patersongroup

Consulting Engineers

154 Colonnade Road South
Ottawa, Ontario
Canada, K2E 7J5

Tel: (613) 226-7381
Fax: (613) 226-6344

Geotechnical Engineering
Environmental Engineering
Hydrogeology
Geological Engineering
Materials Testing
Building Science

www.patersongroup.ca

January 10, 2022
File: PE5434-LET.03

Cornerstone Housing for Women
314 Booth Street
Ottawa, Ontario
K1R 7K2

Attention: **Ms. Sarah Davis**

Subject: **Phase II - Environmental Site Assessment Update**
44 Eccles Street
Ottawa, Ontario

Dear Ms. Davis,

Further to your request, Paterson Group (Paterson) carried out a Phase II - Environmental Site Assessment (ESA) Update for the aforementioned property. This report updates a previous Phase II-ESA report entitled, “Phase II Environmental Site Assessment, 44 Eccles Street, Ottawa, Ontario,” prepared by CM3 Environmental Inc, dated December 2017.

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 report is to be read in conjunction with the 2017 report.

Background Information

Physical Setting

The Phase II property is a rectangular shaped parcel located south of Eccles Street, approximately 30 metres east of Booth Street, in the City of Ottawa, Ontario. Adjacent properties to the west, east, and south include residential dwellings, with commercial buildings (automotive repair garage adjacent south, office, and restaurant buildings adjacent east) present. The Phase I property features a three-storey brick clad office building on the north portion of the site, along Eccles Street, with the associated asphaltic parking area in the southern portion of the site.

Areas of Natural Significance

No areas of natural significance are present on the Phase II property or in the Phase I study area.

Water Bodies

No water bodies are present on the Phase II property or in the Phase I study area.

Past Investigations

- ‘Phase I Environmental Site Assessment, 44 Eccles Street, Ottawa, Ontario,’ prepared by Paterson, dated November 17, 2005;
- ‘Phase II Environmental Site Assessment, 44 Eccles Street, Ottawa, Ontario,’ prepared by Paterson, dated February 28, 2006;
- ‘Environmental Remediation Program, 44 Eccles Street, Ottawa, Ontario,’ prepared by Paterson, dated April 27, 2006;

Paterson conducted environmental work on the Phase I property in 2005 and 2006, culminating in an environmental remediation program. Following the Phase I ESA investigation, a Phase II ESA was conducted to identify potential soil and groundwater impacts from former heating methods, specifically furnace oil. The Phase II ESA involved placing ten (10) boreholes on the Phase I property, of which one (1) was completed as a groundwater monitoring well. Based on the results of the Phase II - ESA, it was considered likely that a furnace oil UST had been used on site resulting in the observed contamination of the subsurface environment, and a remediation program was recommended and subsequently conducted. The remediation project consisted of the excavation and off-site disposal of 820 metric tonnes of petroleum hydrocarbon impacted soil from the subject property surrounding the identified tank nest location, located south of the building. A total of 18,000 litres of impacted groundwater were also removed during the remediation program. It should be noted that at the time of this environmental work, the MOE 2004 site standards were used, and as such, soil and/or groundwater may be in excess of current MECP standards.

- “Phase I Environmental Site Assessment, 44 Eccles Street, Ottawa, Ontario,” prepared by CM3 Environmental Inc, dated September 27, 2016;

Based on the report, several Areas of Potential Environmental Concern were identified on the Phase I property including a former UST on-site and remediation to previous MECP

Standards, nearby auto body facilities and garages, dry-cleaning facilities and laundries, a former retail fuel outlet, and a former glazier/leaded glass.

Based on the presence of APECs, a Phase II ESA was recommended for the site.

- ❑ '*Phase II Environmental Site Assessment, 44 Eccles Street, Ottawa, Ontario,*' prepared by CM3 Environmental, dated December 2017;

The 2017 Phase II ESA involved drilling 12 boreholes across the Phase I property, 10 of which were instrumented with groundwater monitoring wells, to assess soil and groundwater quality. The subsurface profile consists of asphalt or topsoil over silty sand and gravel fill, extending to shallow limestone bedrock, encountered between 1.22 m to 2.44 m below ground surface.

A total of 39 soil samples were obtained by means of split-spoon sampling, of which 12 were submitted for analysis of BTEX, PHCs, VOCs, metals, and/or PAHs. Six (6) samples were found to exceed the MECP Table 7 Commercial standards for PHCs fraction F2 and/or F3 (MW1-SA4, MW3-SA1, MW8-SA3, MW11-SA3, MW12-SA4, MW10-SA3) while two (2) samples exceeded the MECP Table 7 standards for metals concentrations (MW12-SA3, MW1-SA4; lead and thallium respectively). The remaining 4 soil samples analyzed did not identify any concentrations in excess of the MECP Table 7 standards.

Groundwater samples were obtained from the 10 onsite monitoring wells, and analyzed for BTEX, PHCs, VOCs, metals, and/or PAHs. Three (3) groundwater samples were found to be in excess of MECP Table 7 Standards, for PHCs (MW3), PAHs (MW6), and both PHCs and PAHs (MW9). The remaining samples analyzed did not identify any concentrations in excess of MECP Table 7 standards.

Based on the results of the CM3 Phase II ESA, contaminants of concern identified on the Phase I property include PHCs and metals in the soil, and PHCs and PAHs in the groundwater.

A Phase I ESA Update has been conducted for the subject property to satisfy the requirements of the O.Reg 153/04, Section 28(2) as amended.

- ❒ *"Phase I Environmental Site Assessment Update, 44 Eccles Street, Ottawa, Ontario,"* prepared by Paterson Group Inc., dated December 8, 2021.

Based on the historical review, records update and site visit, several potentially contaminating activities (PCAs) were identified on the Phase I property and within the Phase I study area considered to represent Areas of Potential Environmental Concern

(APECs) on the subject site. The following APECs are considered to exist on the Phase I ESA property:

- ❑ APEC 1 – Former UST;
- ❑ APEC 2 – Former Auto Body Shop;
- ❑ APEC 3 – Existing Automotive Garage;
- ❑ APEC 4 –Automotive Service Garage and Dry Cleaners;
- ❑ APEC 5 – Former Gasoline Service Stations and Dry Cleaners;
- ❑ APEC 6 – Existing Transformer;
- ❑ APEC 7 – Former Glazier and Glass Works;
- ❑ APEC 8 – Fill Material of Unknown Quality.

No other PCAs were considered to represent APECs on the Phase I ESA Property were identified during the Phase I ESA Update.

Investigation Method

As part of the Phase II ESA Update, Paterson advanced 4 boreholes on the Phase II property, 3 of which were instrumented with groundwater monitoring wells. The boreholes / monitoring wells were completed by Downing Drilling under the full-time supervision of Paterson personnel on October 21, 2021 (BH1-21 to BH3-21) and on November 11, 2021 (BH4-21).

All soil samples collected underwent a preliminary screening procedure, which included visual screening for colour and evidence of deleterious fill, as well as screening with a photo ionization detector (PID). The detection limit is 0.1 ppm, with a precision of +/- 2 ppm or 10% of the reading. Fill material consisted of silty sand, traces of gravel, crushed stone, brick, and cobble. No new environmental concerns were identified during the field screening program.

Paterson completed 4 groundwater sampling events including existing and newly installed groundwater monitoring wells in order to update the groundwater quality at the Phase II ESA Property.

Phase II Conceptual Site Model

Potentially Contaminating Activities and Areas of Potential Environmental Concern

Based on the results of the Phase I ESA and the Phase I ESA Update completed for the Phase II ESA property, the following APECs were identified on the Phase II ESA property. The APECs are summarized in Table 1.

Table 1. Areas of Potential Environmental Concern

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern with respect to Phase I Property	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 UST	Central portion of the Phase I property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-Site	PHCs (F_1-F_4) BTEX	Soil and Groundwater
APEC 2 Former Auto Body Shop	Southwest corner of the Phase I property	Item 10 – Commercial Autobody Shops	40 metres South of the Phase I Property	PHCs (F_1-F_4) BTEX	Soil and Groundwater
APEC 3 Existing Automotive Service Garage	Southern portion of the Phase I property	Item 52 – Storage, Maintenance, fuelling and repair of equipment vehicles, and material used to maintain transportation systems	Adjacent Southeast of the Phase I Property	PHCs (F_1-F_4) BTEX	Soil and Groundwater
APEC 4 Automotive Service Garage and Dry Cleaners	Northern portion of the Phase I Property	Item 52 – Storage, Maintenance, fuelling and repair of equipment vehicles, and material used to maintain transportation systems Item 37 - Operation of Dry Cleaning Equipment (where chemicals are used)	North of the Phase I Property (Various Places)	PHCs (F_1-F_4) BTEX VOCs	Groundwater
APEC 5 Former Gasoline Service Stations and Dry Cleaners	Northeastern portion of the Phase I Property	Item 28 – Gasoline and Associated Products Storage in Fixed Tanks Item 37 - Operation of Dry Cleaning Equipment (where chemicals are used)	Northeast of the Phase I Property (Various Places)	PHCs (F_1-F_4) BTEX VOCs	Groundwater
APEC 6 Existing Transformer	Southeast corner of the Phase I property	Item 55: Transformer Manufacturing, Processing and Use	On-Site	PCBs	Soil
APEC 7 Former Glazier and Glass Works	Northeastern portion of Phase I Property	Item 29 - Glass Manufacturing	Adjacent East of the Phase I Property	Metals	Groundwater

Table 1. Areas of Potential Environmental Concern

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern with respect to Phase I Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil, and/or Sediment)
APEC 8 Fill Material of Unknown Quality	Throughout the Phase I property	Item 30 – Importation of Fill Material of Unknown Quality	On-Site	PHCs (F_1-F_4) BTEX PAHs Metals	Soil

Contaminants of Potential Concern

The contaminants of potential concern (CPCs) identified in the Phase II ESA property include Benzene, Toluene, Ethylbenzene and Xylenes (BTEX), Petroleum Hydrocarbons (PHCs, F1-F4), VOCs, PAHs, PCBs, and Metals in the soil and/or groundwater.

Subsurface Structures and Utilities

Underground utilities on the Phase II property include a private hydro wire extending along the east property line from the on-site southern pad mounted transformer and connecting to the southern building face. Private gate wires are present in the northeast and northwest property corners, as well as water and sewer utilities extending from the north building face towards Eccles Street.

Physical Setting

Site Stratigraphy

The site stratigraphy, from ground surface to the deepest aquifer or aquitard investigated, is illustrated on the attached cross-section. The stratigraphy of the Phase II ESA property generally consists of:

- Asphaltic concrete, ranging in thickness from 0.05 to 0.10 m, with a concrete slab approximately 0.25 m in thickness in the building footprint area.
- Fill, consisting of brown silty sand with some to trace clay, gravel, brick, and cobbles, varying in thickness from 0.5 to 2.4 m. The fill material is not expected to be a significant water bearing unit at the Phase II ESA property. Groundwater was not observed in this stratigraphic unit.

- Intermittent layer of native glacial till, consisting of brown silty sand with gravel, cobbles, and boulders, varying in thickness from 0.2 to 0.4 m.
- Grey limestone bedrock, encountered at depths ranging from 0.5 to 2.4 m below the existing grade. The upper bedrock is fractured, becoming more competent with depth. Groundwater was encountered in this unit and is considered to be an aquifer.

Hydrogeological Setting

The Geological Survey of Canada (GSC) website on the Urban Geology of the National Capital Area was consulted as part of this assessment. Based on this information, the Phase II property is located in an area of interbedded limestone and shale of the Verulam formation, with an overburden consisting of glacial till and an approximate drift thickness of 0 to 3 m. The geological description of the site on the GSC web site was generally consistent with the results of the previous subsurface investigations, with overburden encountered to be between 0.5 m and 2.4 m thick.

Based on the 2017 Phase II ESA, groundwater beneath the Phase II property was inferred to flow in a southwesterly direction.

Approximate Depth to Bedrock

Bedrock was encountered approximately 1.2 to 2.4 m below the existing ground surface (0.5 m below the top of the building slab).

Approximate Depth to Water Table

Depth to the water table at the Phase II property varied from approximately 1.0 to 2.0 m below the existing ground surface based on recent groundwater monitoring events.

Sections 41 and 43.1 of the Regulation

Section 41 of the Regulation (Site Condition Standards, Environmentally Sensitive Areas) does not apply to the Phase II ESA property. A search for areas of natural significance and features was completed on the Ontario Ministry of Natural Resources (MNR) website as part of the Phase I ESA within the Phase I ESA Study Area (250m Radius from site boundary) and did not reveal any areas of natural significance or environmentally sensitive areas within the Phase I ESA Study Area.

Section 43.1 of the Regulation does apply to the Phase II ESA property in that the subject site is a shallow soil property.

Fill Placement

Fill material is present on-site as the uppermost layer of overburden soil, comprising the majority of on-site soil. Visual screening and analytical testing indicate that the fill material is contaminated with PHCs (F2-F3) and metals (lead and thallium) exceeding MECP Table 7 Standards.

Existing Structures and Utilities

The Phase II ESA property is currently occupied by a three-storey brick clad commercial office building.

Underground utilities on the Phase II property include a private hydro wire extending along the east property line from the southern pad mounted transformer and connecting to the southern building face. Private gate wires are present in the northeast and northwest property corners, as well as water and sewer utilities extending from the north building face towards Eccles Street. A natural gas pipeline extends from Eccles Street along the western property line and connects near the centre of the southern building face.

The utility trenches are not expected to affect contaminant distribution and transport, based their shallow depth and the nature of the contaminants.

Proposed Buildings and Other Structures

The proposed development plans for the property include a retrofit of the interior of the existing building, including the addition of elevators for access.

Environmental Condition

Areas Where Contaminants are Present

Based on the analytical test results, fill material exceeding the selected MECP Table 7 Residential Standards for metals (lead and thallium) and PHCs is present beneath the rear parking area of the Phase II property.

Analytical results for groundwater exceeded the MECP Table 7 Standards for BTEX and PHCs adjacent to the wall of the building. All other groundwater sampling locations are considered to be in compliance with the MECP Table 7 Standards.

Types of Contaminants

Based on the analytical test results, the contaminants of concern on the Phase II ESA property include Benzene, Toluene, Ethylbenzene and Xylenes (BTEX), Petroleum Hydrocarbons (PHCs, F1-F4), and/or Metals in the soil and/or groundwater.

Contaminated Media

Based on the results of the Phase II ESA, soil on the Phase II property is contaminated with lead, thallium, and PHCs (F2-F3), and groundwater is contaminated with PHCs (F2-F3) and benzene.

What Is Known About Areas where Contaminants are Present

The impacted soil is considered to be related to the importation of fill material prior to the construction of the rear parking lot. The source of the impacted groundwater is not known at this time.

Distribution of Contaminants

The impacted soil is considered to be present throughout the rear parking area of the site, while the impacted groundwater is confined to the southeastern building corner.

Discharge of Contaminants

The impacted fill material is considered to be associated with the placement of poor-quality fill material, and not a specific discharge event. The conditions leading to the impacted groundwater on the Phase II ESA property is not known at this time.

Distribution and Migration of Contaminants

Based on the findings of the Phase II ESA, the distribution of BTEX and PHC contaminants in groundwater appear to be adjacent to the southeast building corner. Based on the analytical test results from the adjacent monitoring wells, it appears that the migration of impacted water is limited. The groundwater within the rear parking area is in compliance with the applicable standards. The impacts associated with the poor quality fill material are not considered to have migrated.

Climatic and Meteorological Conditions

In general, climatic and meteorological conditions have the potential to affect contaminant distribution. Two ways by which climatic and meteorological conditions may affect

contaminant distribution include the downward leaching of contaminants by means of the infiltration of precipitation, and the migration of contaminants via groundwater levels and/or flow, which may fluctuate seasonally. Based on the results of the subsurface investigation, BTEX and PHC contaminant distribution is likely to have occurred at the Phase II property.

Potential for Vapour Intrusion

Based on the nature of the contaminated material, and the footings of the building likely extending to the bedrock surface, the potential for vapour intrusion is considered to be low.

Recommendations

Based on the soil and groundwater test results, impacted soil and groundwater is present on the Phase II Property. Further soil and groundwater sampling should be conducted as part of the redevelopment of the site. Additional site specific recommendations can be discussed as part of the redevelopment plans for the property.

Statement of Limitations

This Phase II - Environmental Site Assessment Update report has been prepared under the supervision of a Qualified Person, in general accordance with Ontario Regulation 153/04, as amended, under the Environmental Protection Act.

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 a review of readily available geological, historical and regulatory information and a cursory review made at the time of the field assessment.

Should any conditions be encountered at the subject site and/or historical information that differ from our findings, we request that we be notified immediately in order to allow for a reassessment.

This report was prepared for the sole use of Cornerstone Housing for Women. Permission and notification from the above noted party and this firm 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.

Paterson Group Inc.

Jesse Andrechek, BASc

Michael Beaudoin, P. Eng., QP_{ESA}

Report Distribution

- Cornerstone Housing for Women
- Paterson Group

Appendix

- Key Plan
- Drawing PE5434-3 – Test Hole Location Plan
- Drawing PE5434-4 – Analytical Testing Plan – Soil
- Drawing PE5434-4A – Cross-section A-A' – Soil
- Drawing PE5434-5 – Analytical Testing Plan - Groundwater
- Drawing PE5434-5A – Cross-section A-A' – Groundwater
- Soil Profile and Test Data Sheets
- Laboratory Certificates of Analysis

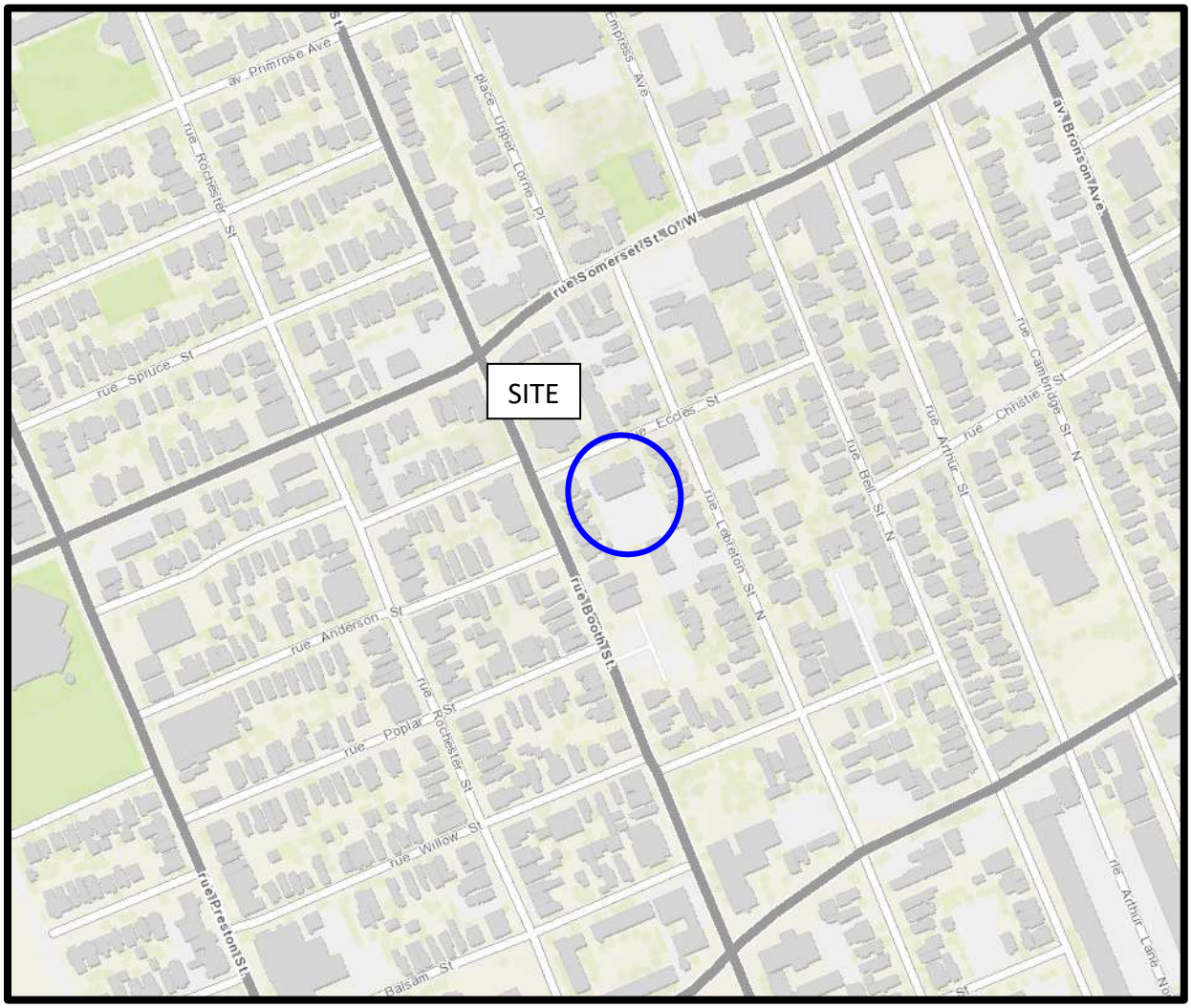
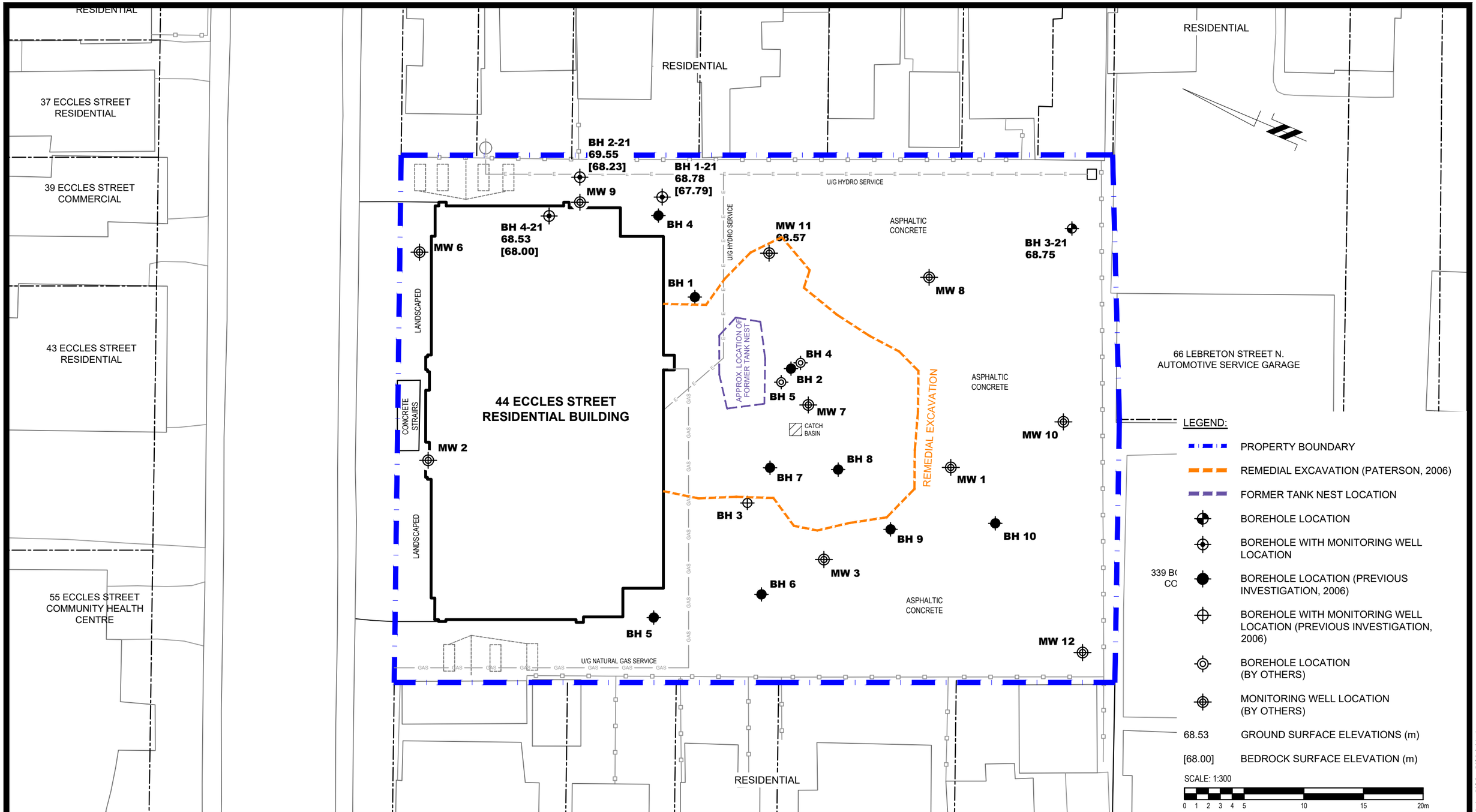


Figure 1:

KEY PLAN



patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL
0			

CORNERSTONE HOUSING FOR WOMEN

PHASE II - ENVIRONMENTAL SITE ASSESSMENT UPDATE
44 ECCLES STREET

OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:300	Date: 10/2021
Drawn by: RCG	Report No.: PE5434-1
Checked by: JA	Dwg. No.: PE5434-3
Approved by: MB	Revision No.:

p:\autocad drawings\environmental\pe54xx\pe5434\pe5434-4 thlp.dwg

RESIDENTIAL

37 ECCLES STREET
RESIDENTIAL

39 ECCLES STREET
COMMERCIAL

43 ECCLES STREET
RESIDENTIAL

RESIDENTIAL

RESIDENTIAL

MW9 SA1 0.0-0.61 m 4-OCT-2017
Metals comply with MECP Table 7 standards

MW9 SA2 0.61-1.22 m 4-OCT-2017
VOCs comply with MECP Table 7 standards

MW9 SA2 0.61-1.22 m 4-OCT-2017
PAHs comply with MECP Table 7 standards

MW9 SA2 0.61-1.22 m 4-OCT-2017
PHCs(F1-F4) comply with MECP Table 7 standards
BTEX complies with MECP Table 7 standards

MW11 SA3 1.22-1.83 m 4-OCT-2017

Parameter	Result (µg/g)	Standard (µg/g)
PHC (F2)	135	98
PHC (F3)	308	300

Remaining PHCs(F1-F4) comply with MECP Table 7 standards
BTEX complies with MECP Table 7 standards

BH 2-21
69.55
[68.23]

BH 1-21
68.78
[67.79]

MW 9

BH 4

U/G HYDRO SERVICE

A

A'

BH 4-21
68.53
[68.00]

MW 11
68.57

ASPHALTIC CONCRETE

BH 3-21
68.75

MW 8

MW8 SA3 0.0-0.61 m 3-OCT-2017

Parameter	Result (µg/g)	Standard (µg/g)
PHC (F3)	359	300

Remaining PHCs(F1-F4) comply with MECP Table 7 standards
BTEX complies with MECP Table 7 standards

MW 6

BH 1

LANDSCAPED

MW7 SA3 1.22-1.83 m 3-OCT-2017
PHCs(F1-F4) comply with MECP Table 7 standards
BTEX complies with MECP Table 7 standards

APPROX. LOCATION OF FORMER TANK NEST

BH 4

BH 2

BH 5

MW 7

CONCRETE STRAIRS

CATCH BASIN

66 LEBRETON STREET N.
AUTOMOTIVE SERVICE GARAGE

MW10 SA1 0.0-0.61 m 4-OCT-2017
Metals comply with MECP Table 7 standards

MW10 SA3 1.22-1.83 m 4-OCT-2017
VOCs comply with MECP Table 7 standards

MW10 SA3 1.22-1.83 m 4-OCT-2017

Parameter	Result (µg/g)	Standard (µg/g)
PHC (F3)	366	300

Remaining PHCs(F1-F4) comply with MECP Table 7 standards
BTEX complies with MECP Table 7 standards

MW 2

44 ECCLES STREET
RESIDENTIAL BUILDING

BH 8

BH 7

REMEDIAL EXCAVATION

MW 1

BH 3

BH 9

BH 10

MW 10

MW 3

BH 6

ASPHALTIC CONCRETE

MW1 SA1 0.0-0.61 m 2-OCT-2017

Parameter	Result (µg/g)	Standard (µg/g)
Thallium	1.6	1.0

Remaining Metals comply with MECP Table 7 standards

MW1 SA4 1.83-2.13 m 2-OCT-2017

Parameter	Result (µg/g)	Standard (µg/g)
PHC (F2)	636	98
PHC (F3)	830	300

Remaining PHCs(F1-F4) comply with MECP Table 7 standards
BTEX complies with MECP Table 7 standards

COMMERCIAL

BH 5

MW12 SA3 1.22-1.83 m 4-OCT-2017

Parameter	Result (µg/g)	Standard (µg/g)
Lead	521	120

Remaining Metals comply with MECP Table 7 standards

MW 12

MW12 SA4 1.83-2.44 m 4-OCT-2017

Parameter	Result (µg/g)	Standard (µg/g)
PHC (F3)	369	300

Remaining PHCs(F1-F4) comply with MECP Table 7 standards
BTEX complies with MECP Table 7 standards

MW12 SA4 1.83-2.44 m 4-OCT-2017
VOCs comply with MECP Table 7 standards

U/G NATURAL GAS SERVICE

MW3 SA1 0.0-0.61 m 2-OCT-2017

Parameter	Result (µg/g)	Standard (µg/g)
PHC (F2)	421	98
PHC (F3)	1170	300

Remaining PHCs(F1-F4) comply with MECP Table 7 standards
BTEX complies with MECP Table 7 standards

RESIDENTIAL

SCALE: 1:300

0 1 2 3 4 5 10 15 20m

LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION, CURRENT INVESTIGATION
- BOREHOLE LOCATION, CURRENT INVESTIGATION
- BOREHOLE LOCATION BY CM3 (2016)
- BOREHOLE WITH MONITORING WELL LOCATION BY CM3 (2016)
- BOREHOLE LOCATION, PATERSON GROUP REPORT PE0614, 2006
- BOREHOLE WITH MONITORING WELL LOCATION, PATERSON GROUP REPORT PE0614, 2006
- 68.78 GROUND SURFACE ELEVATION (m)
- [67.79] BEDROCK SURFACE ELEVATION (m)
- (____) GROUNDWATER SURFACE ELEVATION (m)
- PHASE I, PHASE II PROPERTY

SOIL RESULT IN COMPLIANCE WITH MECP TABLE 7 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 7 STANDARDS

patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL
0			

CORNERSTONE HOUSING FOR WOMEN

PHASE II - ENVIRONMENTAL SITE ASSESSMENT UPDATE
44 ECCLES STREET

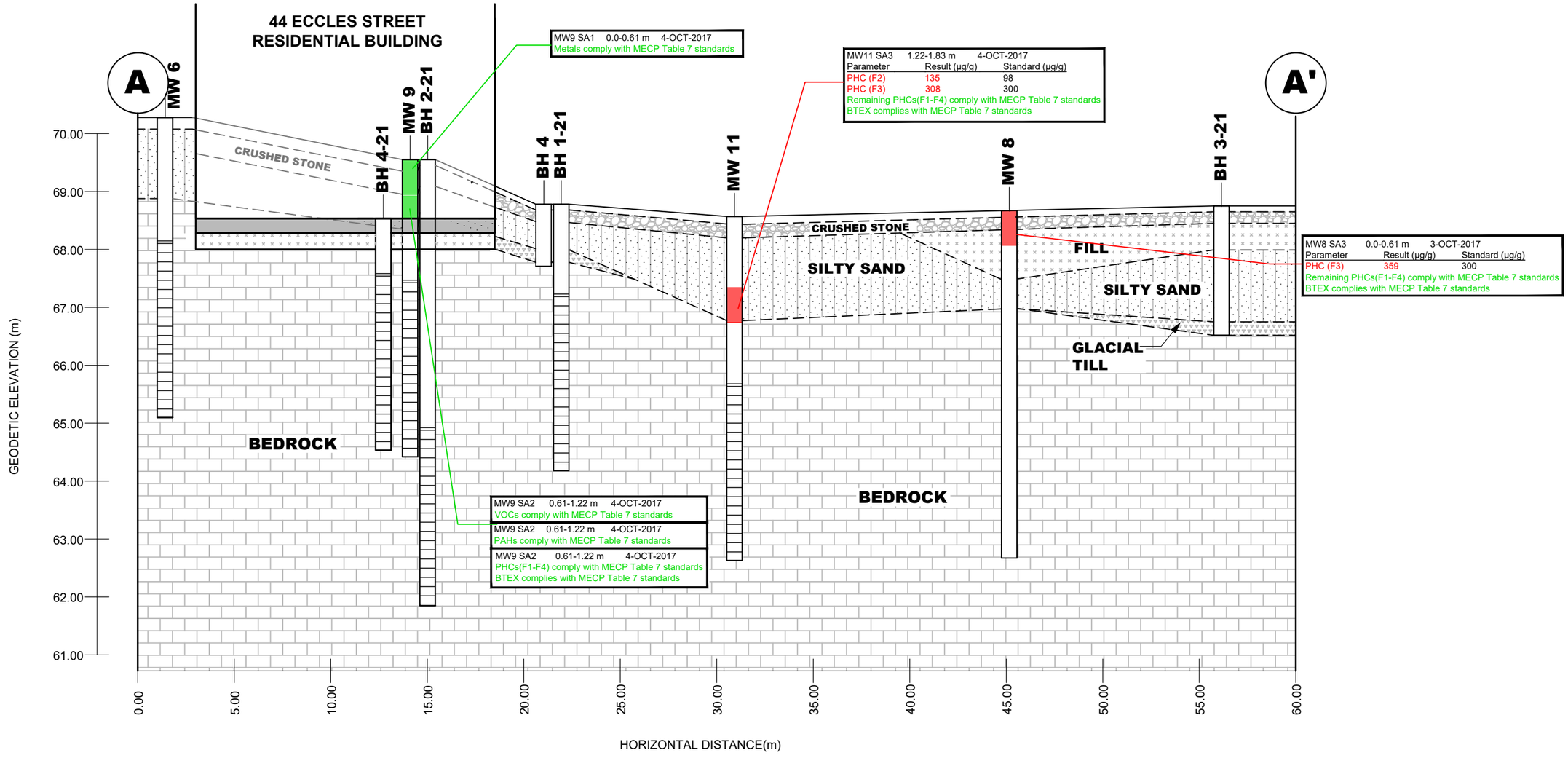
OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN - SOIL

Scale: 1:300	Date: 12/2021
Drawn by: RCG	Report No.: PE5434-1
Checked by: JA	Dwg. No.: PE5434-4
Approved by: MB	Revision No.:

p:\autocad drawings\environmental\pe54xx\pe5434\pe5434-4 thlp.dwg



LEGEND:

SOIL RESULT IN COMPLIANCE WITH MECP TABLE 7 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 7 STANDARDS

patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL
0			

CORNERSTONE HOUSING FOR WOMEN

PHASE II - ENVIRONMENTAL SITE ASSESSMENT UPDATE
44 ECCLES STREET

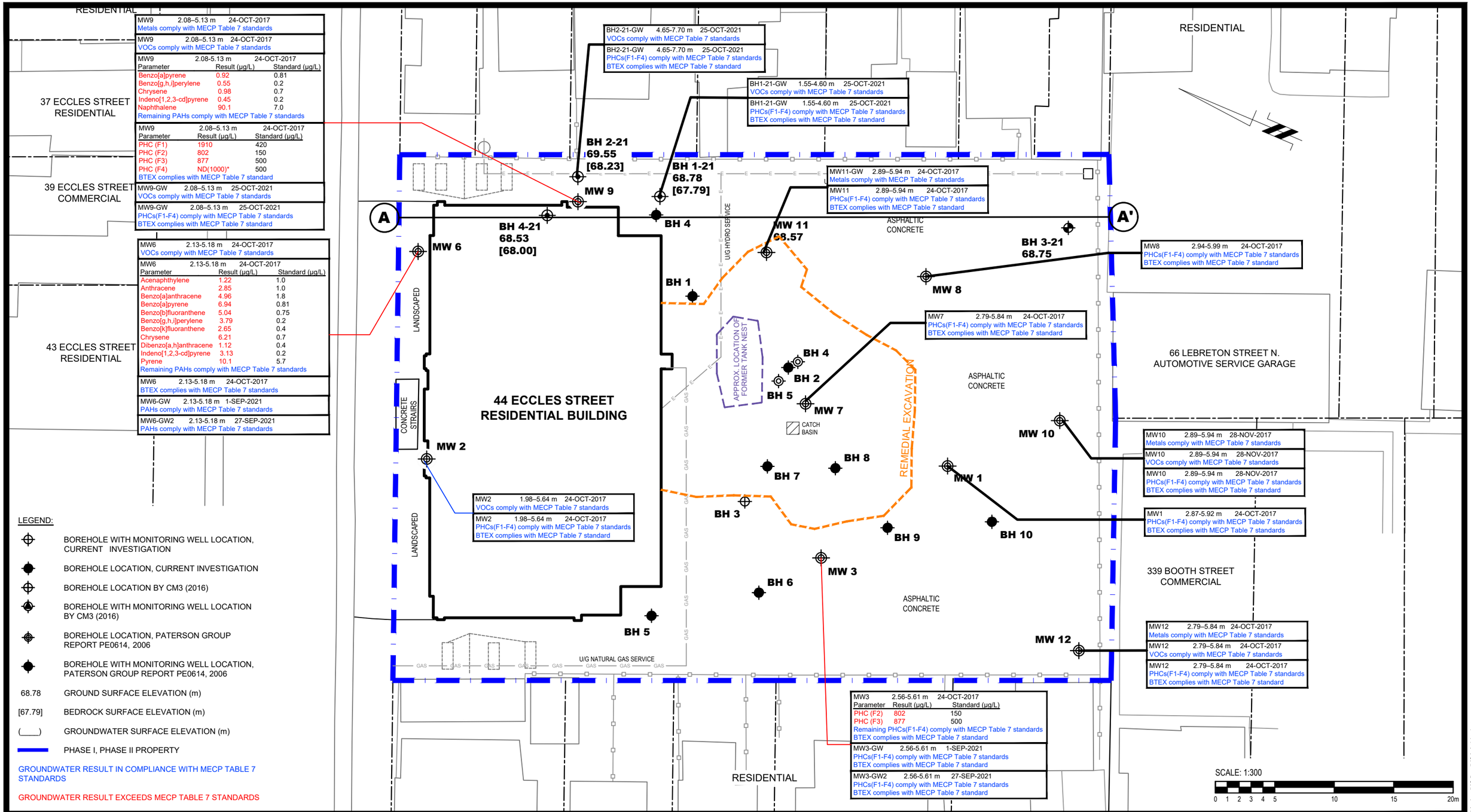
OTTAWA, ONTARIO

Title:

CROSS SECTION A-A' - SOIL

Scale: AS SHOWN	Date: 12/2021
Drawn by: RCG	Report No.: PE5434-1
Checked by: JA	Dwg. No.: PE5434-4A
Approved by: MB	Revision No.:

c:\users\robertg\documents\pe5434\pe5434-4 thlp.dwg



LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION, CURRENT INVESTIGATION
- BOREHOLE LOCATION, CURRENT INVESTIGATION
- BOREHOLE LOCATION BY CM3 (2016)
- BOREHOLE WITH MONITORING WELL LOCATION BY CM3 (2016)
- BOREHOLE LOCATION, PATERSON GROUP REPORT PE0614, 2006
- BOREHOLE WITH MONITORING WELL LOCATION, PATERSON GROUP REPORT PE0614, 2006
- 68.78 GROUND SURFACE ELEVATION (m)
- [67.79] BEDROCK SURFACE ELEVATION (m)
- (____) GROUNDWATER SURFACE ELEVATION (m)
- PHASE I, PHASE II PROPERTY

GROUNDWATER RESULT IN COMPLIANCE WITH MECP TABLE 7 STANDARDS

GROUNDWATER RESULT EXCEEDS MECP TABLE 7 STANDARDS

patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL
0			

CORNERSTONE HOUSING FOR WOMEN

PHASE II - ENVIRONMENTAL SITE ASSESSMENT UPDATE
44 ECCLES STREET

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN - GROUNDWATER

Scale: 1:300	Date: 12/2021
Drawn by: RCG	Report No.: PE5434-1
Checked by: JA	Dwg. No.: PE5434-5
Approved by: MB	Revision No.:

p:\autocad drawings\environmental\pe54xx\pe5434\pe5434-4 thlp.dwg

MW6 2.13-5.18 m 24-OCT-2017
VOCs comply with MECP Table 7 standards

MW6 2.13-5.18 m 24-OCT-2017

Parameter	Result (µg/L)	Standard (µg/L)
Acenaphthylene	1.22	1.0
Anthracene	2.85	1.0
Benzo[a]anthracene	4.96	1.8
Benzo[a]pyrene	6.94	0.81
Benzo[b]fluoranthene	5.04	0.75
Benzo[g,h,i]perylene	3.79	0.2
Benzo[k]fluoranthene	2.65	0.4
Chrysene	6.21	0.7
Dibenzo[a,h]anthracene	1.12	0.4
Indeno[1,2,3-cd]pyrene	3.13	0.2
Pyrene	10.1	5.7

Remaining PAHs comply with MECP Table 7 standards

MW6 2.13-5.18 m 24-OCT-2017
BTEX complies with MECP Table 7 standards

MW6-GW 2.13-5.18 m 1-SEP-2021
PAHs comply with MECP Table 7 standards

MW6-GW2 2.13-5.18 m 27-SEP-2021
PAHs comply with MECP Table 7 standards

MW9 2.08–5.13 m 24-OCT-2017
Metals comply with MECP Table 7 standards

MW9 2.08–5.13 m 24-OCT-2017
VOCs comply with MECP Table 7 standards

MW9 2.08-5.13 m 24-OCT-2017

Parameter	Result (µg/L)	Standard (µg/L)
Benzo[a]pyrene	0.92	0.81
Benzo[g,h,i]perylene	0.55	0.2
Chrysene	0.98	0.7
Indeno[1,2,3-cd]pyrene	0.45	0.2
Naphthalene	90.1	7.0

Remaining PAHs comply with MECP Table 7 standards

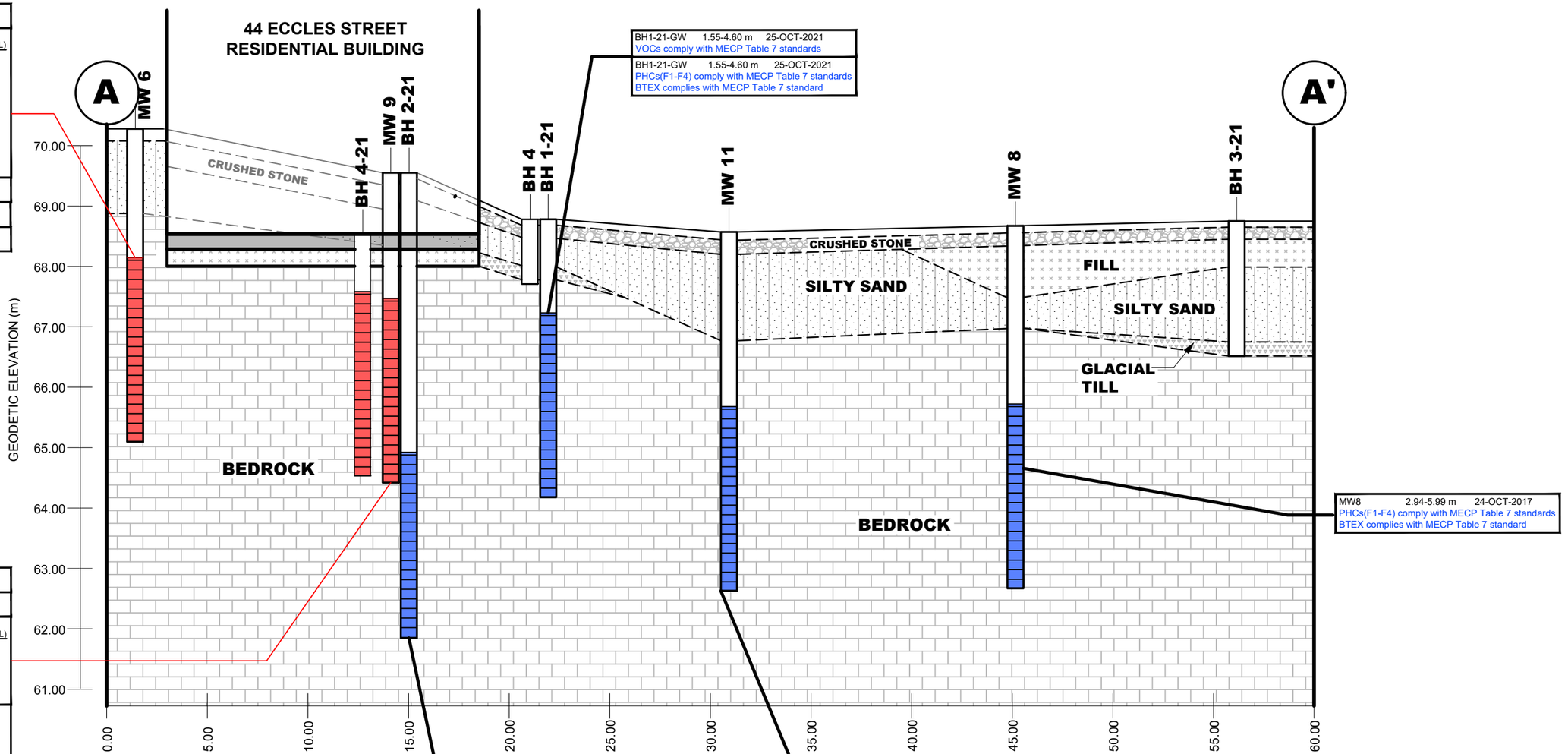
MW9 2.08–5.13 m 24-OCT-2017

Parameter	Result (µg/L)	Standard (µg/L)
PHC (F1)	1910	420
PHC (F2)	802	150
PHC (F3)	877	500
PHC (F4)	ND(1000)*	500

BTEX complies with MECP Table 7 standard

MW9-GW 2.08–5.13 m 25-OCT-2021
VOCs comply with MECP Table 7 standards

MW9-GW 2.08–5.13 m 25-OCT-2021
PHCs(F1-F4) comply with MECP Table 7 standards
BTEX complies with MECP Table 7 standard



BH1-21-GW 1.55-4.60 m 25-OCT-2021
VOCs comply with MECP Table 7 standards

BH1-21-GW 1.55-4.60 m 25-OCT-2021
PHCs(F1-F4) comply with MECP Table 7 standards
BTEX complies with MECP Table 7 standard

MW8 2.94-5.99 m 24-OCT-2017
PHCs(F1-F4) comply with MECP Table 7 standards
BTEX complies with MECP Table 7 standard

BH2-21-GW 4.65-7.70 m 25-OCT-2021
VOCs comply with MECP Table 7 standards

BH2-21-GW 4.65-7.70 m 25-OCT-2021
PHCs(F1-F4) comply with MECP Table 7 standards
BTEX complies with MECP Table 7 standard

MW11-GW 2.89–5.94 m 24-OCT-2017
Metals comply with MECP Table 7 standards

MW11 2.89–5.94 m 24-OCT-2017
PHCs(F1-F4) comply with MECP Table 7 standards
BTEX complies with MECP Table 7 standard

LEGEND:

GROUNDWATER RESULT IN COMPLIANCE WITH MECP TABLE 7 STANDARDS

GROUNDWATER RESULT EXCEEDS MECP TABLE 7 STANDARDS

patersongroup
consulting engineers
154 Colonnade Road South
Ottawa, Ontario K2E 7J5
Tel: (613) 226-7381 Fax: (613) 226-6344

NO.	REVISIONS	DATE	INITIAL
0			

CORNERSTONE HOUSING FOR WOMEN

PHASE II - ENVIRONMENTAL SITE ASSESSMENT UPDATE
44 ECCLES STREET

OTTAWA, ONTARIO

Title:

CROSS SECTION A-A' - GROUNDWATER

Scale: AS SHOWN	Date: 12/2021
Drawn by: RCG	Report No.: PE5434-1
Checked by: JA	Dwg. No.: PE5434-5A
Approved by: MB	Revision No.:

p:\autocad drawings\environmental\pe54xx\pe5434\pe5434-4 thlp.dwg

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
44 Eccles Street
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE5434

REMARKS

HOLE NO. BH 1-21

BORINGS BY CME-55 Low Clearance Drill **DATE** October 21, 2021

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	68.78
Asphaltic concrete 0.05							
FILL: Crushed stone 0.30		AU	1				
FILL: Brown silty sand, some clay, trace gravel 0.76		SS	2	14	50+	1	67.78
GLACIAL TILL: Very dense, brown silty sand with gravel, cobbles and boulders 0.99		RC	1	100	33		
		RC	2	100	75	2	66.78
BEDROCK: Poor to good quality, grey limestone						3	65.78
		RC	3	100	87	4	64.78
4.60 End of Borehole							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
44 Eccles Street
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE5434

REMARKS

HOLE NO. BH 2-21

BORINGS BY CME-55 Low Clearance Drill **DATE** October 21, 2021

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	69.55
Asphaltic concrete 0.10							
FILL: Crushed stone 0.46		AU	1				
FILL: Brown silty sand, some clay, trace gravel 0.91		SS	2	18	50+	1	68.55
GLACIAL TILL: Dense, brown islty sand with gravel, cobbles and boulders 1.32		RC	1	100	82		
		RC	2	100	70	2	67.55
						3	66.55
		RC	3	100	95	4	65.55
BEDROCK: Good to excellent quality, grey limestone						5	64.55
		RC	4	100	93	6	63.55
		RC	5	100	96	7	62.55
7.70 End of Borehole							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

Monitoring Well Construction

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
44 Eccles Street
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE5434

REMARKS

HOLE NO. BH 3-21

BORINGS BY CME-55 Low Clearance Drill **DATE** October 21, 2021

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector: ● Volatile Organic Rdg. (ppm) / ○ Lower Explosive Limit %	Monitoring Well Construction
GROUND SURFACE									
Asphaltic concrete 0.08						0	68.75		
FILL: Crushed stone 0.30									
FILL: Brown silty sand, trace gravel 0.76		AU	1						
Loose to compact, brown **SILTY SAND,** trace gravel		SS	2	0	4	1	67.75		
1.98		SS	3	29	15				
GLACIAL TILL: Brown/black silty sand with gravel, cobbles and boulders 2.23						2	66.75		
End of Borehole									
Practical refusal to augering at 2.23m depth.									

Photo Ionization Detector: ○ Lower Explosive Limit % — 20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
44 Eccles Street
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE5434

REMARKS

HOLE NO. BH 4-21

BORINGS BY Portable Drill **DATE** November 11, 2021

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							
Concrete slab 0.25						0	68.53
FILL: Brown silty sand with crushed stone, gravel and cobbles 0.53		AU	1				
		RC	1	95	64	1	67.53
BEDROCK: Fair to excellent quality, grey limestone						2	66.53
- 12mm thick mud seam at 1.65m depth		RC	2	100	65	3	65.53
		RC	3	100	94		
4.01 End of Borehole						4	64.53

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

Table 1A: Soil Analytical Test Results
Metals

Parameter	Units	MDL	Regulation	MW1 SA1	MW12 SA3	MW10 SA1	MW9 SA1
Sample Depth (m)			Reg 153/04 (2011) - Table 7 Residential, Coarse	0.0-0.61	1.22-1.83	0.0-0.61	0.0-0.61
Sample Date				2-Oct-17	4-Oct-17	4-Oct-17	4-Oct-17
Metals							
Antimony	ug/g dry	1.0	7.5 ug/g dry	ND (1.0)	2	ND (1.0)	ND (1.0)
Arsenic	ug/g dry	1.0	18 ug/g dry	3.7	12.2	2.1	3.4
Barium	ug/g dry	1.0	390 ug/g dry	67.8	258	47.1	53.6
Beryllium	ug/g dry	1.0	4 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Boron	ug/g dry	1.0	120 ug/g dry	9.7	10.8	3.7	4.9
Cadmium	ug/g dry	0.5	1.2 ug/g dry	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Chromium	ug/g dry	1.0	160 ug/g dry	11.2	18.1	18.4	15.6
Cobalt	ug/g dry	1.0	22 ug/g dry	3.5	7	4.6	10.2
Copper	ug/g dry	1.0	140 ug/g dry	9.5	49.8	13.5	11.2
Lead	ug/g dry	1.0	120 ug/g dry	35.8	521	29.1	27.9
Molybdenum	ug/g dry	1.0	6.9 ug/g dry	ND (1.0)	1.3	ND (1.0)	2
Nickel	ug/g dry	1.0	100 ug/g dry	9.7	16	10.4	19.3
Selenium	ug/g dry	1.0	2.4 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	ND(1.0)
Silver	ug/g dry	0.5	20 ug/g dry	ND (0.5)	ND (0.5)	ND (0.5)	0.6
Thallium	ug/g dry	1.0	1.0 ug/g dry	1.6	ND (1.0)	ND (1.0)	ND (1.0)
Uranium	ug/g dry	1.0	23 ug/g dry	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Vanadium	ug/g dry	1.0	86 ug/g dry	17.7	25.2	20.6	14
Zinc	ug/g dry	1.0	340 ug/g dry	35	121	52.6	22.8

2	Sample exceeds MECP Table 7 Residential Coarse Grained Standard
ND (0.5)	No concentrations identified above the MDL
NA	Parameter not analysed

Table 1B: Groundwater Analytical Test Results
Metals and Inorganics

Parameter	Units	MDL	Regulation	MW12	MW10	MW9	MW11-GW
Screen Interval (m)			Table 7 Non-Potable Groundwater, Coarse	2.79-5.84	2.89-5.94	2.08-5.13	2.89-5.94
Sample Date				24-Oct-17	28-Nov-17	24-Oct-17	1-Sep-21
Metals							
Antimony	ug/L	0.5	16000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	0.7
Arsenic	ug/L	1	1500 ug/L	7	ND (1)	ND (1)	2
Barium	ug/L	1	23000 ug/L	726	726	901	320
Beryllium	ug/L	0.5	53 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Boron	ug/L	10	36000 ug/L	138	394	139	431
Cadmium	ug/L	0.1	2.1 ug/L	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Chromium	ug/L	1	640 ug/L	ND (1)	ND (1)	ND (1)	ND (1)
Cobalt	ug/L	0.5	52 ug/L	3.4	0.5	3.3	ND (0.5)
Copper	ug/L	0.5	69 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	0.9
Lead	ug/L	0.1	20 ug/L	0.2	ND (0.1)	ND (0.1)	0.2
Molybdenum	ug/L	0.5	7300 ug/L	3.1	0.5	0.6	5.4
Nickel	ug/L	1	390 ug/L	2	1	3	2
Selenium	ug/L	1	50 ug/L	ND (1)	ND (1)	ND (1)	ND (1)
Silver	ug/L	0.1	1.2 ug/L	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Sodium	ug/L	200	1800000 ug/L	1270000	1090000	936000	3120000
Thallium	ug/L	0.1	400 ug/L	ND (0.1)	ND (0.1)	0.1	ND (0.1)
Uranium	ug/L	0.1	330 ug/L	1.9	1.5	4.1	3.5
Vanadium	ug/L	0.5	200 ug/L	4.5	ND (0.5)	ND (0.5)	0.9
Zinc	ug/L	5	890 ug/L	7	ND (5)	11	7

ND (0.5) No concentrations identified above the MDL

MDL Method Detection Limit

Parameter	Units	MDL	Regulation	MW12 SA4
Sample Depth (m)			Reg 153/04 (2011) - Table 7 Residential, Coarse	1.83-2.44
Sample Date				4-Oct-17
Volatiles				
Acetone	ug/g dry	0.50	16 ug/g dry	ND (0.50)
Benzene	ug/g dry	0.02	0.21 ug/g dry	ND (0.02)
Bromodichloromethane	ug/g dry	0.05	13 ug/g dry	ND (0.05)
Bromoform	ug/g dry	0.05	0.27 ug/g dry	ND (0.05)
Bromomethane	ug/g dry	0.05	0.05 ug/g dry	ND (0.05)
Carbon Tetrachloride	ug/g dry	0.05	0.05 ug/g dry	ND (0.05)
Chlorobenzene	ug/g dry	0.05	2.4 ug/g dry	ND (0.05)
Chloroform	ug/g dry	0.05	0.05 ug/g dry	ND (0.05)
Dibromochloromethane	ug/g dry	0.05	9.4 ug/g dry	ND (0.05)
Dichlorodifluoromethane	ug/g dry	0.05	16 ug/g dry	ND (0.05)
1,2-Dichlorobenzene	ug/g dry	0.05	3.4 ug/g dry	ND (0.05)
1,3-Dichlorobenzene	ug/g dry	0.05	4.8 ug/g dry	ND (0.05)
1,4-Dichlorobenzene	ug/g dry	0.05	0.083 ug/g dry	ND (0.05)
1,1-Dichloroethane	ug/g dry	0.05	3.5 ug/g dry	ND (0.05)
1,2-Dichloroethane	ug/g dry	0.05	0.05 ug/g dry	ND (0.05)
1,1-Dichloroethylene	ug/g dry	0.05	0.05 ug/g dry	ND (0.05)
cis-1,2-Dichloroethylene	ug/g dry	0.05	3.4 ug/g dry	ND (0.05)
trans-1,2-Dichloroethylene	ug/g dry	0.05	0.084 ug/g dry	ND (0.05)
1,2-Dichloropropane	ug/g dry	0.05	0.05 ug/g dry	ND (0.05)
cis-1,3-Dichloropropylene	ug/g dry	0.05		ND (0.05)
trans-1,3-Dichloropropylene	ug/g dry	0.05	0.05 ug/g dry	ND (0.05)
1,3-Dichloropropene, total	ug/g dry	0.05		ND (0.05)
Ethylbenzene	ug/g dry	0.05	2 ug/g dry	ND (0.05)
Ethylene dibromide	ug/g dry	0.05	0.05 ug/g dry	ND (0.05)
Hexane	ug/g dry	0.05	2.8 ug/g dry	ND (0.05)
Methyl Ethyl Ketone	ug/g dry	0.50	16 ug/g dry	ND (0.50)
Methyl Isobutyl Ketone	ug/g dry	0.50	1.7 ug/g dry	ND (0.50)
Methyl tert-butyl ether	ug/g dry	0.05	0.75 ug/g dry	ND (0.05)
Methylene Chloride	ug/g dry	0.05	0.1 ug/g dry	ND (0.05)
Styrene	ug/g dry	0.05	0.7 ug/g dry	ND (0.05)
1,1,1,2-Tetrachloroethane	ug/g dry	0.05	0.058 ug/g dry	ND (0.05)
1,1,2,2-Tetrachloroethane	ug/g dry	0.05	0.05 ug/g dry	ND (0.05)
Tetrachloroethylene	ug/g dry	0.05	0.28 ug/g dry	ND (0.05)
Toluene	ug/g dry	0.05	2.3 ug/g dry	ND (0.05)
1,1,1-Trichloroethane	ug/g dry	0.05	0.38 ug/g dry	ND (0.05)
1,1,2-Trichloroethane	ug/g dry	0.05	0.05 ug/g dry	ND (0.05)
Trichloroethylene	ug/g dry	0.05	0.061 ug/g dry	ND (0.05)
Trichlorofluoromethane	ug/g dry	0.05	4 ug/g dry	ND (0.05)
Vinyl Chloride	ug/g dry	0.02	0.02 ug/g dry	ND (0.02)
m/p-Xylene	ug/g dry	0.05		ND (0.05)
o-Xylene	ug/g dry	0.05	3.1 ug/g dry	ND (0.05)
Xylenes, total	ug/g dry	0.05		ND (0.05)

ND (0.5) No concentrations identified above the MDL

MDL Method Detection Limit

Table 2B: Groundwater Analytical Test Results
VOCs and BTEX

Parameter	Units	MDL	Regulation	MW12	MW10	MW2	MW6	MW9	BH1-21-GW	BH2-21-GW	MW9-GW
Screen Interval (m)			Table 7 Non-Potable Groundwater, Coarse	2.79-5.84	2.89-5.94	1.98-5.64	2.13-5.18	2.08-5.13	1.55-4.60	4.65-7.70	2.08-5.13
Sample Date				24-Oct-17	28-Nov-17	24-Oct-17	24-Oct-17	24-Oct-17	25-Oct-21	25-Oct-21	25-Oct-21
Volatiles											
Acetone	ug/L	5.0	100000 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Benzene	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromodichloromethane	ug/L	0.5	67000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromoform	ug/L	0.5	5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromomethane	ug/L	0.5	0.89 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Carbon Tetrachloride	ug/L	0.2	0.2 ug/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Chlorobenzene	ug/L	0.5	140 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Chloroform	ug/L	0.5	2 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	1.8	ND (0.5)	ND (0.5)	0.5	ND (0.5)
Dibromochloromethane	ug/L	0.5	65000 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Dichlorodifluoromethane	ug/L	1.0	3500 ug/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,2-Dichlorobenzene	ug/L	0.5	150 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,3-Dichlorobenzene	ug/L	0.5	7600 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,4-Dichlorobenzene	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1-Dichloroethane	ug/L	0.5	11 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,2-Dichloroethane	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1-Dichloroethylene	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
cis-1,2-Dichloroethylene	ug/L	0.5	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
trans-1,2-Dichloroethylene	ug/L	0.5	1.6 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,2-Dichloropropane	ug/L	0.5	0.58 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
cis-1,3-Dichloropropylene	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
trans-1,3-Dichloropropylene	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,3-Dichloropropene, total	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethylbenzene	ug/L	0.5	54 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	27.2	ND (0.5)	1.9	0.7
Ethylene dibromide	ug/L	0.2	0.2 ug/L	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Hexane	ug/L	1.0	5 ug/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	2	ND (1.0)
Methyl Ethyl Ketone	ug/L	5.0	21000 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Methyl Isobutyl Ketone	ug/L	5.0	5200 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Methyl tert-butyl ether	ug/L	2.0	15 ug/L	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)
Methylene Chloride	ug/L	5.0	26 ug/L	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Styrene	ug/L	0.5	43 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,1,2-Tetrachloroethane	ug/L	0.5	1.1 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,2,2-Tetrachloroethane	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Tetrachloroethylene	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Toluene	ug/L	0.5	320 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,1-Trichloroethane	ug/L	0.5	23 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,2-Trichloroethane	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Trichloroethylene	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Trichlorofluoromethane	ug/L	1.0	2000 ug/L	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Vinyl Chloride	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
m/p-Xylene	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	20.2	ND (0.5)	0.9	0.5
o-Xylene	ug/L	0.5	72 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Xylenes, total	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	20.2	ND (0.5)	0.9	0.5

2	Sample exceeds MECP Table 7 Residential Coarse Grained Standard
ND (0.5)	No concentrations identified above the MDL
NA	Parameter not analysed

Parameter	Units	MDL	Regulation	MW9 SA2
Sample Depth (m)			Reg 153/04 (2011) - Table 7 Residential, Coarse	0.61-1.22
Sample Date				4-Oct-17
Semi-Volatiles				
Acenaphthene	ug/g dry	0.02	7.9 ug/g dry	ND (0.02)
Acenaphthylene	ug/g dry	0.02	0.15 ug/g dry	ND (0.02)
Anthracene	ug/g dry	0.02	0.67 ug/g dry	ND (0.02)
Benzo[a]anthracene	ug/g dry	0.02	0.5 ug/g dry	ND (0.02)
Benzo[a]pyrene	ug/g dry	0.02	0.3 ug/g dry	ND (0.02)
Benzo[b]fluoranthene	ug/g dry	0.02	0.78 ug/g dry	ND (0.02)
Benzo[g,h,i]perylene	ug/g dry	0.02	6.6 ug/g dry	ND (0.02)
Benzo[k]fluoranthene	ug/g dry	0.02	0.78 ug/g dry	ND (0.02)
Chrysene	ug/g dry	0.02	7 ug/g dry	ND (0.02)
Dibenzo[a,h]anthracene	ug/g dry	0.02	0.1 ug/g dry	ND (0.02)
Fluoranthene	ug/g dry	0.02	0.69 ug/g dry	0.03
Fluorene	ug/g dry	0.02	62 ug/g dry	ND (0.02)
Indeno[1,2,3-cd]pyrene	ug/g dry	0.02	0.38 ug/g dry	ND (0.02)
1-Methylnaphthalene	ug/g dry	0.02	0.99 ug/g dry	ND (0.02)
2-Methylnaphthalene	ug/g dry	0.02	0.99 ug/g dry	ND (0.02)
Methylnaphthalene (1&2)	ug/g dry	0.04	0.99 ug/g dry	ND (0.04)
Naphthalene	ug/g dry	0.01	0.6 ug/g dry	ND (0.01)
Phenanthrene	ug/g dry	0.02	6.2 ug/g dry	ND (0.02)
Pyrene	ug/g dry	0.02	78 ug/g dry	0.03

ND (0.5)	No concentrations identified above the MDL
MDL	Method Detection Limit

Table 3B: Groundwater Analytical Test Results
PAHs

Parameter	Units	MDL	Regulation	MW6	MW9	MW6-GW	MW6-GW2
Screen Interval (m)			Table 7 Non-Potable Groundwater, Coarse	2.13-5.18	2.08-5.13	2.13-5.18	2.13-5.18
Sample Date				24-Oct-17	24-Oct-17	1-Sep-21	27-Sep-21
Semi-Volatiles							
Acenaphthene	ug/L	0.05	17 ug/L	0.99	10.9	ND (0.05)	ND (0.05)
Acenaphthylene	ug/L	0.05	1 ug/L	1.22	ND (0.25)*	ND (0.05)	ND (0.05)
Anthracene	ug/L	0.01	1 ug/L	2.85	0.56	ND (0.01)	ND (0.01)
Benzo[a]anthracene	ug/L	0.01	1.8 ug/L	4.96	0.74	ND (0.01)	ND (0.01)
Benzo[a]pyrene	ug/L	0.01	0.81 ug/L	6.94	0.92	ND (0.01)	ND (0.01)
Benzo[b]fluoranthene	ug/L	0.05	0.75 ug/L	5.04	0.72	ND (0.05)	ND (0.05)
Benzo[g,h,i]perylene	ug/L	0.05	0.2 ug/L	3.79	0.55	ND (0.05)	ND (0.05)
Benzo[k]fluoranthene	ug/L	0.05	0.4 ug/L	2.65	0.36	ND (0.05)	ND (0.05)
Chrysene	ug/L	0.05	0.7 ug/L	6.21	0.98	ND (0.05)	ND (0.05)
Dibenzo[a,h]anthracene	ug/L	0.05	0.4 ug/L	1.12	ND (0.25)*	ND (0.05)	ND (0.05)
Fluoranthene	ug/L	0.01	44 ug/L	11.1	32.22	ND (0.01)	ND (0.01)
Fluorene	ug/L	0.05	290 ug/L	0.95	8.12	ND (0.05)	ND (0.05)
Indeno[1,2,3-cd]pyrene	ug/L	0.05	0.2 ug/L	3.13	0.45	ND (0.05)	ND (0.05)
1-Methylnaphthalene	ug/L	0.05	1500 ug/L	0.36	478	ND (0.05)	0.12
2-Methylnaphthalene	ug/L	0.05	1500 ug/L	0.43	503	ND (0.05)	0.05
Methylnaphthalene (1&2)	ug/L	0.10	1500 ug/L	0.79	981	ND (0.10)	0.17
Naphthalene	ug/L	0.05	7 ug/L	0.5	90.1	ND (0.05)	ND (0.05)
Phenanthrene	ug/L	0.05	380 ug/L	9.28	5.75	ND (0.05)	ND (0.05)
Pyrene	ug/L	0.01	5.7 ug/L	10.1	1.84	ND (0.01)	ND (0.01)

2	Sample exceeds MECP Table 7 Residential Coarse Grained Standard
ND (0.5)	No concentrations identified above the MDL
NA	Parameter not analysed

Table 4A: Soil Analytical Test Results
BTEX and PHCs

Parameter	Units	MDL	Regulation	MW1 SA4	MW3 SA1	MW7 SA3	MW8 SA3	MW11 SA3	MW12 SA4	MW10 SA3	MW9 SA2
Sample Depth (m)			Reg 153/04 (2011) - Table 7 Residential, Coarse	1.83-2.13	0.0-0.61	1.22-1.83	1.22-1.68	1.22-1.83	1.83-2.44	1.22-1.83	0.61-1.22
Sample Date				2-Oct-17	2-Oct-17	3-Oct-17	3-Oct-17	4-Oct-17	4-Oct-17	4-Oct-17	4-Oct-17
BTEX											
Benzene	ug/g dry	0.02	0.21 ug/g dry	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Ethylbenzene	ug/g dry	0.05	2 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Toluene	ug/g dry	0.05	2.3 ug/g dry	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
m/p-Xylene	ug/g dry	0.05		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
o-Xylene	ug/g dry	0.05		0.7	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Xylenes, total	ug/g dry	0.05	3.1 ug/g dry	0.7	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Hydrocarbons											
F1 PHCs (C6-C10)	ug/g dry	7	55 ug/g dry	11	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)
F2 PHCs (C10-C16)	ug/g dry	4	98 ug/g dry	636	421	24	ND (40)*	135	ND (40)*	11	ND (4)
F3 PHCs (C16-C34)	ug/g dry	8	300 ug/g dry	830	1170	259	359	308	369	366	9
F4 PHCs (C34-C50)	ug/g dry	6	2800 ug/g dry	ND (60)*	840	314	570	237	719	433	23
F4G PHCs (gravimetric)	ug/g dry	50	2800 ug/g dry	ND (60)	840	368	NA	NA	NA	401	NA

2	Sample exceeds MECP Table 7 Residential Coarse Grained Standard
ND (0.5)	No concentrations identified above the MDL
MDL	Method Detection Limit

Table 4B: Groundwater Analytical Test Results
BTEX and PHCs

Parameter	Units	MDL	Regulation	MW1	MW3	MW7	MW8	MW11	MW12	MW10	MW2	MW6	MW9
Screen Inverval (m)			Table 7 Non-Potable Groundwater, Coarse	2.87-5.92	2.56-5.61	2.79-5.84	2.94-5.99	2.89-5.94	2.79-5.84	2.89-5.94	1.98-5.64	2.13-5.18	2.08-5.13
Sample Date				24-Oct-17	24-Oct-17	24-Oct-17	24-Oct-17	24-Oct-17	24-Oct-17	28-Nov-17	24-Oct-17	24-Oct-17	24-Oct-17
BTEX													
Benzene	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethylbenzene	ug/L	0.5	54 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	27.2
Toluene	ug/L	0.5	320 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
m/p-Xylene	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	20.2
o-Xylene	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Xylenes, total	ug/L	0.5	72 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	20.2
Hydrocarbons													
F1 PHCs (C6-C10)	ug/L	25	420 ug/L	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	NA	1910
F2 PHCs (C10-C16)	ug/L	100	150 ug/L	ND (100)	802	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	NA	72500
F3 PHCs (C16-C34)	ug/L	100	500 ug/L	ND (100)	877	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	NA	1520
F4 PHCs (C34-C50)	ug/L	100	500 ug/L	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	NA	ND (1000)*

ND No concentrations identified above the MDL
MDL Method Detection Limit

Table 4B: Groundwater Analytical Test Results
BTEX and PHCs

Parameter	Units	MDL	Regulation	MW3-GW	MW3-GW2	BH1-21-GW	BH2-21-GW	MW9-GW	BH4-21-GW
Screen Inverval (m)			Table 7 Non-Potable Groundwater, Coarse	2.56-5.61	2.56-5.61	1.55-4.60	4.65-7.70	2.08-5.13	0.96-4.01
Sample Date				1-Sep-21	27-Sep-21	25-Oct-21	25-Oct-21	25-Oct-21	18-Nov-21
BTEX									
Benzene	ug/L	0.5	0.5 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	1.9
Ethylbenzene	ug/L	0.5	54 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	1.9	0.7	13.5
Toluene	ug/L	0.5	320 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	0.6
m/p-Xylene	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	0.9	0.5	10
o-Xylene	ug/L	0.5		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	0.6
Xylenes, total	ug/L	0.5	72 ug/L	ND (0.5)	ND (0.5)	ND (0.5)	0.9	0.5	10.6
Hydrocarbons									
F1 PHCs (C6-C10)	ug/L	25	420 ug/L	ND (25)	ND (25)	ND (25)	ND (25)	ND (25)	346
F2 PHCs (C10-C16)	ug/L	100	150 ug/L	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	1700
F3 PHCs (C16-C34)	ug/L	100	500 ug/L	ND (100)	ND (100)	ND (100)	ND (100)	288	ND (100)
F4 PHCs (C34-C50)	ug/L	100	500 ug/L	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)	ND (100)

ND No concentrations identified above the MDL
MDL Method Detection Limit

Table 5A: Maximum Concentrations
Soil

Parameter	Sample ID / Depth (m)	MECP Table 7 Residential Coarse Grained Standard	Concentration
Antimony	MW12 SA3 / 1.22-1.83	7.5 ug/g dry	2.0
Arsenic	MW12 SA3 / 1.22-1.83	18 ug/g dry	12.2
Barium	MW12 SA3 / 1.22-1.83	390 ug/g dry	258
Boron	MW12 SA3 / 1.22-1.83	120 ug/g dry	10.8
Chromium	MW10 SA1 / 0.0-0.61	160 ug/g dry	18.4
Cobalt	MW9 SA1 / 0.0-0.61	22 ug/g dry	10.2
Copper	MW12 SA3 / 1.22-1.83	140 ug/g dry	49.8
Lead	MW12 SA3 / 1.22-1.83	120 ug/g dry	521
Molybdenum	MW9 SA1 / 0.0-0.61	6.9 ug/g dry	2.0
Nickel	MW9 SA1 / 0.0-0.61	100 ug/g dry	19.3
Silver	MW9 SA1 / 0.0-0.61	20 ug/g dry	0.6
Thallium	MW1 SA1 / 0.0-0.61	1.0 ug/g dry	1.6
Vanadium	MW12 SA3 / 1.22-1.83	86 ug/g dry	25.2
Zinc	MW12 SA3 / 1.22-1.83	340 ug/g dry	121
Fluoranthene	MW9 SA2 / 0.61-1.22	0.69 ug/g dry	0.03
Pyrene	MW9 SA2 / 0.61-1.22	78 ug/g dry	0.03
o-Xylene	MW1 SA4 / 1.83-2.13	3.1 ug/g dry	0.70
Xylenes, total	MW1 SA4 / 1.83-2.13	3.1 ug/g dry	0.70
F1 PHCs (C6-C10)	MW1 SA4 / 1.83-2.13	55 ug/g dry	11
F2 PHCs (C10-C16)	MW1 SA4 / 1.83-2.13	98 ug/g dry	636
F3 PHCs (C16-C34)	MW3 SA1 / 0.0-0.61	300 ug/g dry	1170
F4 PHCs (C34-C50)	MW3 SA1 / 0.0-0.61	2800 ug/g dry	840
F4G PHCs (gravimetric)	MW3 SA1 / 0.0-0.61	2800 ug/g dry	840

All remaining parameters analysed were reported non-detect in all samples.

Table 5B: Maximum Concentrations
Groundwater

Parameter	Sample ID / Screen Interval (m)	MECP Table 7 Residential Coarse	Concentration
Antimony	MW11-GW / 2.89-5.94	16000 ug/L	0.7
Arsenic	MW12 / 2.79-5.84	1500 ug/L	7
Barium	MW9 / 2.08-5.13	23000 ug/L	901
Boron	MW10 / 2.89-5.94	36000 ug/L	394
Cobalt	MW12 / 2.79-5.84	52 ug/L	3.4
Copper	MW11-GW / 2.89-5.94	69 ug/L	0.9
Lead	MW12 / 2.79-5.84	20 ug/L	0.2
Molybdenum	MW12 / 2.79-5.84	7300 ug/L	3.1
Nickel	MW9 / 2.08-5.13	390 ug/L	3
Sodium	MW12 / 2.79-5.84	1800000 ug/L	1270000
Thallium	MW9 / 2.08-5.13	400 ug/L	0.1
Uranium	MW9 / 2.08-5.13	330 ug/L	4.1
Vanadium	MW12 / 2.79-5.84	200 ug/L	4.5
Zinc	MW9 / 2.08-5.13	890 ug/L	11
Benzene	BH4-21-GW	0.5 ug/L	1.9
Chloroform	MW6 / 2.13-5.18	2 ug/L	1.8
Ethylbenzene	MW9 / 2.08-5.13	54 ug/L	27.2
Hexane	BH2-21-GW / 4.65-7.70	5 ug/L	2
Toluene	BH4-21-GW	320 ug/L	0.6
m/p-Xylene	MW9 / 2.08-5.13	72 ug/L	20.2
Xylenes, total	MW9 / 2.08-5.13		20.2
Acenaphthene	MW9 / 2.08-5.13	17 ug/L	10.9
Acenaphthylene	MW6 / 2.13-5.18	1 ug/L	1.22
Anthracene	MW6 / 2.13-5.18	1 ug/L	2.85
Benzo[a]anthracene	MW6 / 2.13-5.18	1.8 ug/L	4.96
Benzo[a]pyrene	MW6 / 2.13-5.18	0.81 ug/L	6.94
Benzo[b]fluoranthene	MW6 / 2.13-5.18	0.75 ug/L	5.04
Benzo[g,h,i]perylene	MW6 / 2.13-5.18	0.2 ug/L	3.79
Benzo[k]fluoranthene	MW6 / 2.13-5.18	0.4 ug/L	2.65
Chrysene	MW6 / 2.13-5.18	0.7 ug/L	6.21
Dibenzo[a,h]anthracene	MW6 / 2.13-5.18	0.4 ug/L	1.12
Fluoranthene	MW9 / 2.08-5.13	44 ug/L	32.22
Fluorene	MW9 / 2.08-5.13	290 ug/L	8.12
Indeno[1,2,3-cd]pyrene	MW6 / 2.13-5.18	0.2 ug/L	3.13
1-Methylnaphthalene	MW9 / 2.08-5.13	1500 ug/L	478
2-Methylnaphthalene	MW9 / 2.08-5.13	1500 ug/L	503
Methylnaphthalene (1&2)	MW9 / 2.08-5.13	1500 ug/L	981
Naphthalene	MW9 / 2.08-5.13	7 ug/L	90.1
Phenanthrene	MW6 / 2.13-5.18	380 ug/L	9.28
Pyrene	MW6 / 2.13-5.18	5.7 ug/L	10.1
F1 PHCs (C6-C10)	BH4-21-GW / 0.96-4.01	420 ug/L	1910
F2 PHCs (C10-C16)	MW9 / 2.08-5.13	150 ug/L	72500
F3 PHCs (C16-C34)	BH4-21-GW / 0.96-4.01	500 ug/L	1520
F4 PHCs (C34-C50)	MW9 / 2.08-5.13	500 ug/L	ND (1000)

All remaining parameters analysed were reported non-detect in all samples.

PARACEL LABORATORIES LTD.

TRUSTED.
RESPONSIVE.
RELIABLE.

300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mike Beaudoin

Client PO: 32096
Project: PE5434
Custody: 132418

Report Date: 26-Oct-2021
Order Date: 25-Oct-2021

Order #: 2144126

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

Paracel ID	Client ID
2144126-01	BH1-21-GW
2144126-02	BH2-21-GW
2144126-03	MW9-GW

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Report Date: 26-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 25-Oct-2021

Client PO: 32096

Project Description: PE5434

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
PHC F1	CWS Tier 1 - P&T GC-FID	25-Oct-21	26-Oct-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	26-Oct-21	26-Oct-21
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	25-Oct-21	26-Oct-21

Certificate of Analysis

Report Date: 26-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 25-Oct-2021

Client PO: 32096

Project Description: PE5434

	Client ID:	BH1-21-GW	BH2-21-GW	MW9-GW	-
	Sample Date:	25-Oct-21 09:25	25-Oct-21 09:25	25-Oct-21 09:25	-
	Sample ID:	2144126-01	2144126-02	2144126-03	-
	MDL/Units	Water	Water	Water	-
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	-
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	-
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Chloroform	0.5 ug/L	<0.5	0.5	<0.5	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	-
Ethylbenzene	0.5 ug/L	<0.5	1.9	0.7	-
Ethylene dibromide (dibromoethane, 1,2-)	0.2 ug/L	<0.2	<0.2	<0.2	-
Hexane	1.0 ug/L	<1.0	2.0	<1.0	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	-
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-

Certificate of Analysis

Report Date: 26-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 25-Oct-2021

Client PO: 32096

Project Description: PE5434

	Client ID:	BH1-21-GW	BH2-21-GW	MW9-GW	-
	Sample Date:	25-Oct-21 09:25	25-Oct-21 09:25	25-Oct-21 09:25	-
	Sample ID:	2144126-01	2144126-02	2144126-03	-
	MDL/Units	Water	Water	Water	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	-
m,p-Xylenes	0.5 ug/L	<0.5	0.9	0.5	-
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Xylenes, total	0.5 ug/L	<0.5	0.9	0.5	-
4-Bromofluorobenzene	Surrogate	106%	108%	114%	-
Dibromofluoromethane	Surrogate	88.9%	90.0%	104%	-
Toluene-d8	Surrogate	94.4%	94.0%	92.8%	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	288	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	-

Certificate of Analysis

Report Date: 26-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 25-Oct-2021

Client PO: 32096

Project Description: PE5434

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%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									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroform	ND	0.5	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Ethylene dibromide (dibromoethane, 1,2	ND	0.2	ug/L						
Hexane	ND	1.0	ug/L						
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L						
Methyl Isobutyl Ketone	ND	5.0	ug/L						
Methyl tert-butyl ether	ND	2.0	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Styrene	ND	0.5	ug/L						
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L						
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L						
Tetrachloroethylene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
1,1,1-Trichloroethane	ND	0.5	ug/L						
1,1,2-Trichloroethane	ND	0.5	ug/L						
Trichloroethylene	ND	0.5	ug/L						
Trichlorofluoromethane	ND	1.0	ug/L						
Vinyl chloride	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: 4-Bromofluorobenzene	*85.2*		*ug/L*		*107*	*50-140*			
Surrogate: Dibromofluoromethane	*71.7*		*ug/L*		*89.6*	*50-140*			
Surrogate: Toluene-d8	*76.4*		*ug/L*		*95.6*	*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	
F2 PHCs (C10-C16)	1060	100	ug/L	952			10.8	30	
F3 PHCs (C16-C34)	890	100	ug/L	857			3.9	30	
F4 PHCs (C34-C50)	ND	100	ug/L	ND			NC	30	
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	ND	0.5	ug/L	ND			NC	30	
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	
Chlorobenzene	ND	0.5	ug/L	ND			NC	30	
Chloroform	ND	0.5	ug/L	ND			NC	30	
Dibromochloromethane	ND	0.5	ug/L	ND			NC	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	0.86	0.5	ug/L	0.83			3.6	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Ethylene dibromide (dibromoethane, 1,2-	ND	0.2	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	0.83	0.5	ug/L	0.76			8.8	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	2.12	0.5	ug/L	2.09			1.4	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
Vinyl chloride	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: 4-Bromofluorobenzene	*84.9*		*ug/L*		*106*	*50-140*			
Surrogate: Dibromofluoromethane	*71.2*		*ug/L*		*89.0*	*50-140*			
Surrogate: Toluene-d8	*76.7*		*ug/L*		*95.9*	*50-140*			

Certificate of Analysis

Report Date: 26-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 25-Oct-2021

Client PO: 32096

Project Description: PE5434

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1730	25	ug/L	ND	86.6	68-117			
F2 PHCs (C10-C16)	1500	100	ug/L	ND	93.8	60-140			
F3 PHCs (C16-C34)	4060	100	ug/L	ND	104	60-140			
F4 PHCs (C34-C50)	2760	100	ug/L	ND	111	60-140			
Volatiles									
Acetone	108	5.0	ug/L	ND	108	50-140			
Benzene	34.3	0.5	ug/L	ND	85.8	60-130			
Bromodichloromethane	34.5	0.5	ug/L	ND	86.2	60-130			
Bromoform	33.5	0.5	ug/L	ND	83.7	60-130			
Bromomethane	43.1	0.5	ug/L	ND	108	50-140			
Carbon Tetrachloride	34.9	0.2	ug/L	ND	87.2	60-130			
Chlorobenzene	36.3	0.5	ug/L	ND	90.8	60-130			
Chloroform	34.6	0.5	ug/L	ND	86.5	60-130			
Dibromochloromethane	34.4	0.5	ug/L	ND	85.9	60-130			
Dichlorodifluoromethane	35.2	1.0	ug/L	ND	88.0	50-140			
1,2-Dichlorobenzene	35.1	0.5	ug/L	ND	87.8	60-130			
1,3-Dichlorobenzene	35.7	0.5	ug/L	ND	89.2	60-130			
1,4-Dichlorobenzene	35.5	0.5	ug/L	ND	88.7	60-130			
1,1-Dichloroethane	34.4	0.5	ug/L	ND	86.0	60-130			
1,2-Dichloroethane	34.5	0.5	ug/L	ND	86.4	60-130			
1,1-Dichloroethylene	38.6	0.5	ug/L	ND	96.6	60-130			
cis-1,2-Dichloroethylene	30.6	0.5	ug/L	ND	76.4	60-130			
trans-1,2-Dichloroethylene	32.2	0.5	ug/L	ND	80.5	60-130			
1,2-Dichloropropane	36.2	0.5	ug/L	ND	90.5	60-130			
cis-1,3-Dichloropropylene	34.6	0.5	ug/L	ND	86.5	60-130			
trans-1,3-Dichloropropylene	37.2	0.5	ug/L	ND	93.0	60-130			
Ethylbenzene	39.9	0.5	ug/L	ND	99.8	60-130			
Ethylene dibromide (dibromoethane, 1,2-	37.7	0.2	ug/L	ND	94.3	60-130			
Hexane	32.0	1.0	ug/L	ND	80.1	60-130			
Methyl Ethyl Ketone (2-Butanone)	106	5.0	ug/L	ND	106	50-140			
Methyl Isobutyl Ketone	112	5.0	ug/L	ND	112	50-140			
Methyl tert-butyl ether	112	2.0	ug/L	ND	112	50-140			
Methylene Chloride	36.1	5.0	ug/L	ND	90.2	60-130			
Styrene	30.9	0.5	ug/L	ND	77.2	60-130			
1,1,1,2-Tetrachloroethane	44.2	0.5	ug/L	ND	110	60-130			
1,1,2,2-Tetrachloroethane	42.2	0.5	ug/L	ND	106	60-130			
Tetrachloroethylene	37.3	0.5	ug/L	ND	93.2	60-130			
Toluene	35.7	0.5	ug/L	ND	89.2	60-130			
1,1,1-Trichloroethane	39.0	0.5	ug/L	ND	97.4	60-130			
1,1,2-Trichloroethane	43.5	0.5	ug/L	ND	109	60-130			
Trichloroethylene	34.7	0.5	ug/L	ND	86.8	60-130			
Trichlorofluoromethane	37.9	1.0	ug/L	ND	94.8	60-130			
Vinyl chloride	40.5	0.5	ug/L	ND	101	50-140			
m,p-Xylenes	73.6	0.5	ug/L	ND	92.0	60-130			
o-Xylene	37.3	0.5	ug/L	ND	93.3	60-130			
Surrogate: 4-Bromofluorobenzene	*95.9*		*ug/L*		*120*	*50-140*			
Surrogate: Dibromofluoromethane	*80.5*		*ug/L*		*101*	*50-140*			
Surrogate: Toluene-d8	*74.8*		*ug/L*		*93.5*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

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: 2144126

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2144126	№ 132418

Client Name: PATERSON GROUP	Project Ref: PE5434	Page 1 of 1
Contact Name: MIKE BEAUDOIN	Quote #:	Turnaround Time
Address: 154 COLONNADE Rd. S. OTTAWA, ON.	PO #: 32096	☑ 1 day ☐ 3 day ☐ 2 day ☐ Regular
Telephone: 613 ☒ 226 7381	E-mail: MBEAUDOIN@PATERSONGROUP.CO	Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☐ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☑ Table 7	Mun:
For RSC: ☐ Yes ☐ No	☐ Other:

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)
1	BH1-21-GW	GW	\	3	OCT 25/21	9:25A	✓	✓					
2	BH2-21-GW	↓	\	3	↓	9:55A	✓	✓					
3	MW9-GW	↓	\	3	↓		✓	✓					
4													
5													
6													
7													
8													
9													
10													

Comments:

Method of Delivery: Drop Box

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab: Sunneepawn Dhumal	Verified By:
Relinquished By (Print): DOMINIC LANORY	Date/Time:	Date/Time: Oct 25, 2021 04:50	Date/Time: Oct 25 2021 5:06
Date/Time: OCT 25, 2021	Temperature: °C	Temperature: 14.2 °C	pH Verified: ☐ By:

PARACEL LABORATORIES LTD.

TRUSTED.
RESPONSIVE.
RELIABLE.

300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mike Beaudoin

Client PO: 32968
Project: PE5434
Custody: 132298

Report Date: 23-Nov-2021
Order Date: 18-Nov-2021

Order #: 2147505

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

Paracel ID	Client ID
2147505-01	BH4-21-GW

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Report Date: 23-Nov-2021

Client: Paterson Group Consulting Engineers

Order Date: 18-Nov-2021

Client PO: 32968

Project Description: PE5434

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	21-Nov-21	21-Nov-21
PHC F1	CWS Tier 1 - P&T GC-FID	19-Nov-21	21-Nov-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	22-Nov-21	23-Nov-21

Certificate of Analysis

Report Date: 23-Nov-2021

Client: Paterson Group Consulting Engineers

Order Date: 18-Nov-2021

Client PO: 32968

Project Description: PE5434

	Client ID:	BH4-21-GW	-	-	-
	Sample Date:	18-Nov-21 10:05	-	-	-
	Sample ID:	2147505-01	-	-	-
	MDL/Units	Water	-	-	-
Volatiles					
Benzene	0.5 ug/L	1.9	-	-	-
Ethylbenzene	0.5 ug/L	13.5	-	-	-
Toluene	0.5 ug/L	0.6	-	-	-
m,p-Xylenes	0.5 ug/L	10.0	-	-	-
o-Xylene	0.5 ug/L	0.6	-	-	-
Xylenes, total	0.5 ug/L	10.6	-	-	-
Toluene-d8	Surrogate	92.5%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	346	-	-	-
F2 PHCs (C10-C16)	100 ug/L	1700	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	-	-

Certificate of Analysis

Report Date: 23-Nov-2021

Client: Paterson Group Consulting Engineers

Order Date: 18-Nov-2021

Client PO: 32968

Project Description: PE5434

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%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	*76.3*		*ug/L*		*95.4*	*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	*76.3*		*ug/L*		*95.4*	*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)	1700	25	ug/L	ND	84.9	68-117			
F2 PHCs (C10-C16)	1440	100	ug/L	ND	90.1	60-140			
F3 PHCs (C16-C34)	4050	100	ug/L	ND	103	60-140			
F4 PHCs (C34-C50)	1980	100	ug/L	ND	79.9	60-140			
Volatiles									
Benzene	36.8	0.5	ug/L	ND	92.0	60-130			
Ethylbenzene	31.8	0.5	ug/L	ND	79.5	60-130			
Toluene	42.3	0.5	ug/L	ND	106	60-130			
m,p-Xylenes	90.0	0.5	ug/L	ND	112	60-130			
o-Xylene	32.0	0.5	ug/L	ND	80.0	60-130			
Surrogate: Toluene-d8	*73.6*		*ug/L*		*92.0*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

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.

PARACE LABORATORIES LT

Paracel ID: 2147505

Blvd. 4J8 s.com

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2147505	№ 132298

Client Name: PATERSON	Project Ref: PE5434
Contact Name: MICHEAL BEAUDION	Quote #:
Address: 154 COLONNADE Rd. S, OTTAWA, ON	PO #: 32968
Telephone: 613 226 7381	E-mail: MBEAUDION@PATERSONGROUP.CA

Page __ of __

Turnaround Time
- ☐ 1 day
- ☐ 3 day
- ☐ 2 day
- ☑ Regular

Date Required:

Regulation 153/04
- ☐ Table 1 ☐ Res/Park ☐ Med/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other
- ☑ Table 3
- For RSC: ☐ Yes ☐ No

Other Regulation
- ☐ 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)

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)
1	BH4-21-GW	GW	\	3	Nov. 18/2021	10:05A	✓						
2													
3													
4													
5													
6													
7													
8													
9													
10													

Required Analysis

Comments:

Method of Delivery: PACACEL COURIER

Relinquished By (Sign):	Received By Driver/Depot: M. LOUISE	Received at Lab: BS&m	Verified By: BS&m
Relinquished By (Print): DOMINIC LANDRY	Date/Time: 18/11/21 3:00	Date/Time: Nov 18,21 17:30	Date/Time: Nov 19,2021 10:07
Date/Time: Nov. 18, 2021	Temperature: °C	Temperature: 14.8 °C	pH Verified: ☐ By:

PARACEL LABORATORIES LTD.

TRUSTED.
RESPONSIVE.
RELIABLE.

300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mike Beaudoin

Client PO: 32744
Project: PE5434
Custody: 133093

Report Date: 8-Sep-2021
Order Date: 2-Sep-2021

Order #: 2136528

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

Paracel ID	Client ID
2136528-01	MW3-GW
2136528-02	MW6-GW
2136528-03	MW11-GW

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Report Date: 08-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 2-Sep-2021

Client PO: 32744

Project Description: PE5434

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	4-Sep-21	4-Sep-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	3-Sep-21	3-Sep-21
PHC F1	CWS Tier 1 - P&T GC-FID	3-Sep-21	4-Sep-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	7-Sep-21	7-Sep-21
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	7-Sep-21	7-Sep-21

Certificate of Analysis

Report Date: 08-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 2-Sep-2021

Client PO: 32744

Project Description: PE5434

	Client ID:	MW3-GW	MW6-GW	MW11-GW	-
	Sample Date:	01-Sep-21 10:30	01-Sep-21 11:30	01-Sep-21 16:00	-
	Sample ID:	2136528-01	2136528-02	2136528-03	-
	MDL/Units	Water	Water	Water	-
Metals					
Antimony	0.5 ug/L	-	-	0.7	-
Arsenic	1 ug/L	-	-	2	-
Barium	1 ug/L	-	-	320	-
Beryllium	0.5 ug/L	-	-	<0.5	-
Boron	10 ug/L	-	-	431	-
Cadmium	0.1 ug/L	-	-	<0.1	-
Chromium	1 ug/L	-	-	<1	-
Cobalt	0.5 ug/L	-	-	<0.5	-
Copper	0.5 ug/L	-	-	0.9	-
Lead	0.1 ug/L	-	-	0.2	-
Molybdenum	0.5 ug/L	-	-	5.4	-
Nickel	1 ug/L	-	-	2	-
Selenium	1 ug/L	-	-	<1	-
Silver	0.1 ug/L	-	-	<0.1	-
Sodium	200 ug/L	-	-	3120000	-
Thallium	0.1 ug/L	-	-	<0.1	-
Uranium	0.1 ug/L	-	-	3.5	-
Vanadium	0.5 ug/L	-	-	0.9	-
Zinc	5 ug/L	-	-	7	-
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	97.0%	-	-	-
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	-	-	-
Semi-Volatiles					
Acenaphthene	0.05 ug/L	-	<0.05	-	-
Acenaphthylene	0.05 ug/L	-	<0.05	-	-

Certificate of Analysis

Report Date: 08-Sep-2021

Client: **Paterson Group Consulting Engineers**

Order Date: 2-Sep-2021

Client PO: **32744**

Project Description: PE5434

	Client ID:	MW3-GW	MW6-GW	MW11-GW	-
	Sample Date:	01-Sep-21 10:30	01-Sep-21 11:30	01-Sep-21 16:00	-
	Sample ID:	2136528-01	2136528-02	2136528-03	-
	MDL/Units	Water	Water	Water	-
Anthracene	0.01 ug/L	-	<0.01	-	-
Benzo [a] anthracene	0.01 ug/L	-	<0.01	-	-
Benzo [a] pyrene	0.01 ug/L	-	<0.01	-	-
Benzo [b] fluoranthene	0.05 ug/L	-	<0.05	-	-
Benzo [g,h,i] perylene	0.05 ug/L	-	<0.05	-	-
Benzo [k] fluoranthene	0.05 ug/L	-	<0.05	-	-
Chrysene	0.05 ug/L	-	<0.05	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	-	<0.05	-	-
Fluoranthene	0.01 ug/L	-	<0.01	-	-
Fluorene	0.05 ug/L	-	<0.05	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	-	<0.05	-	-
1-Methylnaphthalene	0.05 ug/L	-	<0.05	-	-
2-Methylnaphthalene	0.05 ug/L	-	<0.05	-	-
Methylnaphthalene (1&2)	0.10 ug/L	-	<0.10	-	-
Naphthalene	0.05 ug/L	-	<0.05	-	-
Phenanthrene	0.05 ug/L	-	<0.05	-	-
Pyrene	0.01 ug/L	-	<0.01	-	-
2-Fluorobiphenyl	Surrogate	-	94.3%	-	-
Terphenyl-d14	Surrogate	-	113%	-	-

Certificate of Analysis

Report Date: 08-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 2-Sep-2021

Client PO: 32744

Project Description: PE5434

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%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						
Metals									
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Lead	ND	0.1	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	*19.7*		*ug/L*		*98.7*	*50-140*			
Surrogate: Terphenyl-d14	*23.2*		*ug/L*		*116*	*50-140*			
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	*89.8*		*ug/L*		*112*	*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	
Metals									
Antimony	ND	0.5	ug/L	0.53			NC	20	
Arsenic	ND	1	ug/L	ND			NC	20	
Barium	22.3	1	ug/L	22.5			0.7	20	
Beryllium	ND	0.5	ug/L	ND			NC	20	
Boron	23	10	ug/L	22			5.4	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	1.10	0.5	ug/L	1.10			0.3	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Molybdenum	1.80	0.5	ug/L	1.79			0.5	20	
Nickel	ND	1	ug/L	ND			NC	20	
Selenium	ND	1	ug/L	ND			NC	20	
Silver	ND	0.1	ug/L	ND			NC	20	
Sodium	16700	200	ug/L	17400			4.0	20	
Thallium	ND	0.1	ug/L	ND			NC	20	
Uranium	ND	0.1	ug/L	ND			NC	20	
Vanadium	ND	0.5	ug/L	ND			NC	20	
Zinc	9	5	ug/L	9			7.9	20	
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	*77.4*		*ug/L*		*96.8*	*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)	1640	25	ug/L	ND	81.9	68-117			
F2 PHCs (C10-C16)	1290	100	ug/L	ND	80.7	60-140			
F3 PHCs (C16-C34)	3410	100	ug/L	ND	87.0	60-140			
F4 PHCs (C34-C50)	2130	100	ug/L	ND	85.8	60-140			
Metals									
Antimony	50.0	0.5	ug/L	0.53	99.0	80-120			
Arsenic	52.5	1	ug/L	ND	104	80-120			
Barium	70.1	1	ug/L	22.5	95.2	80-120			
Beryllium	47.7	0.5	ug/L	ND	95.5	80-120			
Boron	64	10	ug/L	22	84.1	80-120			
Cadmium	51.2	0.1	ug/L	ND	102	80-120			
Chromium	52.5	1	ug/L	ND	104	80-120			
Cobalt	51.1	0.5	ug/L	ND	102	80-120			
Copper	50.0	0.5	ug/L	1.10	97.8	80-120			
Lead	42.3	0.1	ug/L	ND	84.4	80-120			
Molybdenum	49.9	0.5	ug/L	1.79	96.2	80-120			
Nickel	49.9	1	ug/L	ND	98.8	80-120			
Selenium	48.7	1	ug/L	ND	97.0	80-120			
Silver	48.8	0.1	ug/L	ND	97.6	80-120			
Sodium	26400	200	ug/L	17400	90.6	80-120			
Thallium	50.6	0.1	ug/L	ND	101	80-120			
Uranium	49.1	0.1	ug/L	ND	98.2	80-120			
Vanadium	52.9	0.5	ug/L	ND	105	80-120			
Zinc	60	5	ug/L	9	102	80-120			
Semi-Volatiles									
Acenaphthene	4.93	0.05	ug/L	ND	98.5	50-140			
Acenaphthylene	4.49	0.05	ug/L	ND	89.7	50-140			
Anthracene	5.03	0.01	ug/L	ND	101	50-140			
Benzo [a] anthracene	4.49	0.01	ug/L	ND	89.8	50-140			
Benzo [a] pyrene	5.37	0.01	ug/L	ND	107	50-140			
Benzo [b] fluoranthene	5.58	0.05	ug/L	ND	112	50-140			
Benzo [g,h,i] perylene	5.42	0.05	ug/L	ND	108	50-140			
Benzo [k] fluoranthene	4.94	0.05	ug/L	ND	98.7	50-140			
Chrysene	5.12	0.05	ug/L	ND	102	50-140			
Dibenzo [a,h] anthracene	5.41	0.05	ug/L	ND	108	50-140			
Fluoranthene	4.75	0.01	ug/L	ND	95.0	50-140			
Fluorene	4.66	0.05	ug/L	ND	93.2	50-140			
Indeno [1,2,3-cd] pyrene	4.64	0.05	ug/L	ND	92.7	50-140			
1-Methylnaphthalene	4.96	0.05	ug/L	ND	99.2	50-140			
2-Methylnaphthalene	5.30	0.05	ug/L	ND	106	50-140			
Naphthalene	4.97	0.05	ug/L	ND	99.4	50-140			
Phenanthrene	4.54	0.05	ug/L	ND	90.9	50-140			
Pyrene	4.87	0.01	ug/L	ND	97.4	50-140			
Surrogate: 2-Fluorobiphenyl	*20.5*		*ug/L*		*103*	*50-140*			
Surrogate: Terphenyl-d14	*23.2*		*ug/L*		*116*	*50-140*			
Volatiles									
Benzene	38.8	0.5	ug/L	ND	97.1	60-130			
Ethylbenzene	38.8	0.5	ug/L	ND	97.1	60-130			

Certificate of Analysis

Report Date: 08-Sep-2021

Client: Paterson Group Consulting Engineers

Order Date: 2-Sep-2021

Client PO: 32744

Project Description: PE5434

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Toluene	28.9	0.5	ug/L	ND	72.2	60-130			
m,p-Xylenes	81.0	0.5	ug/L	ND	101	60-130			
o-Xylene	31.9	0.5	ug/L	ND	79.8	60-130			
Surrogate: Toluene-d8	*93.4*		*ug/L*		*117*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

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. | TRUSTED. RESPONSIVE. RELIABLE.

Paracel ID: 2136528

Chain Of Custody
(Lab Use Only)
№ 133093

Client Name: PATERSON	Project Ref: PE5434	Page __ of __
Contact Name: MIKE BEAUDOIN	Quote #:	Turnaround Time
Address: 154 COLONNADE Rd. S. OTTAWA, ON.	PO #: 32744	☐ 1 day ☐ 3 day ☐ 2 day ☑ Regular
Telephone: 613 226 7381	E-mail:	Date Required:

☐ REG 153/04 ☐ REG 406/19	Other Regulation	Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)					Required Analysis																
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO																						
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA																						
☑ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm																						
☐ Table ___	Mun: ___																						
For RSC: ☐ Yes ☐ No	☐ Other:																						
Sample ID/Location Name		Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)										
1	MW3-GW	GW	\	3	SEPT 1/21	10:30A	✓																
2	MW6-GW	GW	\	1	↓	11:30A			✓														
3	MW11-GW	GW	\	3	↓	4:00P				✓													
4																							
5																							
6																							
7																							
8																							
9																							
10																							

Comments:

Method of Delivery: PARACEL COURIER

Relinquished By (Sign):	Received By Driver/Depot: A. Jesse	Received at Lab: Sivaleepavan Shimai	Verified By:
Relinquished By (Print): Dominic Landry	Date/Time: 02/09/21 1:14	Date/Time: Sept 2, 2021 @4.35	Date/Time: Sept 2 2021 5:00
Date/Time: SEPT. 2, 2021	Temperature: °C PH.	Temperature: 18.7 °C	pH Verified: ☑ By:

PARACEL LABORATORIES LTD.

TRUSTED.
RESPONSIVE.
RELIABLE.

300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mike Beaudoin

Client PO: 32095
Project: PE5434
Custody: 132413

Report Date: 5-Oct-2021
Order Date: 29-Sep-2021

Order #: 2140459

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

Paracel ID	Client ID
2140459-01	MW3-GW2
2140459-02	MW6-GW2

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis

Report Date: 05-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 29-Sep-2021

Client PO: 32095

Project Description: PE5434

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	30-Sep-21	30-Sep-21
PHC F1	CWS Tier 1 - P&T GC-FID	30-Sep-21	30-Sep-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	4-Oct-21	5-Oct-21
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	4-Oct-21	5-Oct-21

Certificate of Analysis

Report Date: 05-Oct-2021

Client: **Paterson Group Consulting Engineers**

Order Date: 29-Sep-2021

Client PO: **32095**

Project Description: **PE5434**

	Client ID:	MW3-GW2	MW6-GW2	-	-
	Sample Date:	27-Sep-21 09:00	27-Sep-21 09:00	-	-
	Sample ID:	2140459-01	2140459-02	-	-
	MDL/Units	Water	Water	-	-
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	94.7%	-	-	-
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	-	-	-
Semi-Volatiles					
Acenaphthene	0.05 ug/L	-	<0.05	-	-
Acenaphthylene	0.05 ug/L	-	<0.05	-	-
Anthracene	0.01 ug/L	-	<0.01	-	-
Benzo [a] anthracene	0.01 ug/L	-	<0.01	-	-
Benzo [a] pyrene	0.01 ug/L	-	<0.01	-	-
Benzo [b] fluoranthene	0.05 ug/L	-	<0.05	-	-
Benzo [g,h,i] perylene	0.05 ug/L	-	<0.05	-	-
Benzo [k] fluoranthene	0.05 ug/L	-	<0.05	-	-
Chrysene	0.05 ug/L	-	<0.05	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	-	<0.05	-	-
Fluoranthene	0.01 ug/L	-	<0.01	-	-
Fluorene	0.05 ug/L	-	<0.05	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	-	<0.05	-	-
1-Methylnaphthalene	0.05 ug/L	-	0.12	-	-
2-Methylnaphthalene	0.05 ug/L	-	0.05	-	-
Methylnaphthalene (1&2)	0.10 ug/L	-	0.17	-	-
Naphthalene	0.05 ug/L	-	<0.05	-	-
Phenanthrene	0.05 ug/L	-	<0.05	-	-
Pyrene	0.01 ug/L	-	0.03	-	-
2-Fluorobiphenyl	Surrogate	-	85.6%	-	-
Terphenyl-d14	Surrogate	-	109%	-	-

Certificate of Analysis

Report Date: 05-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 29-Sep-2021

Client PO: 32095

Project Description: PE5434

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%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						
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	*17.1*		*ug/L*		*85.6*	*50-140*			
Surrogate: Terphenyl-d14	*23.7*		*ug/L*		*118*	*50-140*			
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	*77.0*		*ug/L*		*96.2*	*50-140*			

Certificate of Analysis

Report Date: 05-Oct-2021

Client: Paterson Group Consulting Engineers

Order Date: 29-Sep-2021

Client PO: 32095

Project Description: PE5434

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	*75.3*		*ug/L*		*94.2*	*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)	1910	25	ug/L	ND	95.7	68-117			
F2 PHCs (C10-C16)	1200	100	ug/L	ND	75.0	60-140			
F3 PHCs (C16-C34)	3190	100	ug/L	ND	81.3	60-140			
F4 PHCs (C34-C50)	2170	100	ug/L	ND	87.7	60-140			
Semi-Volatiles									
Acenaphthene	4.60	0.05	ug/L	ND	92.1	50-140			
Acenaphthylene	3.25	0.05	ug/L	ND	65.1	50-140			
Anthracene	4.00	0.01	ug/L	ND	79.9	50-140			
Benzo [a] anthracene	3.91	0.01	ug/L	ND	78.3	50-140			
Benzo [a] pyrene	3.84	0.01	ug/L	ND	76.7	50-140			
Benzo [b] fluoranthene	5.67	0.05	ug/L	ND	113	50-140			
Benzo [g,h,i] perylene	4.83	0.05	ug/L	ND	96.6	50-140			
Benzo [k] fluoranthene	5.43	0.05	ug/L	ND	109	50-140			
Chrysene	4.65	0.05	ug/L	ND	93.0	50-140			
Dibenzo [a,h] anthracene	5.22	0.05	ug/L	ND	104	50-140			
Fluoranthene	4.13	0.01	ug/L	ND	82.5	50-140			
Fluorene	3.93	0.05	ug/L	ND	78.7	50-140			
Indeno [1,2,3-cd] pyrene	5.05	0.05	ug/L	ND	101	50-140			
1-Methylnaphthalene	4.04	0.05	ug/L	ND	80.7	50-140			
2-Methylnaphthalene	4.41	0.05	ug/L	ND	88.2	50-140			
Naphthalene	4.53	0.05	ug/L	ND	90.6	50-140			
Phenanthrene	3.98	0.05	ug/L	ND	79.6	50-140			
Pyrene	4.22	0.01	ug/L	ND	84.4	50-140			
Surrogate: 2-Fluorobiphenyl	*16.5*		*ug/L*		*82.7*	*50-140*			
Surrogate: Terphenyl-d14	*22.2*		*ug/L*		*111*	*50-140*			
Volatiles									
Benzene	31.6	0.5	ug/L	ND	79.1	60-130			
Ethylbenzene	34.4	0.5	ug/L	ND	86.0	60-130			
Toluene	33.8	0.5	ug/L	ND	84.6	60-130			
m,p-Xylenes	70.4	0.5	ug/L	ND	88.0	60-130			
o-Xylene	35.9	0.5	ug/L	ND	89.8	60-130			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

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 ID: 2140459

PARACEL LABORATORIES LTD.

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
458	№ 132413

Client Name: PATERSON GROUP	Project Ref: PE5434
Contact Name: Mike Beaudoin / Jesse Andrechek	Quote #:
Address: 154 Colonnade Rd, S	PO #: 32095
	E-mail: jandrechek@patersongroup.ca mbeaudoin@ " " "
Telephone: 613-226-7381	

Page 1 of 1

Turnaround Time

☐ 1 day ☐ 3 day

☐ 2 day ☒ Regular

Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☒ Ind/Comm ☒ Coarse	☐ CCME ☐ MISA
☐ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☒ Table 7	Mun:
For RSC: ☐ Yes ☐ No	☐ Other:

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

Required Analysis

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)						
1	MW3-GW2	GW	/	3	27-SEP-21	/	X												
2	MW6-GW2	GW	/	1	27-SEP-21	/			X										
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Comments:

Method of Delivery: PARACEL COURIER

Relinquished By (Sign): [signature]	Received By Driver/Depot: M. DEOUSE	Received at Lab: Sivneepom Dohmai	Verified By: [signature]
Relinquished By (Print): Jesse Andrechek	Date/Time: 29/09/21 1:56	Date/Time: Sep 29, 2021 04.00	Date/Time: Sept 29 2021 5:55
Date/Time: 29-SEP-21 12PM	Temperature: °C PH	Temperature: 15.8 °C	pH Verified: ☐ By: