



November 8, 2019

Our File Ref.: 190227

Alexander Fleck House Inc.
250 Rue Ste-Anne
Ottawa, Ontario K1L 7C4

Attention: Denis Michaud

Subject: Contamination Delineation
593 Laurier Avenue West, Ottawa, Ontario

Dear Mr. Michaud,

LRL Associates Ltd. (LRL) was retained by Alexander Fleck House Inc. to conduct contamination delineation at 593 Laurier Avenue West in Ottawa, Ontario (herein referred to as the 'Site'). The Site's location is shown in **Figure 1**. A Phase II Environmental Site Assessment (ESA), report dated November 7, 2019, revealed metals parameters in exceedance to the applicable standards in the fill material in the two (2) boreholes advanced in the northeast (BH/MW19-2) and southeast (BH/MW19-1) portions of the Site. The exceedances were detected at depths between surface and 1.2 m below ground surface (bgs).

The contamination delineation was conducted on October 31, 2019 and consisted of the advancement of sixteen (16) manual auger holes (AH19-1 through AH19-16) at distances of approximately 3.0 m and 6.0 m from the Phase II ESA boreholes. The locations of the auger holes are presented in **Figure 2**. The auger holes were advanced through approximately 0.2 m of topsoil followed by fill to depths between 0.2 m and 0.7 m bgs where refusal was encountered over inferred dense fill or bedrock.

In addition, due to a limited amount of water in MW19-1 at the time of the Phase II ESA, an insufficient amount was submitted to the laboratory, causing the laboratory method detection limit for Petroleum Hydrocarbon Compound (PHC) Fraction F2 to be raised to 196 µg/L, which is above the standard of 150 µg/L. It therefore could not be determined whether the sample met the applicable standard for PHC F2. A sample was collected from MW19-1 on October 31, 2019 to verify the level of PHC F2.

Representative soil samples collected during the investigation from approximately 3.0 m from the Phase II ESA boreholes were submitted to Paracel Laboratories Ltd. (Ottawa, Ontario) for metals analysis including mercury. The groundwater sample collected from MW19-1 was submitted for the analysis of PHC fractions F2 to F4.

The results of the soil analysis and respective MECP standards are presented in **Table 1**. The Laboratory Certificate of Analysis is included in **Attachment I**. Lead and/or mercury exceeded the applicable standards in all nine (9) samples submitted. Seven (7) of the samples submitted



exceeded the standard for lead (120 µg/g) with levels between 129 µg/g and 532 µg/g. Six (6) of the samples submitted exceeded the standard for mercury (0.27 µg/g) with levels between 0.3 µg/g and 1.6 µg/g and the detection limits in the remaining three (3) samples were (1.0 µg/g), above the standard of 0.27 µg/g. The exceedances were found at depths ranging between surface and 0.5 m bgs.

The groundwater analysis results and respective MECP standards are summarized in **Table 2**. PHC parameters were not detected in the additional sample from MW19-1.

The soil contamination encountered onsite presents a low risk to the building occupants if left undisturbed. Tenants should be notified not to dig, and not to allow dogs to dig, in the yard. It is recommended that the soil contamination be remediated at the time of Site development. The vertical extent of contamination is anticipated to be from surface to bedrock, encountered at depths between 0.5 m and 1.65 m bgs. The horizontal extent of contamination has not been delineated, however, it is anticipated to extend across the majority of the Site.

It is recommended that if groundwater monitoring wells are not required for future monitoring purposes, they should be decommissioned in accordance with O. Reg. 903.

Yours truly,
LRL Associates Ltd.



Geneviève Marcoux
Environmental Technician



Matthew Whitney, P. Eng.

- Encl. Figure 1 – Site Location
Figure 2 – Site Plan, Monitoring Well and Auger Hole Locations
Table 1 – Summary of Soil Metals Analysis
Table 2 – Summary of Groundwater PHC Analysis
Attachment I – Laboratory Certificates of Analysis

W:\FILES 2019\190227\04 Environmental\02 Phase I\ESA\05 Reports\Contamination Delineation\2019.11.08.Contamination Delineation, 593 Laurier Avenue west, Ottawa.R0.docx





LRJ

ENGINEERING | INGÉNIÉRIE

5430 Canotek Road | Ottawa, ON, K1J 9G2
www.lri.ca | (613) 842-3434

PROJECT

CONTAMINATION DELINEATION
593 LAURIER AVENUE WEST
OTTAWA, ONTARIO

DRAWING TITLE

SITE LOCATION
(NOT TO SCALE)
SOURCE: GeoOttawa

CLIENT

ALEXANDER FLECK HOUSE INC.

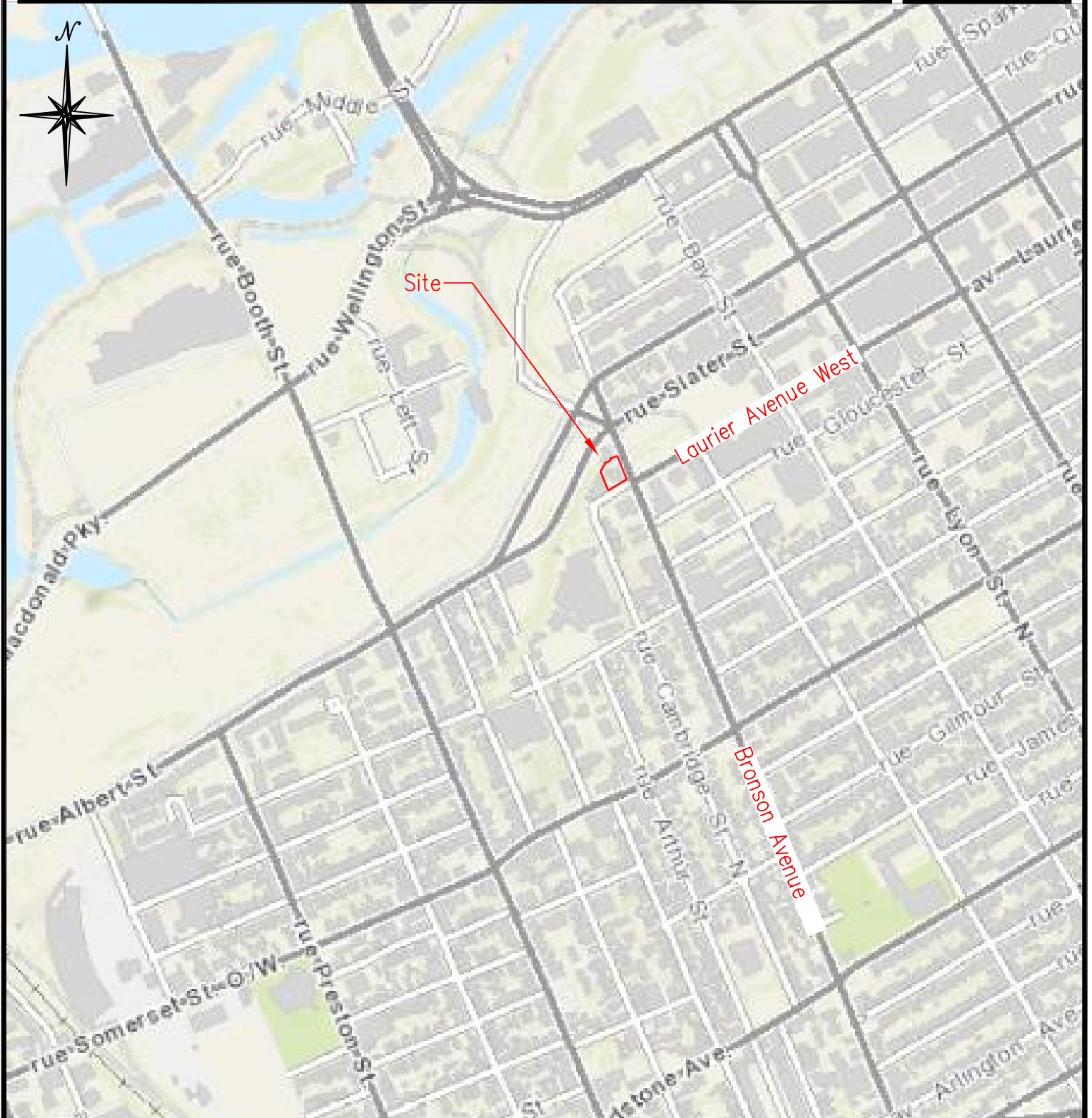
DATE

NOVEMBER 2019

PROJECT

190227

FIGURE 1





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PROJECT

CONTAMINATION DELINEATION
593 LAURIER AVENUE WEST
OTTAWA, ONTARIO

DRAWING TITLE

SITE PLAN,
MONITORING WELL & AUGER HOLE
LOCATIONS

CLIENT

ALEXANDER FLECK HOUSE INC.

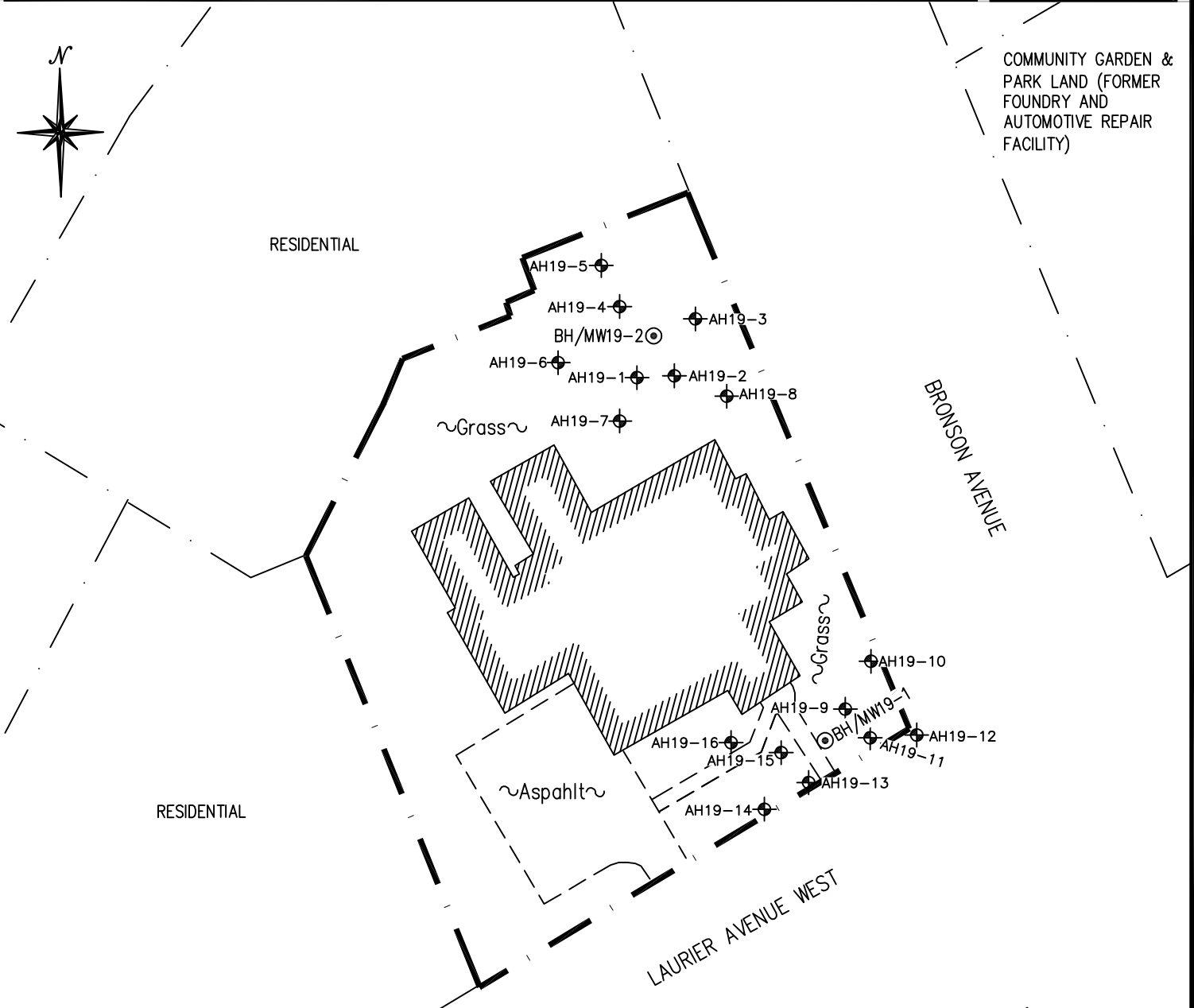
DATE

NOVEMBER 2019


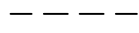
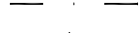
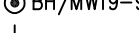

PROJECT

190227

FIGURE 2



LEGEND

-  Existing Building
-  Division between various surface materials
-  Property Line
-  BH/MW19-9 Monitoring Well
-  AH19-99 Manual Auger Hole



SCALE: 1:400

Table 1
Summary of Soil Metals Analysis
Contamination Delineation
593 Laurier Avenue West, Ottawa, Ontario
LRL File: 190227

Parameter	Units	MDL	O. Reg. 153/04 ¹ Table 7 ² Residential Property Use Coarse Textured Soil	Sample								
				AH19-1-3	Composite AH19-2-5 + AH19-2-6	AH19-3-8	AH19-4-10	AH19-9-23	AH19-11-28	AH19-13-32	AH19-15-35	AH19-15-37
Sample Date (d/m/y)			--	31/10/19	31/10/19	31/10/19	31/10/19	31/10/19	31/10/19	31/10/19	31/10/19	31/10/19
Depth	m		--	0.3 - 0.4	0.2 - 0.5	0.2 - 0.5	0.2 - 0.4	0.2 - 0.4	0.2 - 0.3	0.2 - 0.3	0.0 - 0.2	0.3 - 0.5
Physical Characteristics												
% Solids	% by wt.	0.1	--	79.6	82.5	84.9	82.1	80.9	77.8	81.4	66.5	76.2
Metals												
Antimony	µg/g dry	1.0	7.5	4.4	2.4	1.6	1.8	1.2	1.4	1.8	2.7	<1.0
Arsenic	µg/g dry	1.0	18	2.9	9.0	4.4	4.6	8.3	7.4	8.9	8.2	3.9
Barium	µg/g dry	1.0	390	117	125	86.4	80.2	176	121	147	156	101
Beryllium	µg/g dry	0.5	4	1.1	0.6	0.7	0.6	0.6	0.8	0.6	0.5	<0.5
Boron	µg/g dry	5.0	120	5.6	7.1	6.4	6.5	7.0	7.4	8.4	9.0	5.4
Cadmium	µg/g dry	0.5	1.2	0.6	0.7	<0.5	0.6	0.5	0.6	<0.5	0.8	<0.5
Chromium	µg/g dry	5.0	160	16.1	21.2	20.7	19.6	23.8	25.9	23.8	33.3	18.0
Cobalt	µg/g dry	1.0	22	3.6	5.5	6.3	6.0	5.5	5.9	5.4	5.3	3.8
Copper	µg/g dry	5.0	140	9.5	18.0	15.7	16.2	20.4	19.8	24.2	35.4	14.7
Lead	µg/g dry	1.0	120	532	218	52.3	129	200	183	231	298	81.8
Mercury	µg/g dry	0.1	0.27	1.2	<1.0	0.3	1.0	0.3	0.3	<1.0	1.6	<1.0
Molybdenum	µg/g dry	1.0	6.9	1.0	1.0	<1.0	<1.0	1.0	1.4	1.1	1.1	<1.0
Nickel	µg/g dry	5.0	100	8.7	11.7	12.7	11.8	13.0	14.3	12.5	16.0	9.1
Selenium	µg/g dry	1.0	2.4	1.1	1.7	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0
Silver	µg/g dry	0.3	20	0.5	0.5	<0.3	0.5	0.3	0.5	0.4	0.7	<0.3
Thallium	µg/g dry	1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Uranium	µg/g dry	1.0	23	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vanadium	µg/g dry	10.0	86	18.6	27.5	28.9	28.5	27.5	28.4	28.4	37.4	23.0
Zinc	µg/g dry	20.0	340	66.7	131	55.1	74.5	95.4	110	129	177	57.4

NOTES:

¹ MECP's Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011

² Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Groundwater Condition, residential property use.

³ Combustible soil vapour concentrations measured with a MiniRAE 2000 PID

MDL Method Detection Limit

-- No Value/Not Analysed

BOLD Above Table 7 Site Condition Standard

Italics Detection limit above Table 7 Site Condition Standard

Table 2
Summary of Groundwater PHC Analysis
Contamination Delineation
593 Laurier Avenue West, Ottawa, Ontario
LRL File: 190227

Parameter	Units	MDL	O. Reg. 153/04 ¹	Sample
			Table 7 ² Residential Property Use Coarse Textured Soil	MW19-1
Sample Date (d/m/y)				31/10/2019
Headspace VOC Readings ³	ppm	0.1		2.4
Evidence of free product?	--	--	4	No
Petroleum Hydrocarbon Compounds (PHC)				
F1 PHCs (C6-C10)	µg/L	25	420	--
F2 PHCs (C10-C16)	µg/L	100	150	<100
F3 PHCs (C16-C34)	µg/L	100	500	<100
F4 PHCs (C34-C50)	µg/L	100	500	<100

NOTES:

¹ MECP's *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011*

² Table 7: Generic Site Condition Standards for Shallow Soils in a Non-Potable Groundwater Condition, residential property use.

³ Headspace values measured with a MiniRAE 2000 PID

⁴ To meet the standard there must be no evidence of free product including film or sheen.

MDL Method Detection Limit

-- No Value/Not Analysed

PHC Petroleum Hydrocarbon Compounds

ATTACHMENT I
Laboratory Certificates of Analysis

Certificate of Analysis

LRL Associates Ltd.

5430 Canotek Road
Ottawa, ON K1J 9G2
Attn: Genevieve Marcoux

Client PO:
Project: 190227
Custody: 190227

Report Date: 7-Nov-2019
Order Date: 1-Nov-2019

Order #: 1944616

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

Parcel ID	Client ID
1944616-01	AH19-1-3
1944616-02	Composite of AH19-2-5 & AH19-2-6
1944616-03	AH19-3-8
1944616-04	AH19-4-10
1944616-05	AH19-9-23
1944616-06	AH19-11-28
1944616-07	AH19-13-32
1944616-08	AH19-15-35
1944616-09	AH19-15-37

Approved By:



Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: LRL Associates Ltd.
Client PO:

Report Date: 07-Nov-2019

Order Date: 1-Nov-2019

Project Description: 190227

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Mercury by CVAA	EPA 7471B - CVAA, digestion	5-Nov-19	6-Nov-19
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	5-Nov-19	6-Nov-19
Solids, %	Gravimetric, calculation	5-Nov-19	5-Nov-19

Certificate of Analysis
 Client: LRL Associates Ltd.
 Client PO:

Report Date: 07-Nov-2019

Order Date: 1-Nov-2019

Project Description: 190227

Client ID:	AH19-1-3	Composite of AH19-2-5 & AH19-2-6	AH19-3-8	AH19-4-10
Sample Date:	31-Oct-19 09:00	31-Oct-19 09:00	31-Oct-19 09:00	31-Oct-19 09:00
Sample ID:	1944616-01	1944616-02	1944616-03	1944616-04
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	79.6	82.5	84.9	82.1
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Metals

Antimony	1.0 ug/g dry	4.4	2.4	1.6	1.8
Arsenic	1.0 ug/g dry	2.9	9.0	4.4	4.6
Barium	1.0 ug/g dry	117	125	86.4	80.2
Beryllium	0.5 ug/g dry	1.1	0.6	0.7	0.6
Boron	5.0 ug/g dry	5.6	7.1	6.4	6.5
Cadmium	0.5 ug/g dry	0.6	0.7	<0.5	0.6
Chromium	5.0 ug/g dry	16.1	21.2	20.7	19.6
Cobalt	1.0 ug/g dry	3.6	5.5	6.3	6.0
Copper	5.0 ug/g dry	9.5	18.0	15.7	16.2
Lead	1.0 ug/g dry	532	218	52.3	129
Mercury	0.1 ug/g dry	1.2	<1.0	0.3	1.0
Molybdenum	1.0 ug/g dry	1.0	1.0	<1.0	<1.0
Nickel	5.0 ug/g dry	8.7	11.7	12.7	11.8
Selenium	1.0 ug/g dry	1.1	1.7	<1.0	<1.0
Silver	0.3 ug/g dry	0.5	0.5	<0.3	0.5
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	10.0 ug/g dry	18.6	27.5	28.9	28.5
Zinc	20.0 ug/g dry	66.7	131	55.1	74.5

Certificate of Analysis
 Client: LRL Associates Ltd.
 Client PO:

Report Date: 07-Nov-2019

Order Date: 1-Nov-2019

Project Description: 190227

Client ID:	AH19-9-23	AH19-11-28	AH19-13-32	AH19-15-35
Sample Date:	31-Oct-19 09:00	31-Oct-19 12:00	31-Oct-19 12:00	31-Oct-19 12:00
Sample ID:	1944616-05	1944616-06	1944616-07	1944616-08
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	80.9	77.8	81.4	66.5
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Metals

Antimony	1.0 ug/g dry	1.2	1.4	1.8	2.7
Arsenic	1.0 ug/g dry	8.3	7.4	8.9	8.2
Barium	1.0 ug/g dry	176	121	147	156
Beryllium	0.5 ug/g dry	0.6	0.8	0.6	0.5
Boron	5.0 ug/g dry	7.0	7.4	8.4	9.0
Cadmium	0.5 ug/g dry	0.5	0.6	<0.5	0.8
Chromium	5.0 ug/g dry	23.8	25.9	23.8	33.3
Cobalt	1.0 ug/g dry	5.5	5.9	5.4	5.3
Copper	5.0 ug/g dry	20.4	19.8	24.2	35.4
Lead	1.0 ug/g dry	200	183	231	298
Mercury	0.1 ug/g dry	0.3	0.3	<1.0	1.6
Molybdenum	1.0 ug/g dry	1.0	1.4	1.1	1.1
Nickel	5.0 ug/g dry	13.0	14.3	12.5	16.0
Selenium	1.0 ug/g dry	<1.0	1.0	<1.0	<1.0
Silver	0.3 ug/g dry	0.3	0.5	0.4	0.7
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	10.0 ug/g dry	27.5	28.4	28.4	37.4
Zinc	20.0 ug/g dry	95.4	110	129	177

Certificate of Analysis
 Client: LRL Associates Ltd.
 Client PO:

Report Date: 07-Nov-2019

Order Date: 1-Nov-2019

Project Description: 190227

Client ID:	AH19-15-37	-	-	-
Sample Date:	31-Oct-19 12:00	-	-	-
Sample ID:	1944616-09	-	-	-
MDL/Units	Soil	-	-	-

Physical Characteristics

% Solids	0.1 % by Wt.	76.2	-	-	-
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Metals

Antimony	1.0 ug/g dry	<1.0	-	-	-
Arsenic	1.0 ug/g dry	3.9	-	-	-
Barium	1.0 ug/g dry	101	-	-	-
Beryllium	0.5 ug/g dry	<0.5	-	-	-
Boron	5.0 ug/g dry	5.4	-	-	-
Cadmium	0.5 ug/g dry	<0.5	-	-	-
Chromium	5.0 ug/g dry	18.0	-	-	-
Cobalt	1.0 ug/g dry	3.8	-	-	-
Copper	5.0 ug/g dry	14.7	-	-	-
Lead	1.0 ug/g dry	81.8	-	-	-
Mercury	0.1 ug/g dry	<1.0	-	-	-
Molybdenum	1.0 ug/g dry	<1.0	-	-	-
Nickel	5.0 ug/g dry	9.1	-	-	-
Selenium	1.0 ug/g dry	<1.0	-	-	-
Silver	0.3 ug/g dry	<0.3	-	-	-
Thallium	1.0 ug/g dry	<1.0	-	-	-
Uranium	1.0 ug/g dry	<1.0	-	-	-
Vanadium	10.0 ug/g dry	23.0	-	-	-
Zinc	20.0 ug/g dry	57.4	-	-	-

Certificate of Analysis
Client: LRL Associates Ltd.
Client PO:

Report Date: 07-Nov-2019

Order Date: 1-Nov-2019

Project Description: 190227

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						

Certificate of Analysis
 Client: LRL Associates Ltd.
 Client PO:

Report Date: 07-Nov-2019

Order Date: 1-Nov-2019

Project Description: 190227

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	3.8	1.0	ug/g dry	ND			0.0	30	
Arsenic	3.6	1.0	ug/g dry	3.6			0.3	30	
Barium	71.3	1.0	ug/g dry	76.3			6.7	30	
Beryllium	0.9	0.5	ug/g dry	0.7			14.9	30	
Boron	10.1	5.0	ug/g dry	10.6			4.7	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium	20.8	5.0	ug/g dry	22.5			7.9	30	
Cobalt	7.7	1.0	ug/g dry	7.9			3.1	30	
Copper	35.1	5.0	ug/g dry	47.8			30.7	30	
Lead	16.6	1.0	ug/g dry	18.5			10.8	30	
Mercury	ND	0.1	ug/g dry	ND			0.0	30	
Molybdenum	1.1	1.0	ug/g dry	ND			0.0	30	
Nickel	16.7	5.0	ug/g dry	17.6			5.1	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	0.4	0.3	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	ND	1.0	ug/g dry	ND			0.0	30	
Vanadium	27.6	10.0	ug/g dry	30.9			11.3	30	
Zinc	55.5	20.0	ug/g dry	58.2			4.8	30	
Physical Characteristics									
% Solids	86.1	0.1	% by Wt.	85.6			0.6	25	

Certificate of Analysis
 Client: LRL Associates Ltd.
 Client PO:

Report Date: 07-Nov-2019

Order Date: 1-Nov-2019

Project Description: 190227
Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	75.4		ug/L	ND	75.0	70-130			
Arsenic	86.1		ug/L	1.4	84.7	70-130			
Barium	115		ug/L	30.5	84.5	70-130			
Beryllium	92.2		ug/L	ND	91.9	70-130			
Boron	85.1		ug/L	ND	80.8	70-130			
Cadmium	86.5		ug/L	ND	86.4	70-130			
Chromium	103		ug/L	9.0	94.2	70-130			
Cobalt	86.8		ug/L	3.2	83.7	70-130			
Copper	107		ug/L	19.1	88.2	70-130			
Lead	90.6		ug/L	7.4	83.2	70-130			
Mercury	1.60	0.1	ug/g	ND	106	70-130			
Molybdenum	95.0		ug/L	ND	94.8	70-130			
Nickel	97.2		ug/L	7.0	90.1	70-130			
Selenium	88.2		ug/L	ND	88.1	70-130			
Silver	69.5		ug/L	ND	69.5	70-130			
Thallium	82.2		ug/L	ND	82.1	70-130			
Uranium	84.5		ug/L	ND	84.3	70-130			
Vanadium	104		ug/L	12.3	92.0	70-130			
Zinc	108		ug/L	23.3	84.5	70-130			

Certificate of Analysis
Client: LRL Associates Ltd.
Client PO:

Report Date: 07-Nov-2019

Order Date: 1-Nov-2019

Project Description: 190227

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.

Certificate of Analysis

LRL Associates Ltd.

5430 Canotek Road
Ottawa, ON K1J 9G2
Attn: Genevieve Marcoux

Client PO:
Project: 190227
Custody: 50635

Report Date: 6-Nov-2019
Order Date: 1-Nov-2019

Order #: 1944614

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

Parcel ID	Client ID
1944614-01	MW19-1

Approved By:



Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: **LRL Associates Ltd.**
Client PO:

Report Date: 06-Nov-2019

Order Date: 1-Nov-2019

Project Description: 190227

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	4-Nov-19	6-Nov-19

Certificate of Analysis
Client: LRL Associates Ltd.
Client PO:

Report Date: 06-Nov-2019

Order Date: 1-Nov-2019

Project Description: 190227

Client ID:	MW19-1	-	-	-
Sample Date:	31-Oct-19 12:00	-	-	-
Sample ID:	1944614-01	-	-	-
MDL/Units	Water	-	-	-

Hydrocarbons

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

Certificate of Analysis
Client: LRL Associates Ltd.
Client PO:

Report Date: 06-Nov-2019

Order Date: 1-Nov-2019

Project Description: 190227

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						

Certificate of Analysis
 Client: LRL Associates Ltd.
 Client PO:

Report Date: 06-Nov-2019

Order Date: 1-Nov-2019

Project Description: 190227

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F2 PHCs (C10-C16)	1000	100	ug/L		62.6	60-140			
F3 PHCs (C16-C34)	3170	100	ug/L		80.9	60-140			
F4 PHCs (C34-C50)	2010	100	ug/L		80.9	60-140			

Certificate of Analysis
Client: LRL Associates Ltd.
Client PO:

Report Date: 06-Nov-2019

Order Date: 1-Nov-2019

Project Description: 190227

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

CCME PHC additional information:

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