

December 14, 2018
File: PE4194-LET.03

**CHSS International Investments and
Management Inc.**

310-1827 Woodward Drive
Ottawa, Ontario
K2C 0P9

Attention: **Mr. Roberto Compagna**

Subject: **Response to Site Plan Comments**
City File No. D07-12-17-0173 and D02-02-17-0126
Re: Phase II ESA
443 and 447 Kent Street and 423-425 McLeod Street
Ottawa, Ontario

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
Archaeological Services

www.patersongroup.ca

Dear Sir,

Paterson Group (Paterson) have prepared this letter in response to the Site Plan Comments issued by the City of Ottawa (City) with regard to the proposed development of 443 and 447 Kent Street and 423-425 McLeod Street. Specifically, the comments addressed herein pertain to the comments from the Phase II Environmental Site Assessment (Comments 1-3).

Phase II ESA Comments

1. Additional boreholes have not been completed for the subject site at this time, as discussed below.
2. The attached test hole location plan has been updated to include two additional sampling events for BH3 since issuance of the Phase II ESA. The concentration of Tetrachloroethylene has dropped significantly since the previous testing in March 2018 and is in compliance with the MECP Table 3 Fine-Grained Standards, but remains marginally in excess of the MECP Table 3 Coarse-Grained Standards. No other VOC parameters were identified during the additional testing with the exception of chloroform, which is in compliance with the applicable MECP Table 3

Standards. Based on the most recent VOC results from BH3, the original test results are not considered to be representative of the actual groundwater quality.

Additional testing of BH1 and BH2 was also completed in conjunction with the November 22, 2018 groundwater monitoring. The groundwater samples from BH1 and BH2 did not contain any VOC parameters and the results are in compliance with the applicable MECP Table 3 Standards.

For the original Phase II ESA, Paterson selected the MECP Table 3 Coarse Grained Standards for the subject site since grain size analysis was not completed, however a review of the soil profile data indicates that fine grained standards can be utilized for the subject site, as the silty clay deposit, which is a fine grained material, is the predominant deposit. Using fine grained, the groundwater is in compliance with the applicable MECP Table 3 Standards.

The supplemental groundwater monitoring has also provided new information with respect to the groundwater flow direction. Based on the recent groundwater depth measurements, the groundwater flow direction is towards the west, which suggest that the source of contamination is not the site.

3. Logistically, it is not possible to place additional boreholes at the property corners or centrally on the 423 and 425 McLeod Street property. More importantly, it is our opinion that additional boreholes are not required based on the more up to date groundwater test results and flow direction. The groundwater test results all comply with the MECP fine grained standards which are considered to be suitable for the subject property. Furthermore, the groundwater flow direction indicates that the contamination is from an offsite source to the east. Based on this information, rather than placing additional boreholes where it may be possible to do so, it is our recommendation that the groundwater quality in BH3 continue to be monitored, just prior to construction commencing and periodically throughout the process. Any groundwater that does enter the construction excavation, the footprint of which will not cover majority of the McLeod Street property, should be monitored for quality purposes.

Mr. Roberto Campagna
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We trust this information satisfies your requirements.

Paterson Group Inc.



Michael Beaudoin, P.Eng.



Mark S. D'Arcy, P.Eng.



Report Distribution:

- ☐ CHSS International Investments and Management Inc.

Attachments:

- ☐ Laboratory Certificates of Analysis
- ☐ Drawing PE4194 – 3 - Test Hole Location Plan

Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 23465
Project: PE4194
Custody: 115619

Report Date: 21-Feb-2018
Order Date: 14-Feb-2018

Order #: 1807312

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

Paracel ID	Client ID
1807312-01	BH1-SS6
1807312-02	BH2-SS6

Approved By:



Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23465

Report Date: 21-Feb-2018
Order Date: 14-Feb-2018
Project Description: PE4194

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
PHC F1	CWS Tier 1 - P&T GC-FID	15-Feb-18	17-Feb-18
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	15-Feb-18	17-Feb-18
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	15-Feb-18	21-Feb-18
Solids, %	Gravimetric, calculation	16-Feb-18	16-Feb-18

Certificate of Analysis
 Client: Paterson Group Consulting Engineers
 Client PO: 23465

Report Date: 21-Feb-2018

Order Date: 14-Feb-2018

Project Description: PE4194

Client ID:	BH1-SS6	BH2-SS6	-	-
Sample Date:	13-Feb-18	13-Feb-18	-	-
Sample ID:	1807312-01	1807312-02	-	-
MDL/Units	Soil	Soil	-	-

Physical Characteristics

% Solids	0.1 % by Wt.	57.9	56.3	-	-
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Volatiles

Acetone	0.50 ug/g dry	<0.50	<0.50	-	-
Benzene	0.02 ug/g dry	<0.02	<0.02	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Bromoform	0.05 ug/g dry	<0.05	<0.05	-	-
Bromomethane	0.05 ug/g dry	<0.05	<0.05	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	-	-
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Chloroform	0.05 ug/g dry	<0.05	<0.05	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Ethylene dibromide (dibromoethane)	0.05 ug/g dry	<0.05	<0.05	-	-
Hexane	0.05 ug/g dry	<0.05	<0.05	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	-	-
Styrene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-

Certificate of Analysis
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Report Date: 21-Feb-2018

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Project Description: PE4194

	Client ID:	BH1-SS6	BH2-SS6	-	-
	Sample Date:	13-Feb-18	13-Feb-18	-	-
	Sample ID:	1807312-01	1807312-02	-	-
	MDL/Units	Soil	Soil	-	-
Toluene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	-	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	-	-
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	-	-
4-Bromofluorobenzene	Surrogate	106%	106%	-	-
Dibromofluoromethane	Surrogate	97.3%	81.9%	-	-
Toluene-d8	Surrogate	103%	113%	-	-

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	-	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	-	-
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	-	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	-	-

Certificate of Analysis

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Client PO: 23465

Project Description: PE4194

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane)	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	3.10		ug/g		96.9	50-140			
Surrogate: Dibromofluoromethane	2.78		ug/g		86.8	50-140			
Surrogate: Toluene-d8	2.35		ug/g		73.5	50-140			

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Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND				40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND				30	
F3 PHCs (C16-C34)	ND	8	ug/g dry	ND				30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND				30	
Physical Characteristics									
% Solids	83.7	0.1	% by Wt.	84.5			0.9	25	
Volatiles									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	
Bromodichloromethane	ND	0.05	ug/g dry	ND				50	
Bromoform	ND	0.05	ug/g dry	ND				50	
Bromomethane	ND	0.05	ug/g dry	ND				50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND				50	
Chlorobenzene	ND	0.05	ug/g dry	ND				50	
Chloroform	ND	0.05	ug/g dry	ND				50	
Dibromochloromethane	ND	0.05	ug/g dry	ND				50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND				50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Ethylene dibromide (dibromoethane)	ND	0.05	ug/g dry	ND				50	
Hexane	ND	0.05	ug/g dry	ND				50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND				50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND				50	
Methylene Chloride	ND	0.05	ug/g dry	ND				50	
Styrene	ND	0.05	ug/g dry	ND				50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
1,1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND				50	
Trichloroethylene	ND	0.05	ug/g dry	ND				50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND				50	
Vinyl chloride	ND	0.02	ug/g dry	ND				50	
m,p-Xylenes	ND	0.05	ug/g dry	ND				50	
o-Xylene	ND	0.05	ug/g dry	ND				50	
Surrogate: 4-Bromofluorobenzene	3.17		ug/g dry		86.4	50-140			
Surrogate: Dibromofluoromethane	2.52		ug/g dry		68.9	50-140			
Surrogate: Toluene-d8	3.61		ug/g dry		98.5	50-140			

Certificate of Analysis
 Client: Paterson Group Consulting Engineers
 Client PO: 23465

Report Date: 21-Feb-2018
 Order Date: 14-Feb-2018
 Project Description: PE4194

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	203	7	ug/g		101	80-120			
F2 PHCs (C10-C16)	105	4	ug/g	ND	97.7	60-140			
F3 PHCs (C16-C34)	209	8	ug/g	ND	94.4	60-140			
F4 PHCs (C34-C50)	181	6	ug/g	ND	123	60-140			
Volatiles									
Acetone	7.02	0.50	ug/g		70.2	50-140			
Benzene	2.75	0.02	ug/g		68.7	60-130			
Bromodichloromethane	2.58	0.05	ug/g		64.5	60-130			
Bromoform	3.25	0.05	ug/g		81.3	60-130			
Bromomethane	2.47	0.05	ug/g		61.8	50-140			
Carbon Tetrachloride	2.51	0.05	ug/g		62.9	60-130			
Chlorobenzene	4.01	0.05	ug/g		100	60-130			
Chloroform	2.82	0.05	ug/g		70.5	60-130			
Dibromochloromethane	4.15	0.05	ug/g		104	60-130			
Dichlorodifluoromethane	2.50	0.05	ug/g		62.5	50-140			
1,2-Dichlorobenzene	3.80	0.05	ug/g		95.0	60-130			
1,3-Dichlorobenzene	3.88	0.05	ug/g		97.0	60-130			
1,4-Dichlorobenzene	3.90	0.05	ug/g		97.5	60-130			
1,1-Dichloroethane	2.59	0.05	ug/g		64.7	60-130			
1,2-Dichloroethane	2.91	0.05	ug/g		72.7	60-130			
1,1-Dichloroethylene	3.20	0.05	ug/g		80.1	60-130			
cis-1,2-Dichloroethylene	2.50	0.05	ug/g		62.6	60-130			
trans-1,2-Dichloroethylene	3.17	0.05	ug/g		79.3	60-130			
1,2-Dichloropropane	2.67	0.05	ug/g		66.7	60-130			
cis-1,3-Dichloropropylene	2.74	0.05	ug/g		68.6	60-130			
trans-1,3-Dichloropropylene	3.56	0.05	ug/g		89.1	60-130			
Ethylbenzene	3.85	0.05	ug/g		96.2	60-130			
Ethylene dibromide (dibromoethane)	3.62	0.05	ug/g		90.5	60-130			
Hexane	2.42	0.05	ug/g		60.5	60-130			
Methyl Ethyl Ketone (2-Butanone)	7.77	0.50	ug/g		77.7	50-140			
Methyl Isobutyl Ketone	9.51	0.50	ug/g		95.1	50-140			
Methyl tert-butyl ether	5.42	0.05	ug/g		54.2	50-140			
Methylene Chloride	2.75	0.05	ug/g		68.8	60-130			
Styrene	3.65	0.05	ug/g		91.3	60-130			
1,1,1,2-Tetrachloroethane	3.60	0.05	ug/g		89.9	60-130			
1,1,2,2-Tetrachloroethane	3.40	0.05	ug/g		85.1	60-130			
Tetrachloroethylene	4.15	0.05	ug/g		104	60-130			
Toluene	3.79	0.05	ug/g		94.9	60-130			
1,1,1-Trichloroethane	2.75	0.05	ug/g		68.7	60-130			
1,1,2-Trichloroethane	2.69	0.05	ug/g		67.3	60-130			
Trichloroethylene	2.68	0.05	ug/g		67.1	60-130			
Trichlorofluoromethane	3.46	0.05	ug/g		86.5	50-140			
Vinyl chloride	2.82	0.02	ug/g		70.5	50-140			
m,p-Xylenes	7.98	0.05	ug/g		99.7	60-130			
o-Xylene	4.16	0.05	ug/g		104	60-130			
Surrogate: 4-Bromofluorobenzene	2.20		ug/g		68.7	50-140			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23465

Report Date: 21-Feb-2018
Order Date: 14-Feb-2018
Project Description: PE4194

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.

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.

Paracel ID: 1807312



LABORATORIES LTD.

T
R
R.

Head Office
30-2319 St. Laurent Blvd.
Ottawa, Ontario K1G 4J8
1-800-749-1947
info@paracellabs.com

Chain of Custody
(Lab Use Only)

No 115619

Page 1 of 1

Client Name: <u>Paterson Group</u>	Project Reference: <u>PE4194</u>	Turnaround Time: ☐ 1 Day ☐ 3 Day ☐ 2 Day ☒ Regular Date Required: _____
Contact Name: <u>Mark D'Arcy</u>	Quote # _____	
Address: <u>154 Colonnade Rd 5</u> <u>Ottawa, ON</u>	PO # <u>23465</u>	
Telephone: <u>613-226-7381</u>	Email Address: <u>mdarcy@patersongroup.ca</u>	

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☐ Other: _____

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

Required Analyses

Paracel Order Number:

1807312

Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken		PHCs FT-F4-F5	VOCs	PAHs	Metals by IC-MS	Hg	CrVI	B (HWS)						
				Date	Time													
1 BH1-SS6	S		2	FEB 13/18	PM	✓	✓						120 vial.					
2 BH2-SS6	S		2	↓	PM	✓	✓						"					
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Method of Delivery:

Paracel

Comments:

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot: <u>[Signature]</u>	Received at Lab: <u>[Signature]</u>	Verified By: <u>[Signature]</u>
Relinquished By (Print): <u>Greg V</u>	Date/Time: <u>14/02/18 3:10 PM</u>	Date/Time: <u>02/11/18 9:13 PM</u>	Date/Time: <u>02/11/18 8:50 PM</u>
Date/Time:	Temperature: <u>7°C</u>	Temperature: <u>13°C</u>	pH Verified [] By: _____

Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 22059
Project: PE4194
Custody: 112432

Report Date: 26-Feb-2018
Order Date: 20-Feb-2018

Order #: 1808110

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

Paracel ID
1808110-01

Client ID
BH3-SS8

Approved By:



Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 22059

Report Date: 26-Feb-2018
Order Date: 20-Feb-2018
Project Description: PE4194

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	21-Feb-18	23-Feb-18
Solids, %	Gravimetric, calculation	22-Feb-18	22-Feb-18

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 22059

Report Date: 26-Feb-2018

Order Date: 20-Feb-2018

Project Description: PE4194

Client ID:	BH3-SS8	-	-	-
Sample Date:	16-Feb-18	-	-	-
Sample ID:	1808110-01	-	-	-
MDL/Units	Soil	-	-	-

Physical Characteristics

% Solids	0.1 % by Wt.	71.4	-	-	-
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Volatiles

Acetone	0.50 ug/g dry	<0.50	-	-	-
Benzene	0.02 ug/g dry	<0.02	-	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	-	-	-
Bromoform	0.05 ug/g dry	<0.05	-	-	-
Bromomethane	0.05 ug/g dry	<0.05	-	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	-	-	-
Chlorobenzene	0.05 ug/g dry	<0.05	-	-	-
Chloroform	0.05 ug/g dry	<0.05	-	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	-	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	-	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	-	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	-	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	-	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	-	-	-
Ethylene dibromide (dibromoethane)	0.05 ug/g dry	<0.05	-	-	-
Hexane	0.05 ug/g dry	<0.05	-	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	-	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	-	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	-	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	-	-	-
Styrene	0.05 ug/g dry	<0.05	-	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	-	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	-	-	-

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 22059

Report Date: 26-Feb-2018

Order Date: 20-Feb-2018

Project Description: PE4194

	Client ID:	BH3-SS8	-	-	-
	Sample Date:	16-Feb-18	-	-	-
	Sample ID:	1808110-01	-	-	-
	MDL/Units	Soil	-	-	-
Toluene	0.05 ug/g dry	<0.05	-	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	-	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	-	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	-	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	-	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	-	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
4-Bromofluorobenzene	Surrogate	106%	-	-	-
Dibromofluoromethane	Surrogate	102%	-	-	-
Toluene-d8	Surrogate	114%	-	-	-

Certificate of Analysis
 Client: Paterson Group Consulting Engineers
 Client PO: 22059

Report Date: 26-Feb-2018
 Order Date: 20-Feb-2018
 Project Description: PE4194

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane)	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	3.00		ug/g		93.7	50-140			
Surrogate: Dibromofluoromethane	3.52		ug/g		110	50-140			
Surrogate: Toluene-d8	2.95		ug/g		92.3	50-140			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 22059

Report Date: 26-Feb-2018
Order Date: 20-Feb-2018
Project Description: PE4194

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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Physical Characteristics

% Solids	79.3	0.1	% by Wt.	80.7			1.8	25	
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Certificate of Analysis
 Client: Paterson Group Consulting Engineers
 Client PO: 22059

Report Date: 26-Feb-2018

Order Date: 20-Feb-2018

Project Description: PE4194

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	3.27	0.50	ug/g		65.4	50-140			
Benzene	1.61	0.02	ug/g		80.4	60-130			
Bromodichloromethane	1.55	0.05	ug/g		77.4	60-130			
Bromoform	1.92	0.05	ug/g		95.8	60-130			
Bromomethane	1.45	0.05	ug/g		72.4	50-140			
Carbon Tetrachloride	1.67	0.05	ug/g		83.3	60-130			
Chlorobenzene	2.16	0.05	ug/g		108	60-130			
Chloroform	1.66	0.05	ug/g		82.8	60-130			
Dibromochloromethane	2.30	0.05	ug/g		115	60-130			
Dichlorodifluoromethane	1.70	0.05	ug/g		84.8	50-140			
1,2-Dichlorobenzene	1.89	0.05	ug/g		94.4	60-130			
1,3-Dichlorobenzene	2.08	0.05	ug/g		104	60-130			
1,4-Dichlorobenzene	1.99	0.05	ug/g		99.7	60-130			
1,1-Dichloroethane	1.55	0.05	ug/g		77.4	60-130			
1,2-Dichloroethane	1.68	0.05	ug/g		84.2	60-130			
1,1-Dichloroethylene	1.85	0.05	ug/g		92.7	60-130			
cis-1,2-Dichloroethylene	1.55	0.05	ug/g		77.6	60-130			
trans-1,2-Dichloroethylene	1.82	0.05	ug/g		90.9	60-130			
1,2-Dichloropropane	1.57	0.05	ug/g		78.6	60-130			
cis-1,3-Dichloropropylene	1.60	0.05	ug/g		80.1	60-130			
trans-1,3-Dichloropropylene	2.49	0.05	ug/g		125	60-130			
Ethylbenzene	2.14	0.05	ug/g		107	60-130			
Hexane	1.73	0.05	ug/g		86.4	60-130			
Methyl Ethyl Ketone (2-Butanone)	3.37	0.50	ug/g		67.5	50-140			
Methyl Isobutyl Ketone	3.09	0.50	ug/g		61.7	50-140			
Methyl tert-butyl ether	3.52	0.05	ug/g		70.5	50-140			
Methylene Chloride	1.49	0.05	ug/g		74.6	60-130			
Styrene	2.06	0.05	ug/g		103	60-130			
1,1,1,2-Tetrachloroethane	1.98	0.05	ug/g		98.8	60-130			
1,1,2,2-Tetrachloroethane	2.27	0.05	ug/g		114	60-130			
Tetrachloroethylene	2.31	0.05	ug/g		116	60-130			
Toluene	2.06	0.05	ug/g		103	60-130			
1,1,1-Trichloroethane	1.69	0.05	ug/g		84.3	60-130			
1,1,2-Trichloroethane	1.57	0.05	ug/g		78.3	60-130			
Trichloroethylene	1.55	0.05	ug/g		77.5	60-130			
Trichlorofluoromethane	1.86	0.05	ug/g		92.9	50-140			
Vinyl chloride	1.48	0.02	ug/g		74.2	50-140			
m,p-Xylenes	4.35	0.05	ug/g		109	60-130			
o-Xylene	2.23	0.05	ug/g		111	60-130			
Surrogate: 4-Bromofluorobenzene	2.48		ug/g		77.5	50-140			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 22059

Report Date: 26-Feb-2018
Order Date: 20-Feb-2018
Project Description: PE4194

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.



Client Name: <u>Peterson Group</u>	Project Reference: <u>PE 4194</u>	Turnaround Time: ☐ 1 Day ☐ 3 Day ☐ 2 Day ☒ Regular Date Required: _____
Contact Name: <u>Mark D'Arcy</u>	Quote #	
Address:	PO # <u>22059</u>	
Telephone: <u>226-7381</u>	Email Address:	

Criteria: ☒ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☐ Other: _____

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

Required Analyses

Parcel Order Number:		Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)						
Sample ID/Location Name					Date	Time													
1	BH 3-SS8	S	*	2	Feb 16/18	2pm		✓											250 ml.
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Comments: _____ Method of Delivery: Paracel.

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot: <u>[Signature]</u>	Received at Lab: <u>Rachel Subject</u>	Verified By: <u>[Signature]</u>
Relinquished By (Print): <u>Mark Moroz</u>	Date/Time: <u>20/02/18 3:30</u>	Date/Time: <u>Feb 20/18</u>	Date/Time: <u>Feb 20/18 4:55 pm</u>
Date/Time: <u>2018-02-20</u>	Temperature: <u>7.1</u> °C	Temperature: <u>15.8</u> °C	pH Verified By: <u>4:45</u>

Certificate of Analysis

Paterson Group Consulting Engineers

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

Client PO: 23533
Project: PE4194
Custody: 33453

Report Date: 5-Mar-2018
Order Date: 1-Mar-2018

Order #: 1809403

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

Paracel ID
1809403-01

Client ID
BH1-GW1

Approved By:



Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23533

Report Date: 05-Mar-2018
Order Date: 1-Mar-2018
Project Description: PE4194

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
PHC F1	CWS Tier 1 - P&T GC-FID	2-Mar-18	3-Mar-18
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	2-Mar-18	5-Mar-18
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	2-Mar-18	3-Mar-18

Certificate of Analysis
 Client: Paterson Group Consulting Engineers
 Client PO: 23533

Report Date: 05-Mar-2018

Order Date: 1-Mar-2018

Project Description: PE4194

Client ID:	BH1-GW1	-	-	-
Sample Date:	22-Feb-18	-	-	-
Sample ID:	1809403-01	-	-	-
MDL/Units	Water	-	-	-

Volatiles

Acetone	5.0 ug/L	<5.0 [1]	-	-	-
Benzene	0.5 ug/L	<0.5 [1]	-	-	-
Bromodichloromethane	0.5 ug/L	<0.5 [1]	-	-	-
Bromoform	0.5 ug/L	<0.5 [1]	-	-	-
Bromomethane	0.5 ug/L	<0.5 [1]	-	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2 [1]	-	-	-
Chlorobenzene	0.5 ug/L	<0.5 [1]	-	-	-
Chloroform	0.5 ug/L	<0.5 [1]	-	-	-
Dibromochloromethane	0.5 ug/L	<0.5 [1]	-	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0 [1]	-	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5 [1]	-	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5 [1]	-	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5 [1]	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5 [1]	-	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5 [1]	-	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5 [1]	-	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5 [1]	-	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5 [1]	-	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5 [1]	-	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5 [1]	-	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5 [1]	-	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5 [1]	-	-	-
Ethylbenzene	0.5 ug/L	<0.5 [1]	-	-	-
Ethylene dibromide (dibromoethane)	0.2 ug/L	<0.2 [1]	-	-	-
Hexane	1.0 ug/L	<1.0 [1]	-	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0 [1]	-	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0 [1]	-	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0 [1]	-	-	-
Methylene Chloride	5.0 ug/L	<5.0 [1]	-	-	-
Styrene	0.5 ug/L	<0.5 [1]	-	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5 [1]	-	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5 [1]	-	-	-
Tetrachloroethylene	0.5 ug/L	<0.5 [1]	-	-	-
Toluene	0.5 ug/L	<0.5 [1]	-	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5 [1]	-	-	-

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23533

Report Date: 05-Mar-2018

Order Date: 1-Mar-2018

Project Description: PE4194

	Client ID:	BH1-GW1	-	-	-
	Sample Date:	22-Feb-18	-	-	-
	Sample ID:	1809403-01	-	-	-
	MDL/Units	Water	-	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5 [1]	-	-	-
Trichloroethylene	0.5 ug/L	<0.5 [1]	-	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0 [1]	-	-	-
Vinyl chloride	0.5 ug/L	<0.5 [1]	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5 [1]	-	-	-
o-Xylene	0.5 ug/L	<0.5 [1]	-	-	-
Xylenes, total	0.5 ug/L	<0.5 [1]	-	-	-
4-Bromofluorobenzene	Surrogate	90.0% [1]	-	-	-
Dibromofluoromethane	Surrogate	101% [1]	-	-	-
Toluene-d8	Surrogate	100% [1]	-	-	-

Hydrocarbons

F1 PHCs (C6-C10)	25 ug/L	<25 [1]	-	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	-	-

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23533

Report Date: 05-Mar-2018

Order Date: 1-Mar-2018

Project Description: PE4194

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)	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	72.4		ug/L		90.5	50-140			
Surrogate: Dibromofluoromethane	81.0		ug/L		101	50-140			
Surrogate: Toluene-d8	82.8		ug/L		104	50-140			

Certificate of Analysis
 Client: Paterson Group Consulting Engineers
 Client PO: 23533

Report Date: 05-Mar-2018

Order Date: 1-Mar-2018

Project Description: PE4194

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				30	
Volatiles									
Acetone	ND	5.0	ug/L	ND				30	
Benzene	ND	0.5	ug/L	ND				30	
Bromodichloromethane	4.52	0.5	ug/L	4.51			0.2	30	
Bromoform	ND	0.5	ug/L	ND				30	
Bromomethane	ND	0.5	ug/L	ND				30	
Carbon Tetrachloride	ND	0.2	ug/L	ND				30	
Chlorobenzene	ND	0.5	ug/L	ND				30	
Chloroform	5.51	0.5	ug/L	5.17			6.4	30	
Dibromochloromethane	3.17	0.5	ug/L	4.03			23.9	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND				30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
1,2-Dichloroethane	ND	0.5	ug/L	ND				30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND				30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
1,2-Dichloropropane	ND	0.5	ug/L	ND				30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Ethylene dibromide (dibromoethane)	ND	0.2	ug/L	ND				30	
Hexane	ND	1.0	ug/L	ND				30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND				30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND				30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Styrene	ND	0.5	ug/L	ND				30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
Tetrachloroethylene	ND	0.5	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND				30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND				30	
Trichloroethylene	ND	0.5	ug/L	ND				30	
Trichlorofluoromethane	ND	1.0	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: 4-Bromofluorobenzene	70.9		ug/L		88.6	50-140			
Surrogate: Dibromofluoromethane	82.2		ug/L		103	50-140			
Surrogate: Toluene-d8	81.9		ug/L		102	50-140			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23533

Report Date: 05-Mar-2018

Order Date: 1-Mar-2018

Project Description: PE4194

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1830	25	ug/L		91.6	68-117			
F2 PHCs (C10-C16)	1770	100	ug/L		98.5	60-140			
F3 PHCs (C16-C34)	3460	100	ug/L		93.0	60-140			
F4 PHCs (C34-C50)	2520	100	ug/L		101	60-140			
Volatiles									
Acetone	110	5.0	ug/L		110	50-140			
Benzene	35.7	0.5	ug/L		89.3	60-130			
Bromodichloromethane	39.4	0.5	ug/L		98.5	60-130			
Bromoform	37.7	0.5	ug/L		94.2	60-130			
Bromomethane	33.6	0.5	ug/L		84.0	50-140			
Carbon Tetrachloride	41.2	0.2	ug/L		103	60-130			
Chlorobenzene	33.8	0.5	ug/L		84.4	60-130			
Chloroform	37.8	0.5	ug/L		94.5	60-130			
Dibromochloromethane	38.8	0.5	ug/L		97.0	60-130			
Dichlorodifluoromethane	31.6	1.0	ug/L		79.0	50-140			
1,2-Dichlorobenzene	28.4	0.5	ug/L		71.1	60-130			
1,3-Dichlorobenzene	28.6	0.5	ug/L		71.6	60-130			
1,4-Dichlorobenzene	28.9	0.5	ug/L		72.3	60-130			
1,1-Dichloroethane	41.8	0.5	ug/L		104	60-130			
1,2-Dichloroethane	40.6	0.5	ug/L		101	60-130			
1,1-Dichloroethylene	36.2	0.5	ug/L		90.6	60-130			
cis-1,2-Dichloroethylene	32.2	0.5	ug/L		80.6	60-130			
trans-1,2-Dichloroethylene	38.8	0.5	ug/L		97.1	60-130			
1,2-Dichloropropane	38.8	0.5	ug/L		97.0	60-130			
cis-1,3-Dichloropropylene	36.5	0.5	ug/L		91.2	60-130			
trans-1,3-Dichloropropylene	46.0	0.5	ug/L		115	60-130			
Ethylbenzene	34.2	0.5	ug/L		85.5	60-130			
Ethylene dibromide (dibromoethane)	34.6	0.2	ug/L		86.6	60-130			
Hexane	33.2	1.0	ug/L		83.0	60-130			
Methyl Ethyl Ketone (2-Butanone)	112	5.0	ug/L		112	50-140			
Methyl Isobutyl Ketone	113	5.0	ug/L		113	50-140			
Methyl tert-butyl ether	76.0	2.0	ug/L		76.0	50-140			
Methylene Chloride	36.8	5.0	ug/L		92.1	60-130			
Styrene	38.9	0.5	ug/L		97.3	60-130			
1,1,1,2-Tetrachloroethane	41.1	0.5	ug/L		103	60-130			
1,1,2,2-Tetrachloroethane	34.8	0.5	ug/L		87.1	60-130			
Tetrachloroethylene	29.3	0.5	ug/L		73.2	60-130			
Toluene	34.6	0.5	ug/L		86.4	60-130			
1,1,1-Trichloroethane	34.6	0.5	ug/L		86.4	60-130			
1,1,2-Trichloroethane	37.5	0.5	ug/L		93.8	60-130			
Trichloroethylene	35.0	0.5	ug/L		87.4	60-130			
Trichlorofluoromethane	36.3	1.0	ug/L		90.8	60-130			
Vinyl chloride	32.5	0.5	ug/L		81.3	50-140			
m,p-Xylenes	70.6	0.5	ug/L		88.2	60-130			
o-Xylene	37.2	0.5	ug/L		93.0	60-130			
Surrogate: 4-Bromofluorobenzene	66.3		ug/L		82.9	50-140			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23533

Report Date: 05-Mar-2018
Order Date: 1-Mar-2018
Project Description: PE4194

Qualifier Notes:

Sample Qualifiers :

1 : Sample decanted prior to analysis due to sediments.

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.

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.



Client Name: PATERSON	Project Reference: PE4194	Turnaround Time: ☐ 1 Day ☐ 3 Day ☒ 2 Day ☒ Regular Date Required: _____
Contact Name: MIKE BEAUDOIN	Quote #	
Address: 154 Colonnade Rd	PO # 23533	
Telephone: 613-226-7381	Email Address: mbeaudoin@paterisongroup.ca	

Criteria: ☒ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☐ Other: _____

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

Required Analyses

Parcel Order Number:		Matrix	Air Volume	# of Containers	Sample Taken		pH	5-ppm	C/1000																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		</
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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 23521
Project: PE4194
Custody: 115546

Report Date: 1-Mar-2018
Order Date: 23-Feb-2018

Order #: 1808494

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

Paracel ID	Client ID
1808494-01	BH2-GW1
1808494-02	BH3-GW1

Approved By:



Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23521

Report Date: 01-Mar-2018
Order Date: 23-Feb-2018
Project Description: PE4194

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
PHC F1	CWS Tier 1 - P&T GC-FID	23-Feb-18	1-Mar-18
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	27-Feb-18	1-Mar-18
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	23-Feb-18	1-Mar-18

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23521

Report Date: 01-Mar-2018

Order Date: 23-Feb-2018

Project Description: PE4194

Client ID:	BH2-GW1	BH3-GW1	-	-
Sample Date:	22-Feb-18	22-Feb-18	-	-
Sample ID:	1808494-01	1808494-02	-	-
MDL/Units	Water	Water	-	-

Volatiles

Acetone	5.0 ug/L	<5.0	<250 [1]	-	-
Benzene	0.5 ug/L	<0.5	<25.0 [1]	-	-
Bromodichloromethane	0.5 ug/L	<0.5	<25.0 [1]	-	-
Bromoform	0.5 ug/L	<0.5	<25.0 [1]	-	-
Bromomethane	0.5 ug/L	<0.5	<25.0 [1]	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<10.0 [1]	-	-
Chlorobenzene	0.5 ug/L	<0.5	<25.0 [1]	-	-
Chloroform	0.5 ug/L	<0.5	<25.0 [1]	-	-
Dibromochloromethane	0.5 ug/L	<0.5	<25.0 [1]	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<50.0 [1]	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<25.0 [1]	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<25.0 [1]	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<25.0 [1]	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<25.0 [1]	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<25.0 [1]	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<25.0 [1]	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<25.0 [1]	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<25.0 [1]	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<25.0 [1]	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<25.0 [1]	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<25.0 [1]	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<25.0 [1]	-	-
Ethylbenzene	0.5 ug/L	<0.5	<25.0 [1]	-	-
Ethylene dibromide (dibromoethane)	0.2 ug/L	<0.2	<10.0 [1]	-	-
Hexane	1.0 ug/L	<1.0	<50.0 [1]	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<250 [1]	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<250 [1]	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<100 [1]	-	-
Methylene Chloride	5.0 ug/L	<5.0	<250 [1]	-	-
Styrene	0.5 ug/L	<0.5	<25.0 [1]	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<25.0 [1]	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<25.0 [1]	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	1150	-	-
Toluene	0.5 ug/L	<0.5	<25.0 [1]	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<25.0 [1]	-	-

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23521

Report Date: 01-Mar-2018

Order Date: 23-Feb-2018

Project Description: PE4194

	Client ID:	BH2-GW1	BH3-GW1	-	-
	Sample Date:	22-Feb-18	22-Feb-18	-	-
	Sample ID:	1808494-01	1808494-02	-	-
	MDL/Units	Water	Water	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<25.0 [1]	-	-
Trichloroethylene	0.5 ug/L	<0.5	<25.0 [1]	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<50.0 [1]	-	-
Vinyl chloride	0.5 ug/L	<0.5	<25.0 [1]	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<25.0 [1]	-	-
o-Xylene	0.5 ug/L	<0.5	<25.0 [1]	-	-
Xylenes, total	0.5 ug/L	<0.5	<25.0 [1]	-	-
4-Bromofluorobenzene	Surrogate	96.7%	96.2%	-	-
Dibromofluoromethane	Surrogate	107%	112%	-	-
Toluene-d8	Surrogate	108%	109%	-	-

Hydrocarbons

F1 PHCs (C6-C10)	25 ug/L	<25	<1250 [1]	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	-	-

Certificate of Analysis

Report Date: 01-Mar-2018

Client: Paterson Group Consulting Engineers

Order Date: 23-Feb-2018

Client PO: 23521

Project Description: PE4194

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)	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	36.0		ug/L		112	50-140			
Surrogate: Dibromofluoromethane	28.7		ug/L		89.8	50-140			
Surrogate: Toluene-d8	36.4		ug/L		114	50-140			

Certificate of Analysis
 Client: Paterson Group Consulting Engineers
 Client PO: 23521

Report Date: 01-Mar-2018
 Order Date: 23-Feb-2018
 Project Description: PE4194

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				30	
Volatiles									
Acetone	ND	5.0	ug/L	ND				30	
Benzene	ND	0.5	ug/L	ND				30	
Bromodichloromethane	ND	0.5	ug/L	ND				30	
Bromoform	ND	0.5	ug/L	ND				30	
Bromomethane	ND	0.5	ug/L	ND				30	
Carbon Tetrachloride	ND	0.2	ug/L	ND				30	
Chlorobenzene	ND	0.5	ug/L	ND				30	
Chloroform	0.60	0.5	ug/L	0.60			0.0	30	
Dibromochloromethane	ND	0.5	ug/L	ND				30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND				30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
1,2-Dichloroethane	ND	0.5	ug/L	ND				30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND				30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
1,2-Dichloropropane	ND	0.5	ug/L	ND				30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Ethylene dibromide (dibromoethane)	ND	0.2	ug/L	ND				30	
Hexane	ND	1.0	ug/L	ND				30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND				30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND				30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Styrene	ND	0.5	ug/L	ND				30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
Tetrachloroethylene	ND	0.5	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND				30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND				30	
Trichloroethylene	ND	0.5	ug/L	ND				30	
Trichlorofluoromethane	ND	1.0	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: 4-Bromofluorobenzene	28.6		ug/L		89.5	50-140			
Surrogate: Dibromofluoromethane	30.2		ug/L		94.2	50-140			
Surrogate: Toluene-d8	35.7		ug/L		112	50-140			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23521

Report Date: 01-Mar-2018

Order Date: 23-Feb-2018

Project Description: PE4194

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1810	25	ug/L		90.6	68-117			
F2 PHCs (C10-C16)	1780	100	ug/L		99.0	60-140			
F3 PHCs (C16-C34)	3250	100	ug/L		87.3	60-140			
F4 PHCs (C34-C50)	2580	100	ug/L		104	60-140			
Volatiles									
Acetone	132	5.0	ug/L		132	50-140			
Benzene	29.9	0.5	ug/L		74.8	60-130			
Bromodichloromethane	28.5	0.5	ug/L		71.2	60-130			
Bromoform	29.7	0.5	ug/L		74.3	60-130			
Bromomethane	28.5	0.5	ug/L		71.3	50-140			
Carbon Tetrachloride	26.7	0.2	ug/L		66.8	60-130			
Chlorobenzene	30.6	0.5	ug/L		76.5	60-130			
Chloroform	26.6	0.5	ug/L		66.5	60-130			
Dibromochloromethane	24.4	0.5	ug/L		61.0	60-130			
Dichlorodifluoromethane	31.7	1.0	ug/L		79.2	50-140			
1,2-Dichlorobenzene	37.8	0.5	ug/L		94.5	60-130			
1,3-Dichlorobenzene	38.7	0.5	ug/L		96.8	60-130			
1,4-Dichlorobenzene	33.3	0.5	ug/L		83.2	60-130			
1,1-Dichloroethane	37.0	0.5	ug/L		92.4	60-130			
1,2-Dichloroethane	29.5	0.5	ug/L		73.8	60-130			
1,1-Dichloroethylene	28.0	0.5	ug/L		70.0	60-130			
cis-1,2-Dichloroethylene	31.9	0.5	ug/L		79.7	60-130			
trans-1,2-Dichloroethylene	30.9	0.5	ug/L		77.2	60-130			
1,2-Dichloropropane	30.9	0.5	ug/L		77.3	60-130			
cis-1,3-Dichloropropylene	44.0	0.5	ug/L		110	60-130			
trans-1,3-Dichloropropylene	44.2	0.5	ug/L		110	60-130			
Ethylbenzene	41.0	0.5	ug/L		103	60-130			
Ethylene dibromide (dibromoethane)	40.5	0.2	ug/L		101	60-130			
Hexane	44.4	1.0	ug/L		111	60-130			
Methyl Ethyl Ketone (2-Butanone)	140	5.0	ug/L		140	50-140			
Methyl Isobutyl Ketone	108	5.0	ug/L		108	50-140			
Methyl tert-butyl ether	116	2.0	ug/L		116	50-140			
Methylene Chloride	29.7	5.0	ug/L		74.3	60-130			
Styrene	45.7	0.5	ug/L		114	60-130			
1,1,1,2-Tetrachloroethane	31.4	0.5	ug/L		78.4	60-130			
1,1,2,2-Tetrachloroethane	49.3	0.5	ug/L		123	60-130			
Tetrachloroethylene	31.5	0.5	ug/L		78.7	60-130			
Toluene	31.4	0.5	ug/L		78.5	60-130			
1,1,1-Trichloroethane	29.1	0.5	ug/L		72.8	60-130			
1,1,2-Trichloroethane	30.0	0.5	ug/L		75.1	60-130			
Trichloroethylene	28.6	0.5	ug/L		71.4	60-130			
Trichlorofluoromethane	27.4	1.0	ug/L		68.4	60-130			
Vinyl chloride	26.9	0.5	ug/L		67.2	50-140			
m,p-Xylenes	72.2	0.5	ug/L		90.2	60-130			
o-Xylene	36.7	0.5	ug/L		91.7	60-130			
Surrogate: 4-Bromofluorobenzene	41.3		ug/L		129	50-140			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23521

Report Date: 01-Mar-2018
Order Date: 23-Feb-2018
Project Description: PE4194

Qualifier Notes:

Sample Qualifiers :

1 : Elevated detection limit due to dilution required because of high target analyte concentration.

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.

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.



Client Name: Peterson Group	Project Reference: PE4194	Turnaround Time: ☐ 1 Day ☐ 3 Day ☐ 2 Day ☒ Regular Date Required:
Contact Name: Mark D'Arcy / Mike Beaudoin	Quote #	
Address: 154 Colonnade Rd S, Ottawa, ON	PO #: 23521	
Telephone: 613 226 7381	Email Address: mbeaudoin@petersongroup.ca	

Criteria: ☒ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

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

Parcel Order Number: 1808494			Sample Taken		Required Analyses							
Sample ID/Location Name	Matrix	Air Volume	# of Containers	Date	Time	PHCs F1-F4+BTX	VOCs	PAHs	Metals by ICP	Hg	Cd	B (HWS)
1 BH1 - GW1	W	3	3	2018-02-22	12 P	X	X	X	X	X	X	X
2 BH2 - GW1	GW	3	1	11a		X	X					
3 BH3 - GW1	W	3	1	10a		X	X					
4												
5												
6												
7												
8												
9												
10												

Comments: Method of Delivery: **Paracel**

Relinquished By (Sign): <i>[Signature]</i>	Received by Driver/Depot: <i>[Signature]</i>	Received at Lab: Rachel subject	Verified By: <i>[Signature]</i>
Relinquished By (Print): Mark Moro 2	Date/Time: 23/02/18 3:10 PM	Date/Time: Feb 23/18	Date/Time: 02/23/18 5:01 PM
Date/Time: 2018-02-22	Temperature: 7°C	Temperature: 13.9 °C	pH Verified By:

Certificate of Analysis

Paterson Group Consulting Engineers

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

Client PO: 23539
Project: PE4194
Custody: 33452

Report Date: 9-Mar-2018
Order Date: 7-Mar-2018

Order #: 1810310

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

Paracel ID	Client ID
1810310-01	BH3-GW2

Approved By:



Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23539

Report Date: 09-Mar-2018
Order Date: 7-Mar-2018
Project Description: PE4194

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	8-Mar-18	9-Mar-18

Certificate of Analysis
 Client: Paterson Group Consulting Engineers
 Client PO: 23539

Report Date: 09-Mar-2018

Order Date: 7-Mar-2018

Project Description: PE4194

Client ID:	BH3-GW2	-	-	-
Sample Date:	07-Mar-18	-	-	-
Sample ID:	1810310-01	-	-	-
MDL/Units	Water	-	-	-

Volatiles

Acetone	5.0 ug/L	<250 [1]	-	-	-
Benzene	0.5 ug/L	<25.0 [1]	-	-	-
Bromodichloromethane	0.5 ug/L	<25.0 [1]	-	-	-
Bromoform	0.5 ug/L	<25.0 [1]	-	-	-
Bromomethane	0.5 ug/L	<25.0 [1]	-	-	-
Carbon Tetrachloride	0.2 ug/L	<10.0 [1]	-	-	-
Chlorobenzene	0.5 ug/L	<25.0 [1]	-	-	-
Chloroform	0.5 ug/L	<25.0 [1]	-	-	-
Dibromochloromethane	0.5 ug/L	<25.0 [1]	-	-	-
Dichlorodifluoromethane	1.0 ug/L	<50.0 [1]	-	-	-
1,2-Dichlorobenzene	0.5 ug/L	<25.0 [1]	-	-	-
1,3-Dichlorobenzene	0.5 ug/L	<25.0 [1]	-	-	-
1,4-Dichlorobenzene	0.5 ug/L	<25.0 [1]	-	-	-
1,1-Dichloroethane	0.5 ug/L	<25.0 [1]	-	-	-
1,2-Dichloroethane	0.5 ug/L	<25.0 [1]	-	-	-
1,1-Dichloroethylene	0.5 ug/L	<25.0 [1]	-	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<25.0 [1]	-	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<25.0 [1]	-	-	-
1,2-Dichloropropane	0.5 ug/L	<25.0 [1]	-	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<25.0 [1]	-	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<25.0 [1]	-	-	-
1,3-Dichloropropene, total	0.5 ug/L	<25.0 [1]	-	-	-
Ethylbenzene	0.5 ug/L	<25.0 [1]	-	-	-
Ethylene dibromide (dibromoethane)	0.2 ug/L	<10.0 [1]	-	-	-
Hexane	1.0 ug/L	<50.0 [1]	-	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<250 [1]	-	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<250 [1]	-	-	-
Methyl tert-butyl ether	2.0 ug/L	<100 [1]	-	-	-
Methylene Chloride	5.0 ug/L	<250 [1]	-	-	-
Styrene	0.5 ug/L	<25.0 [1]	-	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<25.0 [1]	-	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<25.0 [1]	-	-	-
Tetrachloroethylene	0.5 ug/L	456 [1]	-	-	-
Toluene	0.5 ug/L	<25.0 [1]	-	-	-
1,1,1-Trichloroethane	0.5 ug/L	<25.0 [1]	-	-	-

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 23539

Report Date: 09-Mar-2018

Order Date: 7-Mar-2018

Project Description: PE4194

	Client ID:	BH3-GW2	-	-	-
	Sample Date:	07-Mar-18	-	-	-
	Sample ID:	1810310-01	-	-	-
	MDL/Units	Water	-	-	-
1,1,2-Trichloroethane	0.5 ug/L	<25.0 [1]	-	-	-
Trichloroethylene	0.5 ug/L	<25.0 [1]	-	-	-
Trichlorofluoromethane	1.0 ug/L	<50.0 [1]	-	-	-
Vinyl chloride	0.5 ug/L	<25.0 [1]	-	-	-
m,p-Xylenes	0.5 ug/L	<25.0 [1]	-	-	-
o-Xylene	0.5 ug/L	<25.0 [1]	-	-	-
Xylenes, total	0.5 ug/L	<25.0 [1]	-	-	-
4-Bromofluorobenzene	Surrogate	78.9% [1]	-	-	-
Dibromofluoromethane	Surrogate	114% [1]	-	-	-
Toluene-d8	Surrogate	95.1% [1]	-	-	-

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23539
Report Date: 09-Mar-2018
Order Date: 7-Mar-2018
Project Description: PE4194
Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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,	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	101		ug/L		126	50-140			
Surrogate: Dibromofluoromethane	75.9		ug/L		94.9	50-140			
Surrogate: Toluene-d8	68.2		ug/L		85.3	50-140			

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 23539

Report Date: 09-Mar-2018

Order Date: 7-Mar-2018

Project Description: PE4194

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L	ND				30	
Benzene	ND	0.5	ug/L	ND				30	
Bromodichloromethane	ND	0.5	ug/L	ND				30	
Bromoform	ND	0.5	ug/L	ND				30	
Bromomethane	ND	0.5	ug/L	ND				30	
Carbon Tetrachloride	ND	0.2	ug/L	ND				30	
Chlorobenzene	ND	0.5	ug/L	ND				30	
Chloroform	ND	0.5	ug/L	ND				30	
Dibromochloromethane	ND	0.5	ug/L	ND				30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND				30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
1,2-Dichloroethane	ND	0.5	ug/L	ND				30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND				30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
1,2-Dichloropropane	ND	0.5	ug/L	ND				30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Ethylene dibromide (dibromoethane,	ND	0.2	ug/L	ND				30	
Hexane	ND	1.0	ug/L	ND				30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND				30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND				30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Styrene	ND	0.5	ug/L	ND				30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
Tetrachloroethylene	ND	0.5	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND				30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND				30	
Trichloroethylene	ND	0.5	ug/L	ND				30	
Trichlorofluoromethane	ND	1.0	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: 4-Bromofluorobenzene	71.7		ug/L		89.7	50-140			
Surrogate: Dibromofluoromethane	68.0		ug/L		85.0	50-140			
Surrogate: Toluene-d8	69.0		ug/L		86.3	50-140			

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 23539

Report Date: 09-Mar-2018

Order Date: 7-Mar-2018

Project Description: PE4194

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	40.6	5.0	ug/L		81.2	50-140			
Benzene	17.9	0.5	ug/L		89.7	60-130			
Bromodichloromethane	14.1	0.5	ug/L		70.4	60-130			
Bromoform	15.1	0.5	ug/L		75.4	60-130			
Bromomethane	23.1	0.5	ug/L		116	50-140			
Carbon Tetrachloride	24.2	0.2	ug/L		121	60-130			
Chlorobenzene	18.9	0.5	ug/L		94.7	60-130			
Chloroform	17.5	0.5	ug/L		87.7	60-130			
Dibromochloromethane	16.8	0.5	ug/L		84.0	60-130			
Dichlorodifluoromethane	18.9	1.0	ug/L		94.4	50-140			
1,2-Dichlorobenzene	15.3	0.5	ug/L		76.4	60-130			
1,3-Dichlorobenzene	16.6	0.5	ug/L		83.0	60-130			
1,4-Dichlorobenzene	16.7	0.5	ug/L		83.4	60-130			
1,1-Dichloroethane	18.1	0.5	ug/L		90.7	60-130			
1,2-Dichloroethane	15.6	0.5	ug/L		77.8	60-130			
1,1-Dichloroethylene	19.4	0.5	ug/L		97.1	60-130			
cis-1,2-Dichloroethylene	16.7	0.5	ug/L		83.6	60-130			
trans-1,2-Dichloroethylene	20.0	0.5	ug/L		99.9	60-130			
1,2-Dichloropropane	14.6	0.5	ug/L		73.0	60-130			
cis-1,3-Dichloropropylene	12.2	0.5	ug/L		61.0	60-130			
trans-1,3-Dichloropropylene	12.7	0.5	ug/L		63.7	60-130			
Ethylbenzene	13.8	0.5	ug/L		69.2	60-130			
Ethylene dibromide (dibromoethane,	16.6	0.2	ug/L		83.2	60-130			
Hexane	22.9	1.0	ug/L		115	60-130			
Methyl Ethyl Ketone (2-Butanone)	41.0	5.0	ug/L		82.0	50-140			
Methyl Isobutyl Ketone	32.3	5.0	ug/L		64.6	50-140			
Methyl tert-butyl ether	40.2	2.0	ug/L		80.5	50-140			
Methylene Chloride	17.4	5.0	ug/L		86.8	60-130			
Styrene	12.2	0.5	ug/L		61.2	60-130			
1,1,1,2-Tetrachloroethane	20.5	0.5	ug/L		102	60-130			
1,1,2,2-Tetrachloroethane	17.2	0.5	ug/L		85.8	60-130			
Tetrachloroethylene	19.1	0.5	ug/L		95.7	60-130			
Toluene	18.4	0.5	ug/L		92.2	60-130			
1,1,1-Trichloroethane	19.7	0.5	ug/L		98.5	60-130			
1,1,2-Trichloroethane	13.8	0.5	ug/L		68.9	60-130			
Trichloroethylene	16.1	0.5	ug/L		80.5	60-130			
Trichlorofluoromethane	21.0	1.0	ug/L		105	60-130			
Vinyl chloride	22.2	0.5	ug/L		111	50-140			
m,p-Xylenes	29.8	0.5	ug/L		74.4	60-130			
o-Xylene	14.9	0.5	ug/L		74.4	60-130			
Surrogate: 4-Bromofluorobenzene	76.5		ug/L		95.6	50-140			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23539

Report Date: 09-Mar-2018
Order Date: 7-Mar-2018
Project Description: PE4194

Qualifier Notes:

Sample Qualifiers :

1 : Elevated detection limit due to dilution required because of high target analyte concentration.

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.

Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 25223
Project: PE4194
Custody: 116736

Report Date: 7-Nov-2018
Order Date: 5-Nov-2018

Order #: 1845142

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

Paracel ID	Client ID
1845142-01	BH3-GW3

Approved By:



Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 25223

Report Date: 07-Nov-2018
Order Date: 5-Nov-2018
Project Description: PE4194

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	6-Nov-18	7-Nov-18

Certificate of Analysis
 Client: Paterson Group Consulting Engineers
 Client PO: 25223

Report Date: 07-Nov-2018

Order Date: 5-Nov-2018

Project Description: PE4194

Client ID:	BH3-GW3	-	-	-
Sample Date:	11/02/2018 15:00	-	-	-
Sample ID:	1845142-01	-	-	-
MDL/Units	Water	-	-	-

Volatiles

Acetone	5.0 ug/L	<5.0	-	-	-
Benzene	0.5 ug/L	<0.5	-	-	-
Bromodichloromethane	0.5 ug/L	<0.5	-	-	-
Bromoform	0.5 ug/L	<0.5	-	-	-
Bromomethane	0.5 ug/L	<0.5	-	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	-	-	-
Chlorobenzene	0.5 ug/L	<0.5	-	-	-
Chloroform	0.5 ug/L	1.2	-	-	-
Dibromochloromethane	0.5 ug/L	<0.5	-	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	-	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	-	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	-	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	-	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	-	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Ethylene dibromide (dibromoethane)	0.2 ug/L	<0.2	-	-	-
Hexane	1.0 ug/L	<1.0	-	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	-	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	-	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-
Styrene	0.5 ug/L	<0.5	-	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	-	-	-
Tetrachloroethylene	0.5 ug/L	6.2	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 25223
Report Date: 07-Nov-2018
Order Date: 5-Nov-2018
Project Description: PE4194

	Client ID:	BH3-GW3	-	-	-
	Sample Date:	11/02/2018 15:00	-	-	-
	Sample ID:	1845142-01	-	-	-
	MDL/Units	Water	-	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	-	-	-
Trichloroethylene	0.5 ug/L	<0.5	-	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	-	-	-
Vinyl chloride	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	-	-	-
4-Bromofluorobenzene	Surrogate	114%	-	-	-
Dibromofluoromethane	Surrogate	97.8%	-	-	-
Toluene-d8	Surrogate	109%	-	-	-

Certificate of Analysis
 Client: Paterson Group Consulting Engineers
 Client PO: 25223

Report Date: 07-Nov-2018

Order Date: 5-Nov-2018

Project Description: PE4194

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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)	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	34.6		ug/L		108	50-140			
Surrogate: Dibromofluoromethane	33.3		ug/L		104	50-140			
Surrogate: Toluene-d8	34.9		ug/L		109	50-140			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 25223

Report Date: 07-Nov-2018

Order Date: 5-Nov-2018

Project Description: PE4194

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L	ND				30	
Benzene	ND	0.5	ug/L	ND				30	
Bromodichloromethane	ND	0.5	ug/L	ND				30	
Bromoform	ND	0.5	ug/L	ND				30	
Bromomethane	ND	0.5	ug/L	ND				30	
Carbon Tetrachloride	ND	0.2	ug/L	ND				30	
Chlorobenzene	ND	0.5	ug/L	ND				30	
Chloroform	ND	0.5	ug/L	ND				30	
Dibromochloromethane	ND	0.5	ug/L	ND				30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND				30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
1,2-Dichloroethane	ND	0.5	ug/L	ND				30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND				30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
1,2-Dichloropropane	ND	0.5	ug/L	ND				30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Ethylene dibromide (dibromoethane)	ND	0.2	ug/L	ND				30	
Hexane	ND	1.0	ug/L	ND				30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND				30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND				30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Styrene	ND	0.5	ug/L	ND				30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
Tetrachloroethylene	ND	0.5	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND				30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND				30	
Trichloroethylene	ND	0.5	ug/L	ND				30	
Trichlorofluoromethane	ND	1.0	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: 4-Bromofluorobenzene	29.8		ug/L		93.2	50-140			
Surrogate: Dibromofluoromethane	28.9		ug/L		90.4	50-140			
Surrogate: Toluene-d8	32.1		ug/L		100	50-140			

Certificate of Analysis
 Client: Paterson Group Consulting Engineers
 Client PO: 25223

Report Date: 07-Nov-2018

Order Date: 5-Nov-2018

Project Description: PE4194

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	81.8	5.0	ug/L		81.8	50-140			
Benzene	27.4	0.5	ug/L		68.4	60-130			
Bromodichloromethane	29.1	0.5	ug/L		72.7	60-130			
Bromoform	37.1	0.5	ug/L		92.8	60-130			
Bromomethane	27.5	0.5	ug/L		68.7	50-140			
Carbon Tetrachloride	32.1	0.2	ug/L		80.3	60-130			
Chlorobenzene	33.4	0.5	ug/L		83.5	60-130			
Chloroform	27.2	0.5	ug/L		68.1	60-130			
Dibromochloromethane	36.0	0.5	ug/L		89.9	60-130			
Dichlorodifluoromethane	35.2	1.0	ug/L		88.1	50-140			
1,2-Dichlorobenzene	35.0	0.5	ug/L		87.4	60-130			
1,3-Dichlorobenzene	35.8	0.5	ug/L		89.4	60-130			
1,4-Dichlorobenzene	31.6	0.5	ug/L		78.9	60-130			
1,1-Dichloroethane	29.7	0.5	ug/L		74.2	60-130			
1,2-Dichloroethane	25.3	0.5	ug/L		63.2	60-130			
1,1-Dichloroethylene	38.2	0.5	ug/L		95.6	60-130			
cis-1,2-Dichloroethylene	24.7	0.5	ug/L		61.7	60-130			
trans-1,2-Dichloroethylene	34.3	0.5	ug/L		85.8	60-130			
1,2-Dichloropropane	34.8	0.5	ug/L		86.9	60-130			
cis-1,3-Dichloropropylene	30.6	0.5	ug/L		76.5	60-130			
trans-1,3-Dichloropropylene	31.8	0.5	ug/L		79.4	60-130			
Ethylbenzene	37.0	0.5	ug/L		92.6	60-130			
Ethylene dibromide (dibromoethane)	31.3	0.2	ug/L		78.2	60-130			
Hexane	27.3	1.0	ug/L		68.2	60-130			
Methyl Ethyl Ketone (2-Butanone)	71.8	5.0	ug/L		71.8	50-140			
Methyl Isobutyl Ketone	72.0	5.0	ug/L		72.0	50-140			
Methyl tert-butyl ether	70.4	2.0	ug/L		70.4	50-140			
Methylene Chloride	35.4	5.0	ug/L		88.6	60-130			
Styrene	39.7	0.5	ug/L		99.4	60-130			
1,1,1,2-Tetrachloroethane	34.7	0.5	ug/L		86.7	60-130			
1,1,2,2-Tetrachloroethane	37.6	0.5	ug/L		94.0	60-130			
Tetrachloroethylene	35.4	0.5	ug/L		88.6	60-130			
Toluene	31.3	0.5	ug/L		78.2	60-130			
1,1,1-Trichloroethane	28.7	0.5	ug/L		71.8	60-130			
1,1,2-Trichloroethane	28.4	0.5	ug/L		71.0	60-130			
Trichloroethylene	27.5	0.5	ug/L		68.8	60-130			
Trichlorofluoromethane	39.3	1.0	ug/L		98.2	60-130			
Vinyl chloride	29.6	0.5	ug/L		73.9	50-140			
m,p-Xylenes	76.7	0.5	ug/L		95.9	60-130			
o-Xylene	38.0	0.5	ug/L		95.1	60-130			
Surrogate: 4-Bromofluorobenzene	27.4		ug/L		85.8	50-140			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 25223

Report Date: 07-Nov-2018

Order Date: 5-Nov-2018

Project Description: PE4194

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.



LABORATORIES LTD

Parcel ID: 1845142



Head Office
300-2319 St. Laurent Blvd.
Ottawa, Ontario K1G 4J8
p: 1-800-749-1947
e: paracel@paracellabs.com

Chain of Custody

(Lab Use Only)

No 116736

Page 1 of 1

Client Name: <u>Paterson</u>	Project Reference: <u>P24144</u>	Turnaround Time: ☐ 1 Day ☐ 3 Day ☒ 2 Day ☐ Regular Date Required: _____
Contact Name:	Quote #	
Address: <u>154 Colborne Rd</u>	PO # <u>25223</u>	
Telephone: <u>613 226 7381</u>	Email Address: <u>mdurye@patersongroup.ca</u>	

Criteria: ☒ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☐ Other: _____

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

Required Analyses

Parcel Order Number:

1845142

Sample ID/Location Name		Matrix	Air Volume	# of Containers	Sample Taken		PHCs F1-F4+BTX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)					
					Date	Time												
1	BH3-GW3	W		2	2 Nov	3pm												
2	MW1-GW1	W		2	2 Nov	3pm												
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Comments: please hold on MW1-GW1.

Method of Delivery:

Parcel

Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot: <u>[Signature]</u>	Received at Lab: <u>[Signature]</u>	Verified By: <u>[Signature]</u>
Relinquished By (Print): <u>PHILIP PRICE</u>	Date/Time: <u>05/11/18 3:20</u>	Date/Time: <u>05/11/18 5:48</u>	Date/Time: <u>05/11/18 6:35</u>
Date/Time:	Temperature: <u>7.1</u> °C	Temperature: <u>15.3</u> °C	pH Verified [] By:

Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Mark D'Arcy

Client PO: 25574
Project: PE4194
Custody: 46404

Report Date: 28-Nov-2018
Order Date: 22-Nov-2018

Order #: 1847486

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

Paracel ID	Client ID
1847486-01	BH1-GW
1847486-02	BH2-GW
1847486-03	BH3-GW

Approved By:



Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 25574

Report Date: 28-Nov-2018
Order Date: 22-Nov-2018
Project Description: PE4194

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	23-Nov-18	27-Nov-18

Certificate of Analysis
 Client: Paterson Group Consulting Engineers
 Client PO: 25574

Report Date: 28-Nov-2018

Order Date: 22-Nov-2018

Project Description: PE4194

Client ID:	BH1-GW	BH2-GW	BH3-GW	-
Sample Date:	11/21/2018 12:45	11/21/2018 13:45	11/21/2018 11:45	-
Sample ID:	1847486-01	1847486-02	1847486-03	-
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	0.9	-
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	<0.5	<0.5	-
Ethylene dibromide (dibromoethane)	0.2 ug/L	<0.2	<0.2	<0.2	-
Hexane	1.0 ug/L	<1.0	<1.0	<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	11.8	-
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

Client: Paterson Group Consulting Engineers

Client PO: 25574

Report Date: 28-Nov-2018

Order Date: 22-Nov-2018

Project Description: PE4194

	MDL/Units	Client ID:	BH1-GW	BH2-GW	BH3-GW	
		Sample Date:	11/21/2018 12:45	11/21/2018 13:45	11/21/2018 11:45	
		Sample ID:	1847486-01	1847486-02	1847486-03	
			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	<0.5	<0.5	-
o-Xylene	0.5 ug/L		<0.5	<0.5	<0.5	-
Xylenes, total	0.5 ug/L		<0.5	<0.5	<0.5	-
4-Bromofluorobenzene	Surrogate		116%	124%	115%	-
Dibromofluoromethane	Surrogate		123%	130%	133%	-
Toluene-d8	Surrogate		76.6%	78.8%	79.0%	-

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 25574

Report Date: 28-Nov-2018

Order Date: 22-Nov-2018

Project Description: PE4194

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
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)	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	86.8		ug/L		108	50-140			
Surrogate: Dibromofluoromethane	79.9		ug/L		99.9	50-140			
Surrogate: Toluene-d8	84.2		ug/L		105	50-140			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 25574

Report Date: 28-Nov-2018
Order Date: 22-Nov-2018
Project Description: PE4194

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L	ND				30	
Benzene	ND	0.5	ug/L	ND				30	
Bromodichloromethane	ND	0.5	ug/L	ND				30	
Bromoform	ND	0.5	ug/L	ND				30	
Bromomethane	ND	0.5	ug/L	ND				30	
Carbon Tetrachloride	ND	0.2	ug/L	ND				30	
Chlorobenzene	ND	0.5	ug/L	ND				30	
Chloroform	ND	0.5	ug/L	ND				30	
Dibromochloromethane	ND	0.5	ug/L	ND				30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND				30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
1,2-Dichloroethane	ND	0.5	ug/L	ND				30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND				30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
1,2-Dichloropropane	ND	0.5	ug/L	ND				30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Ethylene dibromide (dibromoethane)	ND	0.2	ug/L	ND				30	
Hexane	ND	1.0	ug/L	ND				30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND				30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND				30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Styrene	ND	0.5	ug/L	ND				30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
Tetrachloroethylene	ND	0.5	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND				30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND				30	
Trichloroethylene	ND	0.5	ug/L	ND				30	
Trichlorofluoromethane	ND	1.0	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: 4-Bromofluorobenzene	78.7		ug/L		98.4	50-140			
Surrogate: Dibromofluoromethane	91.2		ug/L		114	50-140			
Surrogate: Toluene-d8	85.9		ug/L		107	50-140			

Certificate of Analysis
 Client: Paterson Group Consulting Engineers
 Client PO: 25574

Report Date: 28-Nov-2018
 Order Date: 22-Nov-2018
 Project Description: PE4194

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	84.2	5.0	ug/L		84.2	50-140			
Benzene	27.4	0.5	ug/L		68.6	60-130			
Bromodichloromethane	27.9	0.5	ug/L		69.8	60-130			
Bromoform	32.1	0.5	ug/L		80.2	60-130			
Bromomethane	30.5	0.5	ug/L		76.2	50-140			
Carbon Tetrachloride	30.4	0.2	ug/L		75.9	60-130			
Chlorobenzene	32.4	0.5	ug/L		81.1	60-130			
Chloroform	30.3	0.5	ug/L		75.7	60-130			
Dibromochloromethane	27.4	0.5	ug/L		68.4	60-130			
Dichlorodifluoromethane	26.0	1.0	ug/L		65.1	50-140			
1,2-Dichlorobenzene	27.2	0.5	ug/L		68.1	60-130			
1,3-Dichlorobenzene	29.2	0.5	ug/L		73.0	60-130			
1,4-Dichlorobenzene	30.1	0.5	ug/L		75.2	60-130			
1,1-Dichloroethane	28.8	0.5	ug/L		71.9	60-130			
1,2-Dichloroethane	30.0	0.5	ug/L		75.1	60-130			
1,1-Dichloroethylene	29.2	0.5	ug/L		73.0	60-130			
cis-1,2-Dichloroethylene	28.2	0.5	ug/L		70.5	60-130			
trans-1,2-Dichloroethylene	29.0	0.5	ug/L		72.6	60-130			
1,2-Dichloropropane	28.8	0.5	ug/L		72.1	60-130			
cis-1,3-Dichloropropylene	32.2	0.5	ug/L		80.5	60-130			
trans-1,3-Dichloropropylene	37.7	0.5	ug/L		94.3	60-130			
Ethylbenzene	34.9	0.5	ug/L		87.2	60-130			
Ethylene dibromide (dibromoethane)	31.0	0.2	ug/L		77.4	60-130			
Hexane	34.7	1.0	ug/L		86.8	60-130			
Methyl Ethyl Ketone (2-Butanone)	69.9	5.0	ug/L		69.9	50-140			
Methyl Isobutyl Ketone	55.8	5.0	ug/L		55.8	50-140			
Methyl tert-butyl ether	56.6	2.0	ug/L		56.6	50-140			
Methylene Chloride	28.4	5.0	ug/L		71.0	60-130			
Styrene	30.3	0.5	ug/L		75.8	60-130			
1,1,1,2-Tetrachloroethane	30.2	0.5	ug/L		75.6	60-130			
1,1,2,2-Tetrachloroethane	27.0	0.5	ug/L		67.6	60-130			
Tetrachloroethylene	32.4	0.5	ug/L		81.1	60-130			
Toluene	35.2	0.5	ug/L		87.9	60-130			
1,1,1-Trichloroethane	32.6	0.5	ug/L		81.4	60-130			
1,1,2-Trichloroethane	26.7	0.5	ug/L		66.7	60-130			
Trichloroethylene	36.3	0.5	ug/L		90.8	60-130			
Trichlorofluoromethane	33.0	1.0	ug/L		82.5	60-130			
Vinyl chloride	32.6	0.5	ug/L		81.6	50-140			
m,p-Xylenes	73.9	0.5	ug/L		92.3	60-130			
o-Xylene	40.2	0.5	ug/L		101	60-130			
Surrogate: 4-Bromofluorobenzene	72.0		ug/L		90.0	50-140			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 25574

Report Date: 28-Nov-2018
Order Date: 22-Nov-2018
Project Description: PE4194

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.



Client Name: <u>Peterson</u>	Project Reference: <u>PE4194</u>	Turnaround Time: ☐ 1 Day ☐ 3 Day ☐ 2 Day ☒ Regular Date Required: _____
Contact Name:	Quote #	
Address: <u>154 Clarence</u>	PO # <u>25574</u>	
Telephone: <u>613 226 7281</u>	Email Address: <u>mdarcy@petersongroup.ca</u>	

Criteria: ☒ O. Reg. 153/04 (As Amended) Table ___ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☐ Other: _____

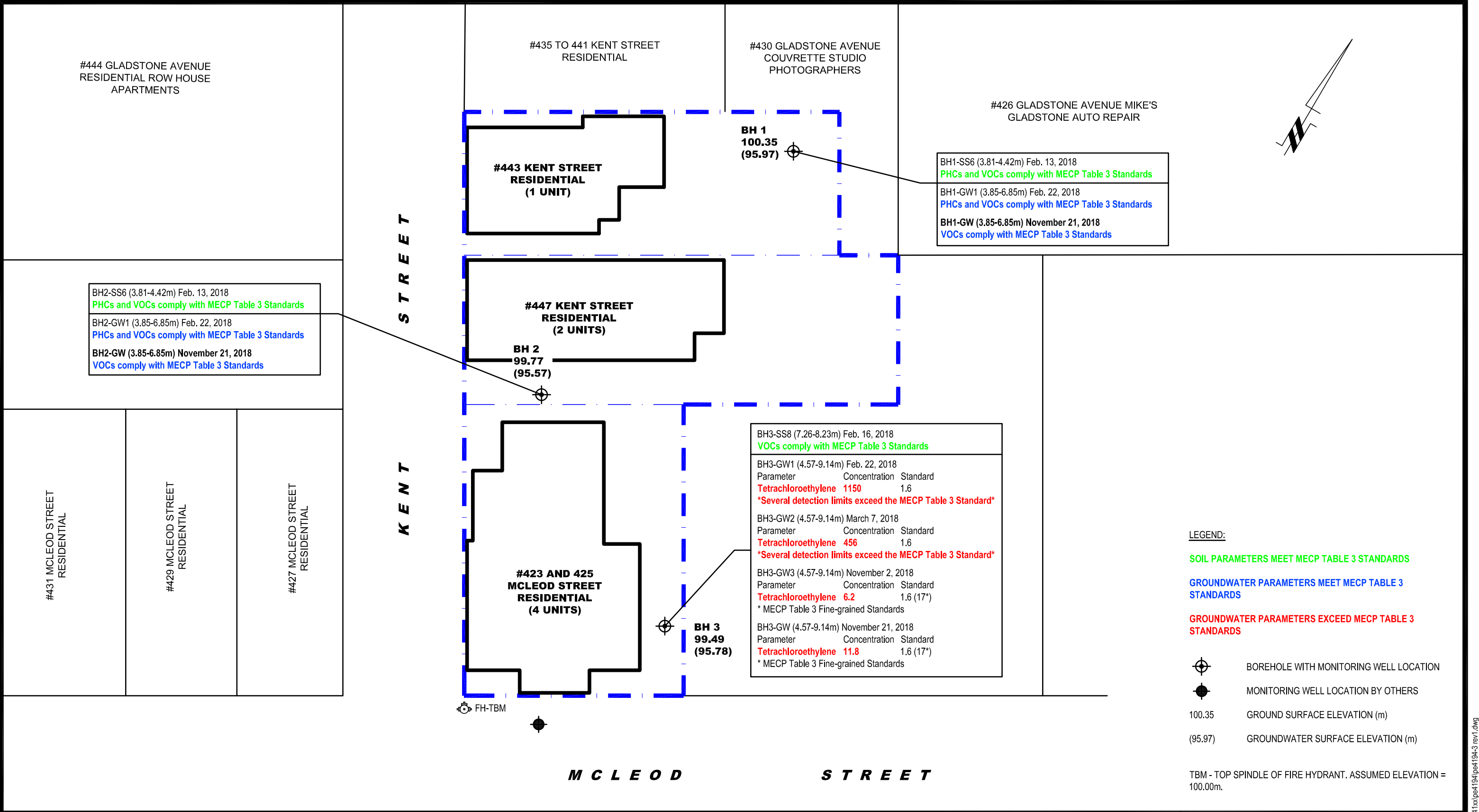
Matrix Type: S (Soil Sed.) GW (Ground Water) SW (Surface Water) SS (Storm-Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Parcel Order Number: 1847486		Matrix	Air Volume	# of Containers	Sample Taken		Voc's											
Sample ID/Location Name					Date	Time												
1	BH1-GW	W		2	21 Nov	12.45	✓											
2	BH2-GW	W		2	↓	1.45	✓											
3	BH3-GW	W		2	↓	11.45	✓											
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Comments:	Method of Delivery: <u>Paracel</u>
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Relinquished By (Sign): <u>[Signature]</u>	Received by Driver/Depot: <u>[Signature]</u>	Received at Lab: <u>[Signature]</u>	Verified By: <u>[Signature]</u>
Relinquished By (Print): <u>Philip Price</u>	Date/Time: <u>22/11/18 4:30</u>	Date/Time: <u>Nov 22, 18 5:11</u>	Date/Time: <u>Nov 22/18 6:00pm</u>
Date/Time:	Temperature: <u>PA</u>	Temperature: <u>15.0 °C</u>	pH Verified By:



patersongroup consulting engineers 154 Colonnade Road South Ottawa, Ontario K2E 7J5 Tel: (613) 226-7381 Fax: (613) 226-6344					CHSS INTERNATIONAL INVESTMENTS AND MANAGEMENT INC. PHASE II - ENVIRONMENTAL SITE ASSESSMENT 443 & 447 KENT STREET AND 423 & 425 MCLEOD STREET OTTAWA, ONTARIO Title: TEST HOLE LOCATION PLAN	Scale: 1:250	Date: 03/2018
						Drawn by: MPG	Report No.: PE4194-2
						Checked by: MB	Dwg. No.: PE4194-3
						Approved by: MSD	Revision No.: 1
	1	ANALYTICAL RESULTS ADDED	10/12/2018	MB			
	NO.	REVISIONS	DATE	INITIAL			

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