

March 11, 2020
File: PE4880-LET.02

Oligo Group
996-B St Augustin Rd.
Embrun, Ontario
K0A 1W0

Attention: **Mr. Eric Brisson**

Subject: **Phase II Environmental Site Assessment Update
3817, 3819, 3835, 3843 Innes Road
Ottawa, Ontario**

154 Colonnade Road South
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Dear Sir,

Further to your request, Paterson Group (Paterson) carried out a Phase II Environmental Site Assessment (ESA) Update for the aforementioned property. This report updates a previous Phase II ESA report entitled, "Phase II Environmental Site Assessment, Residential Properties, 3817, 3819, 3835 and 3845 Innes Road, Ottawa, Ontario" prepared by Paterson, dated June 5, 2015.

This Phase II ESA Update is intended to meet the requirements of a Phase II ESA, as per O.Reg. 153/04, as amended, under the Environmental Protection Act. This report is to be read in conjunction with the Phase II ESA Report (PE3532-2).

Background Information

Physical Setting

The site is located on the north side of Innes Road, approximately 65m west of the Innes Road and Belcourt Boulevard intersection, in Ottawa, Ontario. The property is situated in a residential and commercial area. Four unoccupied residential buildings are on-site and are currently in poor condition. Neighbouring land use is residential to the north and west; commercial with residential beyond to the east, and commercial to the south, across Innes Road.

The site slopes south toward Innes Road, and the local topography is generally at a point of higher elevation. The regional topography generally slopes to the north, toward the Ottawa River. Site drainage consists primarily of infiltration in the grassed areas, with some runoff toward catch basins on Innes Road. No private sewage systems or potable

water wells have been observed on the Phase II property by Paterson personnel; however, historical information indicates that at least one potable well and at least one septic tank were formerly present on-site. Their locations and condition are not known.

Past Investigations

Paterson conducted a Phase I ESA and Phase II ESA in May and June 2015, respectively, and completed a Phase I ESA Update in March 2020.

The 2015 Phase I ESA identified one on-site and one off-site potentially contaminating activity (PCA); an interior aboveground storage tank (AST) in the basement of 3843 Innes Road and a retail fuel outlet (RFO) immediately to the east of the site were considered to represent areas of potential environmental concern (APEC) on-site. A Phase II ESA was subsequently conducted to address these APECs. Three boreholes were drilled and completed as monitoring wells. Soil and groundwater samples were submitted and analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) and petroleum hydrocarbons (PHC, fractions 1-4) following the drilling program. Soil and groundwater samples analyzed from the boreholes/monitoring wells were in compliance the selected MECP Standards (Table 3).

Based on the results of the 2015 Phase II ESA, soil and groundwater were considered to be in compliance with the selected MECP standards and no further work was recommended.

The Phase I ESA Update (2020) did not identify additional PCAs or APECs, but did recommend reassessing potential impacts originating from the adjacent retail fuel outlet by sampling the on-site monitoring well, BH1 (installed 2015). All monitoring wells are shown on Drawing PE4880-3 – Test Hole Location Plan, which is appended to this report.

Impediments

There were no impediments to completing the scope of work, as described in this Phase II ESA Update.

Investigation Method

Following the measurement of the water level and purging the well, groundwater samples were collected from BH1 on February 20, 2020. A sample and its duplicate were submitted for analysis of BTEX and PHC fractions 1-4.

Review and Evaluation

Geology

Site geology details are provided in the 2015 Phase II ESA Report and on Drawing PE4880-6 – Cross-Section A-A’, attached. The soils on-site generally consisted of topsoil and brown silty sand with gravel or trace clay, overlying compact to very dense glacial till consisting of brown silty sand with gravel, cobbles and boulders, underlain by limestone bedrock with shale partings. Bedrock was encountered at depths varying from 2.7 to 4.6 m below ground surface (mbgs). Groundwater was encountered in the glacial till and bedrock layers at depths ranging from 4.0 to 4.8 mbgs.

Groundwater Elevations, Flow Direction and Hydraulic Gradient

The groundwater level in BH1 was measured on February 20, 2020, using an electronic water level meter. The water level in BH1 was 4.40 mbgs.

Based on the 2015 Phase II ESA, the groundwater flow beneath the Phase II property is southerly toward Innes Road with a calculated hydraulic gradient of approximately 0.022 m/m. A groundwater contour plan is shown on Drawing PE4880-4 in Appendix A.

Groundwater Quality

Groundwater samples from monitoring well BH1 were submitted for laboratory analysis of BTEX and PHCs. The results of the analytical testing conducted in February 2020 are presented in Table 1. The laboratory certificate of analysis is provided in Appendix 1.

Table 1. Analytical Test Results – Groundwater – BTEX and PHCs				
Parameter	MDL (µg/L)	Groundwater Sample (µg/L)		MECP Table 3 Standards
		March 25, 2019		
		BH1-GW2	DUP1 (duplicate)	
Benzene	0.5	nd	nd	44
Ethylbenzene	0.5	nd	nd	2,300
Toluene	0.5	nd	nd	18,000
Xylenes	0.5	nd	nd	4,200
PHCs F1	25	nd	nd	750
PHCs F2	100	nd	NA	150
PHCs F3	100	nd	NA	500
PHCs F4	100	nd	NA	500

Notes:

- MDL – Method Detection Limit
- NA – Parameter not analyzed
- nd – Not detected above the MDL
- nd** – Value exceeds applicable MECP Standard

All BTEX and PHC results are in compliance with the selected MECP Table 3 Standards.

Phase II Conceptual Site Model

Contaminants of Potential Concern

The contaminants of potential concern (CPCs) include benzene, toluene, ethylbenzene, xylenes (BTEX), and petroleum hydrocarbons (PHCs, F1-F4) in groundwater.

Potentially Contaminating Activities and Areas of Potential Environmental Concern

Based on the 2015 Phase II ESA and 2020 Phase I ESA Update, there are no on-site PCAs and one off-site PCA. Per Table 2 of O.Reg 153/04, the following is a description of the PCA that represents an APEC on the Phase II property:

- Item 28: Gasoline and Associated Products Storage in Fixed Tanks* –A retail fuel outlet immediately east of the site.

Existing Structures and Utilities

Four unoccupied residential buildings are on-site, and, although underground services to the buildings are no longer active, they may be intact. The Phase II property is located in a municipally serviced area; however, an on-site septic system historically serviced 3835 Innes Road. It is unknown whether the septic system is still present.

Physical Setting

Site Stratigraphy

The site stratigraphy is provided in the 2015 Phase II ESA report and on Drawing PE4880-6 – Cross-Section A-A'. Stratigraphy generally consists of:

- Intermittent topsoil, 0.1 m in thickness;
- Fill material (silt sand with gravel or trace clay), extending to depths ranging from approximately 0.9 to 1.5 m below ground surface (mbgs);
- Glacial till (silty sand and gravel, cobbles, boulders), extending to depths ranging from approximately 1.2 to 3.5 mbgs;
- Bedrock (limestone with shale partings), investigated to depths ranging from approximately 7.3 to 8.7 mbgs.

Hydrogeological Setting

The Geological Survey of Canada website on the Urban Geology of the National Capital Area was consulted as part of this assessment. Based on this information, bedrock in the area of the site consists of middle Ordovician interbedded limestone and dolomite of the Gull River Formation. Overburden consists of offshore marine sediments on the north side of the site, plain till on the south side, and Paleozoic rock at the south end of the Phase II property. Drift thickness at the south end of site is on the order of 0 to 2 m, while drift thickness on the rest of the site is 2 to 3 m.

The regional topography slopes downward to the north. The groundwater flow is anticipated to flow in this direction toward the Ottawa River.

Approximate Depth to Bedrock

At locations where bedrock was cored in 2015, bedrock was encountered at depths varying from 2.7 to 4.6 m.

Approximate Depth to Water Table

The depth to water table at the site ranged from 3.8 to 4.8 m during the June 2015 monitoring event. Groundwater elevations are indicated on the attached drawings.

Sections 41 and 43.1 of the Regulation

Section 41 of the Regulation (Site Condition Standards, Environmentally Sensitive Areas) does not apply to the subject site, in that there are no Environmentally Sensitive Areas in the vicinity of the property, and the soil pH at the property is between 5 and 9.

Section 43.1 of the Regulation does not apply to the subject site in that the subject site is not a Shallow Soil Property and is not within 30 m of a water body.

Fill Placement

Fill material was identified on the Phase I property. This fill material consists of silty sand with gravel and trace clay. No evidence of deleterious material or contamination was identified in the fill material. The analytical results from the fill layer indicate that it is in compliance with MECP Table 1 standards.

Existing Buildings and Structures

The site is currently occupied by 4 residential dwellings and 1 storage shed.

Proposed Buildings and Other Structures

It is our understanding that a residential (condo) building is proposed for the site. The proposed building does not represent a change to a more sensitive land use (i.e., from commercial to residential) and therefore, a record of site condition is not required.

Environmental Condition

Based on visual and olfactory observations and on analytical testing results, the soil and groundwater present beneath the Phase II property are considered to be in compliance with the 2011 MECP Table 3 standards selected for the site.

Analytical test results for soil and groundwater are presented on Drawing PE4880-4.

Recommendations

Based on the results of the 2015 Phase II ESA and this Phase II ESA Update, soil and groundwater beneath the Phase II property are considered to be in compliance with the selected MECP Table 3 Standards. At this time, no further investigative work is recommended.

Statement of Limitations

This Phase II Environmental Site Assessment Update has been prepared in general accordance with Ontario Regulation 153/04, as amended, by O.Reg. 269/11 under the Environmental Protection Act. The conclusions presented herein are based on information gathered from a limited historical review and field inspection program. The findings of the Phase II ESA Update are based on a review of readily available geological, historical, and regulatory information and a cursory review made at the time of the field assessment.

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

This report was prepared for the sole use of Oligo Group. Permission and notification from the above-noted party and this firm will be required to release this report to any other party.

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

Paterson Group Inc.

K. Martinell

Kelly Martinell, P.Eng.(NB)



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

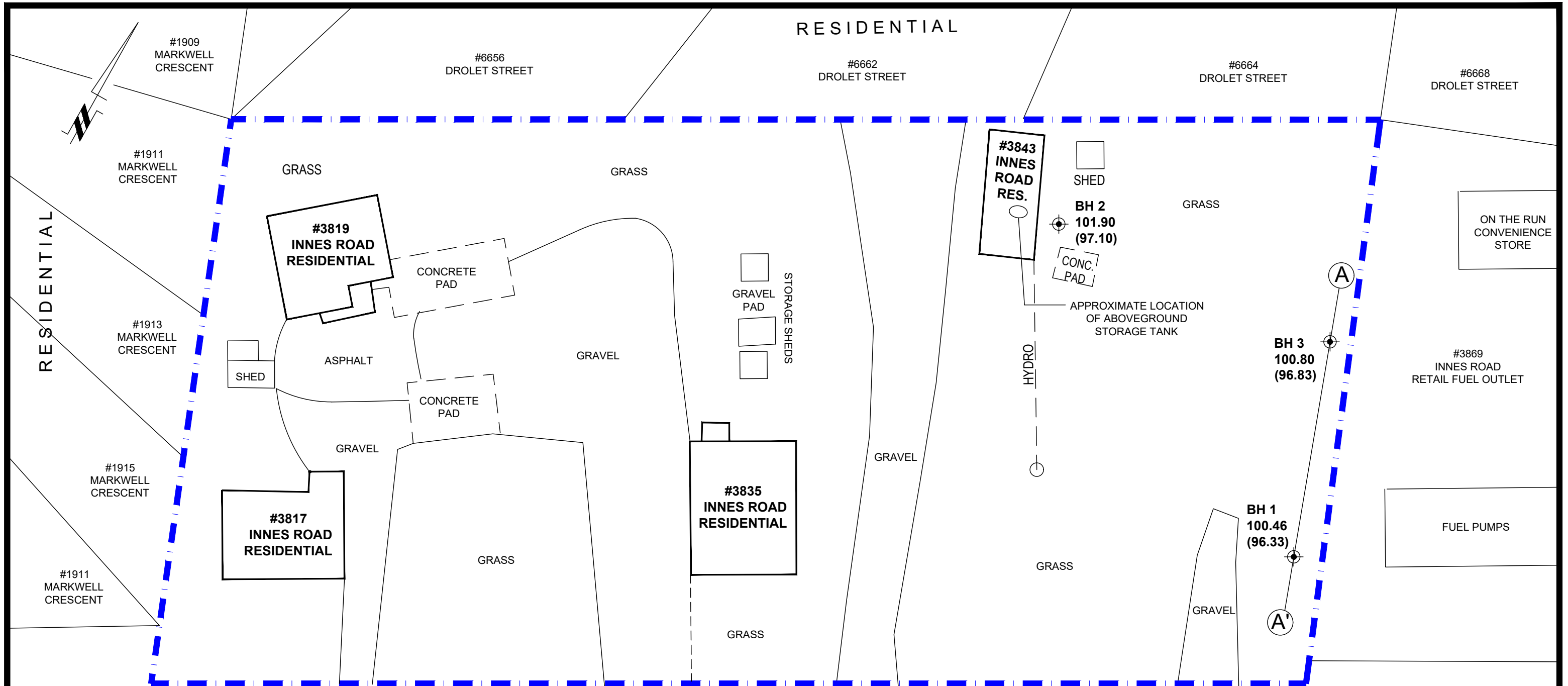


Report Distribution

- Oligo Group .
- Paterson Group

Appendix A

- Drawing PE4880-3 – Test Hole Location Plan
- Drawing PE4880-4 – Groundwater Contour Plan
- Drawing PE4880-5 – Analytical Testing Plan
- Drawing PE4880-6 – Cross-Section A-A'
- Laboratory Certificate of Analysis



LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION
- 100.46 GROUND SURFACE ELEVATION (m)
- (98.33) GROUNDWATER SURFACE ELEVATION (m)
(MAY, 2015)

TBM - TOP OF MANHOLE COVER, NORTH SIDE OF INNES ROAD, NEAR THE SOUTHEAST CORNER OF SUBJECT SITE. ASSUMED ELEVATION = 100.00m.

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NO.	REVISIONS	DATE	INITIAL

OLIGO GROUP

**PHASE II - ENVIRONMENTAL SITE ASSESSMENT UPDATE
RESIDENTIAL PROPERTIES**

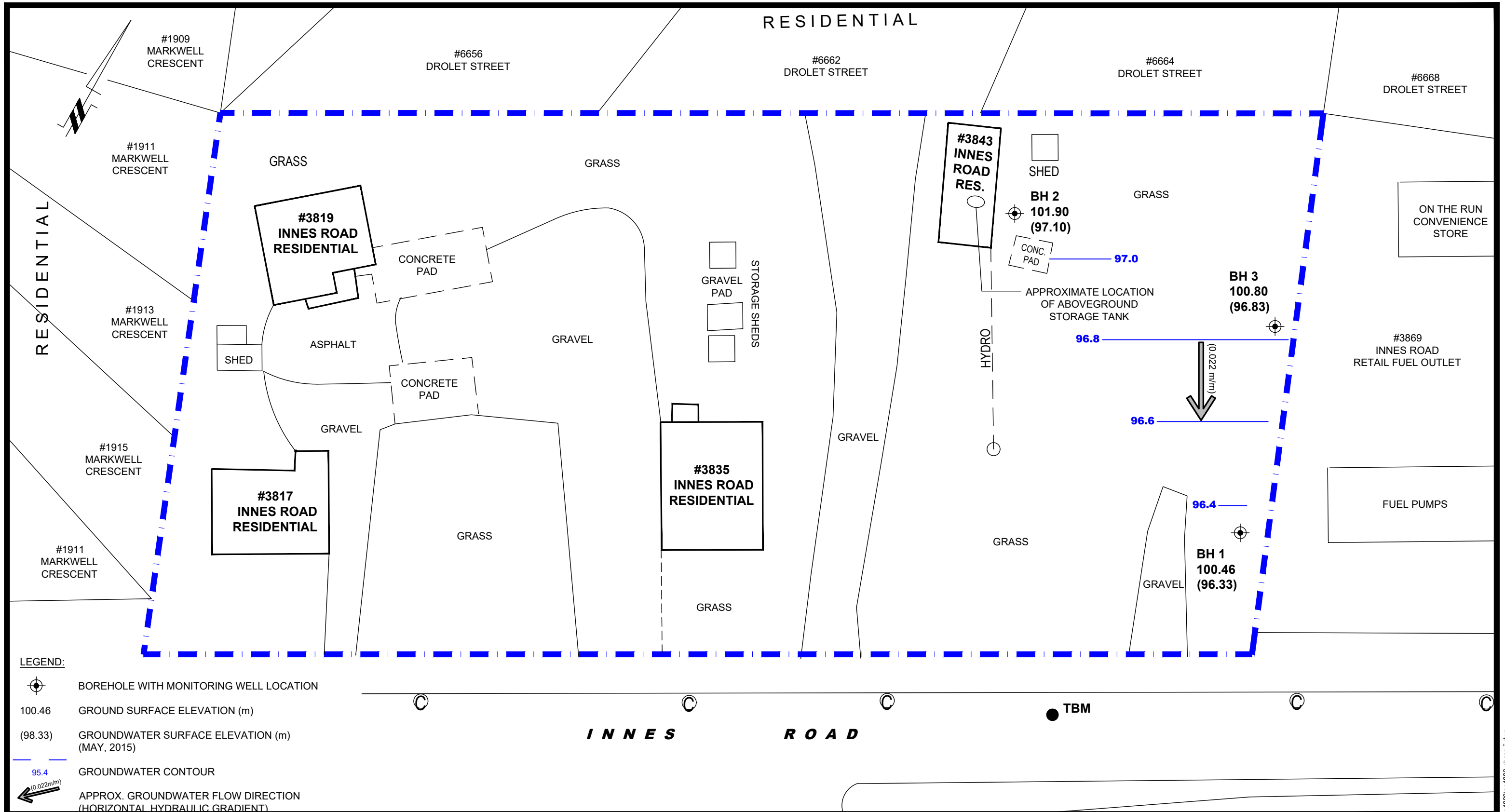
3817, 3819, 3835 AND 3843 INNES ROAD



ONTARIO

TEST HOLE LOCATION PLAN

OTTAWA,
Title:

Scale:	1:400	Date:	03/2020
Drawn by:	YA	Report No.:	PE4880-2
Checked by:	KAM	Drawing No.:	PE4880-3
Approved by:	MSD		



- LEGEND:**
-  BOREHOLE WITH MONITORING WELL LOCATION
 - 100.46 GROUND SURFACE ELEVATION (m)
 - (98.33) GROUNDWATER SURFACE ELEVATION (m) (MAY, 2015)
 - 95.4 GROUNDWATER CONTOUR
 -  (0.022m/m) APPROX. GROUNDWATER FLOW DIRECTION (HORIZONTAL HYDRAULIC GRADIENT)

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NO.	REVISIONS	DATE	INITIAL

OLIGO GROUP

**PHASE II - ENVIRONMENTAL SITE ASSESSMENT UPDATE
RESIDENTIAL PROPERTIES**

3817, 3819, 3835 AND 3843 INNES ROAD

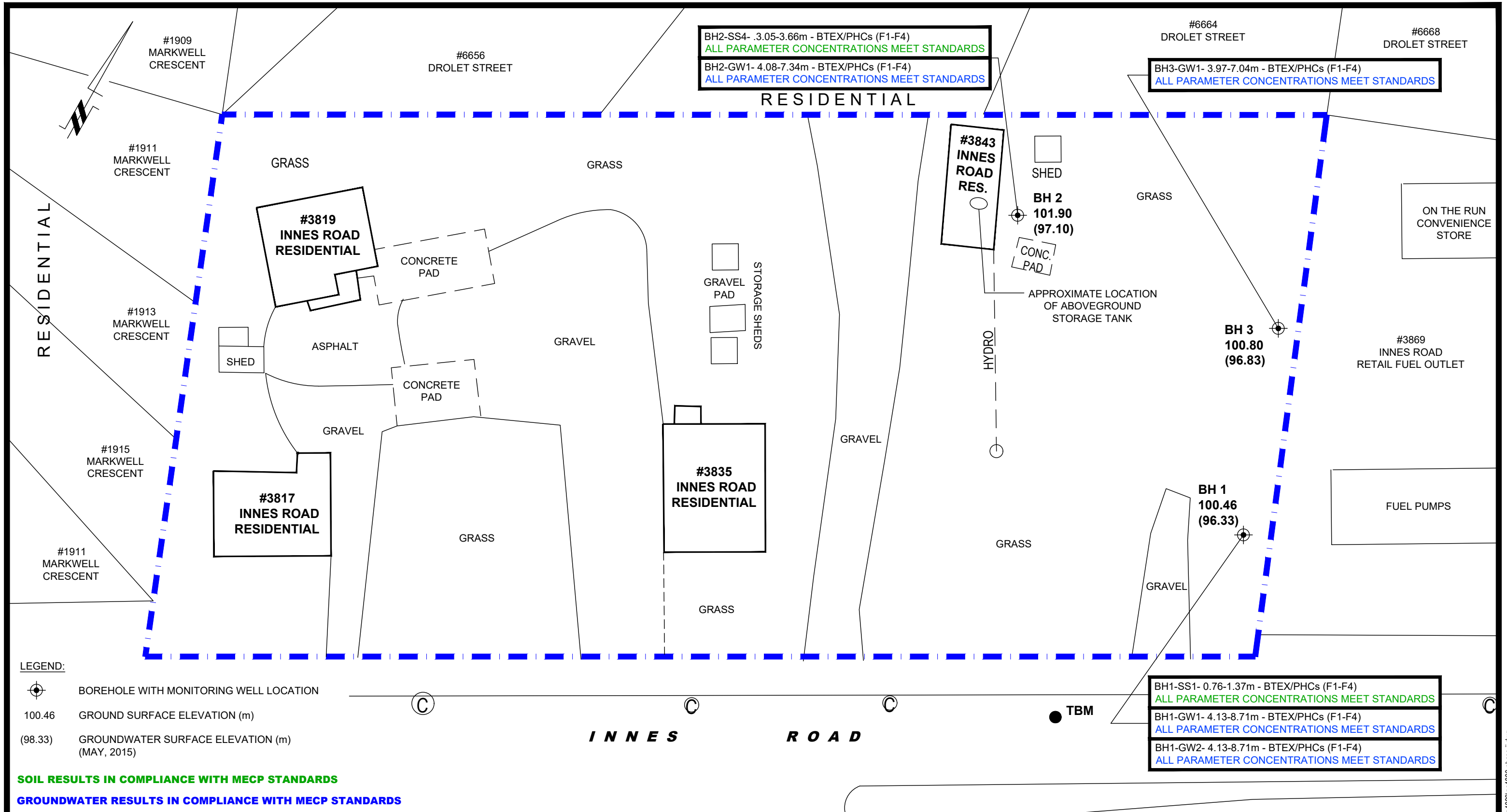
ONTARIO

GROUNDWATER CONTOUR PLAN

OTTAWA,
Title:

Scale:	1:400	Date:	03/2020
Drawn by:	YA	Report No.:	PE4880-2
Checked by:	KAM	Drawing No.:	PE4880-4
Approved by:	MSD		

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NO.	REVISIONS	DATE	INITIAL

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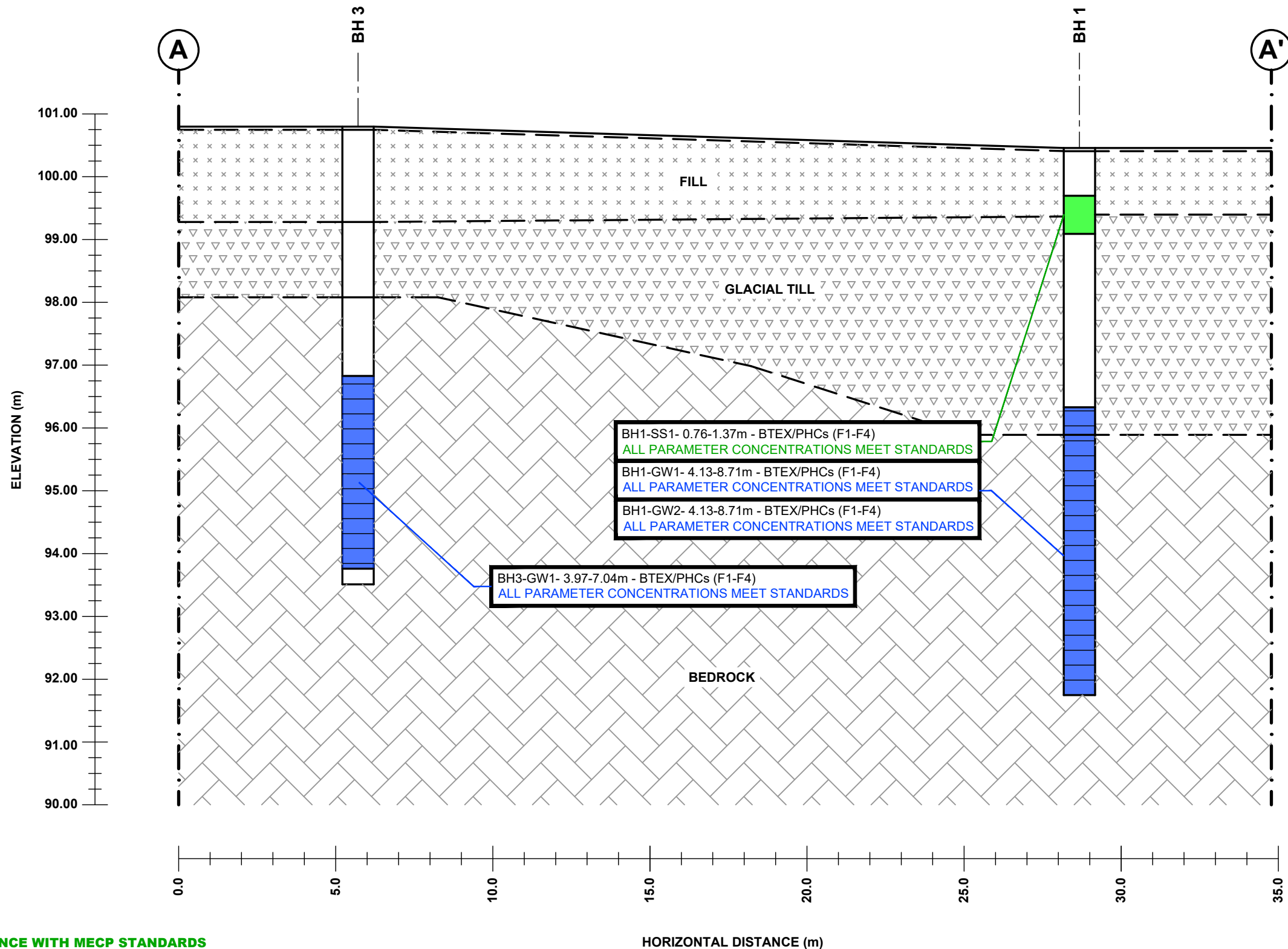
PHASE II - ENVIRONMENTAL SITE ASSESSMENT UPDATE
RESIDENTIAL PROPERTIES
3817, 3819, 3835 AND 3843 INNES ROAD

OTTAWA, ONTARIO

ANALYTICAL TESTING PLAN

Scale:	1:400	Date:	03/2020
Drawn by:	YA	Report No.:	PE4880-2
Checked by:	KAM	Drawing No.:	PE4880-5
Approved by:	MSD		

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OLIGO GROUP
PHASE II - ENVIRONMENTAL SITE ASSESSMENT UPDATE
RESIDENTIAL PROPERTIES
3817, 3819, 3835 AND 3843 INNES ROAD
OTTAWA, ONTARIO

CROSS-SECTION A-A'

Scale:	AS SHOWN	Date:	03/2020
Drawn by:	YA	Report No.:	PE4880-2
Checked by:	KAM	Drawing No.:	PE4880-6
Approved by:	MSD		

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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: 29544
Project: PE4880
Custody: 52330

Report Date: 26-Feb-2020
Order Date: 21-Feb-2020

Order #: 2008477

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

Paracel ID	Client ID
2008477-01	BH1-GW2
2008477-02	DUP1

Approved By:



Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis

Report Date: 26-Feb-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Feb-2020

Client PO: 29544

Project Description: PE4880

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	22-Feb-20	22-Feb-20
PHC F1	CWS Tier 1 - P&T GC-FID	21-Feb-20	22-Feb-20
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	25-Feb-20	25-Feb-20

Certificate of Analysis

Report Date: 26-Feb-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Feb-2020

Client PO: 29544

Project Description: PE4880

Client ID:	BH1-GW2	DUP1	-	-
Sample Date:	20-Feb-20 11:00	20-Feb-20 11:00	-	-
Sample ID:	2008477-01	2008477-02	-	-
MDL/Units	Water	Water	-	-

Volatiles

Benzene	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	-	-
Toluene-d8	Surrogate	109%	109%	-	-

Hydrocarbons

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

Certificate of Analysis

Report Date: 26-Feb-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Feb-2020

Client PO: 29544

Project Description: PE4880

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: Toluene-d8	93.0		ug/L		116	50-140			

Certificate of Analysis

Report Date: 26-Feb-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Feb-2020

Client PO: 29544

Project Description: PE4880

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: Toluene-d8	87.1		ug/L		109	50-140			

Certificate of Analysis

Report Date: 26-Feb-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Feb-2020

Client PO: 29544

Project Description: PE4880

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1920	25	ug/L	ND	96.0	68-117			
F2 PHCs (C10-C16)	1660	100	ug/L	ND	104	60-140			
F3 PHCs (C16-C34)	4280	100	ug/L	ND	109	60-140			
F4 PHCs (C34-C50)	2560	100	ug/L	ND	103	60-140			
Volatiles									
Benzene	40.8	0.5	ug/L	ND	102	60-130			
Ethylbenzene	44.3	0.5	ug/L	ND	111	60-130			
Toluene	40.0	0.5	ug/L	ND	100	60-130			
m,p-Xylenes	90.1	0.5	ug/L	ND	113	60-130			
o-Xylene	46.5	0.5	ug/L	ND	116	60-130			
Surrogate: Toluene-d8	77.7		ug/L		97.1	50-140			

Certificate of Analysis

Report Date: 26-Feb-2020

Client: Paterson Group Consulting Engineers

Order Date: 21-Feb-2020

Client PO: 29544

Project Description: PE4880

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.
- When reported, data for F4G has been processed using a silica gel cleanup.

