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Environmental Engineering
Hydrogeology
Materials Testing
Building Science
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patersongroup.ca

August 4, 2023
File: PE4710-LET.04

Minto Communities - Canada
200 – 180 Kent Street
Ottawa, Ontario
K1P 0B6

Attention: **Mr. Kevin Harper**

Subject: **Phase II-Environmental Site Assessment Update**
178, 180, 182 and 200 Isabella Street and 205 Pretoria Avenue
Ottawa, Ontario

Dear Sir,

Further to your request, Paterson Group (Paterson) has completed a Phase II Environmental Site Assessment (ESA) Update for the aforementioned property. This report updates a Phase II ESA entitled “Phase II Environmental Site Assessment, 178, 180, 182 and 200 Isabella Stret, and 205 Pretoria Avenue, Ottawa, Ontario” prepared by Paterson Group Inc. (Paterson), dated October 10, 2019.

This update report is intended to meet the requirements for an updated Phase II ESA, as per the MECP O.Reg. 153/04, as amended. This update report is to be read in conjunction with the 2019 report.

Background Information

The Phase II Poverty is located on the south side of Isabella Street, approximately 50 m east of Bank Street, in the City of Ottawa, Ontario, in an urban area that consists primarily of residential land use with some neighbouring commercial properties. The subject land has an approximate footprint of 2,400m^2 and currently exists as vacant land. The ground surface on the subject site consists of asphaltic concrete with some vegetated areas where the former buildings were situated. Drainage on the Phase II Property consists primarily of surface infiltration throughout the property. The site is relatively at the grade of the surrounding lands with the regional topography sloping downwards in a south-easterly direction.

Past Assessments

In 2016, Paterson conducted a Phase I ESA for the Phase I Property. According to the historical records, the subject land was first developed for residential purposes in the 1890s.

Neighbouring lands were developed primarily for residential purposes around the same time. The findings of the Phase I ESA identified two (2) on-site potentially contaminating activities (PCAs) on the Phase I Property, which included a former tinsmith at 186 Isabella Street, and a former heating fuel service contractor at 182 Isabella Street. These PCAs were considered to represent APECs on the Phase I Property. A subsequent Phase II ESA was completed to address these APECs.

The 2016, Phase II ESA program consisted of drilling three (3) boreholes instrumented with groundwater monitoring wells on the northwest corner, central south side and northeast side of the Phase II Property. The site soils encountered in the field consisted of a layer of fill material, including demolition debris in former building locations, which is underlain by native silty clay.

Soil samples were collected and submitted for BTEX, PHCs (F1-F4), and/or Metals. Based on the analytical results, all of the analyzed parameters complied with the selected MECP Table 3 Residential Standards. Groundwater samples were collected and submitted from BH2 and BH3 for BTEX and PHCs (F1-F4), from BH1 for and PAHs. Based on the analytical results, all of the analyzed parameters complied with the selected MECP Table 3 Standards.

In 2019, Paterson completed a Phase I ESA Update. Based on the findings, the former on-site PCAs were considered to represent APECs as well as fill material of unknown quality that was identified during the 2016 subsurface program, and the use of road salt on the parking lot of the Phase I Property. As a result, Paterson conducted a Phase II ESA to address the aforementioned APECs on the Phase I Property.

The 2019 Phase II ESA consisted of drilling five (5) boreholes across the site, of which two (2) were instrumented with groundwater monitoring wells.

Soil samples were submitted for BTEX, PHCs, PAHs and/or metals as well as EC/SAR and pH. BTEX and PHCs complied with the selected MECP Table 3 Residential Standards. Metals and PAHs were in excess of the selected standards in the fill material.

Groundwater samples were collected on September 12, 2019 from BH1 and submitted on for PHCs (F1-F4) and metals including Hg and CrVI, and from BH2 for PAHs.

All analyzed parameters complied with the selected MECP Table 3 Standards, with the exception of PHC, fraction F2, which was in excess of the selected standards at location BH1. A second groundwater sample from BH1 was collected and submitted on September 24, 2019, for PHCs(F2-F4). All of the groundwater test results were in compliance with the MECP Table 3 standards.

A Phase I ESA Update was completed in August 2023, in general accordance with O.Reg 153/04, as amended. Based on the findings of the Phase I ESA Update, there are no new PCAs that would result in additional APECs on the Phase I Property.

Applicable Site Condition Standard

The site condition standards for the property were obtained from Table 3 of the document entitled “Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act”, prepared by the Ontario Ministry of the Environment, Conservation and Parks (MECP), April 2011. The intended use of the Phase II Property is residential, and therefore, the residential standards have been selected for the purpose of this Phase II ESA. The MECP Table 3 Residential Standards are based on the following considerations:

- ❒ Coarse-grained soil conditions;
- ❒ Full depth generic site conditions;
- ❒ Non-potable groundwater conditions; and
- ❒ Residential land use.

Section 35 of O.Reg. 153/04 does apply to the Phase II Property in that the property, and the properties within the 250 m study area does not rely upon potable groundwater.

Section 41 of O.Reg. 153/04 does not apply to the Phase II Property, as the property is not considered an environmentally sensitive area.

Section 43.1 of O.Reg. 153/04 does not apply to the Phase II Property in that the property, is a not situated where Shallow Soils are present.

Impediments

No impediments were encountered during this Phase II ESA Update.

Investigation Method

A groundwater sampling event took place on July 21, 2023. A groundwater sample was collected from BH1 and submitted for BTEX and PHCs (F1-F4) analysis.

Review and Evaluation

Geology

Site soils consist of a layer of asphalt or topsoil material, followed by fill material, which is underlain by a native silty clay. Bedrock surface depth was not determined during the subsurface drilling program.

The fill material consisted of crushed stone at BH1-19, silty sand with some gravel at BH2-19, BH3-19 and BH5-19. Some concrete and brick fragments were noted in the fill material at BH5-19.

Groundwater was encountered within either the fill or native soil at depths ranging from approximately of 1.95 to 5.04 m, below the existing grade.

Further details regarding the soil profile are provided on the Soil Profile and Test Data Sheets, appended to the original Phase II ESA Report.

Groundwater Elevations, Flow Direction and Hydraulic Gradient

The groundwater levels were measured in BH1, BH2, BH3, BH2-19 and BH3-19 on July 21, 2023 using an electronic water level meter. Groundwater levels are summarized in Table 1. All elevations are relative to the temporary benchmark. It should be noted that groundwater levels are expected to fluctuate throughout the year with seasonal variations.

Table 1
Groundwater Level Measurements

Borehole Location	Ground Surface Elevation (m)	Water Level Depth (m below grade)	Water Level Elevation (m)	Date of Measurement
BH1	100.88	1.95	98.93	July 21, 2023
BH2	101.33	2.00	99.33	July 21, 2023
BH3	101.37	5.04	96.33	July 21, 2023
BH2-19	101.35	4.64	96.71	July 21, 2023
BH3-19	100.86	2.03	98.83	July 21, 2023

Based on the groundwater elevations from the 2019 groundwater monitoring event, groundwater flow beneath the Phase II Property appears to be in a southerly direction. A horizontal hydraulic gradient of approximately 0.07 m/m was calculated.

Groundwater Quality

A groundwater sample was recovered from BH1 on July 21, 2023. The groundwater sample was submitted for laboratory analysis of BTEX and PHCs (F1-F4).

The results of the analytical testing are presented in Table 2. The laboratory certificate of analysis has been appended to this report.

Table 2
Analytical Test Results – Groundwater – BTEX and PHCs (F1-F4)

Parameter	MDL (µg/L)	Groundwater Samples (µg/L)	MECP Table 3 Standards (µg/L)
		July 21, 2023	
		BH1	
Benzene	0.5	nd	44
Toluene	0.5	nd	18000
Ethylbenzene	0.5	nd	2300
Xylenes	0.5	nd	4200
PHC F_1	25	nd	750
PHC F_2	100	nd	150
PHC F_3	100	nd	500
PHC F_4	100	nd	500

Notes:
- MDL - Method Detection Limit
- nd - Not Detected (i.e <MDL)

No BTEX or PHCs concentrations were detected in the groundwater sample alanyzed. The analytical results comply with the MECP Table 3 standards.

Phase II Conceptual Site Model

Potentially Contaminating Activity (PCA) and Area of Potential Environmental Concern (APEC)

As per the Past Investigations Section of this report, the PCAs considered to result in APECs on the Phase II Property as well as the contaminants of potential concern (CPCs) have been summarized in Table 3.

Table 3
Potentially Contaminating Activities and Areas of Potential Environmental Concern

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil, and/or Sediment)
APEC 1 Former tinsmith at rear of #186 Isabella Street (part of #200 Isabella Street)	Central portion of Phase I Property	Item 34, Table 2, O.Reg. 153/04: Metal fabrication	On-site	Metals	Soil and Groundwater
APEC 2 Former coal and oil business and heating contractor	Central and east portion of Phase I Property	No item: Distribution of fuel oil, coal, and fuel oil burners; Contractor business	On-site	PHCs (F_1-F_4), BTEX, PAHs	Groundwater
APEC 3: Importation of fill material across the site	Entire Phase I Property	Item 30, Table 2, O.Reg. 153/04: Importation of fill material of unknown quality	On-site	BTEX, PAHs, metals	Soil and Groundwater
APECs 4 & 5[1]: Use of road salt across the parking lots at 200 Isabella Street and 178 Isabella Street, respectively	Western portion of 200 Isabella St.	No item: application of salt for de-icing purposes.	On-site	Sodium, chloride, sodium absorption ratio, electrical conductivity	Soil and Groundwater

1 – In accordance with Section 49.1 of Ontario Regulation 153/04 standards are deemed to be met if an applicable site condition standard is exceeded at a property solely because the qualified person has determined that a substance has been applied to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both. The exemption outlined in Section 49.1 is being relied upon with respect to the RSC property.

The rationale for identifying the aforementioned PCAs is based on a review of historical information (including but not limited to aerial photographs, municipal and federal records), personal interviews and field observations.

Contaminants of Potential Concern (CPCs)

The following Contaminants of Potential Concern (CPCs) were identified with respect to the Phase II Property:

- ❒ Petroleum Hydrocarbons fractions 1 through 4 (PHCs F_1-F_4);
- ❒ Polycyclic Aromatic Hydrocarbons (PAHs);

- Metals, including arsenic (As), antimony (Sb), and selenium (Se);
- Mercury (Hg), and Hexavalent Chromium (CrVI); and
- Electrical Conductivity (EC) and Sodium Adsorption Ratio (SAR).

Physical Setting

Site Stratigraphy

The site stratigraphy consists of:

- **Pavement Structure** at BH1-19 consisting of 0.1 m of asphaltic concrete over crushed stone, to a depth of approximately 0.6 m below ground surface. Pavement was also present at the surface at BH3-19 but was underlain by a layer of sandy fill material instead of crushed stone.

- **Topsoil** at BH3-19, BH4-19 and BH5-19 consisting of 0.03 to 0.1 m of soil with some brown silty sand.

- **Fill Material** was encountered beneath the pavement structure in BH2-19 and below the topsoil layer in BH3-19 and BH5-19 and ranged in thickness from approximately 0.1-0.6 m; the fill in BH5-19 extended much deeper, to 2.80 m below ground surface. The fill generally consisted of brown silty sand with gravel. Occasional concrete and brick fragments were identified in the fill recovered from BH5-19.

- **Native silty clay** was encountered in all boreholes beneath the fill material, preceded in several boreholes by a layer of silty sand. This is the deepest unit investigated.

Hydrogeological Characteristics

Groundwater at the Phase II Property was generally encountered in the fill ranging at depths of approximately 1.95 to 5.04 mbgs.

Based on the groundwater contouring map from the 2019 subsurface program, groundwater was measured to flow in a southernly direction with a hydraulic gradient of 0.07 m/m.

Approximate Depth to Water Table

Depth to the water table at the Phase II Property varies between approximately 1.95 to 5.04 mbgs and is expected to fluctuate seasonal.

Approximate Depth to Bedrock

Bedrock was not confirmed during the drilling program. All boreholes were completed in native soil. Based on a DCPT performed during the field drilling program in 2019 the approximate depth to bedrock at the subject site is 17.9 mbgs.

Sections 35, 41 and 43.1 of the Regulation

Section 35 of O.Reg. 153/04 does apply to the Phase II Property in that the property, and the properties within the 250 m study area do not rely upon potable groundwater.

Section 41 of O.Reg. 153/04 does not apply to the Phase II Property, as the property is not considered an environmentally sensitive area.

Section 43.1 of the Regulation does not apply to the Phase II Property, as bedrock is not located less than 2 m below ground surface.

Fill Placement

Based on the findings of the subsurface investigation, the fill material consisted of crushed stone in areas of the former pavement structure(s), and demolition debris in areas of the former building footprints. Fill material on the eastern side of the Phase II Property exceeded the MECP Table 3 Residential Standards for lead and some PAH parameters. It is understood that the fill material will be removed in conjunction with the redevelopment of the Phase II Property.

Existing Buildings and Structures

No buildings or structures are present on the Phase II Property.

Proposed Buildings and Other Structures

The proposed redevelopment of the Phase II Property will be used for residential land use. Due to the change in land use to a more sensitive land use (commercial to residential), a record of site condition (RSC) will be required as per O.Reg 154/03.

Subsurface Structures and Utilities

The Phase II Property is located in a municipally serviced area. There are no known potable water wells in the study area. No underground structures are known to be present beneath the Phase II Property, with the exception of the existing groundwater monitoring wells.

Based on the findings of the Phase II ESA and Phase II ESA Update, the presence of any former utilities would not have affected contaminant distribution at the RSC Property.

Water Bodies and Areas of Natural Significance

No areas of natural significance or natural bodies of water are present within the Phase Study Area.

Environmental Condition

Based on the Phase II ESA Update, there are no contaminants present in the groundwater beneath the Phase II Property.

Conclusion

Based on the findings of the Phase II ESA Update, no further investigation is required on the Phase II Property.

Recommendations

It is our understanding that the Phase II Property will be redeveloped for residential purposes. Due to the more sensitive land use change (commercial to residential), a record of site condition (RSC) will be required as per O.Reg 154/03.

Soil

As recommended in the original Phase II ESA, contaminated material identifed in 2019 is considered to be confined to the upper fill layer. It is our understanding that the impacted fill and building demolition debris identified during the field program will be removed as part of the site redevelopment. This fill material should be disposed of at an approved waste disposal facility. The removal of this material should be monitored to ensure that proper segregation occurs, and that the removal of this material is effective in remediating the property.

Any excess soil generated during site redevelopment must be managed in accordance with Ontario Regulation 406/19 – On-site and Excess Soil Management. Any soils deemed excess during construction will require additional analytical testing to determine an appropriate off-site reuse or disposal site.

Monitoring Wells

It is recommended that the current monitoring wells remain viable, and that BH1 is resampled to confirm the latest groundwater quality for the purpose of filing a RSC in the future. The monitoring wells installed on the Phase II Property are not going to be used in the future, they should be abandoned according to Ontario Regulation 903, in they are registered with the MECP under this regulation. Otherwise, these wells do not need to be abandoned if they are completely excavated during site redevelopment.

Statement of Limitations

This Phase II - Environmental Site Assessment Update report has been prepared by a qualified person, in general accordance with Ontario Regulation 153/04, as amended. The conclusions presented herein are based on information gathered from a limited historical review and field inspection program. The findings of the Phase II - ESA Update are based on the review of the previous subsurface program completed on the Phase II Property in conjunction with the most recent analytical test results.

Should any conditions be encountered at the Phase II Property that differ from our findings, we request that we be notified immediately.

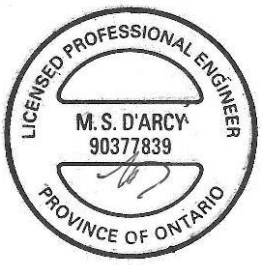
This report was prepared for the sole use of Minto Communities. Permission and notification from Minto Communities and Paterson will be required to release this report to any other party.

We trust that this submission satisfies your current requirements. Should you have any questions please contact the undersigned.

Regards,

Paterson Group Inc.

Mandy Witteman, M.A.Sc., P.Eng.



Mark D'Arcy, P.Eng., QP_{ESA}

Report Distribution:

- ❑ Minto Communities
- ❑ Paterson Group

Appendix

- ❑ Drawing PE4710-3R – Test Hole Location Plan
- ❑ Drawing PE4710-6R – Analytical Testing Plan – Groundwater
- ❑ Laboratory Certificates of Analysis

HIGHWAY 417

ISABELLA STREET

BANK STREET

PRETORIA AVENUE

CONCRETE SIDEWALK

FH - TBM

TRANSFORMER PAD

#210 ISABELLA STREET
RANDALL'S PAINTS

ASPHALTIC CONCRETE PARKING AREA

#200 ISABELLA STREET
VACANT
(FORMER TINSMITH AT REAR OF #186 ISABELLA)

GRASS/WEED COVERED

#182 ISABELLA STREET
VACANT (FORMER COAL AND OIL BUSINESS)

#180 ISABELLA STREET
VACANT
(FORMER COAL AND OIL BUSINESS, HEATING CONTRACTOR)

#178 ISABELLA STREET
VACANT (FORMER COAL AND OIL BUSINESS)

ASPHALTIC CONCRETE

#460 O'CONNOR STREET
COMMERCIAL / OFFICE BUILDING

#575 BANK STREET
CLOCK TOWER BREW PUB

#211 PRETORIA AVENUE RESIDENTIAL

#209 PRETORIA AVENUE RESIDENTIAL

#205 PRETORIA AVENUE RESIDENTIAL

#195-199 PRETORIA AVE. RESIDENTIAL

#191 PRETORIA AVENUE RESIDENTIAL

#187 PRETORIA AVENUE RESIDENTIAL

#183-185 PRETORIA AVENUE RESIDENTIAL

#177 PRETORIA AVENUE RESIDENTIAL

A

A'

B

B'

BH 1
100.88
(98.55)
{98.93}

BH 1-19
101.44

BH 2-19
100.86
(97.36)
{96.71}

BH 2
101.33
(98.82)
{99.33}

BH 3
101.37
(97.67)
{96.40}

BH 4-19
101.48

BH 5-19
101.22

BH 3-19
101.34
(98.83)
{98.83}

APEC 1

APEC 2

APEC 3

APEC 4

APEC 5

ASPHALTIC CONCRETE

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN:

APEC 1	FORMER TINSMITH (1956 FIP)
APEC 2	FORMER TENANTS - GEORGE P. HARRIS LIMITED (COAL AND OIL, DIRECTORIES) AND THOMPSON BROTHERS HEATING CONTRACTOR
APEC 3	FILL MATERIAL OF UNKNOWN QUALITY
APEC 4	POTENTIAL DE-ICING
APEC 5	POTENTIAL DE-ICING

LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION (PATERSON 2016 AND 2019 PHASE II ESAs)
- BOREHOLE LOCATION (PATERSON 2016 AND 2019)
- 100.88 GROUND SURFACE ELEVATION (m)
- (98.36) GROUNDWATER SURFACE ELEVATION (m) (SEPT.24, 2019)
- {98.71} GROUNDWATER SURFACE ELEVATION (m) (JULY.21, 2023)

TBM - TOP SPINDLE OF FIRE HYDRANT LOCATED IN FRONT OF 210 ISABELLA STREET. AN ARBITRARY ELEVATION OF 100.00m WAS ASSIGNED TO THE TBM.

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
0			

MINTO COMMUNITIES INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT UPDATE
178-200 ISABELLA STREET
OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:400	Date: 9/2019
Drawn by: AG	Report No.: PE4710-LET.04
Checked by: MB	Dwg. No.: PE4710-3R
Approved by: MSD	Revision No.: 0

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HIGHWAY 417

ISABELLA STREET

CONCRETE SIDEWALK

BH1 (4.62-7.62) 21-JUL-2023
BTEX complies with MECP Table 3 Standards
PHCs F1-F4 comply with MECP Table 3 Standards

BH1-GW2 (4.62-7.62 m bgs) 24-SEP-2019
PHCs F2-F4 comply with MECP Table 3 Standards

BH 1 - GW1 (4.62-7.62) 14-OCT-2016
PAHs comply with MECP Table 3 Standards

BH1-GW1 (4.62-7.62 m bgs) 12-SEPT-2019

Parameter	Result (ug/L)	Standard (ug/L)
PHC (F2)	2400	150

Remaining PHC and BTEX parameters are in compliance with the MECP Table 3 Standards

BH2-19-GW1 (1.52-4.57 m bgs) 14-OCT-2016
Sodium and chloride comply with MECP Table 3 Standards

BH 1
100.88
(98.55)
{98.93}

BH 5-19
101.22

BH 1-19
101.44

BH 3
101.37
(97.67)
{96.40}

BH 2-19
100.86
(97.36)
{96.71}

BH 2
101.33
(98.82)
{99.33}

BH 4-19
101.48

BH 3-19
101.34
(98.83)
{98.83}

BH 2 - GW1 (3.09-6.09) (2016)
PHC (F1-F4) & BTEX comply with MECP Table 3 Standards

BH3-19-GW1 (1.52-4.57 m bgs) 14-OCT-2016
PHCs F2-F4 and BTEX parameters comply with MECP Table 3 Standards

BH 3 - GW1 (4.62-7.62) (2016)
PHC (F1-F4) & BTEX comply with MECP Table 3 Standards

#200 ISABELLA STREET
VACANT

#182 ISABELLA STREET
VACANT

#180 ISABELLA STREET
VACANT

#178 ISABELLA STREET
VACANT

ASPHALTIC CONCRETE

ASPHALTIC CONCRETE
PARKING AREA

ASPHALTIC CONCRETE
AND GRAVEL

#460 O'CONNOR STREET
COMMERCIAL /
OFFICE BUILDING

#210 ISABELLA STREET
RANDALL'S PAINTS

#575 BANK STREET
CLOCK TOWER
BREW PUB

#211 PRETORIA AVE.
RESIDENTIAL

#209 PRETORIA AVE.
RESIDENTIAL

#205 PRETORIA AVE.
RESIDENTIAL

#195-199 PRETORIA AVE.
RESIDENTIAL

#191 PRETORIA AVENUE
RESIDENTIAL

#187 PRETORIA AVENUE
RESIDENTIAL

#183-185 PRETORIA AVENUE
RESIDENTIAL

#460 O'CONNOR STREET
COMMERCIAL /
OFFICE BUILDING

LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION
- BOREHOLE LOCATION
- 100.88 GROUND SURFACE ELEVATION (m)
- (98.36) GROUNDWATER SURFACE ELEVATION (M) (SEPT.24, 2019)
- {98.71} GROUNDWATER SURFACE ELEVATION (M) (JULY.21, 2023)

TBM - TEMPORAY BENCHMARK - TOP OF FIRE HYDRANT SPINDLE. ASSIGNED AN ASSUMED ELEVATION OF 100.00 m ABOVE SEA LEVEL (ASL)

GROUNDWATER PARAMETERS ARE IN COMPLIANCE WITH MECP TABLE 3 STANDARDS

GROUNDWATER PARAMETERS EXCEED MECP TABLE 3 STANDARDS

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
0			

MINTO COMMUNITIES INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT UPDATE
178-200 ISABELLA STREET

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN - GROUNDWATER

Scale: 1:400	Date: 09/2019
Drawn by: MPG	Report No.: PE4710-LET.04
Checked by: MB	Dwg. No.: PE4710-6R
Approved by: MSD	Revision No.: 0

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Certificate of Analysis

Paterson Group Consulting Engineers
9 Auriga Drive
Ottawa, ON K2E 7T9
Attn: Mandy Witteman

Client PO: 57973
Project: PE4710
Custody: 141935

Report Date: 2-Aug-2023
Order Date: 25-Jul-2023

Revised Report

Order #: 2330171

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2330171-01	BH1

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	28-Jul-23	28-Jul-23
PHC F1	CWS Tier 1 - P&T GC-FID	27-Jul-23	28-Jul-23
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	27-Jul-23	28-Jul-23

	Client ID:	BH1	-	-	-		
	Sample Date:	21-Jul-23 09:00	-	-	-	-	-
	Sample ID:	2330171-01	-	-	-		
	Matrix:	Ground Water	-	-	-		
	MDL/Units						
Volatiles							
Benzene	0.5 ug/L	<0.5	-	-	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-	-	-
Xylenes, total	0.5 ug/L	<0.5	-	-	-	-	-
Toluene-d8	Surrogate	127%	-	-	-	-	-
Hydrocarbons							
F1 PHCs (C6-C10)	25 ug/L	<25	-	-	-	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	-	-	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	-	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	-	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons								
F1 PHCs (C6-C10)	ND	25	ug/L					
F2 PHCs (C10-C16)	ND	100	ug/L					
F3 PHCs (C16-C34)	ND	100	ug/L					
F4 PHCs (C34-C50)	ND	100	ug/L					
Volatiles								
Benzene	ND	0.5	ug/L					
Ethylbenzene	ND	0.5	ug/L					
Toluene	ND	0.5	ug/L					
m,p-Xylenes	ND	0.5	ug/L					
o-Xylene	ND	0.5	ug/L					
Xylenes, total	ND	0.5	ug/L					
Surrogate: Toluene-d8	*105*		*%*	*131*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: Toluene-d8	*104*		*%*		*131*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1920	25	ug/L	ND	95.9	85-115			
F2 PHCs (C10-C16)	1640	100	ug/L	ND	103	60-140			
F3 PHCs (C16-C34)	3760	100	ug/L	ND	96.0	60-140			
F4 PHCs (C34-C50)	2710	100	ug/L	ND	109	60-140			
Volatiles									
Benzene	35.8	0.5	ug/L	ND	89.6	60-130			
Ethylbenzene	40.8	0.5	ug/L	ND	102	60-130			
Toluene	42.8	0.5	ug/L	ND	107	60-130			
m,p-Xylenes	81.0	0.5	ug/L	ND	101	60-130			
o-Xylene	40.8	0.5	ug/L	ND	102	60-130			
Surrogate: Toluene-d8	*77.3*		*%*		*96.6*	*50-140*			

Qualifier Notes:

Sample Data Revisions:

None

Work Order Revisions / Comments:

Revision 1-Revised report includes additional BTEX data.

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.

- F1 range corrected for BTEX.

- F2 to F3 ranges corrected for appropriate PAHs where available.

- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.

- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.

- When reported, data for F4G has been processed using a silica gel cleanup.

PARACEL LABORATORIES LTD.

Paracel ID: 2330171

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2330171	№ 141935

Client Name: Paterson	Project Ref: PE4710	Page __ of __
Contact Name: Mandy Witteman	Quote #:	Turnaround Time
Address: 9 Auriga	PO #: 57973	☐ 1 day ☐ 3 day ☐ 2 day ☒ Regular
Telephone: 613 226 7381	E-mail: MWitteman@Patersongroup.ca GPaterson@Patersongroup.ca	Date Required:

☒ REG 153/04 ☐ REG 406/19

Other Regulation: ☐ Table 1 ☐ Res/Park ☐ Med/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☐ Table ___ For RSC: ☐ Yes ☐ No; ☐ REG 558 ☐ PWQO ☐ CCME ☐ MISA ☐ SU - Sani ☐ SU - Storm Mun: ☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis: PHCs F1-F4 | VOCs | PAHs | Metals by ICP | Hg | CrVI | B (HWS)

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	PHCs F1-F4	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)
1	BH1	GW		3	July 21		X						
2													
3													
4													
5													
6													
7													
8													
9													
10													

Comments:

Method of Delivery: Paracel Courier

Relinquished By (Sign): GPat	Received By Driver/Depot:	Received at Lab:	Verified By: SD
Relinquished By (Print): Grant Paterson	Date/Time:	Date/Time: July 25/23 [illegible]	Date/Time: July 25, 2023 4:04p
Date/Time: July 24 2023	Temperature: °C	Temperature: 11.6 °C	pH Verified: ☐ By: