG-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	06-AUG-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	06-AUG-20
2-Hexanone			<20		ug/L		20	06-AUG-20
Acetone			<20		ug/L		20	06-AUG-20
Benzene			<0.50		ug/L		0.5	06-AUG-20
Bromodichloromethane			<1.0		ug/L		1	06-AUG-20
Bromoform			<1.0		ug/L		1	06-AUG-20
Bromomethane			<0.50		ug/L		0.5	06-AUG-20
Carbon Disulfide			<1.0		ug/L		1	06-AUG-20
Carbon tetrachloride			<0.20		ug/L		0.2	06-AUG-20
Chlorobenzene			<0.50		ug/L		0.5	06-AUG-20
Chloroethane			<1.0		ug/L		1	06-AUG-20
Chloroform			<1.0		ug/L		1	06-AUG-20
Chloromethane			<1.0		ug/L		1	06-AUG-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	06-AUG-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	06-AUG-20



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Client: MCCLYMONT & RAK ENG. INC
111 ZENWAY BLVD. UNIT 4
VAUGHAN ON L4H 3H9
Contact: VICTOR

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R5175186							
WG3376824-2 MB								
Dibromochloromethane			<1.0		ug/L		1	06-AUG-20
Dichlorodifluoromethane			<1.0		ug/L		1	06-AUG-20
Dichloromethane			<2.0		ug/L		2	06-AUG-20
Ethylbenzene			<0.50		ug/L		0.5	06-AUG-20
m+p-Xylenes			<0.40		ug/L		0.4	06-AUG-20
Methyl Ethyl Ketone			<20		ug/L		20	06-AUG-20
Methyl Isobutyl Ketone			<20		ug/L		20	06-AUG-20
n-Hexane			<0.50		ug/L		0.5	06-AUG-20
MTBE			<0.50		ug/L		0.5	06-AUG-20
o-Xylene			<0.30		ug/L		0.3	06-AUG-20
Styrene			<0.50		ug/L		0.5	06-AUG-20
Tetrachloroethylene			<0.50		ug/L		0.5	06-AUG-20
Toluene			<0.40		ug/L		0.4	06-AUG-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	06-AUG-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	06-AUG-20
Trichloroethylene			<0.50		ug/L		0.5	06-AUG-20
Trichlorofluoromethane			<1.0		ug/L		1	06-AUG-20
Vinyl chloride			<0.50		ug/L		0.5	06-AUG-20
Surrogate: 1,4-Difluorobenzene			100.5		%		70-130	06-AUG-20
Surrogate: 4-Bromofluorobenzene			92.0		%		70-130	06-AUG-20
WG3376824-5 MS		WG3376824-3						
1,1,1,2-Tetrachloroethane			95.8		%		50-150	06-AUG-20
1,1,2,2-Tetrachloroethane			93.8		%		50-150	06-AUG-20
1,1,1-Trichloroethane			91.8		%		50-150	06-AUG-20
1,1,2-Trichloroethane			95.5		%		50-150	06-AUG-20
1,2-Dibromoethane			95.3		%		50-150	06-AUG-20
1,1-Dichloroethane			94.8		%		50-150	06-AUG-20
1,1-Dichloroethylene			91.8		%		50-150	06-AUG-20
1,2-Dichlorobenzene			99.8		%		50-150	06-AUG-20
1,2-Dichloroethane			95.0		%		50-150	06-AUG-20
1,2-Dichloropropane			96.2		%		50-150	06-AUG-20
1,3-Dichlorobenzene			99.5		%		50-150	06-AUG-20
1,4-Dichlorobenzene			99.6		%		50-150	06-AUG-20
2-Hexanone			105.5		%		50-150	06-AUG-20



Quality Control Report

Workorder: L2482108

Report Date: 12-AUG-20

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Client: MCCLYMONT & RAK ENG. INC
111 ZENWAY BLVD. UNIT 4
VAUGHAN ON L4H 3H9

Contact: VICTOR

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R5175186							
WG3376824-5	MS	WG3376824-3						
Acetone			110.8		%		50-150	06-AUG-20
Benzene			93.5		%		50-150	06-AUG-20
Bromodichloromethane			110.3		%		50-150	06-AUG-20
Bromoform			95.0		%		50-150	06-AUG-20
Bromomethane			111.5		%		50-150	06-AUG-20
Carbon Disulfide			88.4		%		50-150	06-AUG-20
Carbon tetrachloride			91.5		%		50-150	06-AUG-20
Chlorobenzene			93.2		%		50-150	06-AUG-20
Chloroethane			99.9		%		50-150	06-AUG-20
Chloroform			96.7		%		50-150	06-AUG-20
Chloromethane			106.0		%		50-150	06-AUG-20
cis-1,2-Dichloroethylene			92.1		%		50-150	06-AUG-20
cis-1,3-Dichloropropene			95.7		%		50-150	06-AUG-20
Dibromochloromethane			91.2		%		50-150	06-AUG-20
Dichlorodifluoromethane			63.1		%		50-150	06-AUG-20
Dichloromethane			98.8		%		50-150	06-AUG-20
Ethylbenzene			97.9		%		50-150	06-AUG-20
m+p-Xylenes			97.5		%		50-150	06-AUG-20
Methyl Ethyl Ketone			101.9		%		50-150	06-AUG-20
Methyl Isobutyl Ketone			108.5		%		50-150	06-AUG-20
n-Hexane			85.8		%		50-150	06-AUG-20
MTBE			100.3		%		50-150	06-AUG-20
o-Xylene			99.2		%		50-150	06-AUG-20
Styrene			98.7		%		50-150	06-AUG-20
Tetrachloroethylene			89.5		%		50-150	06-AUG-20
Toluene			97.9		%		50-150	06-AUG-20
trans-1,2-Dichloroethylene			94.7		%		50-150	06-AUG-20
trans-1,3-Dichloropropene			100.9		%		50-150	06-AUG-20
Trichloroethylene			92.3		%		50-150	06-AUG-20
Trichlorofluoromethane			87.6		%		50-150	06-AUG-20
Vinyl chloride			87.7		%		50-150	06-AUG-20

Quality Control Report

Workorder: L2482108

Report Date: 12-AUG-20

Client: MCCLYMONT & RAK ENG. INC
111 ZENWAY BLVD. UNIT 4
VAUGHAN ON L4H 3H9
Contact: VICTOR

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes 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 pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

**SGS Canada Inc.**

P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - K0L 2H0
Phone: 705-652-2000 FAX: 705-652-6365

ALS Laboratory (Mississauga)

Attn : Emily Hansen

5730 Coopers Avenue, Unit # 26
Mississauga, ON
L4Z 2E9, Canada

Phone: 905-507-6910
Fax:

12-August-2020

Date Rec. : 05 August 2020
LR Report: CA13138-AUG20
Reference: Submission #: L2482108

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Sample ID	Sample Date & Time	Temperature Upon Receipt °C	Gold (total) mg/L	Platinum (total) mg/L	Rhodium (total) mg/L
1: Analysis Start Date		---	07-Aug-20	07-Aug-20	07-Aug-20
2: Analysis Start Time		---	14:10	14:10	14:10
3: Analysis Completed Date		---	12-Aug-20	12-Aug-20	12-Aug-20
4: Analysis Completed Time		---	11:47	11:47	11:48
5: QC - Blank		---	< 0.00001	< 0.0001	< 0.0001
6: QC - STD % Recovery		---	101%	96%	103%
7: QC - DUP % RPD		---	ND	ND	ND
8: RL		---	0.00001	0.0001	0.00001
9: L2482108	30-Jul-20 09:00	11.0	< 0.0001	< 0.001	< 0.0001

RL - SGS Reporting Limit
ND - Not Detected

Kimberley Didsbury
Project Specialist,
Environment, Health & Safety

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L2482108-COFC

COC Number: 17 - 624302

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www.alsglobal.com

[illegible]

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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

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

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JULY 2017 FROM