February 22, 2023
File: PE1962-LET.09

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Geotechnical Engineering
Environmental Engineering
Hydrogeology
Materials Testing
Building Science
Rural Development Design
Retaining Wall Design
Noise and Vibration Studies

patersongroup.ca

Attention: **Ms. Giordana Sita**

Subject: **Phase II - Environmental Site Assessment Update**
Part of 1615 Orleans Boulevard
Ottawa, Ontario

Dear Madam,

Further to your request, Paterson Group (Paterson) conducted a Phase II - Environmental Site Assessment (ESA) Update for the aforementioned property. This report updates a Phase II-ESA entitled “Phase II-Environmental Assessment, Part of 1615 Orleans Boulevard, Ottawa, Ontario” prepared by Paterson and dated February 24, 2020

As part of this Phase II ESA Update Paterson completed a groundwater sampling program to update the groundwater quality at the Phase II ESA property.

Conceptual Site Model

Site Description

Potentially Contaminating Activity and Areas of Potential Environmental Concern

Based on the results of the Phase I ESA completed for the subject site, three PCAs have been identified within the study area.

- ❑ PCA 1: Former retail fuel outlet
- ❑ PCA 2: Former UST.
- ❑ PCA3: Existing Hydro Transformer

However, only one PCA (PCA1) is considered to have resulted in an APEC on the Phase II Property:

Areas of Potential Environmental Concern					
Area of Potential Environmental Concern (APEC)	**Location of APEC on Phase I Property**	**Potentially Contaminating Activity (PCA)**	**Location of PCA (on-site or off-site)**	**Contaminants of Potential Concern**	**Media Potentially Impacted (Soil and/or Groundwater)**
APEC 1: Former Retail Fuel Outlet	On the western portion of the property	Item 28: Gasoline and associated product storage in fixed tanks	Off-Site	BTEX PHCs	Soil and Groundwater
APEC2[1] Application of Road Salt	Within the parking areas and drive lanes	NA	On-Site	EC SAR	Soil
1 - – In accordance with Section 49.1 of O.Reg. 153/04 standards are deemed to be met if an applicable site condition standard is exceeded at a property solely because the qualified person has determined that a substance has been applied to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both. The exemption outlined in Section 49.1 is being relied upon with respect to the Phase I ESA property.					

The APEC on the Phase I Property is presented on Drawing PE1962-3 – Site Plan. PCAs identified within the Phase I Study Area are outlined in green on Drawing PE1962-4 – Surrounding Land Use Plan.

The remaining PCAs are not considered to represent APECs on the Phase II ESA property due the nature of the PCA and/or the separation distance from the Phase II ESA property.

Contaminants of Potential Concern

The following contaminants of potential concern (CPCs) are identified with respect to the Phase II Property:

- ❒ Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX).
- ❒ Petroleum Hydrocarbons fractions 1 through 4 (PHCs F_1-F_4).

BTEX and PHCs F_1-F_4 were selected as CPCs for the Phase II Property due to the former presence of a retail fuel outlet situated on the property to the west of the Phase II ESA property.

Subsurface Structures and Utilities

Utilities on the Phase II Property included sanitary/storm sewer lines, a municipal water service, electrical services and telephone lines. Based on standard practice for subsurface utility installation, service trenches are expected to be present approximately 2 m below the existing grade. Subsurface infrastructures on the Phase II Property are shown illustrated on Drawing PE1962-5.

Physical Setting

Site Stratigraphy

The site stratigraphy, from ground surface to the deepest aquifer or aquitard investigated, is illustrated on the attached cross sections. The site stratigraphy consists of:

❒ Pavement structure, consisting of approximately 0.08m of asphaltic concrete over 0.8 to 0.66m of engineered fill material (crushed stone) was encountered at BH1, BH2, BH5 and BH6. Groundwater was not encountered in this layer.

❒ Native soil consisting of sand was encountered beneath the pavement structure or topsoil at most sampling locations. At a similar depth to the native sand intermittent areas of reworked native sand and clay were identified

❒ Silty clay was encountered in all boreholes at depths between approximately 1.47 m and 2.64 m below grade and extended until the borehole was terminated.

Hydrogeological Characteristics

Groundwater at the Phase II Property was encountered in the native silty clay layer. During the most recent groundwater monitoring event, groundwater flow was measured in a northwesterly direction, towards the Ottawa River, with a hydraulic gradient of 0.025 m/m. Groundwater contours are shown on Drawing PE1962-5.

Approximate Depth to Water Table

Depth to the water table at the subject site varies between approximately 1.81m and 3.65 m below existing grade.

Approximate Depth to Bedrock

Bedrock was not confirmed during the drilling program. All boreholes were completed in the native soil and did not reach refusal, as the drift thickness is estimated to be on the order of 50 to 100 m.

Well records for the Phase II Property and study area did not provide any information regarding the bedrock depth.

Sections 41 and 43.1 of the Regulation

Section 41 of the Regulation does not apply to the Phase II Property, in that the subject property is not within 30m of an environmentally sensitive area, and the pH of the soil is between 5 and 9.

Section 43.1 of the Regulation does not apply to the subject site as bedrock is not located less than 2 m below ground surface.

Fill Placement

Engineered fill is present on the Phase II Property and exists as part of the pavement structure. The fill material consists of crushed stone larger than 2 millimeters in size and is not considered to be soil as defined by O.Reg.153/04. The engineered fill material is not considered to represent an APEC on the Phase II Property. Fill material consisting of a brown silty clay was also present on site, this fill material is re-worked native soil from site grading and servicing. This material is not considered to represent a PCA or APEC on the subject site.

Existing Buildings and Structures

The Phase II Property is currently vacant and partially used for parking. The asphaltic paved parking areas, lights and roadway fronting Jeanne d'Arc Boulevard South are the only permanent structures on the subject site. No other structures exist on the Phase II Property.

Proposed Buildings and Other Structures

The proposed site development for the subject site includes several blocks of attached residential dwellings on the northern, central and eastern portions of the property with associated parking on the southern part of the property. The footprint of the development will cover the majority of the site.

Areas of Natural Significance

No areas of natural significance are present on the Phase II Property or within the 250 m study area.

Environmental Condition

Areas Where Contaminants are Present

Based on the analytical test results and Section 49.1 of O.Reg. 153/04 there are no contaminants exceeding the appliable MECP Standards on the subject site.

Statement of Limitations

This Phase II - Environmental Site Assessment Update report 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 subject site and/or historical information that differ from our findings, we request that we be notified immediately in order to allow for a reassessment.

This report was prepared for the sole use of Orleans Gardens J.V. c/o North American Property Group Inc. Permission and notification from the above noted party and this firm will be required to release this report to any other party.

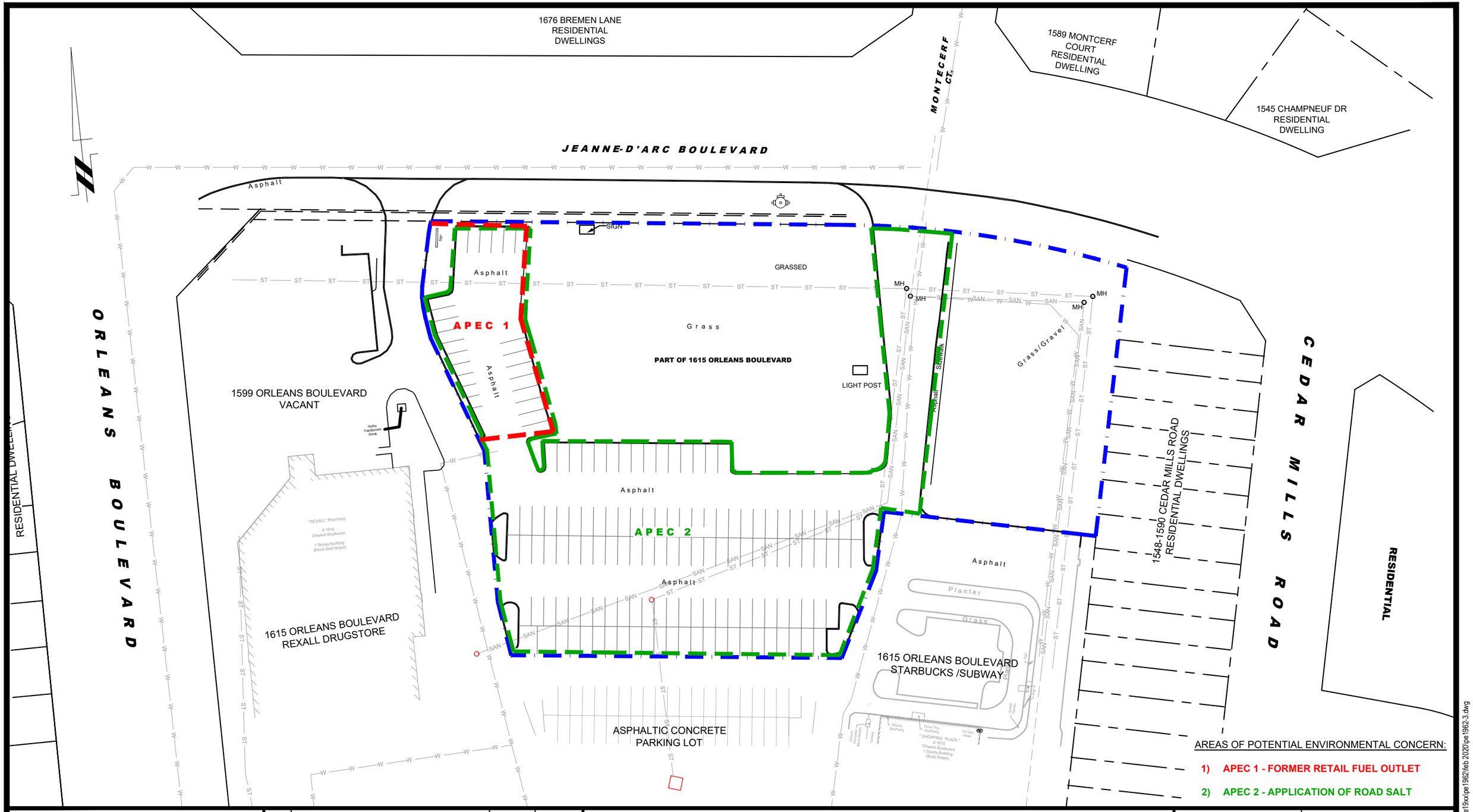
We trust that this submission satisfies your current requirements. Should you have any questions please contact the undersigned.

Paterson Group Inc.

Michael Beaudoin, P.Eng., QP$_{ESA}$

Report Distribution

- ❑ Orleans Gardens J.V. c/o North American Property Group Inc
- ❑ Paterson Group



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NO.	REVISIONS	DATE	INITIAL

ORLEANS GARDEN DEVELOPMENTS INCORPORATED

PHASE I - ENVIRONMENTAL SITE ASSESSMENT
PART OF 1615 ORLEANS BOULEVARD

OTTAWA, **ONTARIO**

Title:

SITE PLAN

Scale: 1:750	Date: 08/2022
Drawn by: YA	Report No.: PE1962-3
Checked by: KAM	Dwg No.: PE1962-3
Approved by: MB	Revision No.:

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POTENTIALLY CONTAMINATING ACTIVITIES:

PCA 1 : ITEM 28 - FORMER RETAIL FUEL OUTLET

PCA 2 : ITEM 28 - FORMER UNDERGROUND FUEL OIL TANK

PCA 3 : ITEM 55 - EXISTING TRANSFORMER

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ORLEANS GARDEN DEVELOPMENTS INCORPORATED.

PHASE I - ENVIRONMENTAL SITE ASSESSMENT
PART OF 1615 ORLEANS BOULEVARD

OTTAWA, ONTARIO

Title:

SURROUNDING LAND USE PLAN

Scale: 1:3000	Date: 08/2022
Drawn by: YA	Report No.: PE1962-3
Checked by: KAM	Dwg. No.: PE1962-4
Approved by: MB	Revision No.:

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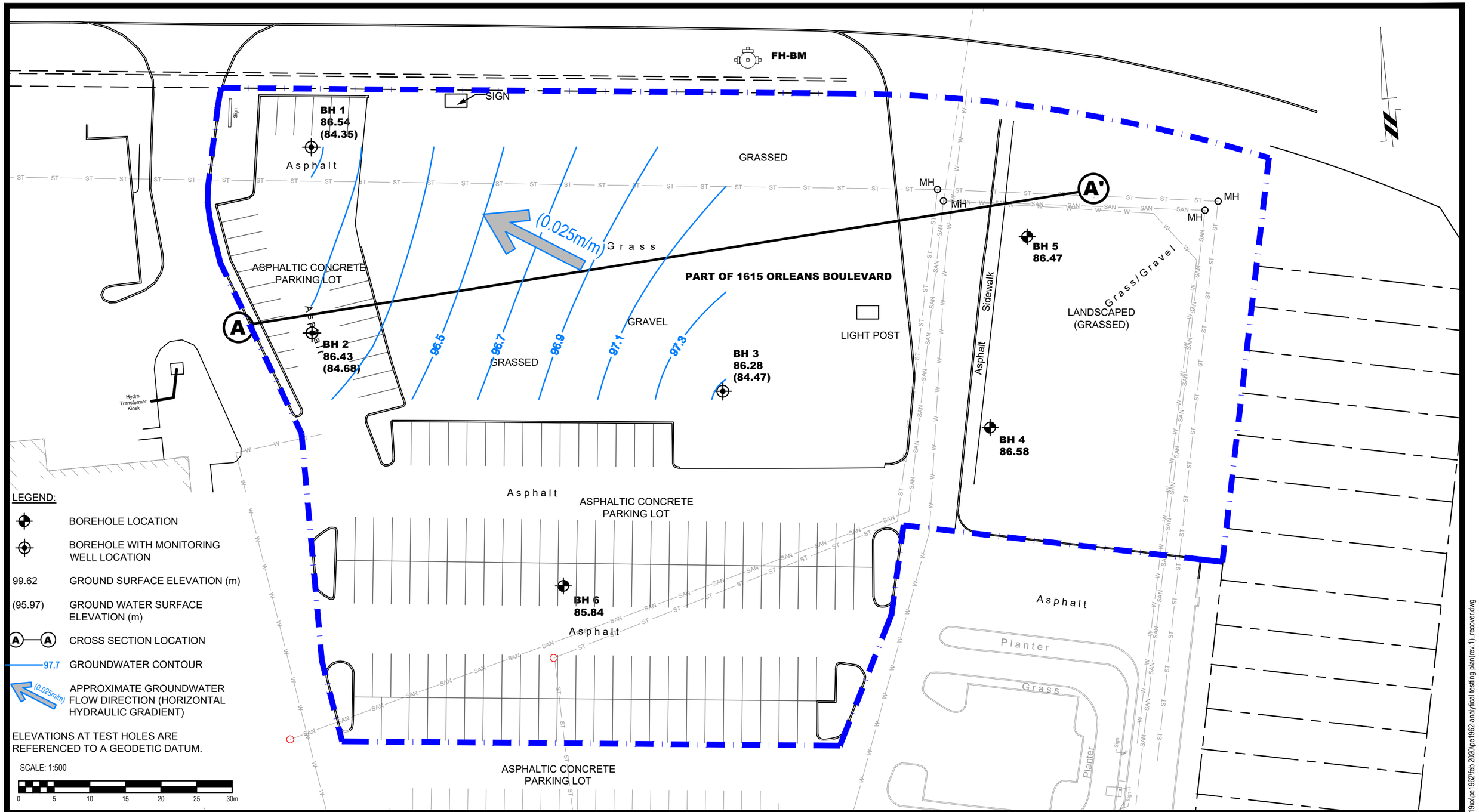

LEGEND:

- BOREHOLE LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION
- 99.62 GROUND SURFACE ELEVATION (m)
- (95.97) GROUND WATER SURFACE ELEVATION (m)
- A—A CROSS SECTION LOCATION
- 97.7 GROUNDWATER CONTOUR
- (0.025m/m) APPROXIMATE GROUNDWATER FLOW DIRECTION (HORIZONTAL HYDRAULIC GRADIENT)

ELEVATIONS AT TEST HOLES ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:500

0 5 10 15 20 25 30m

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NO.	REVISIONS	DATE	INITIAL

NORTH AMERICAN PROPERTY GROUP

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
1615 ORLEANS BOULEVARD

ORLEANS, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:500	Date: 07/2019
Drawn by: YA	Report No.: PE1962-2
Checked by: MB	Dwg. No.: PE1962-5
Approved by: MSD	Revision No.:

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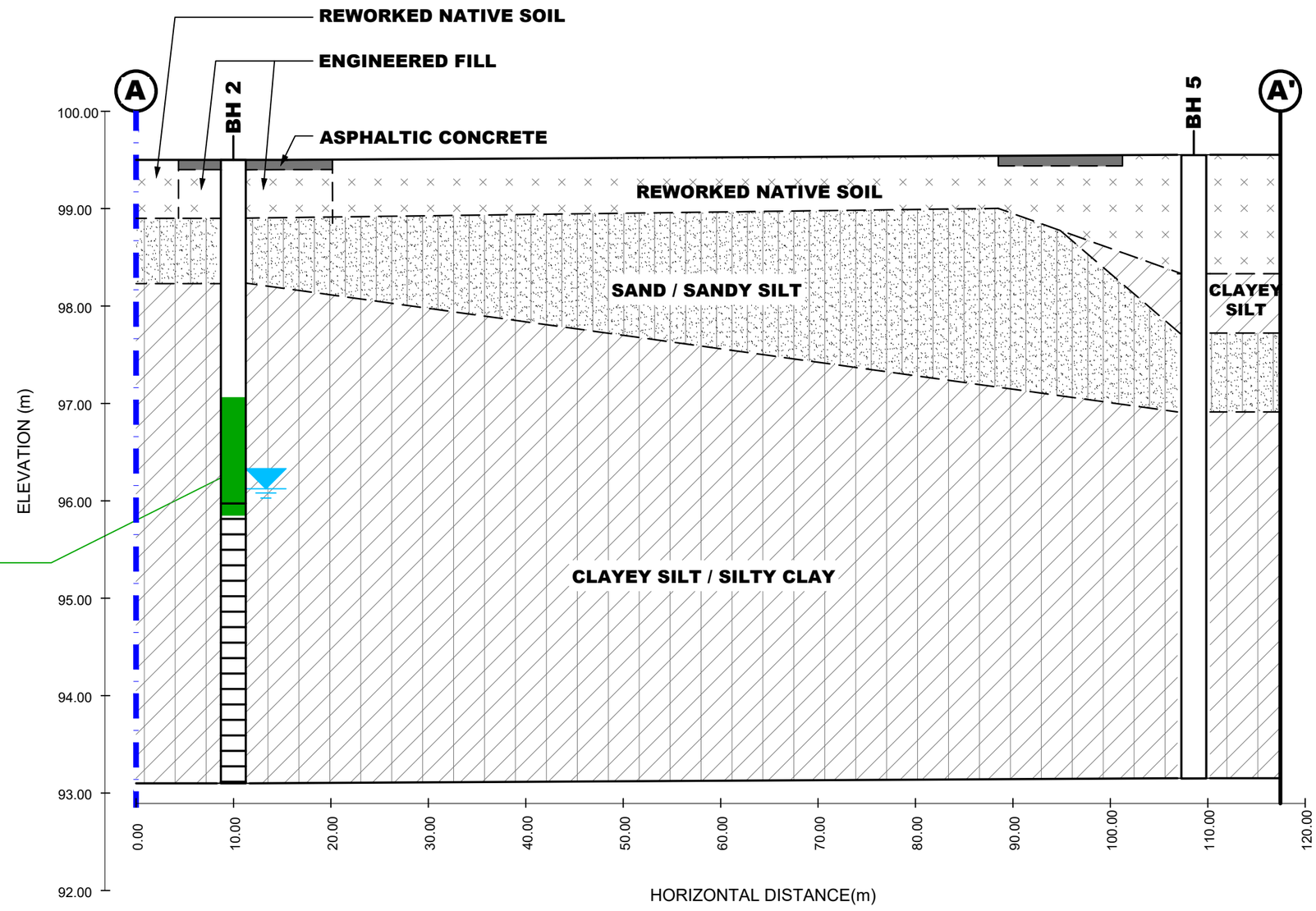

BH2-SS5 2.44-3.65m 10-July-19
BTEXs COMPLIES WITH TABLE 3 STANDARDS
PHCs COMPLIES WITH TABLE 3 STANDARDS

SOIL RESULT IN COMPLIANCE WITH MECP TABLE 3 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 3 STANDARDS

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ORLEANS GARDEN DEVELOPMENTS INC

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
PART OF 1615 ORLEANS BOULEVARD

ORLEANS, ONTARIO

Title:

CROSS SECTION A-A' - SOIL (BTEX AND PHC)

Scale: AS SHOWN	Date: 02/2020
Drawn by: RCG	Report No.: PE1962-4
Checked by: MB	Dwg. No.: PE1962-7A
Approved by: MSD	Revision No.:

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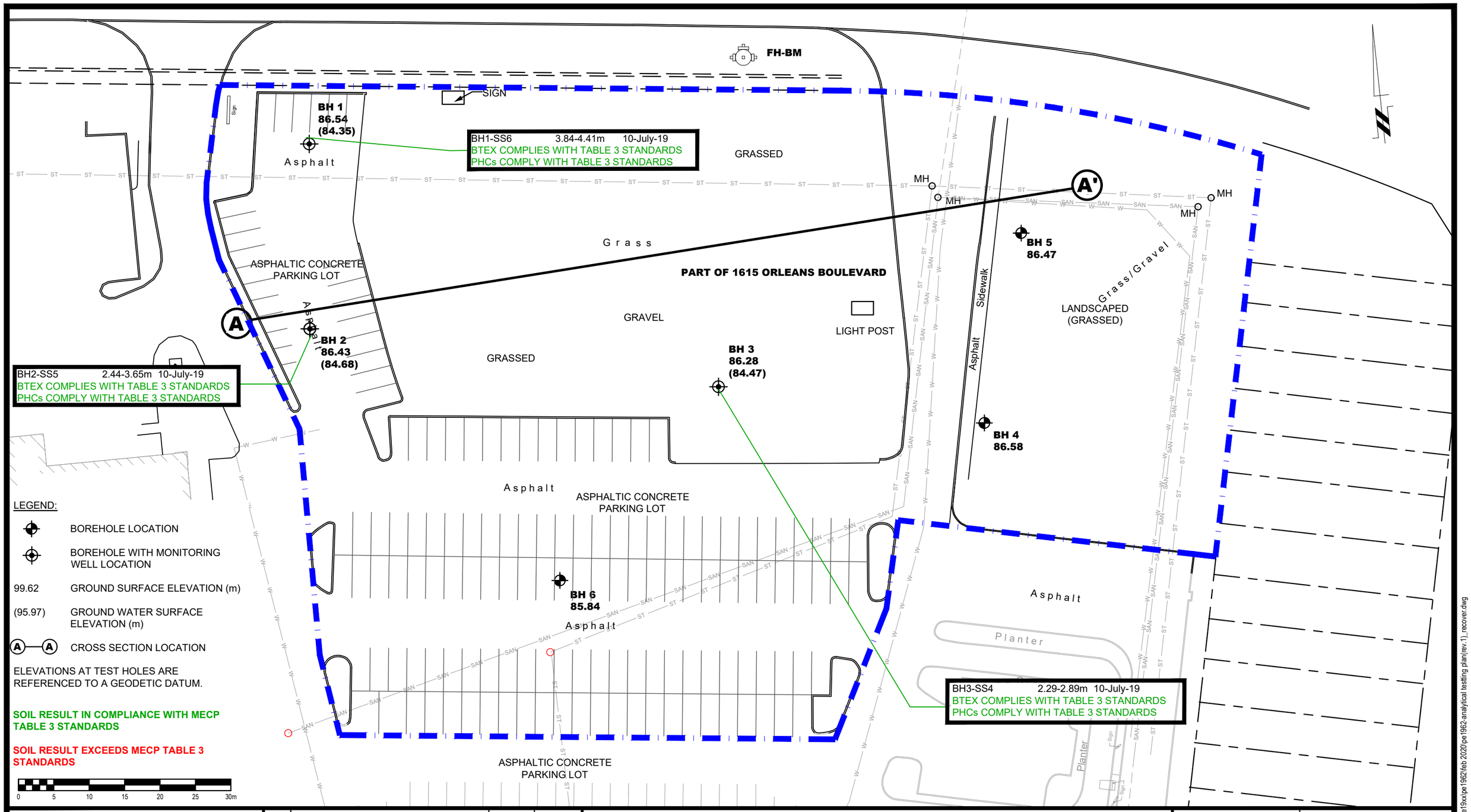

LEGEND:

- BOREHOLE LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION
- 99.62 GROUND SURFACE ELEVATION (m)
- (95.97) GROUND WATER SURFACE ELEVATION (m)
- A—A CROSS SECTION LOCATION

ELEVATIONS AT TEST HOLES ARE REFERENCED TO A GEODETIC DATUM.

SOIL RESULT IN COMPLIANCE WITH MECP TABLE 3 STANDARDS

SOIL RESULT EXCEEDS MECP TABLE 3 STANDARDS

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NO.	REVISIONS	DATE	INITIAL

ORLEANS GARDEN DEVELOPMENT INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
PART OF 1615 ORLEANS BOULEVARD

ORLEANS, ONTARIO

Title:

ANALYTICAL TESTING PLAN - SOIL (BTEX, PHC)

Scale: 1:500	Date: 08/2022
Drawn by: YA	Report No.: PE1962-4
Checked by: KAM	Dwg. No.: PE1962-7
Approved by: MB	Revision No.:

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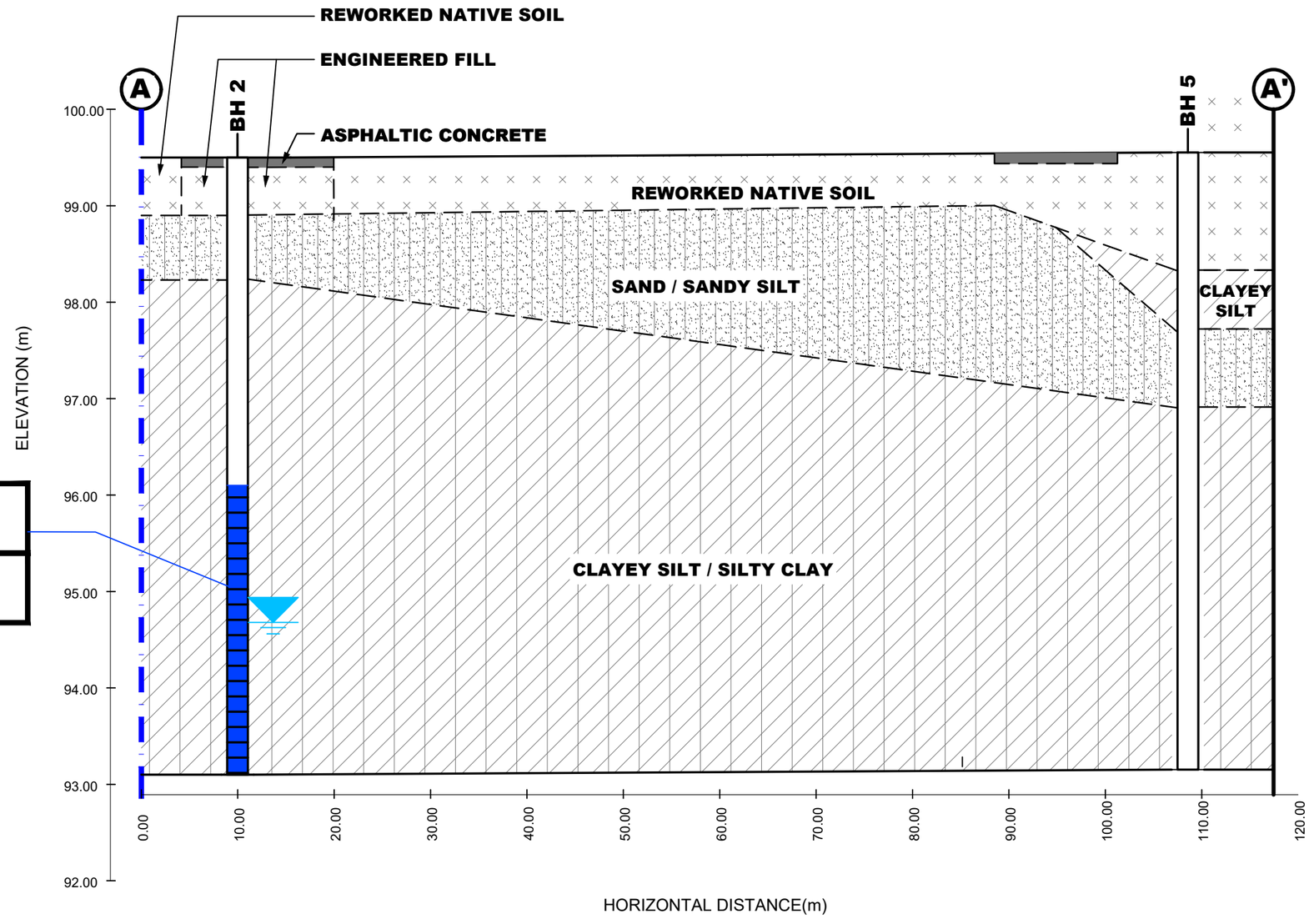

BH2-GW1	3.40-6.40	14-JULY-19
BTEX COMPLIES WITH MECP TABLE 3 STANDARDS		
PHCs COMPLIES WITH MECP TABLE 3 STANDARDS		

BH2-GW1	3.40-6.40	13-JULY-22
BTEX COMPLIES WITH MECP TABLE 3 STANDARDS		
PHCs COMPLIES WITH MECP TABLE 3 STANDARDS		

ALL GROUNDWATER RESULTS COMPLY WITH MECP TABLE 3 STANDARDS

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ORLEANS GARDEN DEVELOPMENTS INC

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
PART OF 1615 ORLEANS BOULEVARD

ORLEANS, ONTARIO

Title:

CROSS SECTION A-A' - GROUNDWATER

Scale: AS SHOWN	Date: 02/2020
Drawn by: RCG	Report No.: PE1962-4
Checked by: MB	Dwg. No.: PE1962-8A
Approved by: MSD	Revision No.:

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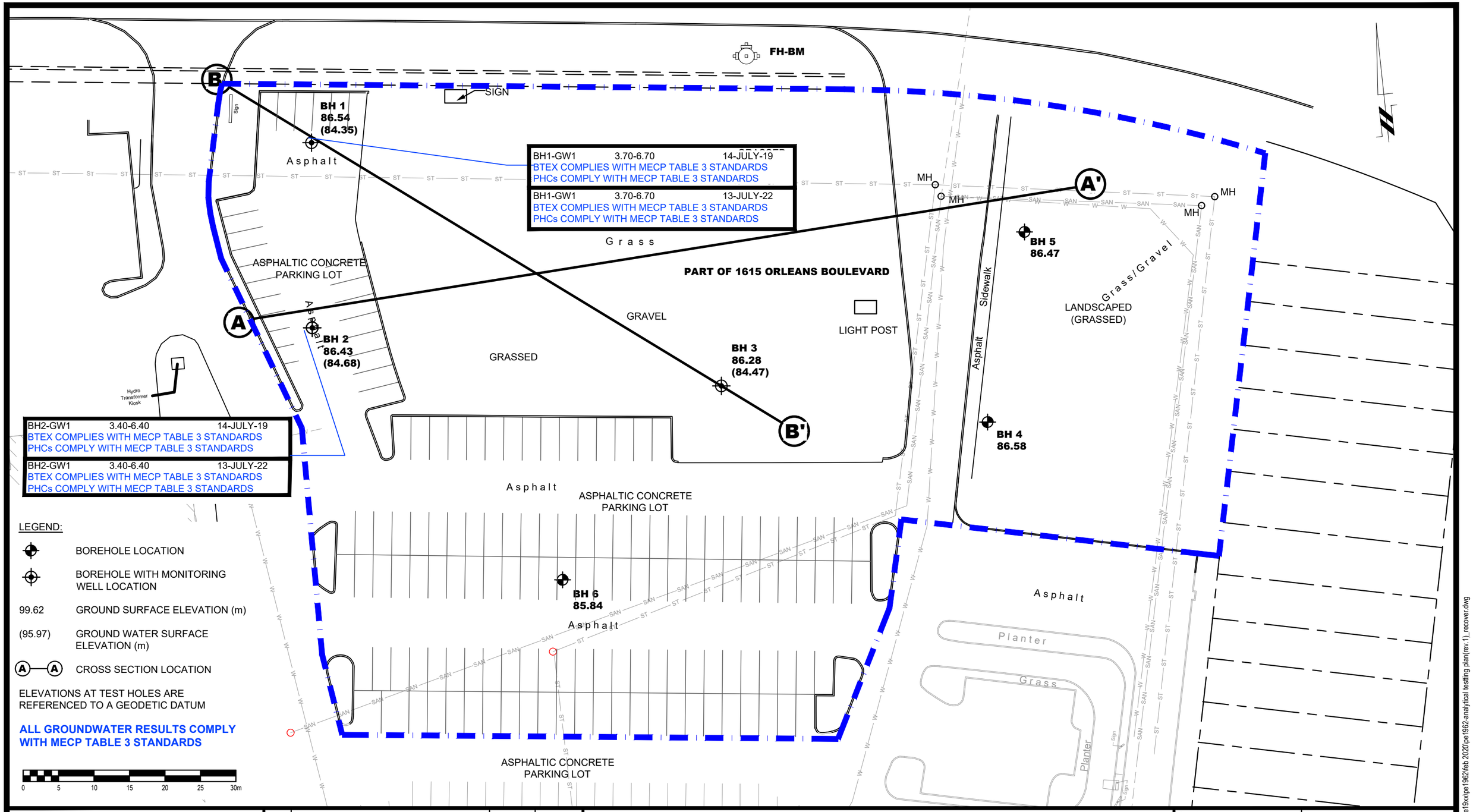

LEGEND:

- BOREHOLE LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION
- 99.62 GROUND SURFACE ELEVATION (m)
- (95.97) GROUND WATER SURFACE ELEVATION (m)
- A—A CROSS SECTION LOCATION

ELEVATIONS AT TEST HOLES ARE REFERENCED TO A GEODETIC DATUM

ALL GROUNDWATER RESULTS COMPLY WITH MECP TABLE 3 STANDARDS

0 5 10 15 20 25 30m

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ORLEANS GARDEN DEVELOPMENT INC.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
PART OF 1615 ORLEANS BOULEVARD

ORLEANS, ONTARIO

Title:

ANALYTICAL TESTING PLAN (GROUNDWATER)

Scale: 1:500	Date: 08/2022
Drawn by: YA	Report No.: PE1962-4
Checked by: KAM	Dwg. No.: PE1962-8
Approved by: MB	Revision No.:

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patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
Part of 1615 Orleans Boulevard
Ottawa, Ontario

DATUM TBM - Top spindle of fire hydrant located on the north property boundary, along Jeanne D'Arc Blvd. An arbitrary elevation of 100.00m was assigned to the TBM.

FILE NO. PE1962

REMARKS

HOLE NO. BH 1

BORINGS BY CME 55 Power Auger **DATE** 2019 July 10

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	99.62
Asphaltic concrete 0.08							
FILL: Brown silty sand with gravel, crushed stone 0.60		AU	1				
Compact, brown **SAND**		SS	2	58	15	1	98.62
1.52							
Very stiff, brown **CLAYEY SILT / SILTY CLAY**		SS	3	92	7	2	97.62
- silt content decreasing with depth 2.29							
		SS	4	96	4	3	96.62
Stiff, brown **SILTY CLAY**		SS	5	0	3		
- firm and grey by 3.8m depth		SS	6	88	W	4	95.62
		SS	7	100	W	5	94.62
		SS	8	100	W		
		SS	9	100	W	6	93.62
6.70							
End of Borehole							
(GWL @ 3.65m - July 17, 2019)							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
Part of 1615 Orleans Boulevard
Ottawa, Ontario

DATUM TBM - Top spindle of fire hydrant located on the north property boundary, along Jeanne D'Arc Blvd. An arbitrary elevation of 100.00m was assigned to the TBM.

FILE NO. PE1962

REMARKS

HOLE NO. BH 2

BORINGS BY CME 55 Power Auger **DATE** 2019 July 10

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	99.50
Asphaltic concrete 0.08 **FILL:** Brown silty sand with gravel, crushed stone 0.60		AU	1				
Comapct to loose, brown **SILTY SAND** with clay 1.27		SS	2	67	8	1	98.50
		SS	3	100	6	2	97.50
		SS	4	0	2		
Very stiff to firm, brown **SILTY CLAY**		SS	5	100	W	3	96.50
- firm and grey by 3.5m depth		SS	6	100	W	4	95.50
		SS	7	100	W	5	94.50
		SS	8	100	W	6	93.50
6.40 End of Borehole							
(GWL @ 3.37m - July 17, 2019)							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
Part of 1615 Orleans Boulevard
Ottawa, Ontario

DATUM TBM - Top spindle of fire hydrant located on the north property boundary, along Jeanne D'Arc Blvd. An arbitrary elevation of 100.00m was assigned to the TBM.

FILE NO. PE1962

REMARKS

HOLE NO. BH 3

BORINGS BY CME 55 Power Auger **DATE** 2019 July 10

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	99.36
FILL: Brown silty sand with gravel and organics		AU	1				
0.60							
		SS	2	88	9	1	98.36
		SS	3	100	6	2	97.36
Very stiff to stiff, brown **SILTY CLAY**		SS	4	100	W		
- firm and grey by 3.0m depth		SS	5	100	W	3	96.36
		SS	6	100	W	4	95.36
		SS	7	100	W	5	94.36
		SS	8	100	W		
		SS	9	100	W	6	93.36
6.70							
End of Borehole							
(GWL @ 1.81m - July 17, 2019)							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
Part of 1615 Orleans Boulevard
Ottawa, Ontario

DATUM TBM - Top spindle of fire hydrant located on the north property boundary, along Jeanne D'Arc Blvd. An arbitrary elevation of 100.00m was assigned to the TBM.

FILE NO. PE1962

REMARKS

HOLE NO. BH 4

BORINGS BY Geoprobe **DATE** 2019 July 11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector ● Volatile Organic Rdg. (ppm) / ○ Lower Explosive Limit %	Monitoring Well Construction
GROUND SURFACE						0	99.66		
FILL: Brown silty sand, some gravel		S	1	25	26				
0.91		SS	2	100	9	1	98.66		
		SS	3	100	2				
		SS	4	100	W	2	97.66		
Very stiff to stiff, brown **SILTY CLAY**		SS	5	100	W				
						3	96.66		
- firm and grey by 3.2m depth									
		SS	7	100	W	4	95.66		
		SS	8	100	W				
		SS	9	100	W	5	94.66		
		SS	10	100	W				
		SS	11	100	W	6	93.66		
6.70									
End of Borehole									

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

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
Part of 1615 Orleans Boulevard
Ottawa, Ontario

DATUM TBM - Top spindle of fire hydrant located on the north property boundary, along Jeanne D'Arc Blvd. An arbitrary elevation of 100.00m was assigned to the TBM.

FILE NO. PE1962

REMARKS

HOLE NO. BH 5

BORINGS BY Geoprobe **DATE** 2019 July 11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	99.55
FILL: Brown silty sand with gravel 0.25		SS	1	88	72		
FILL: Brown silty sand with gravel and crushed stone 1.22		SS	2	38	38	1	98.55
		SS	3	62	3		
FILL: Brown silty clay with sand and gravel 2.70		SS	4	83	12	2	97.55
		SS	5	67	3		
Stiff, brown **SILTY CLAY**		SS	6	100	W	3	96.55
- firm and grey by 3.2m depth		SS	7	100	W	4	95.55
		SS	8	100	W		
		SS	9	100	W	5	94.55
		SS	10	100	W		
						6	93.55
6.40 End of Borehole							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
Part of 1615 Orleans Boulevard
Ottawa, Ontario

DATUM TBM - Top spindle of fire hydrant located on the north property boundary, along Jeanne D'Arc Blvd. An arbitrary elevation of 100.00m was assigned to the TBM.

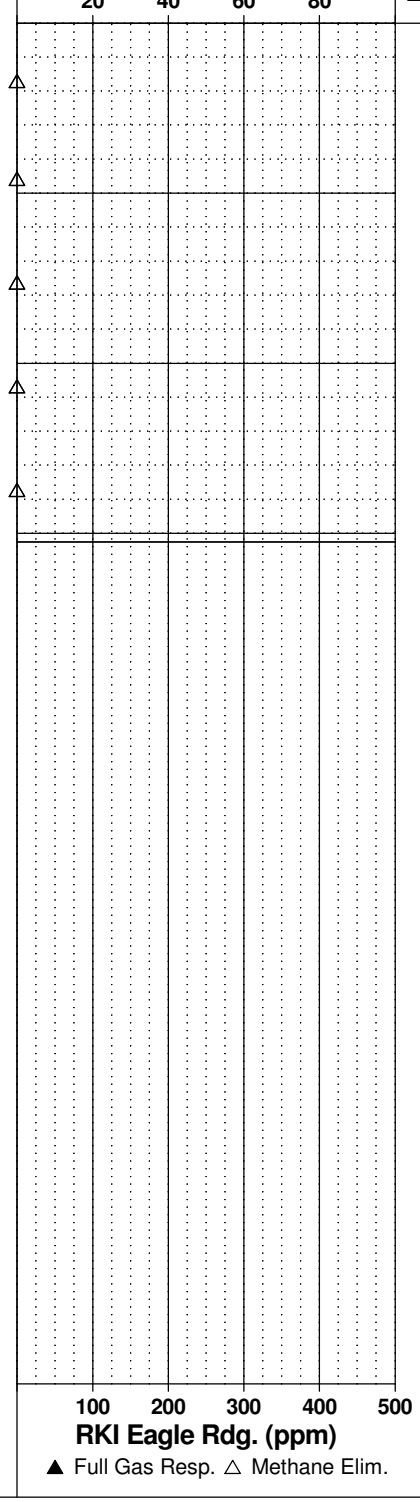
FILE NO. PE1962

REMARKS

HOLE NO. BH 6

BORINGS BY Geoprobe **DATE** 2019 July 11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector: Volatile Organic Rdg. (ppm) / Lower Explosive Limit %	Monitoring Well Construction
GROUND SURFACE									
Asphaltic concrete 0.08						0	98.92		
FILL: Brown sand with gravel and crushed stone 0.66		SS	1	10					
		SS	2	75	5	1	97.92		
Very stiff to stiff, brown **SILTY CLAY**		SS	3	100	3				
		SS	4	100	W	2	96.92		
- firm and grey by 2.6m depth		SS	5	100	W				
3.05						3	95.92		
End of Borehole									



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Certificate of Analysis

Paterson Group Consulting Engineers

9 Auriga Drive
Ottawa, ON K2E 7T9
Attn: Mike Beaudoin

Client PO:
Project: PE1962
Custody: 136696

Report Date: 19-Jul-2022
Order Date: 13-Jul-2022

Order #: 2229405

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

Paracel ID	Client ID
2229405-01	BH1
2229405-02	BH2
2229405-03	DUP

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Report Date: 19-Jul-2022

Client: Paterson Group Consulting Engineers

Order Date: 13-Jul-2022

Client PO:

Project Description: PE1962

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	15-Jul-22	15-Jul-22
PHC F1	CWS Tier 1 - P&T GC-FID	14-Jul-22	15-Jul-22
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	18-Jul-22	18-Jul-22

Certificate of Analysis

Report Date: 19-Jul-2022

Client: **Paterson Group Consulting Engineers**

Order Date: 13-Jul-2022

Client PO:

Project Description: PE1962

	Client ID:	BH1	BH2	DUP	-
	Sample Date:	13-Jul-22 09:00	13-Jul-22 09:00	13-Jul-22 09:00	-
	Sample ID:	2229405-01	2229405-02	2229405-03	-
	MDL/Units	Water	Water	Water	-
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	-
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	-
Toluene-d8	Surrogate	109%	109%	108%	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	-	-

Certificate of Analysis

Report Date: 19-Jul-2022

Client: Paterson Group Consulting Engineers

Order Date: 13-Jul-2022

Client PO:

Project Description: PE1962

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	*89.0*		*ug/L*		*111*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: Toluene-d8	*87.7*		*ug/L*		*110*	*50-140*			

Certificate of Analysis

Report Date: 19-Jul-2022

Client: Paterson Group Consulting Engineers

Order Date: 13-Jul-2022

Client PO:

Project Description: PE1962

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	2290	25	ug/L	ND	115	68-117			
F2 PHCs (C10-C16)	1460	100	ug/L	ND	91.2	60-140			
F3 PHCs (C16-C34)	4220	100	ug/L	ND	108	60-140			
F4 PHCs (C34-C50)	2360	100	ug/L	ND	95.0	60-140			
Volatiles									
Benzene	39.1	0.5	ug/L	ND	97.8	60-130			
Ethylbenzene	37.5	0.5	ug/L	ND	93.7	60-130			
Toluene	38.4	0.5	ug/L	ND	95.9	60-130			
m,p-Xylenes	73.1	0.5	ug/L	ND	91.4	60-130			
o-Xylene	38.6	0.5	ug/L	ND	96.6	60-130			
Surrogate: Toluene-d8	*74.1*		*ug/L*		*92.6*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

CCME PHC additional information:

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

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Paracel ID: 2229405

Chain Of Custody
(Lab Use Only)
№ 136696

Client Name: Paterson	Project Ref: PE1962	Page __ of __
Contact Name: Mike Beaudoin	Quote #:	Turnaround Time
Address: 9 Auriga [redacted]	PO #:	☐ 1 day ☐ 3 day
Telephone: 613 226 7381	E-mail: MBeaudoin@Patersongroup.ca [redacted]	☐ 2 day ☒ Regular
		Date Required:

☒ REG 153/04 ☐ REG 406/19

☒ Table 1 ☐ Res/Park ☐ Med/Fine
☐ Table 2 ☐ Ind/Comm ☐ Coarse
☐ Table 3 ☐ Agri/Other
☐ Table ___
For RSC: ☐ Yes ☐ No

Other Regulation: ☐ REG 558 ☐ PWQO ☐ CCME ☐ MISA ☐ SU - Sani ☐ SU - Storm
Mun: ___
☐ Other:

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	PHCs F1+BTEX
1	BH1	GW		3	July 13		✓							
2	BH2	↓		3	↓		✓							
3	DUP	↓		2	↓									✓
4														
5														
6														
7														
8														
9														
10														

Comments: PO # to come

Method of Delivery: PARACEL COURIER

Relinquished By (Sign): GPat	Received By Driver/Depot: T. Flouie	Received at Lab: BSen	Verified By: [signature]
Relinquished By (Print): Grant Paterson	Date/Time: 13/07/22 3:30	Date/Time: July 13.22 17:20	Date/Time: July 14/22 9:31a
Date/Time: July 13 2022	Temperature: °C PM	Temperature: 19.4 °C	pH Verified: ☐ By: N/A

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Certificate of Analysis

Paterson Group Consulting Engineers

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

Client PO: 27299
Project: PE1962
Custody: 122819

Report Date: 17-Jul-2019
Order Date: 11-Jul-2019

Order #: 1928549

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

Paracel ID	Client ID
1928549-01	BH1-SS2
1928549-02	BH1-SS6
1928549-03	BH2-SS2
1928549-04	BH2-SS5
1928549-05	BH3-SS2
1928549-06	BH3-SS4

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 27299

Report Date: 17-Jul-2019
Order Date: 11-Jul-2019
Project Description: PE1962

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	15-Jul-19	16-Jul-19
Conductivity	MOE E3138 - probe @25 °C, water ext	17-Jul-19	17-Jul-19
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	17-Jul-19	17-Jul-19
PHC F1	CWS Tier 1 - P&T GC-FID	15-Jul-19	16-Jul-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	15-Jul-19	17-Jul-19
SAR	Calculated	16-Jul-19	16-Jul-19
Solids, %	Gravimetric, calculation	16-Jul-19	16-Jul-19

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 27299

Report Date: 17-Jul-2019

Order Date: 11-Jul-2019

Project Description: PE1962

	Client ID:	BH1-SS2	BH1-SS6	BH2-SS2	BH2-SS5
	Sample Date:	10-Jul-19 09:00	10-Jul-19 09:00	10-Jul-19 09:00	10-Jul-19 09:00
	Sample ID:	1928549-01	1928549-02	1928549-03	1928549-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	83.0	57.9	84.1	61.1
General Inorganics					
SAR	0.01 N/A	5.85	-	3.07	-
Conductivity	5 uS/cm	568	-	426	-
pH	0.05 pH Units	7.17	-	-	-
Volatiles					
Benzene	0.02 ug/g dry	-	<0.02	-	<0.02
Ethylbenzene	0.05 ug/g dry	-	<0.05	-	<0.05
Toluene	0.05 ug/g dry	-	<0.05	-	<0.05
m,p-Xylenes	0.05 ug/g dry	-	<0.05	-	<0.05
o-Xylene	0.05 ug/g dry	-	<0.05	-	<0.05
Xylenes, total	0.05 ug/g dry	-	<0.05	-	<0.05
Toluene-d8	Surrogate	-	80.4%	-	76.1%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	-	<7	-	<7
F2 PHCs (C10-C16)	4 ug/g dry	-	<4	-	<4
F3 PHCs (C16-C34)	8 ug/g dry	-	<8	-	<8
F4 PHCs (C34-C50)	6 ug/g dry	-	<6	-	<6

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 27299

Report Date: 17-Jul-2019

Order Date: 11-Jul-2019

Project Description: PE1962

	Client ID:	BH3-SS2	BH3-SS4	-	-
	Sample Date:	10-Jul-19 09:00	10-Jul-19 09:00	-	-
	Sample ID:	1928549-05	1928549-06	-	-
	MDL/Units	Soil	Soil	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	63.3	58.9	-	-
General Inorganics					
SAR	0.01 N/A	14.2	-	-	-
Conductivity	5 uS/cm	1790	-	-	-
pH	0.05 pH Units	-	7.54	-	-
Volatiles					
Benzene	0.02 ug/g dry	-	<0.02	-	-
Ethylbenzene	0.05 ug/g dry	-	<0.05	-	-
Toluene	0.05 ug/g dry	-	<0.05	-	-
m,p-Xylenes	0.05 ug/g dry	-	<0.05	-	-
o-Xylene	0.05 ug/g dry	-	<0.05	-	-
Xylenes, total	0.05 ug/g dry	-	<0.05	-	-
Toluene-d8	Surrogate	-	83.8%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	-	<7	-	-
F2 PHCs (C10-C16)	4 ug/g dry	-	<4	-	-
F3 PHCs (C16-C34)	8 ug/g dry	-	<8	-	-
F4 PHCs (C34-C50)	6 ug/g dry	-	<6	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Conductivity	ND	5	uS/cm						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Volatiles									
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: Toluene-d8	*2.88*		*ug/g*		*90.0*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
SAR	0.18	0.01	N/A	0.19			5.4	200	
Conductivity	1960	5	uS/cm	1950			0.2	5	
pH	7.55	0.05	pH Units	7.60			0.7	2.3	
Hydrocarbons									
F1 PHCs (C6-C10)	29	7	ug/g dry	27			7.9	40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND				30	
F3 PHCs (C16-C34)	ND	8	ug/g dry	ND			0.0	30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND			0.0	30	
Physical Characteristics									
% Solids	96.2	0.1	% by Wt.	96.1			0.1	25	
Volatiles									
Benzene	1.22	0.02	ug/g dry	1.31			7.0	50	
Ethylbenzene	2.81	0.05	ug/g dry	3.07			8.9	50	
Toluene	0.441	0.05	ug/g dry	0.474			7.2	50	
m,p-Xylenes	6.13	0.05	ug/g dry	6.85			11.1	50	
o-Xylene	0.862	0.05	ug/g dry	0.859			0.3	50	
Surrogate: Toluene-d8	*3.61*		*ug/g dry*		*87.1*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	197	7	ug/g		98.6	80-120			
F2 PHCs (C10-C16)	98	4	ug/g	ND	114	60-140			
F3 PHCs (C16-C34)	252	8	ug/g	ND	119	60-140			
F4 PHCs (C34-C50)	165	6	ug/g	ND	124	60-140			
Volatiles									
Benzene	5.01	0.02	ug/g		125	60-130			
Ethylbenzene	4.39	0.05	ug/g		110	60-130			
Toluene	4.37	0.05	ug/g		109	60-130			
m,p-Xylenes	8.58	0.05	ug/g		107	60-130			
o-Xylene	4.42	0.05	ug/g		111	60-130			
Surrogate: Toluene-d8	*2.13*		*ug/g*		*66.5*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

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TRUSTED RESPONS RELIABL

PARACEL WO: 1928549

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

Chain of Custody
(Lab Use Only)
№ 122819

Page 1 of 1

Client Name: ~~Golder~~ Paterson Group	Project Reference: PE1962
Contact Name: Mike Beaudoin	Quote #
Address: 154 Colonnade Rd S.	PO # 27299
Telephone: 613-226-7381	Email Address: mbeaudoin@patersongroup.ca

Turnaround Time:
☐ 1 Day ☐ 3 Day
☐ 2 Day ☒ Regular
Date Required:

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

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

Required Analyses

	Paracel Order Number: 1928549 / Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	EC/SAR	pH					
1	BH1-SS2	S		1	July 10/19									X	X	120 ml				
2	BH1-SS6	S		2	↓		X									120 ml x vial				
3	BH2-SS2	S		1										X		120 ml				
4	BH2-SS5	S		2	↓		X									120 ml x vial				
5	BH3-SS2	S		1										X		120 ml				
6	BH3-SS4	S		2	↓		X								X	120 ml x vial				
7																				
8																				
9																				
10																				

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot: T. Rouse	Received at Lab: Samuel	Verified By:
Relinquished By (Print):	Date/Time: 11/07/19 220 PM	Date/Time: 07/11/19 14:54	Date/Time: 7-11-19 17:55
Date/Time:	Temperature: °C	Temperature: 14.2 °C	pH Verified [ ] By:

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Certificate of Analysis

Paterson Group Consulting Engineers

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

Client PO: 27300
Project: PE1962
Custody: 122821

Report Date: 18-Jul-2019
Order Date: 12-Jul-2019

Order #: 1928679

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

Paracel ID	Client ID
1928679-01	BH4-SS2
1928679-02	BH5-SS3
1928679-03	BH6-SS2

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 27300

Report Date: 18-Jul-2019
Order Date: 12-Jul-2019
Project Description: PE1962

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Conductivity	MOE E3138 - probe @25 °C, water ext	17-Jul-19	17-Jul-19
SAR	Calculated	16-Jul-19	18-Jul-19
Solids, %	Gravimetric, calculation	15-Jul-19	15-Jul-19

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 27300

Report Date: 18-Jul-2019

Order Date: 12-Jul-2019

Project Description: PE1962

	Client ID:	BH4-SS2	BH5-SS3	BH6-SS2	-
	Sample Date:	11-Jul-19 09:00	11-Jul-19 09:00	11-Jul-19 09:00	-
	Sample ID:	1928679-01	1928679-02	1928679-03	-
	MDL/Units	Soil	Soil	Soil	-
Physical Characteristics					
% Solids	0.1 % by Wt.	82.7	82.2	75.4	-
General Inorganics					
SAR	0.01 N/A	2.56	5.43	10.5	-
Conductivity	5 uS/cm	380	724	1140	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Conductivity	ND	5	uS/cm						

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
SAR	0.18	0.01	N/A	0.19			5.4	200	
Conductivity	1960	5	uS/cm	1950			0.2	5	
Physical Characteristics									
% Solids	88.8	0.1	% by Wt.	88.4			0.4	25	

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.

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.

PARACEL LABORATORIES LTD.

TRR

PARACEL WO: 1928679

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

Chain of Custody (Lab Use Only)

Nº 122821

Page 1 of 1

Client Name: Paterson	Project Reference: PE-1962		
Contact Name: Mike Beaudoin	Quote #		
Address: 154 Colonnade Rd S.	PO # 27300		
Telephone: 613-226-7381	Email Address: mbeaudoin@patersongroup.ca		

Turnaround Time: ☐ 1 Day ☐ 3 Day ☐ 2 Day ☑ Regular

Date Required:

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

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

Paracel Order Number: 1928679

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	EC/SAR						
1	BH4-SS2	S		1	July 11/19									X			120 ml			
2	BH5-SS3	S		1	↓									X			↓			
3	BH6-SS2	S		1	✓									X						
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Comments:

Method of Delivery: Paracel

Relinquished By (Sign): [signature]	Received by Driver/Depot: [signature]	Received at Lab: Suneeparm Dehmai	Verified By: [signature]
Relinquished By (Print):	Date/Time: 12/07/19 4:30 PM	Date/Time: JUL 12, 2019 05.15	Date/Time: 7-12-19 18:11
Date/Time:	Temperature: / °C	Temperature: 11.6 °C	pH Verified [ ] By:

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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: 27106
Project: PE1962
Custody: 122840

Report Date: 24-Jul-2019
Order Date: 18-Jul-2019

Order #: 1929548

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

Paracel ID	Client ID
1929548-01	BH1-GW1
1929548-02	BH2-GW1
1929548-03	BH3-GW1

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 27106

Report Date: 24-Jul-2019
Order Date: 18-Jul-2019
Project Description: PE1962

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC	19-Jul-19	19-Jul-19
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	22-Jul-19	22-Jul-19
Metals, ICP-MS	EPA 200.8 - ICP-MS	23-Jul-19	23-Jul-19
PHC F1	CWS Tier 1 - P&T GC-FID	20-Jul-19	22-Jul-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	24-Jul-19	24-Jul-19

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 27106

Report Date: 24-Jul-2019

Order Date: 18-Jul-2019

Project Description: PE1962

	Client ID:	BH1-GW1	BH2-GW1	BH3-GW1	-
	Sample Date:	17-Jul-19 09:00	17-Jul-19 09:00	17-Jul-19 09:00	-
	Sample ID:	1929548-01	1929548-02	1929548-03	-
	MDL/Units	Water	Water	Water	-
Anions					
Chloride	1 mg/L	411	90	135	-
Metals					
Sodium	200 ug/L	124000	39500	66500	-
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	118%	108%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Sodium	ND	200	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	*79.2*		*ug/L*		*99.0*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	135	1	mg/L	133			1.6	10	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND				30	
Metals									
Sodium	15900	200	ug/L	15800			0.7	20	
Volatiles									
Benzene	ND	0.5	ug/L	1.24			0.0	30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Toluene	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: Toluene-d8	*79.5*		*ug/L*		*99.3*	*50-140*			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 27106

Report Date: 24-Jul-2019
Order Date: 18-Jul-2019
Project Description: PE1962

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	143	1	mg/L	133	101	77-123			
Hydrocarbons									
F1 PHCs (C6-C10)	1950	25	ug/L		97.3	68-117			
F2 PHCs (C10-C16)	1610	100	ug/L		101	60-140			
F3 PHCs (C16-C34)	3850	100	ug/L		98.3	60-140			
F4 PHCs (C34-C50)	2580	100	ug/L		104	60-140			
Metals									
Sodium	23500		ug/L	15800	77.1	80-120			QM-07
Volatiles									
Benzene	29.9	0.5	ug/L		74.7	60-130			
Ethylbenzene	50.6	0.5	ug/L		127	60-130			
Toluene	39.0	0.5	ug/L		97.6	60-130			
m,p-Xylenes	86.7	0.5	ug/L		108	60-130			
o-Xylene	49.0	0.5	ug/L		122	60-130			
Surrogate: Toluene-d8	*69.1*		*ug/L*		*86.3*	*50-140*			

Qualifier Notes:

Login Qualifiers :

Container(s) - Bottle and COC sample ID don't match -
Applies to samples: BH2-GW1, BH3-GW1

QC Qualifiers :

QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

CCME PHC additional information:

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

PARACEL LABORATORIES LTD.

Paracel ID: 1929548

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Chain of Custody
(Lab Use Only)
№ 122840

Page ___ of ___

Client Name: Paterson Group Inc.	Project Reference: PE1962	**Turnaround Time:**
Contact Name: Mark D'Arcy	Quote #	☐ 1 Day ☐ 3 Day
Address: 154 Colonnade Rd S	PO # 27106	☐ 2 Day ☐ Regular
Telephone: (613) 226-7381	Email Address: mdarcy@patersongroup.ca	Date Required:

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

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

Required Analyses

Paracel Order Number: 1929548

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	Sodium Chloride						
1	BH1-GW1	GW		4	July 14/19	AM	X							X						
2	BH2-GW2	↓		5	Jul 14/19	↓	X							X						
3	BH3-GW3	↓		3/2	↓	↓								X						
4																				
5																				
6																				
7																				
8	Reporting guidelines. Reporting																			
9																				
10																				

Comments: Date of Sample read July 17 2019 ; No. 2 Sample ID on PHC + VOCs, Metals read = BH2 GW-1
No. 3 " " = ~~General~~ + Metals read = ~~BH3-GW1~~ BH3-GW3

Method of Delivery: Swift

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab: Samuel	Verified By: Mark
Relinquished By (Print):	Date/Time:	Date/Time: 07/18/19 15:57	Date/Time: 7-18-19 1614
Date/Time:	Temperature: °C	Temperature: 10.3 °C	pH Verified ☐ By: NB