

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

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File: PE2636-LET.01

Claridge Homes
2001-210 Gladstone Avenue
Ottawa, Ontario
K2P 0Y6

Geotechnical Engineering
Environmental Engineering
Hydrogeology
Geological Engineering
Materials Testing
Building Science

www.patersongroup.ca

Attention: **Mr. Neil Malhotra**

Subject: **Phase II - Environmental Site Assessment
Existing Commercial Building
1040 Somerset Street West
Ottawa, Ontario**

Dear Sir,

Further to your request and authorization, Paterson Group supervised a Phase II - Environmental Site Assessment (ESA) at the aforementioned site. The results of the ESA are summarized in the following report.

1.0 Background Information

The subject site is located at the southeast corner of the intersection of Somerset Street West and Breezehill Avenue, in the City of Ottawa, Ontario. The subject property is currently occupied by a one-storey, slab-on-grade commercial building. The subject building is located on the southern portion of the property while the land north of the building is asphalt covered and used for vehicular parking. Land west of the building is grassed, while a small strip of land south of the building is covered with gravel.

The subject structure is currently occupied by CompuCorps (charity organization), Paradise Auto automotive service garage, QuIRC (consulting firm) and F Studio (blown glass studio). Historically the subject property was occupied by a coal shed and is suspected to have been part of the former Bruce Fuel property to the south. The neighbouring properties to the south (53 Breezehill Avenue), west (1050 Somerset Street West) and north (47 Breezehill Avenue) are currently occupied by automotive service garages, while the property to the east is occupied by the City of Ottawa O-Train.

A Phase II - ESA was conducted to address any potential soil or groundwater contamination on the subject property resulting from the past and current uses of the subject site and adjacent properties.

2.0 Previous Report

Paterson conducted a Phase I-II ESA report for the subject property in June of 2007. Four (4) boreholes were placed over the northern portion of the site, not occupied by the subject structure. The boreholes were placed for general coverage and to address the former coal shed, while BH3 was placed as close as possible to the oil/water separator located in the automotive service garage. Soil samples were analysed for a combination of petroleum hydrocarbon (PHC), polynuclear aromatic hydrocarbon (PAH) and metal parameters. All analysed parameters were in compliance with the 2004 MOE Table 3 fine grained, commercial soil criteria selected for the subject site. A layer of coal identified in BH1, was not considered to be in compliance with the MOE Table 3 standards, however based on the anticipated volume of this material and the property use, it was not considered necessary to remediate the material at that time. A groundwater sample recovered from the well installed in BH3, was analysed for volatile organic compounds (VOCs) and PHCs. All detected concentrations were in compliance with the 2004 MOE Table 3 commercial standards. No groundwater remediation was recommended.

3.0 Current Subsurface Investigation

The field program consisted of the placement of four (4) boreholes across the northern portion of the subject property. The boreholes were conducted on April 20 and May 3, 2012, by means of a truck mounted drill rig under the full time supervision of Paterson personnel. It should be noted that the Phase II-ESA was carried out in conjunction with a geotechnical investigation. Boreholes numbered BH2-12 to BH4-12, were each extended to depths of approximately 6 m below the existing grade, while BH1 was extended to a depth of 13.6 m, for geotechnical purposes. One (1) borehole (BH3-12) was instrumented with a groundwater monitoring well. The monitoring well previously installed by Paterson was present on the eastern portion of the site. The locations of the boreholes can be seen on the attached Test Hole Location Plan. The depths at which the auger and split spoon samples were obtained from the test holes are shown as “**AU**” and “**SS**” on the Soil Profile and Test Data sheets, attached to this report.

Subsurface Profile

The soil profile generally consists of a pavement structure over fill material underlain by grey silty clay followed by glacial till. The fill generally consists of brown silty sand with gravel and extends to a depth of approximately 3.7 m below the surface. Coal was noted in the fill identified in BH3-12 and BH4-12. A layer of black gravel and sand was identified in BH2-12 from approximately 0.2 to 1.5 m below ground surface. Specific details of the soil profile at each test hole location are presented on the attached Soil Profile and Test Data sheets.

Levelling Survey

The layout of the test hole locations was undertaken by this firm. The ground elevation at each test hole location was referenced to an assumed benchmark established by an in-house levelling survey. The top spindle of the fire hydrant located at the southwest corner of Breezehill Avenue and Somerset Street West, was used for this purpose and was reported to have a Geodetic Elevation = 63.669 m, although this was not verified by this firm. Refer to the Test Hole Location Plan for the locations and ground surface elevations of the boreholes.

Monitoring Well Installation

A groundwater monitoring well was installed in BH3-12. The locations of the monitoring wells can be seen on the attached Test Hole Location Plan. Typical monitoring well construction details are described below:

- Slotted 50 mm diameter PVC screen at base of borehole.
- 50 mm diameter PVC riser pipe from the top of the screen to ground surface.
- No.3 silica sand backfill within annular space around screen.
- 300 mm thick bentonite hole plug directly above PVC slotted screen.
- Clean backfill from top of bentonite plug to the ground surface.

Refer to the Soil Profile and Test Data sheets attached for the actual well construction in BH3-12.

Soil Sampling Protocol

A total of thirty-eight (38) soil samples were recovered from the test holes by means of stainless steel split spoon sampling. Upon recovery, all samples were immediately sealed in appropriate containers to facilitate a preliminary screening procedure. Hydrocarbon odours were detected in some soil samples recovered from the boreholes. As noted previously, a layer of black gravel was noted in BH2-12 from 0.2 to 1.5 m below grade. Pieces of coal, slag, concrete and/or glass were noted in the fill material recovered from BH3-12 and BH4-12.

All samples recovered as part of this investigation will be stored in the laboratory for a period of one (1) month after issuance of this report. All samples will then be discarded unless this firm is otherwise directed.

Soil Sample Headspace Analysis

The technical protocol was obtained from Appendix C of the MOE document titled "Interim Guidelines for the Remediation of Petroleum Contamination at Operating Retail and Private Fuel Outlets in Ontario", dated March 1992.

Soil samples recovered at the time of sampling were placed immediately into airtight plastic bags with nominal headspace. All lumps of soil inside the bags were broken by hand, and the soil was allowed to come to room temperature prior to conducting the vapour survey. Allowing the samples to stabilize to room temperature ensures consistency of readings between samples.

To measure the soil vapours, the analyser probe is inserted into the nominal headspace above the soil sample. An RKI Eagle (gastech) with methane elimination and calibrated to hexane was used for this purpose. The sample is agitated/manipulated gently as the measurement is taken. The peak reading registered within the first 15 seconds is recorded as the vapour measurement.

The parts per million (ppm) scale is used to measure concentrations of hydrocarbon vapours that are too low to register on the Lower Explosive Limit (LEL) scale. The explosive point, 100% LEL, represents the leanest mixture which will burn (or explode) if ignited.

The combustible vapour readings were found to range from 0 to 55 ppm. These readings are not considered to be indicative of the presence of significant concentrations of volatile substances, such as the lighter petroleum hydrocarbon fractions (F_1 and F_2). The vapour results can not be used to identify the presence of heavier petroleum hydrocarbons such as heavy oil. Please refer to the Soil Profile and Test Data sheets attached for soil sample headspace results.

Groundwater

A return visit to the site was conducted on May 8, 2011 in order to obtain stabilized groundwater levels and to sample the groundwater from BH3-12 and BH3 (installed during the previous investigation). The wells were purged prior to sampling by removing three (3) times the volume of water contained in the wells. The groundwater samples were taken using dedicated sampling equipment. The samples were stored in bottles prepared by Paracel Laboratories and stored in a cooler to reduce analyte volatilization during transportation.

The groundwater levels in the above noted monitoring wells were measured at 3.5 m (BH3-12) and 3.6 m (BH3) below the existing ground surface. It should be noted that groundwater levels are expected to fluctuate throughout the year with seasonal variations. A sheen was noted on the groundwater recovered from BH3 and a hydrocarbon odour was detected. Hydrocarbon odours were also detected during the sampling of BH3-12.

4.0 Analytical Test Results

Soil and Groundwater Standards

It is our understanding that the property is to be redeveloped in the future for residential purposes. The soil and groundwater standards for the subject property were obtained from Table 3 of the document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", prepared by the Ontario Ministry of Environment (MOE), April 15, 2011. The MOE Table 3 Standards are based on the following considerations:

- Fine grained soil conditions.
- Surface soil and groundwater conditions.
- Non-potable groundwater situation.
- Residential land use.

It should be noted that MOE Table 1 standards (background conditions) are also provided in the tables below for comparison purposes. Any soil that is removed from the site for construction purposes and exceeding MOE Table 1 standards, must be disposed of at an approved waste disposal facility as contaminated soil.

Paracel Laboratories (Paracel) of Ottawa, performed the laboratory analysis of the samples submitted for analytical testing. Paracel is a member of the Standards Council of Canada/Canadian Association for Environmental Analytical Laboratories (SCC/CAEAL). Paracel is accredited and certified by SCC/CAEAL for specific tests registered with the association.

Soil

Five (5) soil samples were submitted to Paracel Laboratories for analysis of a combination of petroleum hydrocarbons (PHCs, Fractions 1 to 4), polynuclear aromatic hydrocarbons (PAHs) and metals. The results of the analytical testing and selected MOE standards are presented in Tables 1 to 3. A copy of the analytical test results is attached to this report.

| Table 1 Analytical Test Results - Soil PHCs (Fractions 1 to 4) | | | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------------|---------------------|---------------------|----------------------------------------------------------------|---------------------------------------------------------------|
| Parameter | MDL (µg/g) | Soil Samples (µg/g) | | | MOE Table 1 Standards Background Conditions (µg/g) | MOE Table 3 Standards Residential Land Use (µg/g) |
| | | BH2-12- SS5 | BH3-12- SS5 | BH4-12- SS5 | | |
| F ₁ PHCs (C ₆ -C ₁₀) | 7 | 15 | 23 | 15 | 25 | 65 |
| F ₂ PHCs (C ₁₀ -C ₁₆) | 4 | <u>281</u> | <u>785</u> | <u>1,050</u> | 10 | 250 |
| F ₃ PHCs (C ₁₆ -C ₃₄) | 8 | <u>507</u> | <u>1,730</u> | <u>1,770</u> | 240 | 1,300 |
| F ₄ PHCs (C ₃₄ -C ₅₀) | 6 | <u>194</u> | <u>685</u> | <u>738</u> | 120 | 5,600 |
| Notes: <input type="checkbox"/> MDL - Method Detection Limit <input type="checkbox"/> nd - Not Detected (< MDL) <input type="checkbox"/> <u>underlined</u> values exceed MOE Table 1 standards <input type="checkbox"/> <u>bold and underlined</u> - values exceed MOE Table 3 (Residential) standards | | | | | | |

PHC fractions were identified in each of the soil samples submitted for analytical testing. Fractions F₂ and F₃ in samples BH3-12-SS5 and BH2-12-G1 and fraction F₂ in sample BH2-12-SS5 exceed the MOE Table 3 standards for a residential land use.

Table 2
Analytical Test Results - Soil
Polycyclic Aromatic Hydrocarbons (PAHs)

| Parameter | MDL (µg/g) | Soil Samples (µg/g) | | MOE Table 1 Standards Background (µg/g) | MOE Table 3 Standards Residential (µg/g) |
|------------------------|---------------|------------------------|--------------------|--------------------------------------------------|---------------------------------------------------|
| | | BH2-12-AU1* | BH3-12-SS1 | | |
| Acenaphthene | 0.02 | <u>0.08</u> | <u>0.10</u> | 0.072 | 58 |
| Acenaphthylene | 0.02 | 0.07 | <u>0.11</u> | 0.093 | 0.17 |
| Anthracene | 0.02 | 0.07 | <u>0.39</u> | 0.16 | 0.74 |
| Benzo[a]anthracene | 0.02 | 0.17 | <u>0.75</u> | 0.36 | 0.63 |
| Benzo[a]pyrene | 0.02 | 0.12 | <u>0.67</u> | 0.3 | 0.3 |
| Benzo[b]fluoranthene | 0.02 | 0.21 | <u>0.71</u> | 0.47 | 0.78 |
| Benzo[ghi]perylene | 0.02 | nd | 0.31 | 0.68 | 7.8 |
| Benzo[k]fluoranthene | 0.02 | 0.20 | <u>0.63</u> | 0.48 | 0.78 |
| Biphenyl | 0.02 | <u>0.14</u> | 0.04 | 0.05 | 1.1 |
| Chrysene | 0.02 | 0.38 | 0.75 | 2.8 | 7.8 |
| Dibenzo[a,h]anthracene | 0.02 | nd | <u>0.15</u> | 0.1 | 0.1 |
| Fluoranthene | 0.02 | 0.21 | <u>1.44</u> | 0.56 | 0.69 |
| Fluorene | 0.02 | <u>0.14</u> | <u>0.14</u> | 0.12 | 69 |
| Indeno[1,2,3-cd]pyrene | 0.02 | nd | <u>0.31</u> | 0.23 | 0.48 |
| Methylnaphthalene | 0.04 | <u>2.53</u> | <u>0.65</u> | 0.59 | 3.4 |
| Naphthalene | 0.02 | <u>0.90</u> | <u>0.27</u> | 0.09 | 0.75 |
| Phenanthrene | 0.02 | <u>0.74</u> | <u>1.20</u> | 0.69 | 7.8 |
| Pyrene | 0.02 | 0.40 | <u>1.39</u> | 1 | 78 |

Notes:

- MDL - Method Detection Limit
- nd - Not Detected (< MDL)
- Underlined - values exceed MOE Table 1 Standards
- bold and underlined** - values exceed MOE Table 3 (Residential) Standards
- * laboratory report identifies this sample as BH2-12-G1

PAH parameters were detected in both soil samples submitted for analytical testing. The naphthalene parameter in Sample BH2-12-G1 and the benzo[a]anthracene, benzo[a]pyrene and fluoranthene parameters in Sample BH3-12-SS1 exceed the MOE Table 3 fine-grained soil standards for a residential land use. Several other parameters in each soil sample also exceed the more stringent MOE Table 1 Standards.

| Table 3 Analytical Test Results - Soil Metals | | | | | |
|--------------------------------------------------------------|---------------|-----------------------|-------------------|--------------------------------------------------|---------------------------------------------------|
| Parameter | MDL (µg/g) | Soil Sample (µg/g) | | MOE Table 1 Standards Background (µg/g) | MOE Table 3 Standards Residential (µg/g) |
| | | BH2-12-G1 | BH3-12-SS1 | | |
| Antimony | 1 | nd | <u>7</u> | 1.3 | 7.5 |
| Arsenic | 1 | 2 | 2 | 18 | 18 |
| Barium | 1 | <u>230</u> | 75 | 220 | 390 |
| Beryllium | 0.5 | nd | nd | 2.5 | 5 |
| Boron | 5.0 | 12 | 5.3 | 36 | 120 |
| Cadmium | 0.5 | nd | nd | 1.2 | 1.2 |
| Chromium | 5 | 12 | 13 | 70 | 160 |
| Chromium (VI) | 0.2 | nd | nd | 0.66 | 10 |
| Cobalt | 1 | 4 | 5 | 21 | 22 |
| Copper | 5 | 15 | 35 | 92 | 180 |
| Lead | 1 | 17 | <u>121</u> | 120 | 120 |
| Mercury | 0.1 | nd | nd | 0.27 | 1.8 |
| Molybdenum | 1 | nd | nd | 2 | 6.9 |
| Nickel | 5 | 11 | 10 | 82 | 130 |
| Selenium | 1 | nd | nd | 1.5 | 2.4 |
| Silver | 0.3 | nd | nd | 0.5 | 25 |
| Thallium | 1 | nd | nd | 1 | 1 |
| Uranium | 1 | nd | nd | 2.5 | 23 |
| Vanadium | 10 | 19 | 25 | 86 | 86 |
| Zinc | 20 | 26 | 61 | 290 | 340 |

Notes: MDL - Method Detection Limit
 nd - Not Detected (< MDL)
 underlined- value exceeds MOE Table 1 Standards
 bold and underlined - value exceeds MOE Table 3 (Residential) Standards

The lead parameter (121 µg/g) in Sample BH3-12-SS1 marginally exceeds the MOE Table 3 and Table 1 standard of 120 (µg/g). The antimony and barium parameters in Samples BH3-12-SS1 and BH2-12-G1, respectively, exceed the MOE Table 1 standards. It should be noted that the barium (230 µg/g) parameter is only marginally above the Table 1 standard of 220 µg/g. All other metal parameters detected, are in compliance with both the MOE Table 3 and MOE Table 1 standards.

Groundwater

Groundwater samples were collected from the monitoring wells installed in BH3-12 and BH3 (from a previous investigation) on May 8, 2011. The groundwater samples were submitted for analytical testing of PHCs and volatile organic compounds (VOCs). The results of the analytical testing and selected MOE standards are presented in Tables 4 and 5. A copy of the analytical test results is attached to this report.

| Table 4 Analytical Test Results - Groundwater PHCs (Fractions 1 to 4) | | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------------------|------------|---------------------------------------------------|
| Parameter | MDL (ug/L) | Groundwater Samples (µg/L) | | MOE Table 3 Standards Residential Land Use (ug/L) |
| | | BH3-GW2 | BH3-12-GW1 | |
| F1 PHCs (C ₆ -C ₁₀) | 25 | < 250 * | 89 | 750 |
| F2 PHCs (C ₁₀ -C ₁₆) | 100 | 120 | nd | 150 |
| F3 PHCs (C ₁₆ -C ₃₄) | 100 | 460 | nd | 500 |
| F4 PHCs (C ₃₄ -C ₅₀) | 100 | 100 | nd | 500 |
| Notes: <input type="checkbox"/> MDL - Method Detection Limit <input type="checkbox"/> nd - Not Detected (< MDL) <input type="checkbox"/> * elevated detection limits due to the nature of the sample matrix | | | | |

PHC parameters were detected in both groundwater samples submitted for analytical testing. Detected parameters are in compliance with the selected MOE Table 3 standards.

| Table 5 | | | | |
|----------------------------------------------|-----------------------|---------------------------------------|--------------------|-----------------------------------------|
| Analytical Test Results - Groundwater | | | | |
| Volatile Organic Compounds (VOCs) | | | | |
| Parameters | MDL (µg/L) | Groundwater Samples (µg/L) | | MOE Table 3 Standards (µg/g) |
| | | BH3-GW2 * | BH3-12- GW1 | |
| Acetone | 5.0 | < 50.0 | 73.7 | 130,000 |
| Benzene | 0.5 | < 5.0 | nd | 430 |
| Bromodichloromethane | 0.5 | < 5.0 | nd | 85,000 |
| Bromoform | 0.5 | < 5.0 | nd | 770 |
| Bromomethane | 0.5 | < 5.0 | nd | 56 |
| Carbon Tetrachloride | 0.2 | < 2.0 | nd | 8.4 |
| Chlorobenzene | 0.5 | < 5.0 | nd | 630 |
| Chloroethane | 1.0 | < 10.0 | nd | nv |
| Chloroform | 0.5 | < 5.0 | nd | 22 |
| Chloromethane | 3.0 | < 30.0 | nd | nv |
| Dibromochloromethane | 0.5 | < 5.0 | nd | 82,000 |
| 1,2 - Dibromoethane | 0.2 | < 2.0 | nd | nv |
| m - Dichlorobenzene | 0.5 | < 5.0 | nd | 9,600 |
| o - Dichlorobenzene | 0.5 | < 5.0 | nd | 9,600 |
| p - Dichlorobenzene | 0.5 | < 5.0 | nd | 67 |
| Dichlorodifluoromethane | 1.0 | < 10.0 | nd | 4,400 |
| 1,1-Dichloroethane | 0.5 | < 5.0 | nd | 3,100 |
| 1,2-Dichloroethane | 0.5 | < 5.0 | nd | 12 |
| 1,1-Dichloroethylene | 0.5 | < 5.0 | nd | 17 |
| c-1,2-Dichloroethylene | 0.5 | < 5.0 | nd | 17 |
| t-1,2-Dichloroethylene | 0.5 | < 5.0 | nd | 17 |
| 1-2-Dichloroethylene, total | 0.5 | < 5.0 | nd | 34 |
| 1,2-Dichloropropane | 0.5 | < 5.0 | nd | 140 |
| Hexane | 1.0 | < 10.0 | nd | 520 |
| c-1,3-Dichloropropylene | 0.5 | < 5.0 | nd | nv |
| t-1,3-Dichloropropylene | 0.5 | < 5.0 | nd | nv |
| 1,3-Dichloropropene, total | 0.5 | < 5.0 | nd | 45 |
| Ethylbenzene | 0.5 | < 5.0 | 0.7 | 2,300 |
| Methyl Ethyl Ketone | 5.0 | < 50.0 | nd | 1,500,000 |
| Methyl Butyl Ketone | 10.0 | < 100 | nd | nv |
| Methyl Isobutyl Ketone | 5.0 | < 50.0 | nd | 580,000 |
| Methyl tert-Butyl Ether | 2.0 | < 20.0 | nd | 1,400 |
| Methylene Chloride | 5.0 | < 50.0 | nd | 5,500 |
| Styrene | 0.5 | < 5.0 | nd | 9,100 |
| 1,1,1,2-Tetrachloroethane | 0.5 | < 5.0 | nd | 28 |
| 1,1,2,2-Tetrachloroethane | 0.5 | < 5.0 | nd | 15 |

Notes: MDL - Method Detection Limit; * elevated detection limits due to the nature of the sample matrix
 nd - Not Detected (< MDL); nv - No current MOE standards

| Table 5 - continued | | | | |
|---------------------------------------|---------------|----------------------------|-------------|---------------------------------|
| Analytical Test Results - Groundwater | | | | |
| Volatile Organic Compounds (VOCs) | | | | |
| Parameters | MDL (µg/L) | Groundwater Samples (ug/L) | | MOE Table 3 Standards (µg/g) |
| | | BH3- GW2 | BH3-12- GW1 | |
| Tetrachloroethylene | 0.5 | < 5.0 | 1.9 | 17 |
| Toluene | 0.5 | < 5.0 | 9.1 | 18,000 |
| 1,2,4-Trichlorobenzene | 0.5 | < 5.0 | nd | 850 |
| 1,1,1-Trichloroethane | 0.5 | < 5.0 | nd | 6,700 |
| 1,1,2-Trichloroethane | 0.5 | < 5.0 | nd | 30 |
| Trichloroethylene | 0.5 | <5.0 | nd | 17 |
| Trichlorofluoromethane | 1.0 | <10.0 | nd | 2,500 |
| 1,3,5-Trimethylbenzene | 0.5 | < 5.0 | 1.5 | nv |
| Vinyl Chloride | 0.5 | <5.0 | nd | 1.7 |
| Total Xylenes | 0.5 | <5.0 | 4.0 | 4,200 |

Notes: MDL - Method Detection Limit; * elevated detection limits due to the nature of the sample matrix
 nd - Not Detected (< MDL); nv - No current MOE standard

There were no VOC parameters detected in the groundwater sample recovered from BH3-GW2. It should be noted however, that the Certificate of Analysis indicates that the detection limits were elevated due to the nature of the sample matrix. Several VOC parameters were detected in the groundwater Sample BH3-12-GW1. The parameters were in compliance with the MOE Table 3 groundwater standards.

5.0 Assessment and Recommendations

Assessment

A Phase II - Environmental Site Assessment was carried out for the commercial property at 1040 Somerset Street West, in the City of Ottawa, Ontario. The purpose of this assessment was to determine if the past and current uses of the site and adjacent properties to the south and west, have impacted the soil and groundwater on the subject property.

Four (4) boreholes were placed along the northern portion of the subject property on May 3, 2012. Hydrocarbon odours were noted in some of the soil samples recovered from the boreholes. A layer of black gravel and sand was identified in BH2-12, and pieces of coal and/or slag were identified in the fill material in BH3-12 and BH4-12. Five (5) soil samples were submitted to Paracel Laboratories for analysis of a combination of PHC, PAH and metal parameters.

PHC fractions (F_2 and/or F_3) and PAH parameters exceeding the selected Table 3 standards were identified in the soil recovered from BH2-12 and BH4-12. The lead parameter identified in a soil sample recovered from BH3-12 (121 $\mu\text{g/g}$) marginally exceeds the MOE Table 3 standard value of 120 $\mu\text{g/g}$.

A barium parameter identified in a soil sample recovered from BH2-12 (230 $\mu\text{g/g}$) marginally exceeds the Table 1 standard (220 $\mu\text{g/g}$).

Groundwater samples were collected from BH3-12 and BH3 on May 8, 2012. The water samples were submitted for analysis of PHC and VOC parameters. Hydrocarbon odours were detected during the sampling event at each monitoring well, and a sheen was noted on the groundwater recovered from BH3.

PHC parameters were detected in both groundwater samples submitted for analytical testing. The detected parameters are in compliance with the selected MOE Table 3 standards.

There were no VOC parameters detected in the groundwater Sample BH3-GW2. It should be noted however, that the laboratory Certificate of Analysis indicates that the detection limits were elevated due to the nature of the sample matrix. Several VOC parameters were detected in the groundwater sample recovered from BH3-12-GW1. The parameters were in compliance with the MOE Table 3 groundwater standards.

Recommendations

Based on the results of the analytical testing, the subject property has been impacted from the former use of the property for the storage of coal and possibly fuel oil. The source of the PAH and hydrocarbon impacts is considered to likely be the former use of the site and/or property to the south (previously occupied by Bruce Coal Limited).

The impacted soil identified on site poses a liability to the property. It is our understanding that the subject property will be redeveloped in the future, for residential purposes. For economical purposes, it is recommended that a soil remediation program be conducted once the building has been removed. The interior of the garage and southern portion of the property was not addressed at the time of the site assessment. It is also recommended that an interior drill program be conducted within the subject structure prior to redevelopment, in order to address potential concerns associated with the on-site garage and adjacent property to the south.

All impacted soil exceeding MOE Table 3 residential standards will require disposal at an approved waste disposal facility. Any soil exceeding MOE Table 1 standards that must leave the site for construction purposes must be disposed of at an approved waste disposal facility. A leachate analysis in accordance with Ontario Regulation 347/558 will be required prior to offsite disposal of the impacted material.

Based on the analytical testing, the groundwater meets the Table 3 standards and a groundwater remediation program is not required. Closer to the time of redevelopment, it is recommended that the groundwater monitoring wells onsite be re-sampled, and the groundwater re-tested to assess the condition of the groundwater, which may be acceptable for disposal to the municipal sewer system. If the groundwater is determined to exceed the municipal sewer discharge guidelines and needs to be removed from the property for construction purposes, it is recommended that the groundwater be treated to acceptable levels prior to discharge to the sewer or pumped offsite by a licenced contractor.

If the monitoring wells installed in BH3-12 and BH3 are not going to be used in the future, they should be abandoned according to Ontario Regulation 903. The wells will be registered with the MOE under this regulation.

5.0 Statement of Limitations

The client should be aware that any information pertaining to soils and all test hole logs are furnished as a matter of general information only and test hole descriptions or logs are not to be interpreted as descriptive of conditions at locations other than those described by the test holes themselves.

This report was prepared for the use of Claridge Homes. Permission from Paterson Group and Claridge Homes will be required to release this report to any other party.

We trust that this submission will satisfy your present requirements. If you have any questions regarding this report, please contact our office.

Paterson Group Inc.



Karyn Munch, P.Eng.



Mark S. D'Arcy, P.Eng

Report Distribution:

- Claridge Homes (3 copies)
- Paterson Group Inc. (1 copy)

Attachments:

- Soil Profile and Test Data Sheets
- Analytical Test Results
- Drawing PE2636-1: Test Hole Location Plan

DATUM TBM - Top spindle of fire hydrant located at the southwest corner of Breezehill Avenue and Somerset Street West. Geodetic elevation = 63.669m.

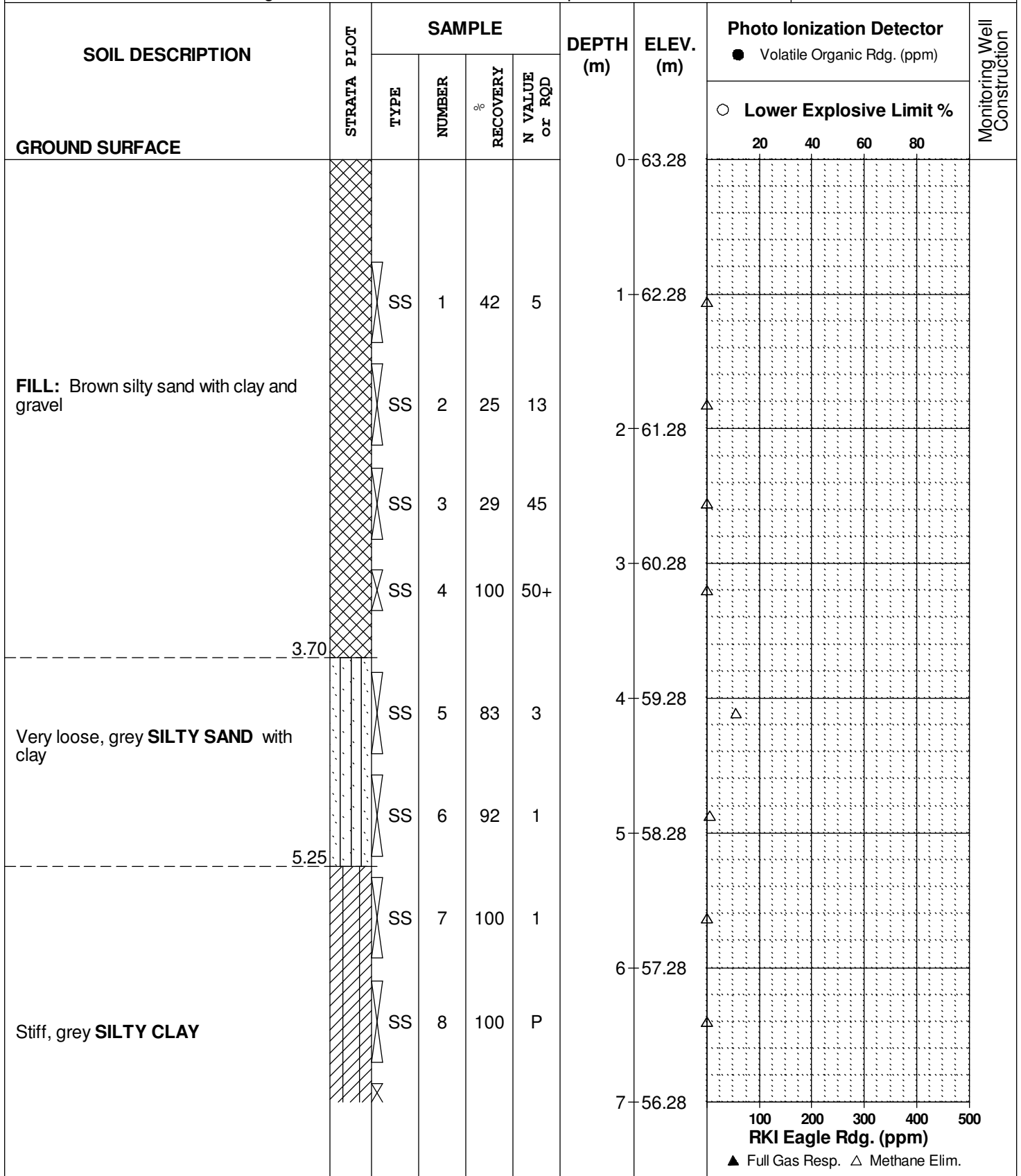
FILE NO. PE2636

REMARKS

HOLE NO. BH 1-12

BORINGS BY CME 55 Power Auger

DATE April 20, 2012



SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
1040 Somerset Street West
Ottawa, Ontario

DATUM TBM - Top spindle of fire hydrant located at the southwest corner of Breezehill Avenue and Somerset Street West. Geodetic elevation = 63.669m.

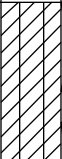









REMARKS

FILE NO.
PE2636

HOLE NO.
BH 1-12

BORINGS BY CME 55 Power Auger

DATE April 20, 2012

| SOIL DESCRIPTION | STRATA PLOT | SAMPLE | | | | DEPTH (m) | ELEV. (m) | Photo Ionization Detector | | | | Monitoring Well Construction |
|-------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------|--------|------------|----------------|-----------|-----------|-------------------------------|----|----|----|------------------------------|
| | | TYPE | NUMBER | RECOVERY % | N VALUE or RQD | | | ● Volatile Organic Rgd. (ppm) | | | | |
| | | | | | | | | ○ Lower Explosive Limit % | | | | |
| | | | | | | | | 20 | 40 | 60 | 80 | |
| Stiff, grey SILTY CLAY |  | SS | 9 | 100 | P | 7 | 56.28 | | | | | |
| |  | SS | 10 | 100 | P | 8 | 55.28 | | | | | |
| GLACIAL TILL: Grey silty clay with sand, gravel, cobbles |  | SS | 11 | 75 | P | 9 | 54.28 | | | | | |
| |  | SS | 12 | 8 | 11 | 10 | 53.28 | | | | | |
| |  | SS | 13 | 58 | 4 | 11 | 52.28 | | | | | |
| |  | SS | 14 | 50 | 20 | 12 | 51.28 | | | | | |
| |  | SS | 15 | 67 | 50+ | 13 | 50.28 | | | | | |
| |  | SS | 16 | 67 | 24 | | | | | | | |
| |  | SS | 17 | 80 | 50+ | | | | | | | |
| End of Borehole Practical refusal to augering at 13.59m depth. |  | | | | | | | | | | | |

100 200 300 400 500
RKI Eagle Rgd. (ppm)
▲ Full Gas Resp. △ Methane Elim.

DATUM TBM - Top spindle of fire hydrant located at the southwest corner of Breezehill Avenue and Somerset Street West. Geodetic elevation = 63.669m.

REMARKS

BORINGS BY CME 55 Power Auger

DATE May 3, 2012

FILE NO. PE2636

HOLE NO. BH 2-12

| SOIL DESCRIPTION | STRATA PLOT | SAMPLE | | | | DEPTH (m) | ELEV. (m) | Photo Ionization Detector | | | | Monitoring Well Construction |
|--------------------------------------------------------|-------------|--------|--------|------------|----------------|-----------|-----------|-------------------------------|---------------------------|----|----|------------------------------|
| | | TYPE | NUMBER | RECOVERY % | N VALUE or RQD | | | ● Volatile Organic Rdg. (ppm) | ○ Lower Explosive Limit % | | | |
| | | | | | | | | 20 | 40 | 60 | 80 | |
| GROUND SURFACE | | | | | | 0 | 63.28 | | | | | |
| Asphaltic concrete | 0.05 | | | | | | | | | | | |
| FILL: Crushed stone | 0.15 | | | | | | | | | | | |
| FILL: Black gravel with silty sand | | | | | | | | | | | | |
| | 1.45 | AU | 1 | | | 1 | 62.28 | | | | | |
| | | SS | 2 | 25 | 9 | 2 | 61.28 | | | | | |
| FILL: Brown silty sand with gravel and boulders | | SS | 3 | 33 | 9 | 3 | 60.28 | | | | | |
| | 3.73 | SS | 5 | 42 | 0 | 4 | 59.28 | | | | | |
| | | SS | 5 | 50 | 3 | 5 | 58.28 | | | | | |
| Grey SILTY CLAY with sand | | SS | 6 | 92 | 3 | 6 | 57.28 | | | | | |
| | 6.02 | SS | 7 | 100 | 2 | 7 | 56.28 | | | | | |
| End of Borehole | | | | | | 6 | 57.28 | | | | | |

100 200 300 400 500
RKI Eagle Rdg. (ppm)
▲ Full Gas Resp. △ Methane Elim.

DATUM TBM - Top spindle of fire hydrant located at the southwest corner of Breezehill Avenue and Somerset Street West. Geodetic elevation = 63.669m.

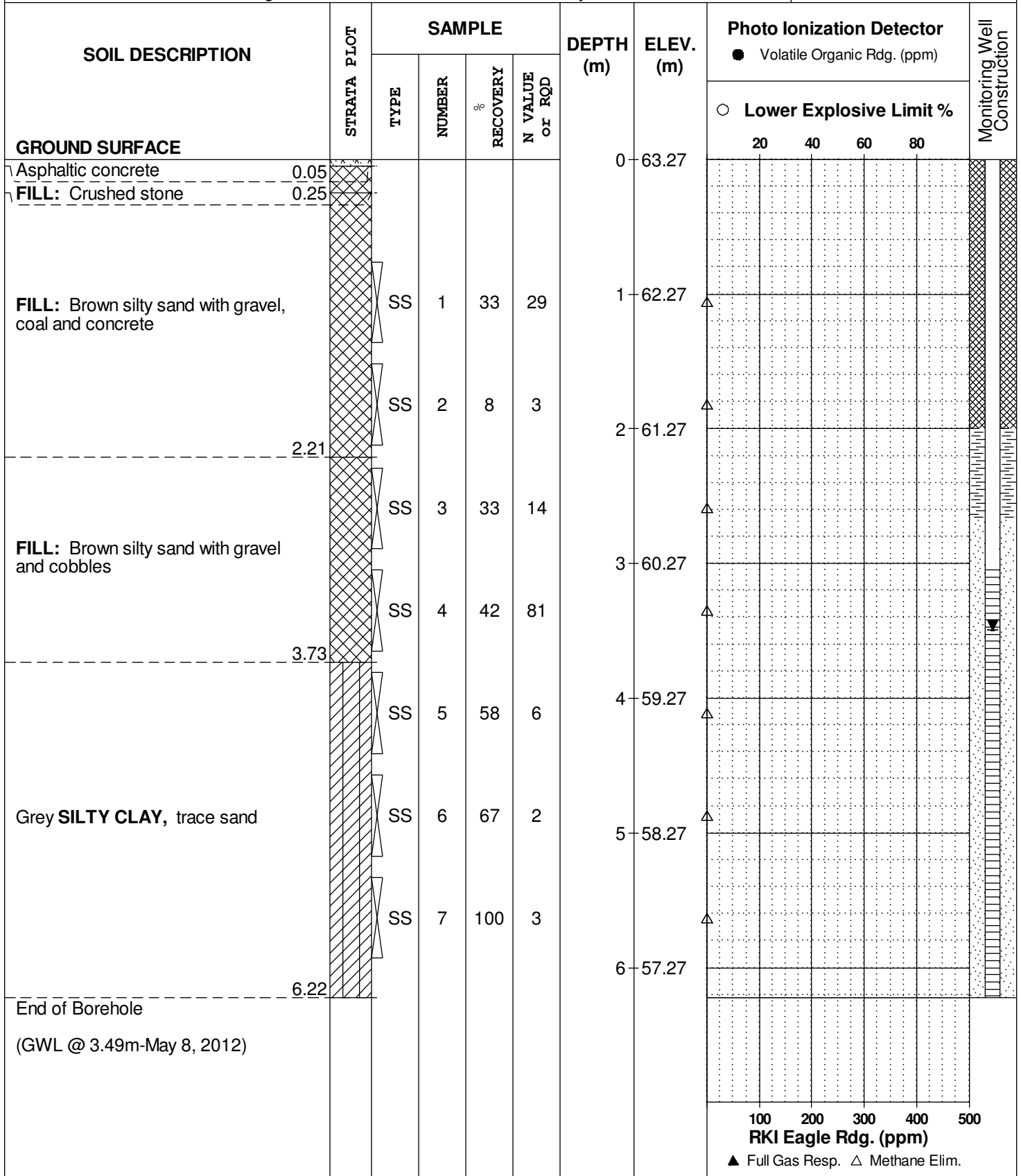
FILE NO. PE2636

REMARKS

HOLE NO. BH 3-12

BORINGS BY CME 55 Power Auger

DATE May 3, 2012



SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
1040 Somerset Street West
Ottawa, Ontario

DATUM TBM - Top spindle of fire hydrant located at the southwest corner of Breezehill Avenue and Somerset Street West. Geodetic elevation = 63.669m.

REMARKS

FILE NO. PE2636

HOLE NO. BH 4-12

BORINGS BY CME 55 Power Auger

DATE May 3, 2012

| SOIL DESCRIPTION | STRATA PLOT | SAMPLE | | | | DEPTH (m) | ELEV. (m) | Photo Ionization Detector | | | | Monitoring Well Construction | |
|-------------------------------------------------------|-------------|--------|--------|------------|----------------|-----------|-----------|-------------------------------|---------------------------|----|----|------------------------------|--|
| | | TYPE | NUMBER | RECOVERY % | N VALUE or RQD | | | ● Volatile Organic Rdg. (ppm) | ○ Lower Explosive Limit % | | | | |
| GROUND SURFACE | | | | | | | | 20 | 40 | 60 | 80 | | |
| Asphaltic concrete | 0.05 | | | | | 0 | 63.29 | | | | | | |
| FILL: Brown silty sand with gravel, coal, slag, glass | | SS | 1 | 33 | 27 | 1 | 62.29 | ▲ | | | | | |
| | | SS | 2 | 8 | 3 | 2 | 61.29 | ▲ | | | | | |
| | | SS | 3 | 25 | 5 | 3 | 60.29 | ▲ | | | | | |
| | | SS | 4 | 42 | 16 | 4 | 60.29 | ▲ | | | | | |
| | | SS | 5 | 42 | 26 | 4 | 59.29 | ▲ | | | | | |
| | | SS | 6 | 17 | 2 | 5 | 58.29 | ▲ | | | | | |
| | | SS | 7 | 100 | | 6 | 57.29 | ▲ | | | | | |
| Grey SILTY CLAY with sand | 3.73 | | | | | | | | | | | | |
| End of Borehole | 6.02 | | | | | 6 | 57.29 | | | | | | |

100 200 300 400 500
RKI Eagle Rdg. (ppm)
▲ Full Gas Resp. △ Methane Elim.

Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Eric Leveque

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

Client PO: 12038
Project: PE2636
Custody: 3147

Report Date: 4-May-2012
Order Date: 3-May-2012

Order #: 1218256

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

| Parcel ID | Client ID |
|------------|------------|
| 1218256-01 | BH2-12 G1 |
| 1218256-02 | BH2-12 SS5 |
| 1218256-03 | BH3-12 SS1 |
| 1218256-04 | BH3-12 SS5 |
| 1218256-05 | BH4-12 SS5 |

Approved By:



Mark Foto, M.Sc. For Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liability in connection with this work, however arising shall be limited to the amount paid by you for this work, and that our employees or agents shall not under circumstances be liable to you in connection with this work

Certificate of Analysis

 Client: **Paterson Group Consulting Engineers**

Client PO: 12038

Project Description: PE2636

Report Date: 04-May-2012

Order Date: 3-May-2012

Analysis Summary Table

| Analysis | Method Reference/Description | Extraction Date | Analysis Date |
|------------------------------|---------------------------------------|-----------------|---------------|
| CCME PHC F1 | CWS Tier 1 - P&T GC-FID | 4-May-12 | 4-May-12 |
| CCME PHC F2 - F4 | CWS Tier 1 - GC-FID, extraction | 4-May-12 | 4-May-12 |
| Chromium, hexavalent | MOE E3056 - Extraction, colourimetric | 4-May-12 | 4-May-12 |
| Mercury | EPA 7471A - CVAA, digestion | 4-May-12 | 4-May-12 |
| Metals | EPA 6020 - Digestion - ICP-MS | 4-May-12 | 4-May-12 |
| PAHs by GC-MS, standard scan | EPA 8270 - GC-MS, extraction | 4-May-12 | 4-May-12 |
| Solids, % | Gravimetric, calculation | 4-May-12 | 4-May-12 |

Certificate of Analysis

 Client: **Paterson Group Consulting Engineers**

Client PO: 12038

Report Date: 04-May-2012

Order Date: 3-May-2012

Project Description: PE2636

| | | | | |
|---------------------|------------|------------|------------|------------|
| Client ID: | BH2-12 G1 | BH2-12 SS5 | BH3-12 SS1 | BH3-12 SS5 |
| Sample Date: | 03-May-12 | 03-May-12 | 03-May-12 | 03-May-12 |
| Sample ID: | 1218256-01 | 1218256-02 | 1218256-03 | 1218256-04 |
| MDL/Units | Soil | Soil | Soil | Soil |

Physical Characteristics

| | | | | | |
|----------|--------------|------|------|------|------|
| % Solids | 0.1 % by Wt. | 93.7 | 79.2 | 85.7 | 85.6 |
|----------|--------------|------|------|------|------|

Metals

| | | | | | |
|---------------|--------------|------|---|------|---|
| Antimony | 1 ug/g dry | <1 | - | 7 | - |
| Arsenic | 1 ug/g dry | 2 | - | 2 | - |
| Barium | 1 ug/g dry | 230 | - | 75 | - |
| Beryllium | 0.5 ug/g dry | <0.5 | - | <0.5 | - |
| Boron | 5.0 ug/g dry | 12.0 | - | 5.3 | - |
| Cadmium | 0.5 ug/g dry | <0.5 | - | <0.5 | - |
| Chromium | 5 ug/g dry | 12 | - | 13 | - |
| Chromium (VI) | 0.2 ug/g dry | <0.2 | - | <0.2 | - |
| Cobalt | 1 ug/g dry | 4 | - | 5 | - |
| Copper | 5 ug/g dry | 15 | - | 35 | - |
| Lead | 1 ug/g dry | 17 | - | 121 | - |
| Mercury | 0.1 ug/g dry | <0.1 | - | <0.1 | - |
| Molybdenum | 1 ug/g dry | <1 | - | <1 | - |
| Nickel | 5 ug/g dry | 11 | - | 10 | - |
| Selenium | 1 ug/g dry | <1 | - | <1 | - |
| Silver | 0.3 ug/g dry | <0.3 | - | <0.3 | - |
| Thallium | 1 ug/g dry | <1 | - | <1 | - |
| Uranium | 1 ug/g dry | <1 | - | <1 | - |
| Vanadium | 10 ug/g dry | 19 | - | 25 | - |
| Zinc | 20 ug/g dry | 26 | - | 61 | - |

Hydrocarbons

| | | | | | |
|-------------------|------------|---|-----|---|---------|
| F1 PHCs (C6-C10) | 7 ug/g dry | - | 15 | - | 23 |
| F2 PHCs (C10-C16) | 4 ug/g dry | - | 281 | - | 785 |
| F3 PHCs (C16-C34) | 8 ug/g dry | - | 507 | - | 1730 |
| F4 PHCs (C34-C50) | 6 ug/g dry | - | 194 | - | 685 [2] |

Semi-Volatiles

| | | | | | |
|------------------------|---------------|------|---|------|---|
| Acenaphthene | 0.02 ug/g dry | 0.08 | - | 0.10 | - |
| Acenaphthylene | 0.02 ug/g dry | 0.07 | - | 0.11 | - |
| Anthracene | 0.02 ug/g dry | 0.07 | - | 0.39 | - |
| Benzo [a] anthracene | 0.02 ug/g dry | 0.17 | - | 0.75 | - |
| Benzo [a] pyrene | 0.02 ug/g dry | 0.12 | - | 0.67 | - |
| Benzo [b] fluoranthene | 0.02 ug/g dry | 0.21 | - | 0.71 | - |

 P: 1-800-749-1947
 E: PARACEL@PARACELLABS.COM

WWW.PARACELLABS.COM

OTTAWA
 300-2319 St. Laurent Blvd.
 Ottawa, ON K1G 4J8

MISSISSAUGA
 6645 Kitimat Rd. Unit #27
 Mississauga, ON L5N 6J3

NIAGARA FALLS
 5415 Morning Glory Cr.
 Niagara Falls, ON L2J 0A3

SARNIA
 123 Christina St. N.
 Sarnia, ON N7T 5T7

Certificate of Analysis

 Client: **Paterson Group Consulting Engineers**

Client PO: 12038

Report Date: 04-May-2012

Order Date: 3-May-2012

Project Description: PE2636

| | MDL/Units | Client ID: | BH2-12 G1 | BH2-12 SS5 | BH3-12 SS1 | BH3-12 SS5 |
|--------------------------|---------------|--------------|------------|------------|------------|------------|
| | | Sample Date: | 03-May-12 | 03-May-12 | 03-May-12 | 03-May-12 |
| | | Sample ID: | 1218256-01 | 1218256-02 | 1218256-03 | 1218256-04 |
| | | | Soil | Soil | Soil | Soil |
| Benzo [g,h,i] perylene | 0.02 ug/g dry | | <0.04 [1] | - | 0.31 | - |
| Benzo [k] fluoranthene | 0.02 ug/g dry | | 0.20 | - | 0.63 | - |
| Biphenyl | 0.02 ug/g dry | | 0.14 | - | 0.04 | - |
| Chrysene | 0.02 ug/g dry | | 0.38 | - | 0.75 | - |
| Dibenzo [a,h] anthracene | 0.02 ug/g dry | | <0.04 [1] | - | 0.15 | - |
| Fluoranthene | 0.02 ug/g dry | | 0.21 | - | 1.44 | - |
| Fluorene | 0.02 ug/g dry | | 0.14 | - | 0.14 | - |
| Indeno [1,2,3-cd] pyrene | 0.02 ug/g dry | | <0.04 [1] | - | 0.31 | - |
| 1-Methylnaphthalene | 0.02 ug/g dry | | 1.07 | - | 0.24 | - |
| 2-Methylnaphthalene | 0.02 ug/g dry | | 1.46 | - | 0.41 | - |
| Methylnaphthalene (1&2) | 0.04 ug/g dry | | 2.53 | - | 0.65 | - |
| Naphthalene | 0.01 ug/g dry | | 0.90 | - | 0.27 | - |
| Phenanthrene | 0.02 ug/g dry | | 0.74 | - | 1.20 | - |
| Pyrene | 0.02 ug/g dry | | 0.40 | - | 1.39 | - |
| 2-Fluorobiphenyl | Surrogate | | 80.1% | - | 96.0% | - |
| Terphenyl-d14 | Surrogate | | 82.0% | - | 108% | - |

| | MDL/Units | Client ID: | BH4-12 SS5 | - | - | - |
|--|-----------|--------------|------------|---|---|---|
| | | Sample Date: | 03-May-12 | - | - | - |
| | | Sample ID: | 1218256-05 | - | - | - |
| | | | Soil | - | - | - |
| | | | | | | |

Physical Characteristics

| | | | | | |
|----------|--------------|------|---|---|---|
| % Solids | 0.1 % by Wt. | 90.5 | - | - | - |
|----------|--------------|------|---|---|---|

Hydrocarbons

| | | | | | |
|-------------------|------------|---------|---|---|---|
| F1 PHCs (C6-C10) | 7 ug/g dry | 15 | - | - | - |
| F2 PHCs (C10-C16) | 4 ug/g dry | 1050 | - | - | - |
| F3 PHCs (C16-C34) | 8 ug/g dry | 1770 | - | - | - |
| F4 PHCs (C34-C50) | 6 ug/g dry | 738 [2] | - | - | - |

Certificate of Analysis

Report Date: 04-May-2012

Client: **Paterson Group Consulting Engineers**

Order Date: 3-May-2012

Client PO: 12038

Project Description: PE2636

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 | | | | | | |
| Metals | | | | | | | | | |
| Antimony | ND | 1 | ug/g | | | | | | |
| Arsenic | ND | 1 | ug/g | | | | | | |
| Barium | ND | 1 | ug/g | | | | | | |
| Beryllium | ND | 0.5 | ug/g | | | | | | |
| Boron | ND | 5.0 | ug/g | | | | | | |
| Cadmium | ND | 0.5 | ug/g | | | | | | |
| Chromium (VI) | ND | 0.2 | ug/g | | | | | | |
| Chromium | ND | 5 | ug/g | | | | | | |
| Cobalt | ND | 1 | ug/g | | | | | | |
| Copper | ND | 5 | ug/g | | | | | | |
| Lead | ND | 1 | ug/g | | | | | | |
| Mercury | ND | 0.1 | ug/g | | | | | | |
| Molybdenum | ND | 1 | ug/g | | | | | | |
| Nickel | ND | 5 | ug/g | | | | | | |
| Selenium | ND | 1 | ug/g | | | | | | |
| Silver | ND | 0.3 | ug/g | | | | | | |
| Thallium | ND | 1 | ug/g | | | | | | |
| Uranium | ND | 1 | ug/g | | | | | | |
| Vanadium | ND | 10 | ug/g | | | | | | |
| Zinc | ND | 20 | ug/g | | | | | | |
| Semi-Volatiles | | | | | | | | | |
| Acenaphthene | ND | 0.02 | ug/g | | | | | | |
| Acenaphthylene | ND | 0.02 | ug/g | | | | | | |
| Anthracene | ND | 0.02 | ug/g | | | | | | |
| Benzo [a] anthracene | ND | 0.02 | ug/g | | | | | | |
| Benzo [a] pyrene | ND | 0.02 | ug/g | | | | | | |
| Benzo [b] fluoranthene | ND | 0.02 | ug/g | | | | | | |
| Benzo [g,h,i] perylene | ND | 0.02 | ug/g | | | | | | |
| Benzo [k] fluoranthene | ND | 0.02 | ug/g | | | | | | |
| Biphenyl | ND | 0.02 | ug/g | | | | | | |
| Chrysene | ND | 0.02 | ug/g | | | | | | |
| Dibenzo [a,h] anthracene | ND | 0.02 | ug/g | | | | | | |
| Fluoranthene | ND | 0.02 | ug/g | | | | | | |
| Fluorene | ND | 0.02 | ug/g | | | | | | |
| Indeno [1,2,3-cd] pyrene | ND | 0.02 | ug/g | | | | | | |
| 1-Methylnaphthalene | ND | 0.02 | ug/g | | | | | | |
| 2-Methylnaphthalene | ND | 0.02 | ug/g | | | | | | |
| Methylnaphthalene (1&2) | ND | 0.04 | ug/g | | | | | | |
| Naphthalene | ND | 0.01 | ug/g | | | | | | |
| Phenanthrene | ND | 0.02 | ug/g | | | | | | |
| Pyrene | ND | 0.02 | ug/g | | | | | | |
| Surrogate: 2-Fluorobiphenyl | 0.922 | | ug/g | | 69.1 | 50-140 | | | |
| Surrogate: Terphenyl-d14 | 1.08 | | ug/g | | 81.2 | 50-140 | | | |

Certificate of Analysis

Client: **Paterson Group Consulting Engineers**

Client PO: 12038

Project Description: PE2636

Report Date: 04-May-2012

Order Date: 3-May-2012

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) | 492 | 4 | ug/g dry | 281 | | | 54.4 | 30 | QR-04 |
| F3 PHCs (C16-C34) | 857 | 8 | ug/g dry | 507 | | | 51.4 | 30 | QR-04 |
| F4 PHCs (C34-C50) | 373 | 6 | ug/g dry | 194 | | | 63.0 | 30 | QR-04 |
| Metals | | | | | | | | | |
| Antimony | ND | 1 | ug/g dry | ND | | | 0.0 | 30 | |
| Arsenic | 2.2 | 1 | ug/g dry | 2.2 | | | 1.1 | 30 | |
| Barium | 13.4 | 1 | ug/g dry | 12.3 | | | 8.6 | 30 | |
| Beryllium | ND | 0.5 | ug/g dry | ND | | | 0.0 | 30 | |
| Boron | 8.4 | 5.0 | ug/g dry | 8.5 | | | 1.8 | 30 | |
| Cadmium | ND | 0.5 | ug/g dry | ND | | | 0.0 | 30 | |
| Chromium (VI) | ND | 0.2 | ug/g dry | ND | | | | 35 | |
| Chromium | 11.2 | 5 | ug/g dry | 9.9 | | | 12.9 | 30 | |
| Cobalt | 3.5 | 1 | ug/g dry | 3.3 | | | 8.3 | 30 | |
| Copper | 19.5 | 5 | ug/g dry | 17.7 | | | 9.7 | 30 | |
| Lead | 28.3 | 1 | ug/g dry | 24.5 | | | 14.4 | 30 | |
| Mercury | ND | 0.1 | ug/g dry | 0.104 | | | 0.0 | 35 | |
| Molybdenum | 1.3 | 1 | ug/g dry | 1.2 | | | 8.8 | 30 | |
| Nickel | 10.1 | 5 | ug/g dry | 9.1 | | | 10.3 | 30 | |
| Selenium | 1.0 | 1 | ug/g dry | 1.0 | | | 0.9 | 30 | |
| Silver | ND | 0.3 | ug/g dry | ND | | | 0.0 | 30 | |
| Thallium | ND | 1 | ug/g dry | ND | | | 0.0 | 30 | |
| Uranium | ND | 1 | ug/g dry | ND | | | 0.0 | 30 | |
| Vanadium | 18.5 | 10 | ug/g dry | 17.7 | | | 4.4 | 30 | |
| Zinc | 45.3 | 20 | ug/g dry | 42.2 | | | 6.9 | 30 | |
| Physical Characteristics | | | | | | | | | |
| % Solids | 86.6 | 0.1 | % by Wt. | 85.9 | | | 0.8 | 25 | |
| Semi-Volatiles | | | | | | | | | |
| Acenaphthene | ND | 0.02 | ug/g dry | ND | | | 0.0 | 40 | |
| Acenaphthylene | ND | 0.02 | ug/g dry | ND | | | 0.0 | 40 | |
| Anthracene | ND | 0.02 | ug/g dry | ND | | | | 40 | |
| Benzo [a] anthracene | ND | 0.02 | ug/g dry | ND | | | | 40 | |
| Benzo [a] pyrene | ND | 0.02 | ug/g dry | ND | | | | 40 | |
| Benzo [b] fluoranthene | ND | 0.02 | ug/g dry | ND | | | | 40 | |
| Benzo [g,h,i] perylene | ND | 0.02 | ug/g dry | ND | | | | 40 | |
| Benzo [k] fluoranthene | ND | 0.02 | ug/g dry | ND | | | | 40 | |
| Biphenyl | ND | 0.02 | ug/g dry | ND | | | | 40 | |
| Chrysene | ND | 0.02 | ug/g dry | ND | | | | 40 | |
| Dibenzo [a,h] anthracene | ND | 0.02 | ug/g dry | ND | | | | 40 | |
| Fluoranthene | ND | 0.02 | ug/g dry | ND | | | | 40 | |
| Fluorene | ND | 0.02 | ug/g dry | ND | | | | 40 | |
| Indeno [1,2,3-cd] pyrene | ND | 0.02 | ug/g dry | ND | | | | 40 | |
| 1-Methylnaphthalene | ND | 0.02 | ug/g dry | ND | | | | 40 | |
| 2-Methylnaphthalene | ND | 0.02 | ug/g dry | ND | | | | 40 | |
| Naphthalene | ND | 0.01 | ug/g dry | ND | | | 0.0 | 40 | |
| Phenanthrene | ND | 0.02 | ug/g dry | ND | | | | 40 | |
| Pyrene | ND | 0.02 | ug/g dry | ND | | | 0.0 | 40 | |
| Surrogate: 2-Fluorobiphenyl | 0.664 | | ug/g dry | ND | 44.8 | 50-140 | | | PAH02 |
| Surrogate: Terphenyl-d14 | 1.55 | | ug/g dry | ND | 104 | 50-140 | | | |

Certificate of Analysis

 Client: **Paterson Group Consulting Engineers**

Client PO: 12038

Project Description: PE2636

Report Date: 04-May-2012

Order Date: 3-May-2012

Method Quality Control: Spike

| Analyte | Result | Reporting Limit | Units | Source Result | %REC | %REC Limit | RPD | RPD Limit | Notes |
|-----------------------------|--------|-----------------|-------|---------------|------|------------|-----|-----------|-------|
| Hydrocarbons | | | | | | | | | |
| F1 PHCs (C6-C10) | 184 | 7 | ug/g | ND | 92.0 | 80-120 | | | |
| Metals | | | | | | | | | |
| Antimony | 48.9 | | ug/L | 0.07 | 97.7 | 70-130 | | | |
| Arsenic | 46.7 | | ug/L | 0.9 | 91.7 | 70-130 | | | |
| Barium | 56.3 | | ug/L | 4.9 | 103 | 70-130 | | | |
| Beryllium | 48.7 | | ug/L | 0.08 | 97.3 | 70-130 | | | |
| Boron | 53.4 | | ug/L | 3.4 | 100 | 70-130 | | | |
| Cadmium | 44.6 | | ug/L | 0.06 | 89.2 | 70-130 | | | |
| Chromium (VI) | 4.9 | 0.2 | ug/g | ND | 98.5 | 89-123 | | | |
| Chromium | 52.2 | | ug/L | 4.0 | 96.4 | 70-130 | | | |
| Cobalt | 50.1 | | ug/L | 1.3 | 97.7 | 70-130 | | | |
| Copper | 53.8 | | ug/L | 7.1 | 93.5 | 70-130 | | | |
| Lead | 58.0 | | ug/L | 9.8 | 96.3 | 70-130 | | | |
| Mercury | 2.34 | 0.1 | ug/g | 0.104 | 149 | 72-128 | | | QM-07 |
| Molybdenum | 45.9 | | ug/L | 0.5 | 90.8 | 70-130 | | | |
| Nickel | 50.8 | | ug/L | 3.6 | 94.4 | 70-130 | | | |
| Selenium | 45.9 | | ug/L | 0.4 | 91.0 | 70-130 | | | |
| Silver | 44.6 | | ug/L | 0.06 | 89.0 | 70-130 | | | |
| Thallium | 53.6 | | ug/L | 0.04 | 107 | 70-130 | | | |
| Uranium | 61.0 | | ug/L | 0.2 | 122 | 70-130 | | | |
| Vanadium | 56.3 | | ug/L | 7.1 | 98.6 | 70-130 | | | |
| Zinc | 59.6 | | ug/L | 16.9 | 85.4 | 70-130 | | | |
| Semi-Volatiles | | | | | | | | | |
| Acenaphthene | 0.112 | 0.02 | ug/g | ND | 60.3 | 50-140 | | | |
| Acenaphthylene | 0.123 | 0.02 | ug/g | ND | 66.4 | 50-140 | | | |
| Anthracene | 0.131 | 0.02 | ug/g | ND | 70.7 | 50-140 | | | |
| Benzo [a] anthracene | 0.142 | 0.02 | ug/g | ND | 76.9 | 50-140 | | | |
| Benzo [a] pyrene | 0.124 | 0.02 | ug/g | ND | 67.0 | 50-140 | | | |
| Benzo [b] fluoranthene | 0.144 | 0.02 | ug/g | ND | 78.1 | 50-140 | | | |
| Benzo [g,h,i] perylene | 0.107 | 0.02 | ug/g | ND | 57.8 | 50-140 | | | |
| Benzo [k] fluoranthene | 0.147 | 0.02 | ug/g | ND | 79.3 | 50-140 | | | |
| Biphenyl | 0.098 | 0.02 | ug/g | ND | 52.9 | 50-140 | | | |
| Chrysene | 0.137 | 0.02 | ug/g | ND | 74.2 | 50-140 | | | |
| Dibenzo [a,h] anthracene | 0.113 | 0.02 | ug/g | ND | 61.3 | 50-140 | | | |
| Fluoranthene | 0.133 | 0.02 | ug/g | ND | 72.0 | 50-140 | | | |
| Fluorene | 0.119 | 0.02 | ug/g | ND | 64.1 | 50-140 | | | |
| Indeno [1,2,3-cd] pyrene | 0.118 | 0.02 | ug/g | ND | 63.8 | 50-140 | | | |
| 1-Methylnaphthalene | 0.113 | 0.02 | ug/g | ND | 61.1 | 50-140 | | | |
| 2-Methylnaphthalene | 0.107 | 0.02 | ug/g | ND | 57.8 | 50-140 | | | |
| Naphthalene | 0.093 | 0.01 | ug/g | ND | 50.4 | 50-140 | | | |
| Phenanthrene | 0.133 | 0.02 | ug/g | ND | 71.7 | 50-140 | | | |
| Pyrene | 0.139 | 0.02 | ug/g | ND | 75.2 | 50-140 | | | |
| Surrogate: 2-Fluorobiphenyl | 0.900 | | ug/g | | 60.9 | 50-140 | | | |

Certificate of Analysis

Client: **Paterson Group Consulting Engineers**

Client PO: 12038

Project Description: PE2636

Report Date: 04-May-2012

Order Date: 3-May-2012

Sample and QC Qualifiers Notes

- 1- GEN09 : Elevated detection limits due to the nature of the sample matrix.
- 2- ORG01 : GC-FID signal did not return to baseline by C50
- 3- PAH02 : PAH surrogate recovery (2-Fluorobiphenyl) lower than expected due to matrix interference.
- 4- QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.
- 5- QR-04 : Duplicate results exceeds RPD limits due to non-homogeneous matrix.

Sample Data Revisions

None

Work Order Revisions/Comments:

None

Other Report Notes:

n/a: not applicable

MDL: Method Detection Limit

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

%REC: Percent recovery.

RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.

Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

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.

OTTAWA © KINGSTON © NIAGARA © MISSISSAUGA © SARNIA

| | | |
|------------------------------------|--------------------------------------------------|--------------------------------------------------------------------------|
| Client Name: <i>Paterson Group</i> | Project Reference: <i>PE 2636</i> | TAT: <input type="checkbox"/> Regular <input type="checkbox"/> 3 Day |
| Contact Name: <i>Eric Leveque</i> | Quote # | <input type="checkbox"/> 2 Day <input checked="" type="checkbox"/> 1 Day |
| Address: <i>154 Colonnade</i> | PO # <i>12038</i> | Date Required: _____ |
| Telephone: <i>613-226-7381</i> | Email Address: <i>e.leveque@patersongroup.ca</i> | |

Criteria: O. Reg. 153/04 Table ___ O. Reg. 153/11 (Current) 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)

| Paracel Order Number: | | | | Required Analyses | | | | | | | | | | | | | | | | | |
|-------------------------|--------|------------|-----------------|-------------------|-----------------|--------|-------|-------------|---|--|--|--|--|--|--|--|--|--|--|--|-----------------|
| 1218256 | | | | Sample Taken | | Metals | PAH's | PbC (Pb-F4) | | | | | | | | | | | | | |
| Sample ID/Location Name | | | | Date | Time | | | | | | | | | | | | | | | | |
| | Matrix | Air Volume | # of Containers | | | | | | | | | | | | | | | | | | |
| 1 | S | | 1 | <i>BH2-12 G1</i> | <i>May 3/12</i> | | X | X | | | | | | | | | | | | | <i>250</i> |
| 2 | S | | 2 | <i>BH2-12 SS5</i> | | | | | X | | | | | | | | | | | | <i>120+vial</i> |
| 3 | S | | 1 | <i>BH3-12 SS1</i> | | | X | X | | | | | | | | | | | | | <i>250</i> |
| 4 | S | | 2 | <i>BH3-12 SS5</i> | | | | | | | | | | | | | | | | | <i>120+vial</i> |
| 5 | S | | 2 | <i>BH4-12 SS5</i> | | | | | | | | | | | | | | | | | <i>120+vial</i> |
| 6 | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | |

Comments: *Subsurface, full list of metals per Eric. -MJC*

| | | | |
|------------------------------------------------------|------------------------------------------|-----------------------------------|---------------------------------|
| Relinquished By (Print & Sign): <i>E. Leveque</i> | Received by Driver/Depot: <i>1221</i> | Received at Lab: <i>SCOL</i> | Verified By: <i>MJC</i> |
| Date/Time: <i>May 3/12</i> | Temperature: _____ °C | Date/Time: <i>May 3/12</i> | Date/Time: <i>May 3/12 4:41</i> |
| | | Temperature: <i>4.9 °C 4.24 p</i> | pH Verified By: <i>N/A</i> |

Method of Delivery: *Swift*

Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Eric Leveque

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

Client PO: 12301
Project: PE2636
Custody: 91305

Report Date: 9-May-2012
Order Date: 8-May-2012

Order #: 1219076

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

| Paracel ID | Client ID |
|------------|------------|
| 1219076-01 | BH3-GW2 |
| 1219076-02 | BH3-12-GW1 |

Approved By:



Mark Foto, M.Sc. For Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

 Client: **Paterson Group Consulting Engineers**

Client PO: 12301

Project Description: PE2636

Report Date: 09-May-2012

Order Date: 8-May-2012

Analysis Summary Table

| Analysis | Method Reference/Description | Extraction Date | Analysis Date |
|------------------|---------------------------------|-----------------|---------------|
| CCME PHC F1 | CWS Tier 1 - P&T GC-FID | 9-May-12 | 9-May-12 |
| CCME PHC F2 - F4 | CWS Tier 1 - GC-FID, extraction | 8-May-12 | 9-May-12 |
| VOCs | EPA 624 - P&T GC-MS | 9-May-12 | 9-May-12 |

P: 1-800-749-1947
E: PARACEL@PARACELLABS.COM

WWW.PARACELLABS.COM

OTTAWA
 300-2319 St. Laurent Blvd.
 Ottawa, ON K1G 4J8

MISSISSAUGA
 6645 Kitimat Rd, Unit #27
 Mississauga, ON L5N 6J3

NIAGARA FALLS
 5415 Morning Glory Cr.
 Niagara Falls, ON L2J 0A3

SARNIA
 123 Christina St. N.
 Sarnia, ON N7T 5T7

Certificate of Analysis

 Client: **Paterson Group Consulting Engineers**

Client PO: 12301

Report Date: 09-May-2012

Order Date: 8-May-2012

Project Description: PE2636

| | | | | |
|---------------------|------------|------------|---|---|
| Client ID: | BH3-GW2 | BH3-12-GW1 | - | - |
| Sample Date: | 08-May-12 | 08-May-12 | - | - |
| Sample ID: | 1219076-01 | 1219076-02 | - | - |
| MDL/Units | Water | Water | - | - |

Volatiles

| | | | | | |
|----------------------------------|-----------|-----------|-------|---|---|
| Acetone | 5.0 ug/L | <50.0 [1] | 73.7 | - | - |
| Benzene | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| Bromodichloromethane | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| Bromoform | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| Bromomethane | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| Carbon Tetrachloride | 0.2 ug/L | <2.0 [1] | <0.2 | - | - |
| Chlorobenzene | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| Chloroethane | 1.0 ug/L | <10.0 [1] | <1.0 | - | - |
| Chloroform | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| Chloromethane | 3.0 ug/L | <30.0 [1] | <3.0 | - | - |
| Dibromochloromethane | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| Dichlorodifluoromethane | 1.0 ug/L | <10.0 [1] | <1.0 | - | - |
| 1,2-Dibromoethane | 0.2 ug/L | <2.0 [1] | <0.2 | - | - |
| 1,2-Dichlorobenzene | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| 1,3-Dichlorobenzene | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| 1,4-Dichlorobenzene | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| 1,1-Dichloroethane | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| 1,2-Dichloroethane | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| 1,1-Dichloroethylene | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| cis-1,2-Dichloroethylene | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| trans-1,2-Dichloroethylene | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| 1,2-Dichloroethylene, total | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| 1,2-Dichloropropane | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| cis-1,3-Dichloropropylene | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| trans-1,3-Dichloropropylene | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| 1,3-Dichloropropene, total | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| Ethylbenzene | 0.5 ug/L | <5.0 [1] | 0.7 | - | - |
| Hexane | 1.0 ug/L | <10.0 [1] | <1.0 | - | - |
| Methyl Ethyl Ketone (2-Butanone) | 5.0 ug/L | <50.0 [1] | <5.0 | - | - |
| Methyl Butyl Ketone (2-Hexanone) | 10.0 ug/L | <100 [1] | <10.0 | - | - |
| Methyl Isobutyl Ketone | 5.0 ug/L | <50.0 [1] | <5.0 | - | - |
| Methyl tert-butyl ether | 2.0 ug/L | <20.0 [1] | <2.0 | - | - |
| Methylene Chloride | 5.0 ug/L | <50.0 [1] | <5.0 | - | - |

Certificate of Analysis

 Client: **Paterson Group Consulting Engineers**

Client PO: 12301

Report Date: 09-May-2012

Order Date: 8-May-2012

Project Description: PE2636

| | Client ID: | BH3-GW2 | BH3-12-GW1 | - | - |
|---------------------------|--------------|------------|------------|---|---|
| | Sample Date: | 08-May-12 | 08-May-12 | - | - |
| | Sample ID: | 1219076-01 | 1219076-02 | - | - |
| | MDL/Units | Water | Water | - | - |
| Styrene | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| 1,1,1,2-Tetrachloroethane | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| 1,1,2,2-Tetrachloroethane | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| Tetrachloroethylene | 0.5 ug/L | <5.0 [1] | 1.9 | - | - |
| Toluene | 0.5 ug/L | <5.0 [1] | 9.1 | - | - |
| 1,2,4-Trichlorobenzene | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| 1,1,1-Trichloroethane | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| 1,1,2-Trichloroethane | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| Trichloroethylene | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| Trichlorofluoromethane | 1.0 ug/L | <10.0 [1] | <1.0 | - | - |
| 1,3,5-Trimethylbenzene | 0.5 ug/L | <5.0 [1] | 1.5 | - | - |
| Vinyl chloride | 0.5 ug/L | <5.0 [1] | <0.5 | - | - |
| m,p-Xylenes | 0.5 ug/L | <5.0 [1] | 0.8 | - | - |
| o-Xylene | 0.5 ug/L | <5.0 [1] | 3.2 | - | - |
| Xylenes, total | 0.5 ug/L | <5.0 [1] | 4.0 | - | - |
| 4-Bromofluorobenzene | Surrogate | 106% [1] | 105% | - | - |
| Dibromofluoromethane | Surrogate | 69.3% [1] | 76.8% | - | - |
| Toluene-d8 | Surrogate | 112% [1] | 111% | - | - |

Hydrocarbons

| | | | | | |
|-------------------|----------|----------|------|---|---|
| F1 PHCs (C6-C10) | 25 ug/L | <250 [1] | 89 | - | - |
| F2 PHCs (C10-C16) | 100 ug/L | 120 | <100 | - | - |
| F3 PHCs (C16-C34) | 100 ug/L | 460 | <100 | - | - |
| F4 PHCs (C34-C50) | 100 ug/L | 100 | <100 | - | - |

Certificate of Analysis

Report Date: 09-May-2012

Client: **Paterson Group Consulting Engineers**

Order Date: 8-May-2012

Client PO: 12301

Project Description: PE2636

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 | | | | | | |
| Chloroethane | ND | 1.0 | ug/L | | | | | | |
| Chloroform | ND | 0.5 | ug/L | | | | | | |
| Chloromethane | ND | 3.0 | ug/L | | | | | | |
| Dibromochloromethane | ND | 0.5 | ug/L | | | | | | |
| Dichlorodifluoromethane | ND | 1.0 | ug/L | | | | | | |
| 1,2-Dibromoethane | ND | 0.2 | 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-Dichloroethylene, total | 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 | | | | | | |
| Hexane | ND | 1.0 | ug/L | | | | | | |
| Methyl Ethyl Ketone (2-Butanone) | ND | 5.0 | ug/L | | | | | | |
| Methyl Butyl Ketone (2-Hexanone) | ND | 10.0 | 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 | | | | | | |
| 1,2,4-Trichlorobenzene | 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 | | | | | | |
| 1,3,5-Trimethylbenzene | ND | 0.5 | 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 | 34.4 | | ug/L | | 107 | 50-140 | | | |
| Surrogate: Dibromofluoromethane | 24.8 | | ug/L | | 77.3 | 50-140 | | | |
| Surrogate: Toluene-d8 | 31.8 | | ug/L | | 99.2 | 50-140 | | | |

Certificate of Analysis

Client: **Paterson Group Consulting Engineers**

Client PO: 12301

Project Description: PE2636

Report Date: 09-May-2012

Order Date: 8-May-2012

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 | |
| Chloroethane | ND | 1.0 | ug/L | ND | | | | 30 | |
| Chloroform | ND | 0.5 | ug/L | ND | | | | 30 | |
| Chloromethane | ND | 3.0 | ug/L | ND | | | | 30 | |
| Dibromochloromethane | ND | 0.5 | ug/L | ND | | | | 30 | |
| Dichlorodifluoromethane | ND | 1.0 | ug/L | ND | | | | 30 | |
| 1,2-Dibromoethane | ND | 0.2 | 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 | |
| Hexane | ND | 1.0 | ug/L | ND | | | | 30 | |
| Methyl Ethyl Ketone (2-Butanone) | ND | 5.0 | ug/L | ND | | | | 30 | |
| Methyl Butyl Ketone (2-Hexanone) | ND | 10.0 | 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 | |
| 1,2,4-Trichlorobenzene | 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 | |
| 1,3,5-Trimethylbenzene | ND | 0.5 | 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 | 33.7 | | ug/L | ND | 105 | 50-140 | | | |
| Surrogate: Dibromofluoromethane | 22.7 | | ug/L | ND | 71.1 | 50-140 | | | |
| Surrogate: Toluene-d8 | 31.6 | | ug/L | ND | 98.8 | 50-140 | | | |

Certificate of Analysis

 Client: **Paterson Group Consulting Engineers**

Client PO: 12301

Project Description: PE2636

Report Date: 09-May-2012

Order Date: 8-May-2012

Method Quality Control: Spike

| Analyte | Result | Reporting Limit | Units | Source Result | %REC | %REC Limit | RPD | RPD Limit | Notes |
|----------------------------------|--------|-----------------|-------|---------------|------|------------|-----|-----------|-------|
| Hydrocarbons | | | | | | | | | |
| F1 PHCs (C6-C10) | 1950 | 25 | ug/L | ND | 97.5 | 68-117 | | | |
| F2 PHCs (C10-C16) | 1400 | 100 | ug/L | ND | 87.5 | 60-140 | | | |
| F3 PHCs (C16-C34) | 3520 | 100 | ug/L | ND | 88.1 | 60-140 | | | |
| F4 PHCs (C34-C50) | 2250 | 100 | ug/L | ND | 93.8 | 60-140 | | | |
| Volatiles | | | | | | | | | |
| Acetone | 125 | 5.0 | ug/L | ND | 125 | 50-140 | | | |
| Benzene | 27.8 | 0.5 | ug/L | ND | 69.4 | 50-140 | | | |
| Bromodichloromethane | 28.4 | 0.5 | ug/L | ND | 70.9 | 50-140 | | | |
| Bromoform | 31.2 | 0.5 | ug/L | ND | 77.9 | 50-140 | | | |
| Bromomethane | 29.1 | 0.5 | ug/L | ND | 72.6 | 50-140 | | | |
| Carbon Tetrachloride | 31.2 | 0.2 | ug/L | ND | 78.0 | 50-140 | | | |
| Chlorobenzene | 31.0 | 0.5 | ug/L | ND | 77.5 | 50-140 | | | |
| Chloroethane | 27.4 | 1.0 | ug/L | ND | 68.6 | 50-140 | | | |
| Chloroform | 30.8 | 0.5 | ug/L | ND | 77.0 | 50-140 | | | |
| Chloromethane | 27.8 | 3.0 | ug/L | ND | 69.6 | 50-140 | | | |
| Dibromochloromethane | 37.0 | 0.5 | ug/L | ND | 92.4 | 50-140 | | | |
| Dichlorodifluoromethane | 30.7 | 1.0 | ug/L | ND | 76.7 | 50-140 | | | |
| 1,2-Dibromoethane | 33.8 | 0.2 | ug/L | ND | 84.4 | 50-140 | | | |
| 1,2-Dichlorobenzene | 35.8 | 0.5 | ug/L | ND | 89.5 | 50-140 | | | |
| 1,3-Dichlorobenzene | 37.3 | 0.5 | ug/L | ND | 93.2 | 50-140 | | | |
| 1,4-Dichlorobenzene | 36.3 | 0.5 | ug/L | ND | 90.8 | 50-140 | | | |
| 1,1-Dichloroethane | 35.0 | 0.5 | ug/L | ND | 87.5 | 50-140 | | | |
| 1,2-Dichloroethane | 27.4 | 0.5 | ug/L | ND | 68.4 | 50-140 | | | |
| 1,1-Dichloroethylene | 27.2 | 0.5 | ug/L | ND | 68.0 | 50-140 | | | |
| cis-1,2-Dichloroethylene | 28.4 | 0.5 | ug/L | ND | 71.0 | 50-140 | | | |
| trans-1,2-Dichloroethylene | 26.7 | 0.5 | ug/L | ND | 66.8 | 50-140 | | | |
| 1,2-Dichloropropane | 28.2 | 0.5 | ug/L | ND | 70.4 | 50-140 | | | |
| cis-1,3-Dichloropropylene | 26.4 | 0.5 | ug/L | ND | 66.0 | 50-140 | | | |
| trans-1,3-Dichloropropylene | 22.4 | 0.5 | ug/L | ND | 56.1 | 50-140 | | | |
| Ethylbenzene | 33.7 | 0.5 | ug/L | ND | 84.3 | 50-140 | | | |
| Hexane | 31.1 | 1.0 | ug/L | ND | 77.8 | 50-140 | | | |
| Methyl Ethyl Ketone (2-Butanone) | 76.7 | 5.0 | ug/L | ND | 76.7 | 50-140 | | | |
| Methyl Butyl Ketone (2-Hexanone) | 114 | 10.0 | ug/L | ND | 114 | 50-140 | | | |
| Methyl Isobutyl Ketone | 110 | 5.0 | ug/L | ND | 110 | 50-140 | | | |
| Methyl tert-butyl ether | 122 | 2.0 | ug/L | ND | 122 | 50-140 | | | |
| Methylene Chloride | 27.6 | 5.0 | ug/L | ND | 69.1 | 50-140 | | | |
| Styrene | 33.4 | 0.5 | ug/L | ND | 83.4 | 50-140 | | | |
| 1,1,1,2-Tetrachloroethane | 41.4 | 0.5 | ug/L | ND | 104 | 50-140 | | | |
| 1,1,1,2,2-Tetrachloroethane | 31.7 | 0.5 | ug/L | ND | 79.3 | 50-140 | | | |
| Tetrachloroethylene | 33.6 | 0.5 | ug/L | ND | 83.9 | 50-140 | | | |
| Toluene | 30.4 | 0.5 | ug/L | ND | 76.0 | 50-140 | | | |
| 1,2,4-Trichlorobenzene | 40.2 | 0.5 | ug/L | ND | 100 | 50-140 | | | |
| 1,1,1-Trichloroethane | 27.9 | 0.5 | ug/L | ND | 69.8 | 50-140 | | | |
| 1,1,2-Trichloroethane | 27.8 | 0.5 | ug/L | ND | 69.4 | 50-140 | | | |
| Trichloroethylene | 30.6 | 0.5 | ug/L | ND | 76.4 | 50-140 | | | |
| Trichlorofluoromethane | 26.6 | 1.0 | ug/L | ND | 66.6 | 50-140 | | | |
| 1,3,5-Trimethylbenzene | 43.0 | 0.5 | ug/L | ND | 108 | 50-140 | | | |
| Vinyl chloride | 37.0 | 0.5 | ug/L | ND | 92.4 | 50-140 | | | |
| m,p-Xylenes | 68.0 | 0.5 | ug/L | ND | 85.1 | 50-140 | | | |

 P: 1-800-749-1947
 E: PARACEL@PARACELLABS.COM

WWW.PARACELLABS.COM

OTTAWA
 300-2319 St. Laurent Blvd.
 Ottawa, ON K1G 4J8

MISSISSAUGA
 6645 Kitimat Rd. Unit #27
 Mississauga, ON L5N 6J3

NIAGARA FALLS
 5415 Morning Glory Cr.
 Niagara Falls, ON L2J 0A3

SARNIA
 123 Christina St. N.
 Sarnia, ON N7T 5T7

Certificate of Analysis

Client: **Paterson Group Consulting Engineers**

Client PO: 12301

Project Description: PE2636

Report Date: 09-May-2012

Order Date: 8-May-2012

Method Quality Control: Spike

| Analyte | Result | Reporting Limit | Units | Source Result | %REC | %REC Limit | RPD | RPD Limit | Notes |
|---------------------------------|--------|-----------------|-------|---------------|------|------------|-----|-----------|-------|
| o-Xylene | 33.4 | 0.5 | ug/L | ND | 83.4 | 50-140 | | | |
| Surrogate: 4-Bromofluorobenzene | 32.6 | | ug/L | | 103 | 50-140 | | | |

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 12301

Project Description: PE2636

Report Date: 09-May-2012

Order Date: 8-May-2012

Sample and QC Qualifiers Notes

1- GEN09 : Elevated detection limits due to the nature of the sample matrix.

Sample Data Revisions

None

Work Order Revisions/Comments:

None

Other Report Notes:

n/a: not applicable

MDL: Method Detection Limit

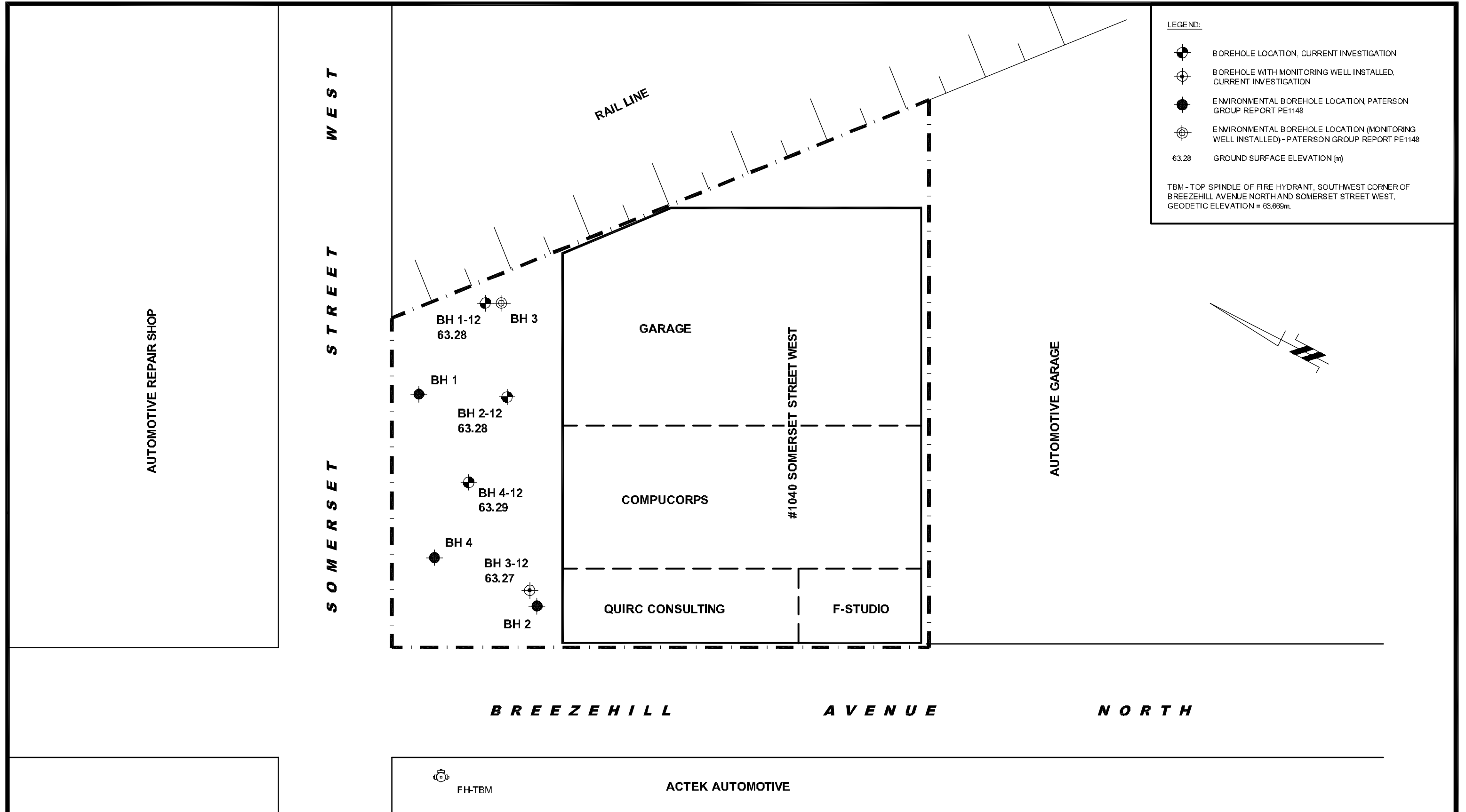
Source Result: Data used as source for matrix and duplicate samples

%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.



paterson group
 consulting engineers
 28 Concourse Gate, Unit 1, Ottawa, Ontario K2E 7T7

Scale: 1:250
 Des.: KM
 Dwn: MPG
 Chkd: MSD

CLARIDGE HOMES
 PHASE II - ENVIRONMENTAL SITE ASSESSMENT
 1040 SOMERSET STREET WEST
 OTTAWA, ONTARIO

TEST HOLE LOCATION PLAN

Dwg. No. **PE2636-1**
 Report No.: PE2636-1
 Date: 05/2012