

**PHASE TWO
ENVIRONMENTAL SITE ASSESSMENT**

of

4078 Victoria Avenue, Niagara Falls, ON

For:
M5V Developments



December 22nd, 2021
Project: E-21-68-2

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4078 Victoria Avenue, Niagara Falls, ON

Prepared by **Hallex Environmental Ltd.** on behalf of:

M5V Developments

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EXECUTIVE SUMMARY

INTRODUCTION

Hallex Environmental Ltd. was retained by M5V Developments to conduct a Phase Two Environmental Site Assessment (ESA) at 4078 Victoria Avenue, Niagara Falls, ON following the Phase One ESA completed by Hallex on August 27th, 2021 that identified the following Potentially Contaminating Activities (PCA)/Areas of Potential Environmental Concern (APEC):

- **PCA-1/APEC-1: Importation of Fill Material of Unknown Quality (#30 as per regulations)** – as identified through aerial photographs and fire insurance plans, previous on-site building structures have been demolished. Fill material of unknown origin and composition may have been placed in the location of the former structures. Target contaminants of concern to the soil includes Metals (by ICP), Polycyclic Aromatic Hydrocarbons (PAHs), Petroleum Hydrocarbons (PHCs (F1-F4)), Benzene, Toluene, Ethylbenzene and Xylene (BTEX), and pH/SAR/EC.
- **PCA-2/APEC-2: Metal Fabrication (#34 as per regulations)** – As identified through the EcoLog ERIS, a Metal Fabrication business was historically located on the West side of Victoria Avenue. This industrial activity represents a PCA resulting in APEC to the study site's soil and/or groundwater for target contaminants PHCs, PAHs, Metals (by ICP), and Volatile Organic Carbons (VOCs).

The objectives of the Phase Two ESA were to determine the presence/absence of potential contaminants of concern within the soil. The presence of contaminants in the soil, if detected, would determine the need for further sampling and analyses of soil to delineate the extent of impact, and to satisfy the requirements of Ontario Regulation (O. Reg.) 153/04, amended by O. Reg. 511/09.

PHASE 2 ESA METHODS

Five (5) test pits, TP-1 to TP-5 were advanced on October 12th, 2021. Soil samples were collected at identified soil strata layers of approximately 0 – 1.25 & 1.25 – 1.60 meters below ground surface (mbgs) to a maximum depth of 1.27 to 1.63 m bgs. Five (5) samples were submitted to Paracel Laboratories Ltd. for analyses of Metals (by ICP), EC/SAR/pH, PHCs, BTEX, VOCs and PAHs.

FINDINGS

Two (2) soil samples *exceeded* applicable Ministry of the Environment, Conservation and Parks (MECP) Site Condition Standards 2011 Table 2 for Residential Land Use in a Potable Ground Water Condition, fine texture soil for PHCs (F3), PAHs, and Metals (ICP).

Parameter	O. Reg. 153/04 (2011) Table 2 Residential, Potable, fine	TP3-1	TP4-1
<i>Semi-Volatiles</i>			
Acenaphthylene	0.17 ug/g dry	0.17	0.26
Benzo[a]anthracene	0.63 ug/g	1.37	1.2
Benzo[a]pyrene	0.3 ug/g	1.06	0.93
Benzo[b]fluoranthene	0.78 ug/g	0.87	0.71
Dibenzo[a,h]anthracene	0.1 ug/g	0.25	0.22
Flouranthene	0.69 ug/g	2.34	2.12
Indeno[1,2,3-cd] pyrene	0.48 ug/g	0.57	0.52
<i>Metals</i>			
Lead	120 ug/g dry	334	1030
Zinc	340 ug/g dry	188	461
<i>Hydrocarbons</i>			
F3 PHCs (C16-C34)	1300 ug/g	244	1360

ND: Not Detected, N/A: Not Applicable, Highlights indicate exceedance to applicable regulation

DELINEATION

Six (6) additional test pits, TP6 – TP11, were advanced on December 10th, 2021 within the preliminary exceedance area to delineate the extent of soil contamination across the site. Soil samples were collected at identified soil strata layers of approximately 0–1.71 meters below ground surface (mbgs) to a maximum depth of 1.50 mbgs. Six (6) samples were submitted to Parcel Laboratories Ltd. for analyses of Metals (by ICP), PHCs (F2-F4), and PAHs to determine the delineation of contamination.

FINDINGS

Six (6) soil samples *exceeded* applicable Ministry of the Environment, Conservation and Parks (MECP) Site Condition Standards 2011 Table 2 for Residential Land Use in a Potable Ground Water Condition, fine texture soil for Metals (ICP) and one (1) sample exceeded ministry standards for PAHs.

Parameter	Reg 153/04 (2011)- Table 2 Residential, fine	TP6-1 (0–0.50 mbgs)	TP7-1 (0–0.45 mbgs)	TP8-1 (0–0.71 mbgs)	TP9-1 (0–0.51 mbgs)	TP10-1 (0–0.60 mbgs)	TP11-1 (0–61 mbgs)
		December 10.					
<i>Metals</i>							
Lead	120 ug/g	334	531	346	484	205	143
Zinc	340 ug/g	341	465	352	384	256	215
<i>Semi-Volatiles</i>							
Benzo[a]pyrene	0.3 ug/g	0.43	0.06	0.16	ND (0.02)	0.03	0.08
Fluoranthene	0.69 ug/g	0.79	0.07	0.10	ND (0.02)	0.03	0.10

ND: Not Detected, Highlights indicate exceedance to applicable regulation

CONCLUSIONS

The Phase Two Environmental Site Assessment at 4078 Victoria Avenue, Niagara Falls, ON revealed soil exceedances to Ministry of the Environment, Conservation & Parks (MECP) Site Condition Standards 2011 Table 2 for Residential Land Use in a Potable groundwater condition, for fine-textured soil for contaminant groups Petroleum Hydrocarbons: TP-4, Polycyclic Aromatic Hydrocarbons (PAHs): TP-3, TP-4 & TP-6 and Metals at test pits: TP-3, TP-4, and TP-6 to TP-11.

As of December 22nd 2021, the estimated volume of contaminated soil material across the site is 638 m³ or (1,339.80 MT).

Contaminated soil management during site remediation and redevelopment can be accomplished by excavation and off-site land fill disposal.

LIST OF ACRONYMS

APEC	Area of Potential Environmental Concern
AST	Aboveground Storage Tank
BH	Borehole
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
COC	Contaminant of Concern
CSM	Conceptual Site Model
CSVC	Combustible Soil Vapour Concentration
EC	Electrical Conductivity
EPA	Environmental Protection Act
ESA	Environmental Site Assessment
GPR	Ground Penetrating Radar
<i>i</i>	Hydraulic Gradient
<i>k_h</i>	Hydraulic Conductivity
LEL	Lower Explosive Limit
masl	Metres above sea level
mbgs	Metres below ground surface
MECP	Ministry of the Environment, Conservation and Parks
MW	Monitoring Well
OC/OCP	Organochlorine Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PCA	Potentially Contaminating Activity
PCB	Polychlorinated Biphenyl
PCE	Perchloroethylene (tetrachloroethylene)
pH	Power of Hydrogen
PHC	Petroleum Hydrocarbons
ppm	Parts per million
QA/QC	Quality Assurance/Quality Control
QP	Qualified Person
RA	Risk Assessment
RSC	Record of Site Condition
SAR	Specific Absorption Rate
SCS	Site Condition Standard
SGWSS	Soil Groundwater and Sediment Standards
SVOC	Semi-Volatile Organic Compounds
TCLP	Toxicity Classification Leachate Procedure
UST	Underground Storage Tank
VOC	Volatile Organic Compounds

Potentially Contaminating Activities (PCAs)
Schedule D Table 2 of O. Reg 511/09



PCA#	Description	PCA#	Description
1	Acid and Alkali Manufacturing, Processing and Bulk Storage	31	Ink Manufacturing, Processing and Bulk Storage
2	Adhesives and Resins Manufacturing, Processing and Bulk Storage	32	Iron and Steel Manufacturing and Processing
3	Airstrips and Hangars Operation	33	Metal Treatment, Coating, Plating and Finishing
4	Antifreeze and De-icing Manufacturing and Bulk Storage	34	Metal Fabrication
5	Asphalt and Bitumen Manufacturing	35	Mining, Smelting and Refining; Ore Processing; Tailings Storage
6	Battery Manufacturing, Recycling and Bulk Storage	36	Oil Production
7	Boat Manufacturing	37	Operation of Dry-Cleaning Equipment (where chemicals are used)
8	Chemical Manufacturing, Processing and Bulk Storage	38	Ordnance Use
9	Coal Gasification	39	Paints Manufacturing, Processing and Bulk Storage
10	Commercial Autobody Shops	40	Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications
11	Commercial Trucking and Container Terminals	41	Petroleum-derived Gas Refining, Manufacturing, Processing and Bulk Storage
12	Concrete, Cement and Lime Manufacturing	42	Pharmaceutical Manufacturing and Processing
13	Cosmetics Manufacturing, Processing and Bulk Storage	43	Plastics (including Fibreglass) Manufacturing and Processing
14	Crude Oil Refining, Processing and Bulk Storage	44	Port Activities, including Operation and Maintenance of Wharves and Docks
15	Discharge of Brine related to oil and gas production	45	Pulp, Paper and Paperboard Manufacturing and Processing
16	Drum and Barrel and Tank Reconditioning and Recycling	46	Rail Yards, Tracks and Spurs
17	Dye Manufacturing, Processing and Bulk Storage	47	Rubber Manufacturing and Processing
18	Electricity Generation, Transformation and Power Stations	48	Salt Manufacturing, Processing and Bulk Storage
19	Electronic and Computer Equipment Manufacturing	49	Salvage Yard, including automobile wrecking
20	Explosives and Ammunition Manufacturing, Production and Bulk Storage	50	Soap and Detergent Manufacturing, Processing and Bulk Storage
21	Explosives and Firing Range	51	Solvent Manufacturing, Processing and Bulk Storage
22	Fertilizer Manufacturing, Processing and Bulk Storage	52	Storage, maintenance, fueling and repair of equipment, vehicles, and material used to maintain transportation systems
23	Fire Retardant Manufacturing, Processing and Bulk Storage	53	Tannery
24	Fire Training	54	Textile Manufacturing and Processing
25	Flocculants Manufacturing, Processing and Bulk Storage	55	Transformer Manufacturing, Processing and Use
26	Foam and Expanded Foam Manufacturing and Processing	56	Treatment of Sewage equal to or greater than 10,000 litres per day
27	Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles	57	Vehicles and Associated Parts Manufacturing
28	Gasoline and Associated Products Storage in Fixed Tanks	58	Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners
29	Glass Manufacturing	59	Wood Treating and Preservative Facility and Bulk Storage of Treated and Preserved Wood Products
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1.0 INTRODUCTION

1.1 Project Objectives

Hallex Environmental Ltd. was retained by M5V Developments (hereinafter referred to as the “client”) to conduct a Phase Two Environmental Site Assessment (ESA) at 4078 Victoria Avenue, Niagara Falls, ON (hereinafter referred to as the “study site”). The objectives of the Phase Two ESA were to determine the presence/absence of potential contaminants of concern within the soil associated with the historic on-site fill material, and off-site historic metal fabrication shop, Potentially Contaminating Activities (PCA) listed in Schedule D, Table 2, of O. Reg. 511/09, thus results in an Areas of Potential Environmental Concern (APEC) triggering the Phase Two ESA.

The presence of contaminants in the soil, if detected, would determine the need for further sampling and analyses to delineate the extent of the impact, and to satisfy the requirements of Ontario Regulation (O. Reg.) 153/04, as amended. The site location is shown on Figure 1 and the PCA/APEC, identified in the Phase One ESA (Hallex, 2021) are shown on Figure 2.

1.2 Limitations and Exceptions of Assessment

This report was prepared by Hallex Environmental Ltd. (hereinafter referred to as “Hallex”) for the client. The material in it reflects Hallex’s best judgment based on the information discovered at the time of preparation and within the scope of work. The investigative procedures, and format of this report, generally follow the guidelines established in: O. Reg. 511/09 per Part XV.1 of the Environmental Protection Act. Any information presented concerning materials at the site is based on information gathered at the Test Pit locations only. There may be materials and/or subsurface soil and/or groundwater conditions on-site which are not represented by these investigations. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Hallex Environmental Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

1.3 Site Description

Municipal address:	4078 Victoria Avenue, Niagara Falls, ON
Client(s):	M5V Developments
UTM coordinates:	17T 656,768.66 m E 4,775,316.83 m N
Elevation:	177 masl
Approx. site area:	813 m ²

1.4 Current and Proposed Future Uses

As of October 12th, 2021, the study site was vacant with no structures on-site. Future plans include complete site redevelopment into residential/ vacation rental units.

1.5 Applicable Site Condition Standard

The Soil, Ground Water and Sediment Standards (SGWSS) that would be applicable to the subject site as per O. Reg. 153/04, as amended, are based on site sensitivity analyses. Site sensitivity is determined based on conformance or non-conformance with shallow soil conditions (<2 m to bedrock), soil pH, proximity to an “Area of Natural Significance”, the presence of a water body on-site or within 30 meters of the subject property, and the site and adjacent lands groundwater conditions being either potable or non-potable. The ‘Full Depth Generic’ standards would apply to a ‘non-sensitive site’, with further distinctions made based on potable or non-potable groundwater conditions, and coarse or fine soil texture. A ‘Sensitive Site’ would require application of generic standards, other than ‘Full Depth’, based on the specific sensitivity.

4078 Victoria Avenue, Niagara Falls, ON – Site Sensitivity Analysis

The rationale for the selection of SGWSS criteria for the subject property included:

- Intended Property Use: **Mixed commercial and residential**
- Soil Texture: **Medium/Fine**
- Adjacent to a designated area of natural significance: **No**
- Within 30 m of a water body: **No**
- Groundwater condition: **Non-Potable**
- Soil pH: **7.53 average**, ranged from 7.42 – 7.61
- Depth to bedrock: **Not encountered at maximum test pit depth of 1.63 metres.** Bedrock is at 4.8 mbgs, as per the well record #, 7339245 outside the study area.

Applicable Regulatory Criteria

O. Reg. 153/04 Ministry of the Environment, Conservation and Parks (MECP) Site Condition Standards Table 3 for Residential Land Use in a Non-Potable Ground Water Condition, fine textured soil is the applicable criteria; however, for conservatory reasons Table 2, Residential Land Use in a Potable Groundwater condition was applied to the subject site, based on conditions observed at the time of the site assessment.

2.0 INVESTIGATION METHODS

2.1 Test Pit

Jay's Excavating utilized a mini excavator – excavation was completed for test pit sampling. Preparation for test pit sampling was initiated via requests for demarcation of underground utilities by Ontario One Call: for Bell, cable, hydro, natural gas, water, sewer and private locates. All services were cleared within the designated work areas.

2.2 Soil Investigation

Five (5) test pit, TP-1 to TP-5 were advanced across the property (APEC areas) on October 12th, 2021. Test pit locations are shown in Figure 3 and test pit logs are contained in Appendix A. Soil samples were collected at identified soil strata layers of approximately 0 – 1.25 & 1.25 – 1.60 meters below ground surface (m bgs) to a maximum depth of 1.27 to 1.63 m bgs.

2.2.1 Soil: Sampling

Each sample was placed in a 250 ml glass jar with a Teflon lined lid, filled to zero head-space, sealed, and placed in a cooler for transportation. Concurrently, a 12 ml soil sample was collected with a disposable syringe and placed inside a 40 ml vial containing methanol for field preservation of Petroleum Hydrocarbons F1, Benzene, Toluene, Ethylbenzene, Xylene (BTEX) and Volatile Organic Compounds (VOCs). A portion of each sample was placed in a plastic bag and allowed to warm to approximately 20° C for headspace combustible vapour measurement using an E-34102 Portable Multi-Gas Detection Eagle Series (Eagle). Each sample was logged for colour, texture, structure, moisture, and visual and olfactory evidence of contamination. Additionally, textural identification of soil, through hand soil textural techniques, including the 'squeeze test' and 'ribbon test' was conducted on soil from each stratum identified.

2.3 Field Screening Combustible Soil Vapour Survey

On-site field screening measurements were conducted utilizing the Eagle, capable of measuring hydrocarbon Combustible Soil Vapour Concentrations (CSVC's) from 1 part per million (ppm) to 100% Lower Explosive Limit (LEL). The readings from the Eagle were utilized to indicate the presence or absence of VOC's within the field samples. The samples with the highest combustible vapour concentration readings were chosen, in addition to other select samples, as determined by the QP, for laboratory analyses. The combustible soil vapour readings are indicated on the borehole logs in Appendix A and tabulated in Section 3.2.

2.8 Quality Assurance and Quality Control Measures

Hallex conducted Quality Assurance/Quality Control (QA/QC) measures throughout all stages of the assessment to verify sampling procedures and results. Decontamination of equipment and sampling tools

was carried out during field work, as well as appropriate precautions, including new nitrile gloves, to minimize potential cross-contamination between samples and test pit.

Soil sampling was implemented according to *Protocol for Analytical Methods Used in the Assessment of Properties Under Part XV.1 of the Environmental Protection Act* (March 9, 2004 as amended as of July 1, 2011). Chain of Custody reports were completed for all samples submitted for analyses to keep track of samples collected and to ensure that all parties involved were properly informed as to the nature of the samples.

Instruments and all their associated components are checked daily prior to field use, and annual equipment servicing and maintenance is conducted by Enviro Measure Inc. to ensure the equipment remains properly calibrated and functioning.

3.0 REVIEW AND EVALUATION

3.1 Soil Conditions

Soil conditions were determined through field investigative measures including the use of analytical equipment, determination of stratigraphy including analysis of moisture, odours, colour, texture, etc. and combustible soil vapor concentration results.

3.1.1 Overburden Stratigraphy

The general overburden stratigraphy observed in test pit TP-1 to TP-5 consisted of:

<u>Depth (avg.)</u>	<u>Description</u>
0 – 0.23 m bgs	Topsoil, Black SANDY SILT with trace Gravel
0.23 – 1.25 m bgs	Brown SILT with some Clay
1.25 – 1.63 m bgs	Brown CLAYEY SILT with trace Gravel

Notes:

- Bedrock was not encountered at test pit maximum depth of 1.63 m bgs. Bedrock is approximately 4.8 m bgs, as per the well record #7339245, outside the study area.
- Moisture remained consistent throughout the test pit depth.
- Colour changed gradually from black (topsoil) to grey (Clayey Silt).
- Hydrocarbon odours were noted in soil samples from test pits; TP3-1, & TP4-1.

3.2 Combustible Soil Vapour Concentrations

The field combustibility soil vapour concentrations are tabulated below, exhibiting a concentration range of 0 to 70 ppm (parts per million). Five (5) worst case samples were chosen for laboratory submission to Paracel Laboratories Ltd. under chain of custodies #2142510 on October 12th, 2021 for analyses of PHCs (F1-F4), BTEX, VOC, PAHs, EC/SAR/pH, and Metals (by ICP). All other samples were stored at the laboratory for later analyses, if required, for delineation of contaminants.

Test Pit #/ ID		Date Sampled	Depth (m bgs)	CSVC (PPM)	APEC-#	Parameters Analyzed
TP1	-1	October 12 th	0 – 1.32	0	2	PHCs/VOC, Metals (ICP), & PAHs
	-2		1.32 – 1.37	0	2	Hold
TP2	-1		0 – 1.50	0	2	PHCs/VOC, Metals (ICP), & PAHs
	-2		1.50 – 1.52	0	2	Hold
TP3	-1		0 -1.40	70	1	PHCs/BTEX, Metals (ICP), pH/SAR/EC & PAHs
	-2		1.40 – 1.63	0	1	Hold
TP4	-1		0 – 1.52	30	1	PHCs/BTEX, Metals (ICP), pH/SAR/EC & PAHs
	-2		1.52 – 1.60	0	1	Hold
TP5	-1		0 – 0.89	0	1	PHCs/BTEX, Metals (ICP), pH/SAR/EC & PAHs
	-2		0.89 – 1.27	0	1	Hold

Highlighted sample ID's above depict the samples chosen for submission to the lab.

3.3 Soil Laboratory Results

The tables below highlight the soil exceedances with complete laboratory analytical reports provided in Appendix C. Figure 4 illustrates the soil exceedances and Figure 5a – 5b depict the cross sections of the contaminated area.

Metals

Soil laboratory analytical data was compared with MECP Site Condition Standards (2011) Table 2 for Residential land use in a Potable Groundwater Condition, fine textured soil. Exceedances were noted in samples from two (2) test pit (TP3-1, and TP4-1) within the fill material from depth ranges 0 – 1.52 m bgs, for target contaminant group Metals.

Parameter	O. Reg. 153/04 (2011) Table 2 Residential, Potable, fine	TP3-1	TP4-1
<i>Metals</i>			
Lead	120 ug/g dry	334	1030
Zinc	340 ug/g dry	188	461

Polycyclic Aromatic Hydrocarbons (PAHs)

Soil laboratory analytical data was compared with MECP Site Condition Standards (2011) Table 2 for Residential land use in a Potable Groundwater Condition, fine textured soil. Exceedances were noted in samples from two (2) test pits (TP3-1, and TP4-1) in the fill material from depth ranges 0 – 1.52 m bgs, for target contaminant group PAHs.

Parameter	O. Reg. 153/04 (2011) Table 2 Residential, Potable, fine	TP3-1	TP4-1
<i>Semi-Volatiles</i>			
Acenaphthylene	0.17 ug/g dry	0.17	0.26
Benzo[a]anthracene	0.63 ug/g	1.37	1.2
Benzo[a]pyrene	0.3 ug/g	1.06	0.93
Benzo[b]fluoranthene	0.78 ug/g	0.87	0.71
Dibenzo[a,h]anthracene	0.1 ug/g	0.25	0.22
Flouranthene	0.69 ug/g	2.34	2.12
Indeno[1,2,3-cd] pyrene	0.48 ug/g	0.57	0.52

ND: Not Detected, N/A: Not Applicable, Highlights indicate exceedance to applicable regulation

Petroleum Hydrocarbons (PHCs (F3))

Soil laboratory analytical data was compared with MECP Site Condition Standards (2011) Table 2 for Residential land use in a Potable Groundwater Condition, fine textured soil. Exceedances were noted in samples from two (2) test pits (TP3-1, and TP4-1) in the fill material from depth ranges 0 – 1.52 m bgs, for target contaminant group PHCs (F3).

Parameter	O. Reg. 153/04 (2011) Table 2 Residential, Potable, fine	TP3-1	TP4-1
<i>Hydrocarbons</i>			
F3 PHCs (C16-C34)	1300 ug/g	244	1360

Highlights indicate exceedance to applicable regulation

3.4 Laboratory Quality Assurance and Quality Control

Laboratory QA/QC measures adhering to the Ministry of the Environment’s “Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act, March 2010” are standard procedure for Paracel Laboratories (accredited to the ISO/IEC 17025 Standard by CALA) in order to ensure that the standards of quality were met within the expected level of confidence.

4.0 DELINEATION

Six (6) additional test pits, TP6 – TP11, were advanced on December 10th, 2021 within the preliminary exceedance area to delineate the extent of soil contamination across the site. Soil sampling was consistent with methods outlined above in section 2.0.

4.1 Soil

Six (6) samples were chosen for submission to Paracel Laboratories Ltd. under chain of custodies #63515 and #63516 on December 10th, 2021 for analyses of Metals (Lead and Zinc), PHCs and PAHs. All other sample were stored at the laboratory for later analyses if required for additional vertical delineation. The test pit locations are depicted on Figure 4b with delineation field logs in Appendix B.

Test pit #/ ID		Date Sampled	Depth (mbgs)	APEC #	Parameters Analyzed
TP-6	-1	Dec. 10	0-0.5	APEC-1	PHCs(F2-F4), Metals (ICP), & PAHs
	-2		0.5-1.5		Metals (Lead & Zinc) & PAHs
TP-7	-1	Dec. 10	0-0.45	APEC-1	PHCs(F2-F4), Metals (ICP), & PAHs
	-2		0.45-1.2		Metals (Lead & Zinc)
TP-8	-1	Dec. 10	0-0.71	APEC-1	PHCs(F2-F4), Metals (ICP), & PAHs
	-2		0.71-1.22		Metals (Lead & Zinc)
TP-9	-1	Dec. 10	0-0.61	APEC-1	PHCs(F2-F4), Metals (ICP), & PAHs
	-2		0.61-1.22		Metals (Lead & Zinc)
TP-10	-1	Dec. 10	0-0.61	APEC-1	PHCs(F2-F4), Metals (ICP), & PAHs
	-2		0.61-1.37		Metals (Lead & Zinc)
TP-11	-1	Dec. 10	0-0.61	APEC-1	PHCs(F2-F4), Metals (ICP), & PAHs
	-2		0.61-1.31		Metals (Lead & Zinc)

Highlighted sample ID's above depict the samples chosen for submission to the lab.

4.2 Soil Results

Soil laboratory analytical data was compared with MECP Site Condition Standards (2011) Table 2 for Residential land use in a Potable Groundwater Condition, fine textured soil. All samples met site condition standards for PHCs (F2-F4).

Metals

Exceedances were noted in samples from six (6) test pit (TP6-1, to TP11-1) within the fill material from depth ranges 0 – 0.71 m bgs, for target contaminant group Metals. All lower samples met site condition standards.

Parameter	Reg 153/04 (2011)-Table 2 Residential, fine	TP6-1 (0–0.50 mbgs)	TP7-1 (0–0.45 mbgs)	TP8-1 (0–0.71 mbgs)	TP9-1 (0–0.51 mbgs)	TP10-1 (0–0.60 mbgs)	TP11-1 (0–61 mbgs)
		December 10.					
<i>Metals</i>							
Lead	120 ug/g	334	531	346	484	205	143
Zinc	340 ug/g	341	465	352	384	256	215

Highlights indicate exceedance to applicable regulation

Polycyclic Aromatic Hydrocarbons (PAHs)

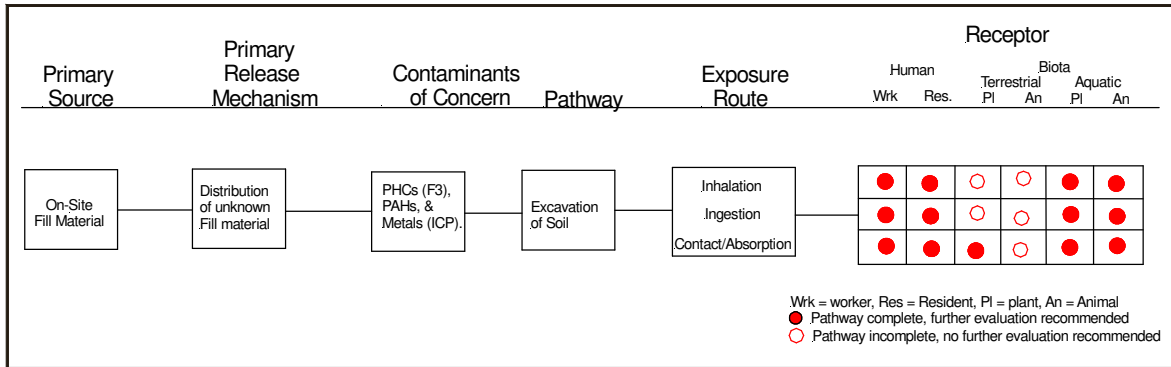
Exceedances were noted in samples from one (1) test pit (TP6-1) within the fill material from depth range 0 – 0.50 m bgs, for target contaminant group PAHs. The lower sample (TP6-2) from depth range 0.5-1.5mbgs met site condition standards.

Parameter	Reg 153/04 (2011)-Table 2 Residential, fine	TP6-1 (0–0.50 mbgs)
		December 10.
<i>Semi-Volatiles</i>		
Benzo[a]pyrene	0.3 ug/g	0.43
Fluoranthene	0.69 ug/g	0.79

Highlights indicate exceedance to applicable regulation

5.0 PHASE TWO CONCEPTUAL SITE MODEL

The Conceptual Site Model (CSM) qualitatively considers the interaction of identified contaminants of concern, and the pathway(s) and exposure route(s) to receptors. Target contaminants PHCs (F3), PAHs and Metals (by ICP) were identified within the soil medium with potential migration pathways to human and/or biota receptors as follows.



6.0 CONTAMINATED SOIL QUANTITY ESTIMATE

The area of soil impacted by contamination appears to be present in two (2) areas of the site. The first area (Area 1) is located in the historic dwelling footprint in the middle of the property to a depth of 1.6 mbgs, the second (Area 2) is located in the eastern portion of the property to a depth of 1.0 mbgs. All of the contamination was noted within the fill material. Based on the sampling results the potential contaminated soil volume and mass is as follows:

	Area 1	Area 2
Site Area	125 m ²	438 m ²
Depth	1.6 m	1.0 m
Volume	200 m³	438 m³
Total Volume	638 m³	
Total Mass	1,339.8 MT (m³ x 2.1 MT/m³)	

*note all values are estimates only, additional sampling and analysis would be required to further refine volumes.

7.0 CONCLUSIONS

The Phase Two Environmental Site Assessment at 4078 Victoria Avenue, Niagara Falls, ON revealed soil exceedances to Ministry of the Environment, Conservation & Parks (MECP) Site Condition Standards 2011 Table 2 for Residential Land Use in a Potable groundwater condition, for fine-textured soil for contaminant groups Petroleum Hydrocarbons: TP-4, Polycyclic Aromatic Hydrocarbons (PAHs): TP-3, TP-4 & TP-6 and Metals at test pits: TP-3, TP-4, and TP-6 to TP-11.

As of December 22nd 2021, the estimated volume of contaminated soil material across the site is 638 m³ or (1,339.80 MT).

Contaminated soil management during site remediation and redevelopment can be accomplished by excavation and off-site land fill disposal.

8.0 AUTHOR

Hallex Environmental Ltd. has conducted this Phase Two Environmental Site Assessment as permitted by Hallex Certificate of Authorization (#90252). The following employees authored the report:

Jiosey Caputo - Ms. Jiosey Caputo, ETDP (Scholar Distinction), was the Environmental Technician for the project with one year of experience in the environmental consulting field. Related project work includes Phase One & Phase Two Environmental Site Assessments, Designated Substances & Hazardous Material Surveys, and groundwater, surface water, and soil sampling.

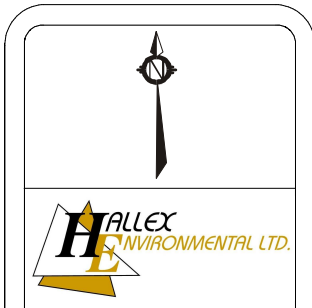
Damen Nyland - Mr. Damen Nyland, B.Sc. (Hons), GIT, was the Project Scientist for the project with two years of experience in the environmental geoscience consulting field. Related project work includes Phase One & Phase Two ESAs, Remediation Planning & Supervision, D.S.&H.M. Surveys, Hydrogeological Assessments, Geotechnical Investigations, and Environmental Project Management & Supervision.

Nicole Metz - Ms. Nicole Metz, ETPD, ERPC, was the Project Coordinator for the project with over seven years of experience in the environmental consulting field. Some projects Mrs. Metz have worked on included: Phase One & Two Environmental Site Assessments, Site Remediation, groundwater and surface water sampling, underground or aboveground storage tank decommissioning, Designated Substance Surveys, Records of Site Condition Filing, Environmental Compliance Approvals, National Pollutant Release Inventory, and Hazardous Waste Information Network training.

Kevin Christian - Mr. Kevin Christian, M.Sc., P.Geo., a Professional Geoscientist (#0387) registered with the Association of Professional Geoscientists of Ontario, and a Qualified Person (Environmental Site Assessment & Risk Assessment) as per Ontario Regulations 153/04 and 511/09, has thirty years of experience in the environmental geoscience consulting industry conducting Phase One and Two ESA's, remedial planning, and site remediation supervision.

FIGURES

- Figure 1: Site Location
- Figure 2: Potentially Contaminating Activities / Areas of Potential Environmental Concern
- Figure 3: Test Pit Locations
- Figure 4: Soil Exceedances
- Figure 4b: Delineation Soil Exceedances
- Figure 5a: Study Site Cross Section Location
- Figure 5b: Cross Section A-A'
- Figure 6: Area of Impact



Legend

- Phase Two Property
- Residential Use
- Industrial Use
- Commercial Use
- Agricultural or other land use

Client
M5V Developments

Project
Phase Two ESA
4078 Victoria Avenue,
Niagara Falls, ON

Figure Name
Site Layout and
Adjacent Land
Use

Project E-21-68-2	Figure 1
Date November 2021	
Drafted: DN	
Reviewed: KC	



↑
Inferred Groundwater
Flow Direction



- Legend**
- Phase Two Property
 - PCA-#
PCA-1: Fill Material
PCA-2: Historic Steel Fabrication
 - APEC-#
APEC-1: Fill Material
APEC-2: Historic Steel Fabrication

Client
M5V Developments

Project
Phase Two ESA
4078 Victoria Avenue,
Niagara Falls, ON

Figure Name
Areas of Potential
Environmental Concern

Project E-21-68-2	2
Date November 2021	
Drafted: DN Reviewed: KC	



- Legend**
- Phase Two Property
 - Test Pit
 - APEC-#
- APEC-1: Fill Material
APEC-2: Historic Steel Fabrication

Client
M5V Developments

Project
Phase Two ESA
4078 Victoria Avenue,
Niagara Falls, ON

Figure Name
Test Pit
Locations

Project E-21-68-2	Figure 3
Date November 2021	
Drafted: DN	
Reviewed: KC	



Legend

- Study Site
- Test Pit
- Historical dwelling

↙ Inferred Groundwater Flow Direction

Red exceeds Table 2 residential fine criteria

Green meets Table 2 residential fine criteria

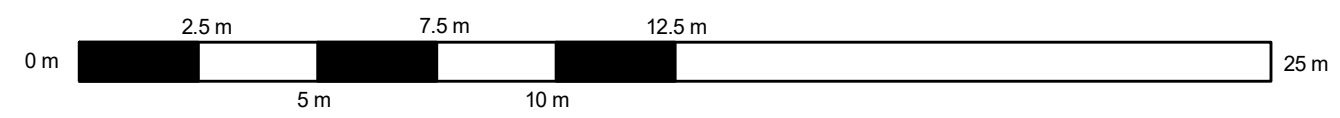
Client
M5V Developments

Project
Phase Two ESA
4078 Victoria Avenue,
Niagara Falls, ON

Figure Name
Soil Results

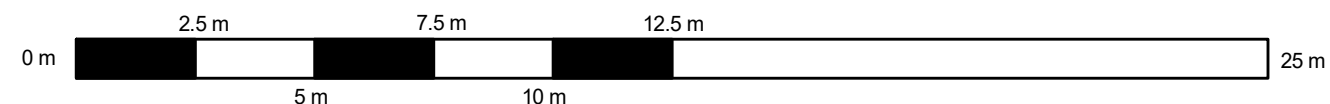
Project E-21-68-2	4
Date November 2021	
Drafted: DN	
Reviewed: KC	

Parameter	Regulation Reg 153/04 (2011)-Table 2 Residential, fine	Sample	
		TP3-1 (0 - 1.40 m bgs)	TP4-1 (0 - 1.52 m bgs)
		October 12.	
Metals			
Lead	120 ug/g	334	1030
Zinc	340 ug/g	188	461
Hydrocarbons			
F3 PHCs (C16-C34)	1300 ug/g	244	1360
Semi-Volatiles			
Acenaphthylene	0.17 ug/g	0.17	0.26
Benzo[a]anthracene	0.63 ug/g	1.37	1.2
Benzo[a]pyrene	0.3 ug/g	1.06	0.93
Benzo[b]fluoranthene	0.78 ug/g	0.87	0.71
Dibenzo[a,h]anthracene	0.1 ug/g	0.25	0.22
Fluoranthene	0.69 ug/g	2.34	2.12
Indeno [1,2,3-cd] pyrene	0.48 ug/g	0.57	0.52





Parameter	Regulation	Sample								
		TP3-1 (0 - 1.40 m bgs)	TP4-1 (0 - 1.52 m bgs)	TP6-1 (0 - 0.50 mbgs)	TP7-1 (0 - 0.45 mbgs)	TP8-1 (0 - 0.71 mbgs)	TP9-1 (0 - 0.51 mbgs)	TP10-1 (0 - 0.60 mbgs)	TP11-1 (0 - 0.61 mbgs)	
		October 12.			December 10.					
Metals										
Lead	120 ug/g	334	1030	334	531	346	484	205	143	
Zinc	340 ug/g	188	461	341	465	352	384	256	215	
Hydrocarbons										
F3 PHCs (C16-C34)	1300 ug/g	244	1360	32	11	10	ND (8)	15	25	
Semi-Volatiles										
Acenaphthylene	0.17 ug/g	0.17	0.26	0.03	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	
Benzo[a]anthracene	0.63 ug/g	1.37	1.2	0.37	0.04	0.07	ND (0.02)	0.02	0.05	
Benzo[a]pyrene	0.3 ug/g	1.06	0.93	0.43	0.06	0.16	ND (0.02)	0.03	0.08	
Benzo[b]fluoranthene	0.78 ug/g	0.87	0.71	0.53	0.07	0.18	0.02	0.05	0.10	
Dibenzo[a,h]anthracene	0.1 ug/g	0.25	0.22	0.06	ND (0.02)	0.04	ND (0.02)	ND (0.02)	ND (0.02)	
Fluoranthene	0.69 ug/g	2.34	2.12	0.79	0.07	0.10	ND (0.02)	0.03	0.10	



Legend

- Study Site
- Test Pit
- Historical dwelling

Inferred Groundwater Flow Direction

Red exceeds Table 2 residential fine criteria

Green meets Table 2 residential fine criteria

Client

M5V Developments

Project

Phase Two ESA
4078 Victoria Avenue,
Niagara Falls, ON

Figure Name

Delineation
Soil Results

Project E-21-68-2

Date December 2021




Drafted: JC

Reviewed: KC

Figure
4b



Legend

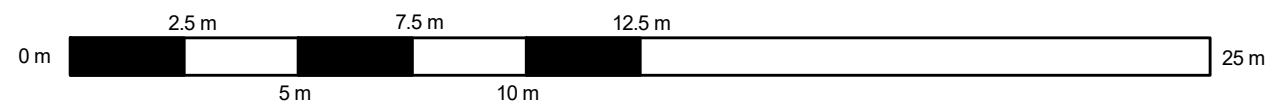
-  Study Site
-  Test Pit Locations
-  A - A'

Client
M5V Developments

Project
Phase Two ESA
4078 Victoria Avenue,
Niagara Falls, ON

Figure Name
Study Site Cross
Section Locations
(A-A')

Project E-21-68-2	Figure 5a
Date November 2021	
Drafted: DN	
Reviewed: KC	





LEGEND

- Topsoil
- Sand
- Silt
- Clay
- Fill
- Soil Sample Location
- Building Footprint

* Green indicates sample meets Table 2, Res criteria
 * Red indicates sample exceeds Table 2, Res criteria

CLIENT:

M5V Developments

PROJECT:

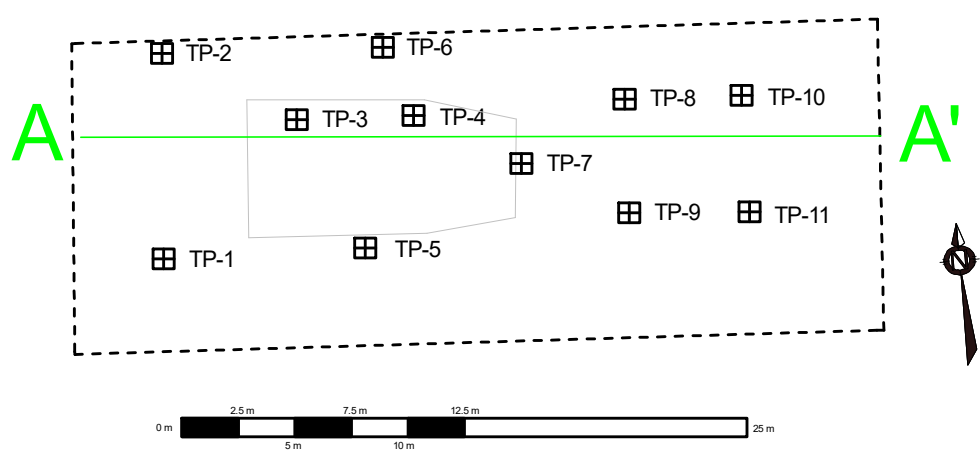
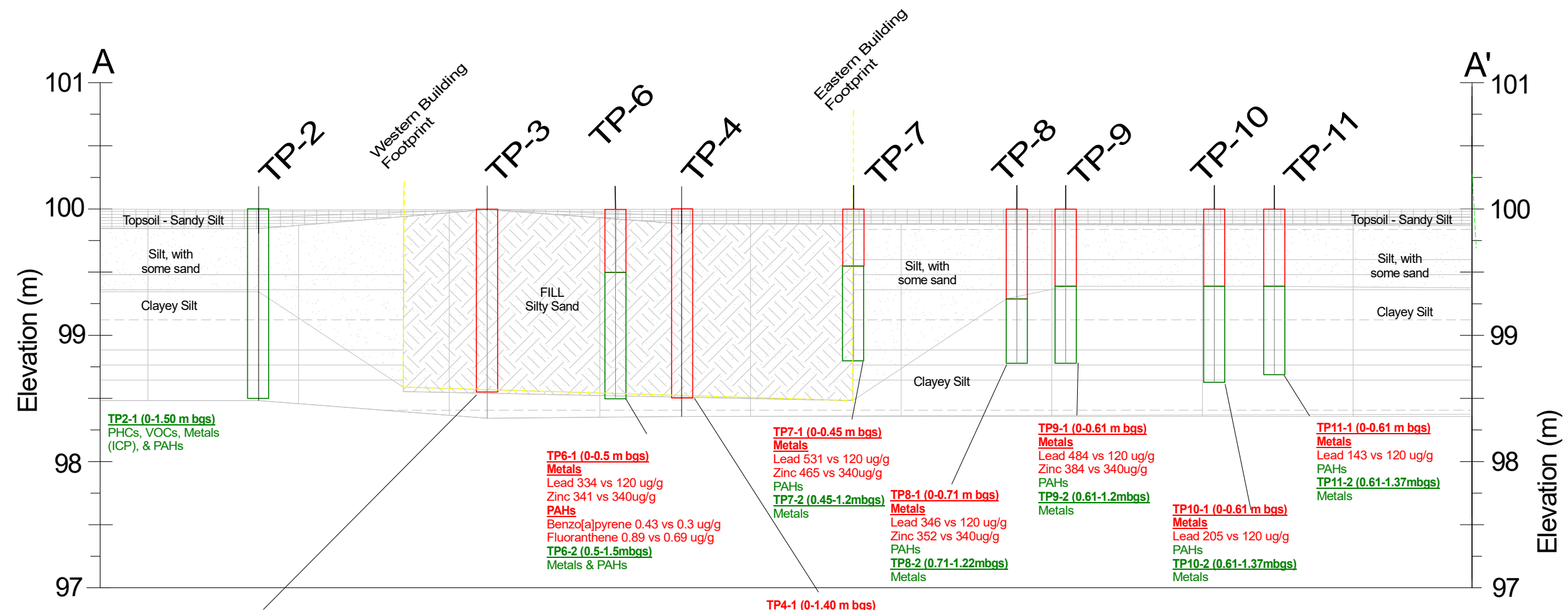
Phase Two ESA
4078 Victoria Avenue,
Niagara Falls, ON

FIGURE NAME:

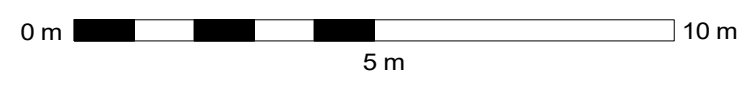
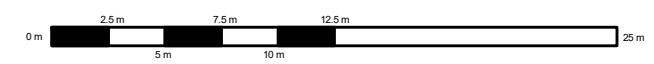
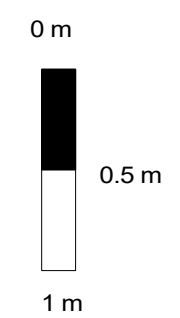
Cross Sections: A - A'

PROJECT:
E-21-68-2
DATE:
November 2021
Drafted: JC
Reviewed: KC

FIGURE
5b

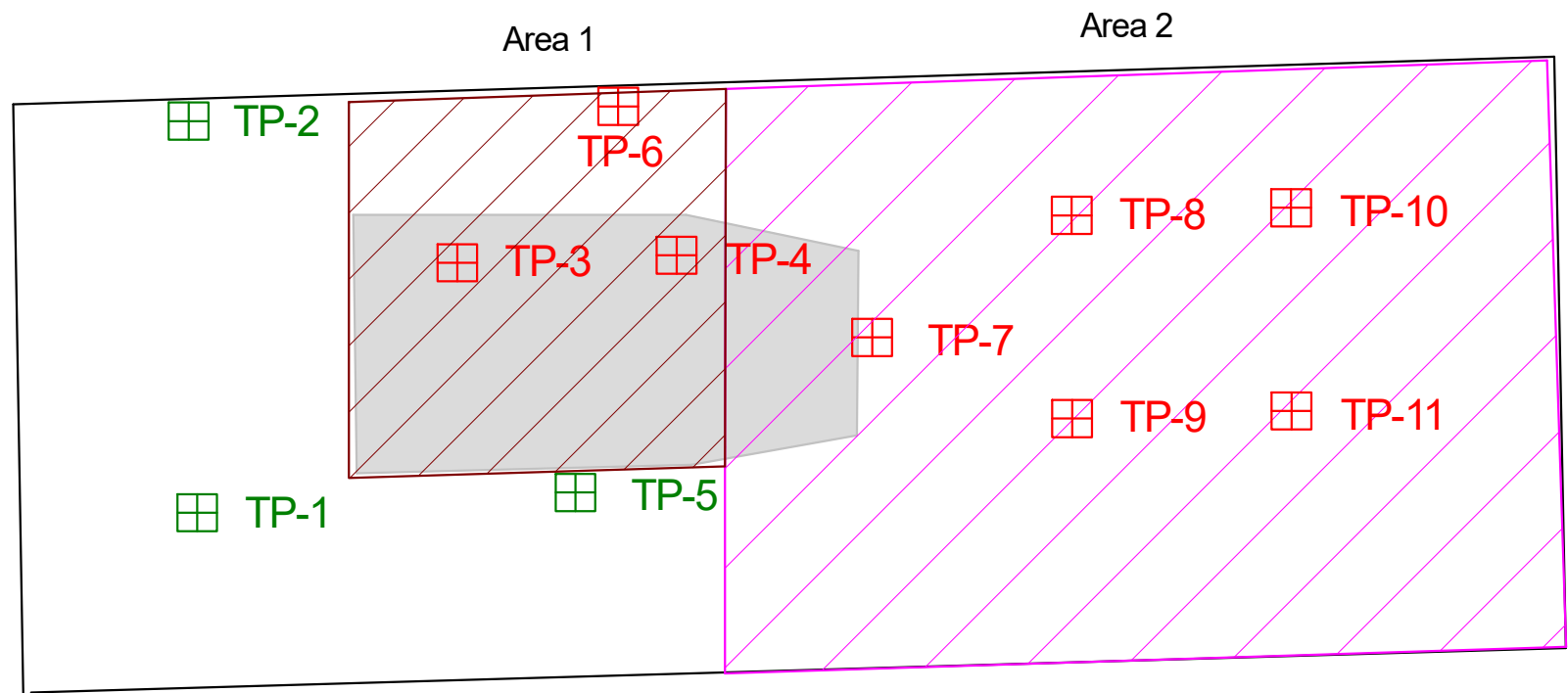


* Vertical Exaggeration 3.354 x

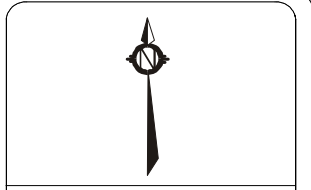


Leader Lane

Victoria Avenue



	Area 1	Area 2
Site Area	125 m ²	438 m ²
Depth	1.60 m	1.0 m
Volume	200 m ³	438 m ³
Total Volume	638 m³	
Total Mass	1,339.80 MT (m³ x 2.1 MT/m³)	



Legend

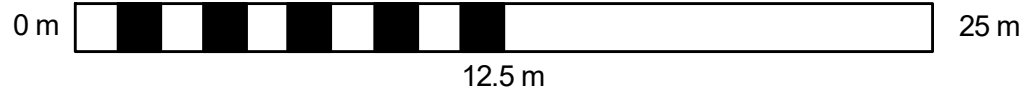
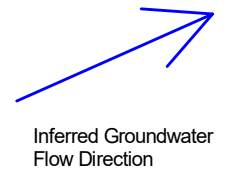
- Study Site
- Test Pit Locations
- Former Building Footprint
- Red exceeds Table 2 residential fine criteria
- Green meets Table 2 residential fine criteria
- Metals (ICP) Soil Contamination
- Metals (ICP), PHCs (F3), and PAH Soil Contamination

Client
M5V Developments

Project
Phase Two ESA
4078 Victoria Avenue,
Niagara Falls, ON

Figure Name
Area of Impact

Project E-21-68-2	6
Date December 2021	
Drafted: JC	
Reviewed: KC	



Appendix A:

Field Logs

TEST PIT LOG

HALLEX ENVIRONMENTAL LTD

Project #: E-21-68-2		Client: M5V Developments	Location: 4078 Victoria Avenue, Niagara Falls, ON	Date: October 12, 2021	
Test Pit #	Depth (m)	Description	Sample #	Lab	
TP#: 1	0 - 0.28	Topsoil - SANDY SILT, with trace gravel, black, dry, soft, organics (roots), organic odour	TP1-1	PHCs/ VOC, Metals (ICP), & PAHs	
	1.32 - 1.37	Silt, with some clay, trace sand, trace gravel, brown, dry, hard, fractures, no odour	TP1-2	Hold	
TP#: 2	0 - 0.18	Topsoil - SANDY SILT, with trace gravel, black, dry, soft, organics (roots), organic odour	TP2-1	PHCs/ VOC, Metals (ICP), & PAHs	
	0.18 - 0.53	Silt, with some sand, trace gravel, light brown, dry, soft, no odour			
	1.50 - 1.52	Clayey Silt, with trace gravel, grey, dry, hard, fractures, organics (roots), no odour	TP2-2	Hold	
TP#: 3	0 - 1.40	Fill - Bricks, Garbage, Trash, Concrete, Asphalt, Lead Pipes. Silty Sand, Black, dry, soft, slight odour	TP3-1	PHCs/ BTEX, Metals (ICP), pH/SAR/EC, & PAHs	
	1.40 - 1.63	Clayey Silt, with trace gravel, grey, moist, hard, no odour	TP3-2	Hold	
TP#: 4	0 - 0.13	Topsoil - SANDY SILT, with trace gravel, black, dry, soft, organics (roots), organic odour	TP4-1	PHCs/ BTEX, Metals (ICP), pH/SAR/EC, & PAHs	
	0.13 - 1.52	Fill - Bricks, Garbage, Trash, Concrete, Asphalt, Lead Pipes. Silty Sand, Black, dry, soft, slight odour			
	1.52 - 1.60	Clayey Silt, with trace gravel, grey, dry, hard, fractures, organics (roots), no odour	TP4-2	Hold	
TP#: 5	0 - 0.23	Topsoil - SANDY SILT, with trace gravel, black, dry, soft, organics (roots), organic odour	TP5-1	PHCs/ BTEX, Metals (ICP), pH/SAR/EC, & PAHs	
	0.23 - 0.51	Silt, with some sand, trace gravel, light brown, dry, soft, no odour			
	0.89 - 1.27	Clayey Silt, with trace gravel, grey, dry, hard, fractures, organics (roots), no odour	TP5-2	Hold	

TEST PIT LOG

HALLEX ENVIRONMENTAL LTD

Project #: E-21-68-2		Client: M5V Developments	Location: 4078 Victoria Avenue, Niagara Falls, ON	Date: December 10th, 2021	
Test Pit #	Depth (m)	Description	Sample #	Lab	
TP#: 6	0 - 0.50	Fill - Concrete, Red Brick, Asphalt. Silty Sand, dark brown, moist, soft, no odour.	TP6-1	PHCs(F2-F4), Metals (ICP), & PAHs	
	0.50 - 1.5	Native - Clayey silt, brown, dry, stiff, no odour	TP6-2	Metals (lead & Zinc) & PAHs	
TP#: 7	0 - 0.15	Topsoil - SANDY SILT, dark brown, moist, soft, organic odour	TP7-1	PHCs(F2-F4), Metals (ICP), & PAHs	
	0.15 - 0.45	Fill - Garbage, Red Brick, Metal, Ceramics. Silt with some sand, dark brown, moist, soft, slight odour.			
	0.45 - 1.2	Native - Clayey silt, brown, dry, stiff, no odour.	TP7-2	Metals (lead & Zinc)	
TP#: 8	0 - 0.71	Fill - Poured Concrete, Cinderblock, Iron Pipe. Silty Clay, with trace gravel, ochre, moist, soft, slight odour.	TP8-1	PHCs(F2-F4), Metals (ICP), & PAHs	
	0.71 - 1.22	Native - Clayey silt, brown, dry, stiff, no odour	TP8-2	Metals (lead & Zinc)	
TP#: 9	0 - 0.25	Topsoil - SANDY SILT, dark brown, moist, soft, organics (roots), organic odour	TP9-1	PHCs(F2-F4), Metals (ICP), & PAHs	
	0.25 - 0.61	Silt, with some sand, dark brown, slightly moist, soft, no odour.			
	0.61 - 1.22	Native - Clayey silt, brown, dry, stiff, no odour.	TP9-2	Metals (lead & Zinc)	
TP#: 10	0 - 0.02	Topsoil Surface - SANDY SILT, dark brown, moist, soft, organic odour	TP10-1	PHCs(F2-F4), Metals (ICP), & PAHs	
	0.02 - 0.61	Fill- Red Brick, Asphalt, Concrete Foundation, Metals. Silty Gravel, dark brown, moist, granular, slight odour.			
	0.61 - 1.37	Native - Clayey Silt, brown, dry, stiff, no odour.	TP10-2	Metals (lead & Zinc)	
TP#: 11	0 - 0.25	Topsoil - SANDY SILT, dark brown, moist, soft, organics (roots), organic odour	TP11-1	PHCs(F2-F4), Metals (ICP), & PAHs	
	0.25 - 0.61	Silt Sand, dark brown, moist, soft, no odour			
	0.61 - 1.31	Native - Clayey Silt, brown, dry, stiff, no odour.	TP11-2	Metals (lead & Zinc)	

Appendix B:
Laboratory Analytical Reports

Certificate of Analysis

Hallex Environmental Ltd.

4999 Victoria Ave
Niagara Falls, ON L2E 4C9
Attn: Kevin Christian

Client PO:
Project: E-21-68-2
Custody: 62008

Report Date: 21-Oct-2021
Order Date: 15-Oct-2021

Order #: 2142510

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

Parcel ID	Client ID	Parcel ID	Client ID
2142510-01	TP1-1		
2142510-02	TP2-1		
2142510-03	TP3-1		
2142510-04	TP4-1		
2142510-05	TP5-1		

Approved By:



Alex Enfield, MSc
Lab Manager

Certificate of Analysis
 Client: Hallex Environmental Ltd.
 Client PO:

Report Date: 21-Oct-2021
 Order Date: 15-Oct-2021
 Project Description: E-21-68-2

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	18-Oct-21	19-Oct-21
Conductivity	MOE E3138 - probe @25 °C, water ext	21-Oct-21	21-Oct-21
PHC F1	CWS Tier 1 - P&T GC-FID	18-Oct-21	19-Oct-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	18-Oct-21	21-Oct-21
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	20-Oct-21	20-Oct-21
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	20-Oct-21	21-Oct-21
REG 153: pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	21-Oct-21	21-Oct-21
REG 153: PHC F4(g)	CWS Tier 1 - Extraction Gravimetric	21-Oct-21	21-Oct-21
REG 153: VOCs by P&T GC-MS	EPA 8260 - P&T GC-MS	18-Oct-21	19-Oct-21
SAR	Calculated	20-Oct-21	21-Oct-21
Solids, %	Gravimetric, calculation	19-Oct-21	20-Oct-21

Certificate of Analysis
 Client: Hallex Environmental Ltd.
 Client PO:

Report Date: 21-Oct-2021
 Order Date: 15-Oct-2021
 Project Description: E-21-68-2

Summary of Exceedances

(If this page is blank then there are no exceedances)

Only those criteria that a sample exceeds will be highlighted in red

Regulatory Comparison:

Paracel Laboratories has provided regulatory guidelines on this report for informational purposes only and makes no representations or warranties that the data is accurate or reflects the current regulatory values. The user is advised to consult with the appropriate official regulations to evaluate compliance. Sample results that are highlighted have exceeded the selected regulatory limit. Calculated uncertainty estimations have not been applied for determining regulatory exceedances. Regulatory limits displayed in brackets, (), applies to medium and fine textured soils.

Criteria:

Client ID	Analyte	MDL / Units	Result	Reg 153/04 (2011)-Table 2 Residential
TP3-1	Lead	1.0 ug/g	334	(120) ug/g
TP3-1	Benzo [a] anthracene	0.02 ug/g	1.37	(0.63) ug/g
TP3-1	Benzo [a] pyrene	0.02 ug/g	1.06	(0.3) ug/g
TP3-1	Benzo [b] fluoranthene	0.02 ug/g	0.87	(0.78) ug/g
TP3-1	Indeno [1,2,3-cd] pyrene	0.02 ug/g	0.57	(0.48) ug/g
TP3-1	Dibenzo [a,h] anthracene	0.02 ug/g	0.25	(0.1) ug/g
TP3-1	Fluoranthene	0.10 ug/g	2.34	(0.69) ug/g
TP4-1	F3 PHCs (C16-C34)	8 ug/g	1360	(1,300) ug/g
TP4-1	Acenaphthylene	0.02 ug/g	0.26	(0.17) ug/g
TP4-1	Benzo [a] anthracene	0.02 ug/g	1.20	(0.63) ug/g
TP4-1	Benzo [a] pyrene	0.02 ug/g	0.93	(0.3) ug/g
TP4-1	Lead	1.0 ug/g	1030	(120) ug/g
TP4-1	Zinc	20.0 ug/g	461	(340) ug/g
TP4-1	Dibenzo [a,h] anthracene	0.02 ug/g	0.22	(0.1) ug/g
TP4-1	Fluoranthene	0.10 ug/g	2.12	(0.69) ug/g
TP4-1	Indeno [1,2,3-cd] pyrene	0.02 ug/g	0.52	(0.48) ug/g

Certificate of Analysis
 Client: Hallex Environmental Ltd.
 Client PO:

Report Date: 21-Oct-2021
 Order Date: 15-Oct-2021
 Project Description: E-21-68-2

Client ID:	TP1-1	TP2-1	TP3-1	TP4-1	Criteria: Reg 153/04 (2011)-Table 2 Residential
Sample Date:	14-Oct-2021	14-Oct-2021	14-Oct-2021	14-Oct-2021	
Sample ID:	2142510-01	2142510-02	2142510-03	2142510-04	
Matrix:	Soil	Soil	Soil	Soil	
MDL/Units					

Physical Characteristics

% Solids	0.1 % by Wt.	80.2	80.2	92.1	80.7	
----------	--------------	------	------	------	------	--

General Inorganics

SAR	0.01 N/A	-	-	0.08	0.19	(5)	N/A
Conductivity	5 uS/cm	-	-	156	220	(0.7)	mS/cm
pH	0.05 pH Units	-	-	7.61	7.42	(5 - 9)	pH units

Metals

Antimony	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	(7.5)	ug/g
Arsenic	1.0 ug/g	5.3	6.0	5.5	7.0	(18)	ug/g
Barium	1.0 ug/g	175	168	78.4	284	(390)	ug/g
Beryllium	0.5 ug/g	1.0	1.1	<0.5	0.7	(5)	ug/g
Boron	5.0 ug/g	9.3	8.1	<5.0	8.7	(120)	ug/g
Cadmium	0.5 ug/g	<0.5	<0.5	1.0	0.9	(1.2)	ug/g
Chromium	5.0 ug/g	26.7	28.0	13.0	33.4	(160)	ug/g
Cobalt	1.0 ug/g	13.6	14.8	3.4	9.4	(22)	ug/g
Copper	5.0 ug/g	26.8	29.3	64.9	37.6	(180)	ug/g
Lead	1.0 ug/g	10.0	11.4	334	1030	(120)	ug/g
Molybdenum	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	(6.9)	ug/g
Nickel	5.0 ug/g	35.4	41.2	17.1	22.9	(130)	ug/g
Selenium	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	(2.4)	ug/g
Silver	0.3 ug/g	<0.3	<0.3	0.7	<0.3	(25)	ug/g
Thallium	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	(1)	ug/g
Uranium	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	(23)	ug/g
Vanadium	10.0 ug/g	35.3	37.8	10.8	25.4	(86)	ug/g

Certificate of Analysis
 Client: Hallex Environmental Ltd.
 Client PO:

Report Date: 21-Oct-2021
 Order Date: 15-Oct-2021
 Project Description: E-21-68-2

	MDL/Units	Client ID:	TP1-1	TP2-1	TP3-1	TP4-1	Criteria: Reg 153/04 (2011)-Table 2 Residential	
		Sample Date:	14-Oct-2021	14-Oct-2021	14-Oct-2021	14-Oct-2021		
		Sample ID:	2142510-01	2142510-02	2142510-03	2142510-04		
		Matrix:	Soil	Soil	Soil	Soil		
Zinc	20.0 ug/g		74.1	79.9	188	461	(340)	ug/g
Volatiles								
Acetone	0.50 ug/g		<0.50	<0.50	-	-	(28)	ug/g
Benzene	0.02 ug/g		<0.02	<0.02	-	-	(0.17)	ug/g
Bromodichloromethane	0.05 ug/g		<0.05	<0.05	-	-	(1.9)	ug/g
Bromoform	0.05 ug/g		<0.05	<0.05	-	-	(0.26)	ug/g
Bromomethane	0.05 ug/g		<0.05	<0.05	-	-	(0.05)	ug/g
Carbon Tetrachloride	0.05 ug/g		<0.05	<0.05	-	-	(0.12)	ug/g
Chlorobenzene	0.05 ug/g		<0.05	<0.05	-	-	(2.7)	ug/g
Chloroform	0.05 ug/g		<0.05	<0.05	-	-	(0.18)	ug/g
Dibromochloromethane	0.05 ug/g		<0.05	<0.05	-	-	(2.9)	ug/g
Dichlorodifluoromethane	0.05 ug/g		<0.05	<0.05	-	-	(25)	ug/g
1,2-Dichlorobenzene	0.05 ug/g		<0.05	<0.05	-	-	(1.7)	ug/g
1,3-Dichlorobenzene	0.05 ug/g		<0.05	<0.05	-	-	(6)	ug/g
1,4-Dichlorobenzene	0.05 ug/g		<0.05	<0.05	-	-	(0.097)	ug/g
1,1-Dichloroethane	0.05 ug/g		<0.05	<0.05	-	-	(0.6)	ug/g
1,2-Dichloroethane	0.05 ug/g		<0.05	<0.05	-	-	(0.05)	ug/g
1,1-Dichloroethylene	0.05 ug/g		<0.05	<0.05	-	-	(0.05)	ug/g
cis-1,2-Dichloroethylene	0.05 ug/g		<0.05	<0.05	-	-	(2.5)	ug/g
trans-1,2-Dichloroethylene	0.05 ug/g		<0.05	<0.05	-	-	(0.75)	ug/g
1,2-Dichloropropane	0.05 ug/g		<0.05	<0.05	-	-	(0.085)	ug/g
cis-1,3-Dichloropropylene	0.05 ug/g		<0.05	<0.05	-	-		
trans-1,3-Dichloropropylene	0.05 ug/g		<0.05	<0.05	-	-		
1,3-Dichloropropene, total	0.05 ug/g		<0.05	<0.05	-	-	(0.081)	ug/g

Certificate of Analysis
 Client: Hallex Environmental Ltd.
 Client PO:

Report Date: 21-Oct-2021
 Order Date: 15-Oct-2021
 Project Description: E-21-68-2

	Client ID:	TP1-1	TP2-1	TP3-1	TP4-1	Criteria: Reg 153/04 (2011)-Table 2 Residential	
	Sample Date:	14-Oct-2021	14-Oct-2021	14-Oct-2021	14-Oct-2021		
	Sample ID:	2142510-01	2142510-02	2142510-03	2142510-04		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Ethylbenzene	0.05 ug/g	<0.05	<0.05	-	-	(1.6)	ug/g
Ethylene dibromide (dibromoethane)	0.05 ug/g	<0.05	<0.05	-	-	(0.05)	ug/g
Hexane	0.05 ug/g	<0.05	<0.05	-	-	(34)	ug/g
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g	<0.50	<0.50	-	-	(44)	ug/g
Methyl Isobutyl Ketone	0.50 ug/g	<0.50	<0.50	-	-	(4.3)	ug/g
Methyl tert-butyl ether	0.05 ug/g	<0.05	<0.05	-	-	(1.4)	ug/g
Methylene Chloride	0.05 ug/g	<0.05	<0.05	-	-	(0.96)	ug/g
Styrene	0.05 ug/g	<0.05	<0.05	-	-	(2.2)	ug/g
1,1,1,2-Tetrachloroethane	0.05 ug/g	<0.05	<0.05	-	-	(0.05)	ug/g
1,1,2,2-Tetrachloroethane	0.05 ug/g	<0.05	<0.05	-	-	(0.05)	ug/g
Tetrachloroethylene	0.05 ug/g	<0.05	<0.05	-	-	(2.3)	ug/g
Toluene	0.05 ug/g	<0.05	<0.05	-	-	(6)	ug/g
1,1,1-Trichloroethane	0.05 ug/g	<0.05	<0.05	-	-	(3.4)	ug/g
1,1,2-Trichloroethane	0.05 ug/g	<0.05	<0.05	-	-	(0.05)	ug/g
Trichloroethylene	0.05 ug/g	<0.05	<0.05	-	-	(0.52)	ug/g
Trichlorofluoromethane	0.05 ug/g	<0.05	<0.05	-	-	(5.8)	ug/g
Vinyl chloride	0.02 ug/g	<0.02	<0.02	-	-	(0.022)	ug/g
m,p-Xylenes	0.05 ug/g	<0.05	<0.05	-	-		
o-Xylene	0.05 ug/g	<0.05	<0.05	-	-		
Xylenes, total	0.05 ug/g	<0.05	<0.05	-	-	(25)	ug/g
4-Bromofluorobenzene	Surrogate	94.0%	93.5%	-	-		
Dibromofluoromethane	Surrogate	85.0%	82.2%	-	-		
Toluene-d8	Surrogate	101%	101%	-	-		
Benzene	0.02 ug/g	-	-	<0.02	<0.02	(0.17)	ug/g

Certificate of Analysis
Client: Hallex Environmental Ltd.
Client PO:

Report Date: 21-Oct-2021
Order Date: 15-Oct-2021
Project Description: E-21-68-2

	MDL/Units	Client ID:	TP1-1	TP2-1	TP3-1	TP4-1	Criteria:	
		Sample Date:	14-Oct-2021	14-Oct-2021	14-Oct-2021	14-Oct-2021	Reg 153/04 (2011)-Table 2 Residential	
		Sample ID:	2142510-01	2142510-02	2142510-03	2142510-04		
		Matrix:	Soil	Soil	Soil	Soil		
Ethylbenzene	0.05 ug/g		-	-	<0.05	<0.05	(1.6)	ug/g
Toluene	0.05 ug/g		-	-	<0.05	<0.05	(6)	ug/g
m,p-Xylenes	0.05 ug/g		-	-	0.06	<0.05		
o-Xylene	0.05 ug/g		-	-	0.06	<0.05		
Xylenes, total	0.05 ug/g		-	-	0.13	<0.05	(25)	ug/g
Toluene-d8	Surrogate		-	-	99.6%	99.2%		

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g	<7	<7	<7	<7	(65)	ug/g
F2 PHCs (C10-C16)	4 ug/g	<4	<4	<4	<4	(150)	ug/g
F3 PHCs (C16-C34)	8 ug/g	<8	<8	244	1360	(1,300)	ug/g
F4 PHCs (C34-C50)	6 ug/g	<6	<6	370	1320	(5,600)	ug/g
F4G-sg PHCs (gravimetric)	50 ug/g	-	-	1480	3590	(5,600)	ug/g

Semi-Volatiles

Acenaphthene	0.02 ug/g	<0.02	<0.02	0.08	0.03	(29)	ug/g
Acenaphthylene	0.02 ug/g	<0.02	<0.02	0.17	0.26	(0.17)	ug/g
Anthracene	0.02 ug/g	<0.02	<0.02	0.38	0.38	(0.74)	ug/g
Benzo [a] anthracene	0.02 ug/g	<0.02	<0.02	1.37	1.20	(0.63)	ug/g
Benzo [a] pyrene	0.02 ug/g	<0.02	<0.02	1.06	0.93	(0.3)	ug/g
Benzo [b] fluoranthene	0.02 ug/g	<0.02	<0.02	0.87	0.71	(0.78)	ug/g
Benzo [g,h,i] perylene	0.02 ug/g	<0.02	<0.02	0.38	0.35	(7.8)	ug/g
Benzo [k] fluoranthene	0.02 ug/g	<0.02	<0.02	0.55	0.46	(0.78)	ug/g
Chrysene	0.02 ug/g	<0.02	<0.02	1.05	0.92	(7.8)	ug/g
Dibenzo [a,h] anthracene	0.02 ug/g	<0.02	<0.02	0.25	0.22	(0.1)	ug/g
Fluoranthene	0.02 ug/g	<0.02	<0.02	2.34	2.12	(0.69)	ug/g

Certificate of Analysis
 Client: Hallex Environmental Ltd.
 Client PO:

Report Date: 21-Oct-2021
 Order Date: 15-Oct-2021
 Project Description: E-21-68-2

	MDL/Units	Client ID:	TP1-1	TP2-1	TP3-1	TP4-1	Criteria: Reg 153/04 (2011)-Table 2 Residential	
		Sample Date:	14-Oct-2021	14-Oct-2021	14-Oct-2021	14-Oct-2021		
		Sample ID:	2142510-01	2142510-02	2142510-03	2142510-04		
		Matrix:	Soil	Soil	Soil	Soil		
Fluorene	0.02 ug/g		<0.02	<0.02	0.10	0.08	(69)	ug/g
Indeno [1,2,3-cd] pyrene	0.02 ug/g		<0.02	<0.02	0.57	0.52	(0.48)	ug/g
1-Methylnaphthalene	0.02 ug/g		<0.02	<0.02	0.10	0.04	(3.4)	ug/g
2-Methylnaphthalene	0.02 ug/g		<0.02	<0.02	0.12	0.05	(3.4)	ug/g
Methylnaphthalene (1&2)	0.03 ug/g		<0.03	<0.03	0.22	0.09	(3.4)	ug/g
Naphthalene	0.01 ug/g		<0.01	<0.01	0.10	0.08	(0.75)	ug/g
Phenanthrene	0.02 ug/g		<0.02	<0.02	1.32	1.13	(7.8)	ug/g
Pyrene	0.02 ug/g		<0.02	<0.02	1.97	1.93	(78)	ug/g
2-Fluorobiphenyl	Surrogate		71.5%	68.7%	87.9%	68.4%		
Terphenyl-d14	Surrogate		92.0%	91.0%	95.2%	83.8%		

Certificate of Analysis
Client: Hallex Environmental Ltd.
Client PO:

Report Date: 21-Oct-2021
Order Date: 15-Oct-2021
Project Description: E-21-68-2

Client ID:	TP5-1	-	-	-	Criteria: Reg 153/04 (2011)-Table 2 Residential
Sample Date:	14-Oct-2021	-	-	-	
Sample ID:	2142510-05	-	-	-	
Matrix:	Soil	-	-	-	
MDL/Units					

Physical Characteristics

% Solids	0.1 % by Wt.	82.5	-	-	-	
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General Inorganics

SAR	0.01 N/A	0.34	-	-	-	(5)	N/A
Conductivity	5 uS/cm	166	-	-	-	(0.7)	mS/cm
pH	0.05 pH Units	7.57	-	-	-	(5 - 9)	pH units

Metals

Antimony	1.0 ug/g	<1.0	-	-	-	(7.5)	ug/g
Arsenic	1.0 ug/g	4.5	-	-	-	(18)	ug/g
Barium	1.0 ug/g	107	-	-	-	(390)	ug/g
Beryllium	0.5 ug/g	0.9	-	-	-	(5)	ug/g
Boron	5.0 ug/g	10.0	-	-	-	(120)	ug/g
Cadmium	0.5 ug/g	<0.5	-	-	-	(1.2)	ug/g
Chromium	5.0 ug/g	21.2	-	-	-	(160)	ug/g
Cobalt	1.0 ug/g	12.5	-	-	-	(22)	ug/g
Copper	5.0 ug/g	20.6	-	-	-	(180)	ug/g
Lead	1.0 ug/g	21.0	-	-	-	(120)	ug/g
Molybdenum	1.0 ug/g	<1.0	-	-	-	(6.9)	ug/g
Nickel	5.0 ug/g	28.2	-	-	-	(130)	ug/g
Selenium	1.0 ug/g	<1.0	-	-	-	(2.4)	ug/g
Silver	0.3 ug/g	<0.3	-	-	-	(25)	ug/g
Thallium	1.0 ug/g	<1.0	-	-	-	(1)	ug/g
Uranium	1.0 ug/g	<1.0	-	-	-	(23)	ug/g
Vanadium	10.0 ug/g	30.6	-	-	-	(86)	ug/g

Certificate of Analysis
Client: Hallex Environmental Ltd.
Client PO:

Report Date: 21-Oct-2021
Order Date: 15-Oct-2021
Project Description: E-21-68-2

	Client ID:	TP5-1	-	-	-	Criteria:	
	Sample Date:	14-Oct-2021	-	-	-	Reg 153/04 (2011)-Table 2 Residential	
	Sample ID:	2142510-05	-	-	-		
	Matrix:	Soil	-	-	-		
	MDL/Units						
Zinc	20.0 ug/g	69.4	-	-	-	(340)	ug/g
Volatiles							
Benzene	0.02 ug/g	<0.02	-	-	-	(0.17)	ug/g
Ethylbenzene	0.05 ug/g	<0.05	-	-	-	(1.6)	ug/g
Toluene	0.05 ug/g	<0.05	-	-	-	(6)	ug/g
m,p-Xylenes	0.05 ug/g	<0.05	-	-	-		
o-Xylene	0.05 ug/g	<0.05	-	-	-		
Xylenes, total	0.05 ug/g	<0.05	-	-	-	(25)	ug/g
Toluene-d8	Surrogate	100%	-	-	-		
Hydrocarbons							
F1 PHCs (C6-C10)	7 ug/g	<7	-	-	-	(65)	ug/g
F2 PHCs (C10-C16)	4 ug/g	<4	-	-	-	(150)	ug/g
F3 PHCs (C16-C34)	8 ug/g	<8	-	-	-	(1,300)	ug/g
F4 PHCs (C34-C50)	6 ug/g	<6	-	-	-	(5,600)	ug/g
Semi-Volatiles							
Acenaphthene	0.02 ug/g	<0.02	-	-	-	(29)	ug/g
Acenaphthylene	0.02 ug/g	<0.02	-	-	-	(0.17)	ug/g
Anthracene	0.02 ug/g	<0.02	-	-	-	(0.74)	ug/g
Benzo [a] anthracene	0.02 ug/g	<0.02	-	-	-	(0.63)	ug/g
Benzo [a] pyrene	0.02 ug/g	<0.02	-	-	-	(0.3)	ug/g
Benzo [b] fluoranthene	0.02 ug/g	<0.02	-	-	-	(0.78)	ug/g
Benzo [g,h,i] perylene	0.02 ug/g	<0.02	-	-	-	(7.8)	ug/g
Benzo [k] fluoranthene	0.02 ug/g	<0.02	-	-	-	(0.78)	ug/g
Chrysene	0.02 ug/g	<0.02	-	-	-	(7.8)	ug/g

Certificate of Analysis
Client: Hallex Environmental Ltd.
Client PO:

Report Date: 21-Oct-2021
Order Date: 15-Oct-2021
Project Description: E-21-68-2

		Client ID:	TP5-1	-	-	-	Criteria: Reg 153/04 (2011)-Table 2 Residential	
		Sample Date:	14-Oct-2021	-	-	-		
		Sample ID:	2142510-05	-	-	-		
		Matrix:	Soil	-	-	-		
		MDL/Units						
Dibenzo [a,h] anthracene	0.02 ug/g	<0.02	-	-	-	(0.1)	ug/g	
Fluoranthene	0.02 ug/g	0.02	-	-	-	(0.69)	ug/g	
Fluorene	0.02 ug/g	<0.02	-	-	-	(69)	ug/g	
Indeno [1,2,3-cd] pyrene	0.02 ug/g	<0.02	-	-	-	(0.48)	ug/g	
1-Methylnaphthalene	0.02 ug/g	<0.02	-	-	-	(3.4)	ug/g	
2-Methylnaphthalene	0.02 ug/g	<0.02	-	-	-	(3.4)	ug/g	
Methylnaphthalene (1&2)	0.03 ug/g	<0.03	-	-	-	(3.4)	ug/g	
Naphthalene	0.01 ug/g	<0.01	-	-	-	(0.75)	ug/g	
Phenanthrene	0.02 ug/g	<0.02	-	-	-	(7.8)	ug/g	
Pyrene	0.02 ug/g	<0.02	-	-	-	(78)	ug/g	
2-Fluorobiphenyl	Surrogate	78.0%	-	-	-			
Terphenyl-d14	Surrogate	88.2%	-	-	-			

Certificate of Analysis
 Client: Hallex Environmental Ltd.
 Client PO:

Report Date: 21-Oct-2021
 Order Date: 15-Oct-2021
 Project Description: E-21-68-2

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						
F4G-sg PHCs (gravimetric)	ND	50	ug/g						
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						
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						
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						
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						

Certificate of Analysis
 Client: Hallex Environmental Ltd.
 Client PO:

Report Date: 21-Oct-2021
 Order Date: 15-Oct-2021
 Project Description: E-21-68-2

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.03	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	0.160		ug/g		80.6	50-140			
Surrogate: Terphenyl-d14	0.196		ug/g		98.0	50-140			
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane, 1,2-	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						

Certificate of Analysis
 Client: Hallex Environmental Ltd.
 Client PO:

Report Date: 21-Oct-2021
 Order Date: 15-Oct-2021
 Project Description: E-21-68-2

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
<i>Surrogate: 4-Bromofluorobenzene</i>	7.57		ug/g		94.6	50-140			
<i>Surrogate: Dibromofluoromethane</i>	6.90		ug/g		86.3	50-140			
<i>Surrogate: Toluene-d8</i>	8.12		ug/g		101	50-140			
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						
<i>Surrogate: Toluene-d8</i>	8.12		ug/g		101	50-140			

Certificate of Analysis
Client: Hallex Environmental Ltd.
Client PO:

Report Date: 21-Oct-2021
Order Date: 15-Oct-2021
Project Description: E-21-68-2

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
SAR	14.5	0.01	N/A	13.4			8.5	30	
Conductivity	1120	5	uS/cm	1120			0.4	5	
pH	7.52	0.05	pH Units	7.56			0.5	10	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g	ND			NC	40	
F2 PHCs (C10-C16)	ND	4	ug/g	ND			NC	30	
F3 PHCs (C16-C34)	32	8	ug/g	39			20.7	30	
F4 PHCs (C34-C50)	76	6	ug/g	96			22.9	30	
F4G-sg PHCs (gravimetric)	2750	50	ug/g	3190			14.6	30	
Metals									
Antimony	ND	1.0	ug/g	ND			NC	30	
Arsenic	10.9	1.0	ug/g	10.4			4.9	30	
Barium	67.5	1.0	ug/g	60.3			11.3	30	
Beryllium	0.7	0.5	ug/g	0.6			2.6	30	
Boron	13.8	5.0	ug/g	11.4			18.7	30	
Cadmium	ND	0.5	ug/g	ND			NC	30	
Chromium	18.9	5.0	ug/g	17.5			7.8	30	
Cobalt	8.7	1.0	ug/g	8.3			4.8	30	
Copper	19.1	5.0	ug/g	18.1			5.6	30	
Lead	13.0	1.0	ug/g	11.8			9.7	30	
Molybdenum	1.6	1.0	ug/g	1.3			24.4	30	
Nickel	23.7	5.0	ug/g	22.7			4.3	30	
Selenium	ND	1.0	ug/g	ND			NC	30	
Silver	ND	0.3	ug/g	ND			NC	30	
Thallium	ND	1.0	ug/g	ND			NC	30	
Uranium	1.0	1.0	ug/g	ND			NC	30	
Vanadium	33.8	10.0	ug/g	31.8			5.9	30	
Zinc	60.2	20.0	ug/g	55.7			7.8	30	
Physical Characteristics									
% Solids	81.0	0.1	% by Wt.	80.2			1.0	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g	ND			NC	40	
Acenaphthylene	ND	0.02	ug/g	ND			NC	40	
Anthracene	ND	0.02	ug/g	ND			NC	40	
Benzo [a] anthracene	ND	0.02	ug/g	ND			NC	40	
Benzo [a] pyrene	ND	0.02	ug/g	ND			NC	40	
Benzo [b] fluoranthene	ND	0.02	ug/g	ND			NC	40	
Benzo [g,h,i] perylene	ND	0.02	ug/g	ND			NC	40	

Certificate of Analysis
Client: Hallex Environmental Ltd.
Client PO:

Report Date: 21-Oct-2021
Order Date: 15-Oct-2021
Project Description: E-21-68-2

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzo [k] fluoranthene	ND	0.02	ug/g	ND			NC	40	
Chrysene	ND	0.02	ug/g	ND			NC	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g	ND			NC	40	
Fluoranthene	ND	0.02	ug/g	ND			NC	40	
Fluorene	ND	0.02	ug/g	ND			NC	40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g	ND			NC	40	
1-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
2-Methylnaphthalene	ND	0.02	ug/g	ND			NC	40	
Naphthalene	ND	0.01	ug/g	ND			NC	40	
Phenanthrene	ND	0.02	ug/g	ND			NC	40	
Pyrene	ND	0.02	ug/g	ND			NC	40	
Surrogate: 2-Fluorobiphenyl	0.187		ug/g		83.1	50-140			
Surrogate: Terphenyl-d14	0.184		ug/g		81.5	50-140			
Volatiles									
Acetone	ND	0.50	ug/g	ND			NC	50	
Benzene	ND	0.02	ug/g	ND			NC	50	
Bromodichloromethane	ND	0.05	ug/g	ND			NC	50	
Bromoform	ND	0.05	ug/g	ND			NC	50	
Bromomethane	ND	0.05	ug/g	ND			NC	50	
Carbon Tetrachloride	ND	0.05	ug/g	ND			NC	50	
Chlorobenzene	ND	0.05	ug/g	ND			NC	50	
Chloroform	ND	0.05	ug/g	ND			NC	50	
Dibromochloromethane	ND	0.05	ug/g	ND			NC	50	
Dichlorodifluoromethane	ND	0.05	ug/g	ND			NC	50	
1,2-Dichlorobenzene	ND	0.05	ug/g	ND			NC	50	
1,3-Dichlorobenzene	ND	0.05	ug/g	ND			NC	50	
1,4-Dichlorobenzene	ND	0.05	ug/g	ND			NC	50	
1,1-Dichloroethane	ND	0.05	ug/g	ND			NC	50	
1,2-Dichloroethane	ND	0.05	ug/g	ND			NC	50	
1,1-Dichloroethylene	ND	0.05	ug/g	ND			NC	50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g	ND			NC	50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g	ND			NC	50	
1,2-Dichloropropane	ND	0.05	ug/g	ND			NC	50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g	ND			NC	50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g	ND			NC	50	
Ethylene dibromide (dibromoethane, 1,2-	ND	0.05	ug/g	ND			NC	50	
Hexane	ND	0.05	ug/g	ND			NC	50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g	ND			NC	50	
Methyl Isobutyl Ketone	ND	0.50	ug/g	ND			NC	50	
Methyl tert-butyl ether	ND	0.05	ug/g	ND			NC	50	

Certificate of Analysis
 Client: Hallex Environmental Ltd.
 Client PO:

Report Date: 21-Oct-2021
 Order Date: 15-Oct-2021
 Project Description: E-21-68-2

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Methylene Chloride	ND	0.05	ug/g	ND			NC	50	
Styrene	ND	0.05	ug/g	ND			NC	50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g	ND			NC	50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g	ND			NC	50	
Tetrachloroethylene	ND	0.05	ug/g	ND			NC	50	
Toluene	ND	0.05	ug/g	ND			NC	50	
1,1,1-Trichloroethane	ND	0.05	ug/g	ND			NC	50	
1,1,2-Trichloroethane	ND	0.05	ug/g	ND			NC	50	
Trichloroethylene	ND	0.05	ug/g	ND			NC	50	
Trichlorofluoromethane	ND	0.05	ug/g	ND			NC	50	
Vinyl chloride	ND	0.02	ug/g	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g	ND			NC	50	
o-Xylene	ND	0.05	ug/g	ND			NC	50	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>8.61</i>		ug/g		<i>93.4</i>	<i>50-140</i>			
<i>Surrogate: Dibromofluoromethane</i>	<i>7.66</i>		ug/g		<i>83.1</i>	<i>50-140</i>			
<i>Surrogate: Toluene-d8</i>	<i>9.30</i>		ug/g		<i>101</i>	<i>50-140</i>			
Benzene	ND	0.02	ug/g	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g	ND			NC	50	
Toluene	ND	0.05	ug/g	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g	ND			NC	50	
o-Xylene	ND	0.05	ug/g	ND			NC	50	
<i>Surrogate: Toluene-d8</i>	<i>9.30</i>		ug/g		<i>101</i>	<i>50-140</i>			

Certificate of Analysis
 Client: Hallex Environmental Ltd.
 Client PO:

Report Date: 21-Oct-2021
 Order Date: 15-Oct-2021
 Project Description: E-21-68-2

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	62	7	ug/g	ND	87.0	80-120			
F2 PHCs (C10-C16)	98	4	ug/g	ND	105	60-140			
F3 PHCs (C16-C34)	215	8	ug/g	39	84.3	60-140			
F4 PHCs (C34-C50)	258	6	ug/g	96	107	60-140			
F4G-sg PHCs (gravimetric)	1160	50	ug/g	ND	116	80-120			
Metals									
Antimony	123	1.0	ug/g	ND	98.1	70-130			
Arsenic	138	1.0	ug/g	10.4	102	70-130			
Barium	200	1.0	ug/g	60.3	112	70-130			
Beryllium	121	0.5	ug/g	0.6	96.3	70-130			
Boron	137	5.0	ug/g	11.4	101	70-130			
Cadmium	118	0.5	ug/g	ND	94.7	70-130			
Chromium	156	5.0	ug/g	17.5	111	70-130			
Cobalt	126	1.0	ug/g	8.3	93.9	70-130			
Copper	138	5.0	ug/g	18.1	95.7	70-130			
Lead	132	1.0	ug/g	11.8	96.5	70-130			
Molybdenum	125	1.0	ug/g	1.3	98.7	70-130			
Nickel	150	5.0	ug/g	22.7	102	70-130			
Selenium	120	1.0	ug/g	ND	95.6	70-130			
Silver	113	0.3	ug/g	ND	90.3	70-130			
Thallium	121	1.0	ug/g	ND	96.5	70-130			
Uranium	116	1.0	ug/g	ND	92.6	70-130			
Vanadium	157	10.0	ug/g	31.8	100	70-130			
Zinc	182	20.0	ug/g	55.7	101	70-130			
Semi-Volatiles									
Acenaphthene	0.110	0.02	ug/g	ND	97.1	50-140			
Acenaphthylene	0.131	0.02	ug/g	ND	116	50-140			
Anthracene	0.127	0.02	ug/g	ND	113	50-140			
Benzo [a] anthracene	0.125	0.02	ug/g	ND	111	50-140			
Benzo [a] pyrene	0.118	0.02	ug/g	ND	105	50-140			
Benzo [b] fluoranthene	0.092	0.02	ug/g	ND	81.5	50-140			
Benzo [g,h,i] perylene	0.167	0.02	ug/g	ND	148	50-140			QM-01
Benzo [k] fluoranthene	0.097	0.02	ug/g	ND	85.9	50-140			

Certificate of Analysis
Client: Hallex Environmental Ltd.
Client PO:

Report Date: 21-Oct-2021
Order Date: 15-Oct-2021
Project Description: E-21-68-2

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Chrysene	0.110	0.02	ug/g	ND	97.7	50-140			
Dibenzo [a,h] anthracene	0.239	0.02	ug/g	ND	212	50-140			QM-01
Fluoranthene	0.141	0.02	ug/g	ND	125	50-140			
Fluorene	0.134	0.02	ug/g	ND	119	50-140			
Indeno [1,2,3-cd] pyrene	0.228	0.02	ug/g	ND	202	50-140			QM-01
1-Methylnaphthalene	0.133	0.02	ug/g	ND	117	50-140			
2-Methylnaphthalene	0.128	0.02	ug/g	ND	113	50-140			
Naphthalene	0.115	0.01	ug/g	ND	102	50-140			
Phenanthrene	0.123	0.02	ug/g	ND	109	50-140			
Pyrene	0.115	0.02	ug/g	ND	102	50-140			
Surrogate: 2-Fluorobiphenyl	0.176		ug/g		78.5	50-140			
Surrogate: Terphenyl-d14	0.170		ug/g		75.2	50-140			
Volatiles									
Acetone	14.9	0.50	ug/g	ND	76.1	50-140			
Benzene	6.32	0.02	ug/g	ND	78.6	60-130			
Bromodichloromethane	5.65	0.05	ug/g	ND	70.2	60-130			
Bromoform	5.15	0.05	ug/g	ND	64.0	60-130			
Bromomethane	6.36	0.05	ug/g	ND	79.6	50-140			
Carbon Tetrachloride	5.34	0.05	ug/g	ND	66.8	60-130			
Chlorobenzene	5.80	0.05	ug/g	ND	72.1	60-130			
Chloroform	6.01	0.05	ug/g	ND	74.8	60-130			
Dibromochloromethane	5.12	0.05	ug/g	ND	64.0	60-130			
Dichlorodifluoromethane	6.29	0.05	ug/g	ND	78.6	50-140			
1,2-Dichlorobenzene	5.63	0.05	ug/g	ND	70.3	60-130			
1,3-Dichlorobenzene	5.60	0.05	ug/g	ND	70.0	60-130			
1,4-Dichlorobenzene	5.52	0.05	ug/g	ND	68.7	60-130			
1,1-Dichloroethane	6.29	0.05	ug/g	ND	78.7	60-130			
1,2-Dichloroethane	6.01	0.05	ug/g	ND	74.7	60-130			
1,1-Dichloroethylene	5.69	0.05	ug/g	ND	71.1	60-130			
cis-1,2-Dichloroethylene	5.70	0.05	ug/g	ND	70.9	60-130			
trans-1,2-Dichloroethylene	5.56	0.05	ug/g	ND	69.1	60-130			
1,2-Dichloropropane	6.06	0.05	ug/g	ND	75.8	60-130			
cis-1,3-Dichloropropylene	5.56	0.05	ug/g	ND	69.5	60-130			
trans-1,3-Dichloropropylene	5.59	0.05	ug/g	ND	69.5	60-130			
Ethylbenzene	5.94	0.05	ug/g	ND	73.9	60-130			

Certificate of Analysis
 Client: Hallex Environmental Ltd.
 Client PO:

Report Date: 21-Oct-2021
 Order Date: 15-Oct-2021
 Project Description: E-21-68-2

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Ethylene dibromide (dibromoethane, 1,2-	5.26	0.05	ug/g	ND	65.5	60-130			
Hexane	6.43	0.05	ug/g	ND	80.3	60-130			
Methyl Ethyl Ketone (2-Butanone)	14.4	0.50	ug/g	ND	70.1	50-140			
Methyl Isobutyl Ketone	15.1	0.50	ug/g	ND	77.5	50-140			
Methyl tert-butyl ether	14.6	0.05	ug/g	ND	72.8	50-140			
Methylene Chloride	6.38	0.05	ug/g	ND	79.3	60-130			
Styrene	5.88	0.05	ug/g	ND	72.8	60-130			
1,1,1,2-Tetrachloroethane	5.30	0.05	ug/g	ND	66.2	60-130			
1,1,2,2-Tetrachloroethane	5.22	0.05	ug/g	ND	64.9	60-130			
Tetrachloroethylene	5.56	0.05	ug/g	ND	69.2	60-130			
Toluene	6.04	0.05	ug/g	ND	75.5	60-130			
1,1,1-Trichloroethane	5.41	0.05	ug/g	ND	67.6	60-130			
1,1,2-Trichloroethane	5.82	0.05	ug/g	ND	72.4	60-130			
Trichloroethylene	5.82	0.05	ug/g	ND	72.4	60-130			
Trichlorofluoromethane	5.69	0.05	ug/g	ND	71.2	50-140			
Vinyl chloride	6.04	0.02	ug/g	ND	75.5	50-140			
m,p-Xylenes	11.7	0.05	ug/g	ND	73.1	60-130			
o-Xylene	5.86	0.05	ug/g	ND	72.9	60-130			
<i>Surrogate: 4-Bromofluorobenzene</i>	16.3		<i>ug/g</i>		102	50-140			
<i>Surrogate: Dibromofluoromethane</i>	18.2		<i>ug/g</i>		113	50-140			
<i>Surrogate: Toluene-d8</i>	16.0		<i>ug/g</i>		100	50-140			
Benzene	6.32	0.02	ug/g	ND	78.6	60-130			
Ethylbenzene	5.94	0.05	ug/g	ND	73.9	60-130			
Toluene	6.04	0.05	ug/g	ND	75.5	60-130			
m,p-Xylenes	11.7	0.05	ug/g	ND	73.1	60-130			
o-Xylene	5.86	0.05	ug/g	ND	72.9	60-130			
<i>Surrogate: Toluene-d8</i>	16.0		<i>ug/g</i>		100	50-140			

Certificate of Analysis
Client: Hallex Environmental Ltd.
Client PO:

Report Date: 21-Oct-2021
Order Date: 15-Oct-2021
Project Description: E-21-68-2

Qualifier Notes:

QC Qualifiers :

QM-01 : The spike recovery for this QC sample is outside of established control limits due to sample matrix interference.

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

Soil/Solid results are reported on a dry weight basis unless otherwise indicated

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.

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 any circumstances be liable to you in connection with this work.



Client Name: Hallex Environmental Ltd.
Contact Name: Contact: Kevin Christian
Address: 4999 Victoria Ave.
Niagara Falls, ON L2E 4C9
Ph: 905-988-8030
Telephone:

Project Ref: E-21-68-2
Quote #:
PO #:
E-mail: kchristian@hallex.ca
n.mets

Page 1 of 1
Turnaround Time
 1 day 3 day
 2 day Regular
Date Required:

REG 153/04 REG 406/19 Other Regulation

Table 1 Res/Park Med/Fine REG,558 PWQO
 Table 2 Ind/Comm Coarse CCME MISA
 Table 3 Agri/Other SU - Sani SU - Storm
 Table _____ Mun: _____
 For RSC: Yes No Other: _____

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

Required Analysis

Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken		PHCS	PAHS	Metals (TCLP)	VOCs	BTEX	AM/SAR/EC							
				Date	Time													
1 TP1-1	S		2	10-14	PM	X	X	X	X									
2 TP2-1 TP2-1	↓		↓	↓	↓	X	X	X	X									
3 TP3-1	↓		↓	↓	↓	X	X	X	X	X	X							
4 TP4-1	↓		↓	↓	↓	X	X	X	X	X	X							
5 TP5-1	↓		↓	↓	↓	X	X	X	X	X	X							
6																		
7																		
8																		
9																		
10																		

Comments: Method of Delivery: drop box

Relinquished By (Sign): *[Signature]* Received By Driver/Depot: B Homenuel
 Relinquished By (Print): Cameron Nyland Date/Time: 15 OCT 21 8:30 Date/Time: 18/10/21 8:30
 Date/Time: 4 2021-10-14 Temperature: 2.8 °C Date/Time: 18/10/21 9:20 Temperature: 8.3 °C
 pH Verified: By:

Certificate of Analysis

Hallex Environmental Ltd.

4999 Victoria Ave
Niagara Falls, ON L2E 4C9
Attn: Kevin Christian

Client PO:
Project: E-21-68-2
Custody: 63515, 63516

Report Date: 16-Dec-2021
Order Date: 10-Dec-2021

Order #: 2151022

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

Parcel ID	Client ID
2151022-01	TP6-1
2151022-02	TP7-1
2151022-03	TP8-1
2151022-04	TP9-1
2151022-05	TP10-1
2151022-06	TP11-1

Approved By:



Alex Enfield, MSc
Lab Manager

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 any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 16-Dec-2021

Client: Hallex Environmental Ltd.

Order Date: 10-Dec-2021

Client PO:

Project Description: E-21-68-2

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Metals, ICP-MS	EPA 6020 - Digestion - ICP-MS	15-Dec-21	15-Dec-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	14-Dec-21	15-Dec-21
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	15-Dec-21	16-Dec-21
Solids, %	Gravimetric, calculation	15-Dec-21	16-Dec-21

Certificate of Analysis

Report Date: 16-Dec-2021

Client: Hallex Environmental Ltd.

Order Date: 10-Dec-2021

Client PO:

Project Description: E-21-68-2

	Client ID:	TP6-1	TP7-1	TP8-1	TP9-1
	Sample Date:	10-Dec-21 00:00	10-Dec-21 00:00	10-Dec-21 00:00	10-Dec-21 00:00
	Sample ID:	2151022-01	2151022-02	2151022-03	2151022-04
	MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	89.7	77.3	73.1	79.3
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Metals

Lead	1 ug/g dry	334	531	346	484
Zinc	20 ug/g dry	341	465	352	384

Hydrocarbons

F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	32	11	10	<8
F4 PHCs (C34-C50)	6 ug/g dry	79	<6	<6	<6

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Acenaphthylene	0.02 ug/g dry	0.03	<0.02	<0.02	<0.02
Anthracene	0.02 ug/g dry	0.08	<0.02	<0.02	<0.02
Benzo [a] anthracene	0.02 ug/g dry	0.37	0.04	0.07	<0.02
Benzo [a] pyrene	0.02 ug/g dry	0.43	0.06	0.16	<0.02
Benzo [b] fluoranthene	0.02 ug/g dry	0.53	0.07	0.18	0.02
Benzo [g,h,i] perylene	0.02 ug/g dry	0.27	0.05	0.17	<0.02
Benzo [k] fluoranthene	0.02 ug/g dry	0.20	0.03	0.07	<0.02
Chrysene	0.02 ug/g dry	0.40	0.05	0.12	<0.02
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.06	<0.02	0.04	<0.02
Fluoranthene	0.02 ug/g dry	0.79	0.07	0.10	<0.02
Fluorene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.23	0.03	0.10	<0.02
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
2-Methylnaphthalene	0.02 ug/g dry	0.02	<0.02	0.02	<0.02
Methylnaphthalene (1&2)	0.03 ug/g dry	0.04	0.04	0.04	<0.03
Naphthalene	0.01 ug/g dry	0.02	<0.01	0.02	<0.01
Phenanthrene	0.02 ug/g dry	0.35	0.07	0.09	<0.02
Pyrene	0.02 ug/g dry	0.71	0.07	0.11	<0.02
2-Fluorobiphenyl	Surrogate	64.0%	51.4%	51.1%	33.4% [2]
Terphenyl-d14	Surrogate	89.1%	91.5%	80.6%	91.4%

Certificate of Analysis

Report Date: 16-Dec-2021

Client: Hallex Environmental Ltd.

Order Date: 10-Dec-2021

Client PO:

Project Description: E-21-68-2

	Client ID:	TP10-1	TP11-1	-	-
	Sample Date:	10-Dec-21 00:00	10-Dec-21 00:00	-	-
	Sample ID:	2151022-05	2151022-06	-	-
	MDL/Units	Soil	Soil	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	70.8	75.5	-	-
Metals					
Lead	1 ug/g dry	205	143	-	-
Zinc	20 ug/g dry	256	215	-	-
Hydrocarbons					
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	-	-
F3 PHCs (C16-C34)	8 ug/g dry	15	25	-	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	-	-
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	<0.02	-	-
Acenaphthylene	0.02 ug/g dry	<0.02	<0.02	-	-
Anthracene	0.02 ug/g dry	<0.02	<0.02	-	-
Benzo [a] anthracene	0.02 ug/g dry	0.02	0.05	-	-
Benzo [a] pyrene	0.02 ug/g dry	0.03	0.08	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	0.05	0.10	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	0.04	0.06	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	0.04	-	-
Chrysene	0.02 ug/g dry	0.03	0.08	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	-	-
Fluoranthene	0.02 ug/g dry	0.03	0.10	-	-
Fluorene	0.02 ug/g dry	<0.02	<0.02	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.02	0.05	-	-
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	-	-
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	-	-
Methylnaphthalene (1&2)	0.03 ug/g dry	<0.03	<0.03	-	-
Naphthalene	0.01 ug/g dry	<0.01	<0.01	-	-
Phenanthrene	0.02 ug/g dry	0.02	0.04	-	-
Pyrene	0.02 ug/g dry	0.03	0.09	-	-
2-Fluorobiphenyl	Surrogate	52.4%	64.4%	-	-
Terphenyl-d14	Surrogate	86.7%	93.8%	-	-

Certificate of Analysis

Report Date: 16-Dec-2021

Client: Hallex Environmental Ltd.

Order Date: 10-Dec-2021

Client PO:

Project Description: E-21-68-2

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Lead	ND	1	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						
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	0.03	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	0.130		ug/g		65.1	50-140			
Surrogate: Terphenyl-d14	0.204		ug/g		102	50-140			

Certificate of Analysis

Report Date: 16-Dec-2021

Client: Hallex Environmental Ltd.

Order Date: 10-Dec-2021

Client PO:

Project Description: E-21-68-2

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND			NC	30	
F3 PHCs (C16-C34)	ND	8	ug/g dry	ND			NC	30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND			NC	30	
Metals									
Lead	4.2	1	ug/g dry	3.4			19.9	30	
Zinc	72.1	20	ug/g dry	53.4			29.7	30	
Physical Characteristics									
% Solids	95.3	0.1	% by Wt.	94.9			0.4	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g dry	ND			NC	40	
Acenaphthylene	ND	0.02	ug/g dry	ND			NC	40	
Anthracene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [a] anthracene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [a] pyrene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [b] fluoranthene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [g,h,i] perylene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [k] fluoranthene	ND	0.02	ug/g dry	ND			NC	40	
Chrysene	ND	0.02	ug/g dry	ND			NC	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g dry	ND			NC	40	
Fluoranthene	ND	0.02	ug/g dry	ND			NC	40	
Fluorene	ND	0.02	ug/g dry	ND			NC	40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g dry	ND			NC	40	
1-Methylnaphthalene	ND	0.02	ug/g dry	ND			NC	40	
2-Methylnaphthalene	ND	0.02	ug/g dry	ND			NC	40	
Naphthalene	ND	0.01	ug/g dry	ND			NC	40	
Phenanthrene	ND	0.02	ug/g dry	ND			NC	40	
Pyrene	ND	0.02	ug/g dry	ND			NC	40	
Surrogate: 2-Fluorobiphenyl	0.117		ug/g dry		49.8	50-140			S-GC
Surrogate: Terphenyl-d14	0.229		ug/g dry		97.0	50-140			

Certificate of Analysis

Report Date: 16-Dec-2021

Client: Hallex Environmental Ltd.

Order Date: 10-Dec-2021

Client PO:

Project Description: E-21-68-2

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F2 PHCs (C10-C16)	95	4	ug/g	ND	98.3	60-140			
F3 PHCs (C16-C34)	193	8	ug/g	ND	88.5	60-140			
F4 PHCs (C34-C50)	155	6	ug/g	ND	99.0	60-140			
Metals									
Lead	123	1	ug/g	3.4	95.8	70-130			
Zinc	180	20	ug/g	53.4	101	70-130			
Semi-Volatiles									
Acenaphthene	0.075	0.02	ug/g	ND	63.1	50-140			
Acenaphthylene	0.068	0.02	ug/g	ND	57.7	50-140			
Anthracene	0.078	0.02	ug/g	ND	66.0	50-140			
Benzo [a] anthracene	0.104	0.02	ug/g	ND	87.8	50-140			
Benzo [a] pyrene	0.122	0.02	ug/g	ND	103	50-140			
Benzo [b] fluoranthene	0.125	0.02	ug/g	ND	106	50-140			
Benzo [g,h,i] perylene	0.119	0.02	ug/g	ND	101	50-140			
Benzo [k] fluoranthene	0.123	0.02	ug/g	ND	104	50-140			
Chrysene	0.117	0.02	ug/g	ND	98.7	50-140			
Dibenzo [a,h] anthracene	0.107	0.02	ug/g	ND	90.4	50-140			
Fluoranthene	0.109	0.02	ug/g	ND	92.3	50-140			
Fluorene	0.081	0.02	ug/g	ND	68.9	50-140			
Indeno [1,2,3-cd] pyrene	0.110	0.02	ug/g	ND	92.9	50-140			
1-Methylnaphthalene	0.072	0.02	ug/g	ND	60.8	50-140			
2-Methylnaphthalene	0.066	0.02	ug/g	ND	56.1	50-140			
Naphthalene	0.066	0.01	ug/g	ND	55.6	50-140			
Phenanthrene	0.094	0.02	ug/g	ND	79.4	50-140			
Pyrene	0.113	0.02	ug/g	ND	95.8	50-140			
Surrogate: 2-Fluorobiphenyl	0.112		ug/g		47.4	50-140			S-GC
Surrogate: Terphenyl-d14	0.218		ug/g		92.3	50-140			

Certificate of Analysis

Report Date: 16-Dec-2021

Client: Hallex Environmental Ltd.

Order Date: 10-Dec-2021

Client PO:

Project Description: E-21-68-2

Qualifier Notes:

Sample Qualifiers :

2 : Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

QC Qualifiers :

S-GC : Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

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

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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Parcel Order Number (Lab Use Only) 2151022	Chain Of Custody (Lab Use Only) No 63515
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Client Name: Hallex Environmental Ltd. Contact: Kevin Christian Address: 4999 Victoria Ave. Niagara Falls, ON L2E 4C9 Telephone: Ph: 905-988-8030	Project Ref: E-21-68-2	Page 1 of 2
Quote #:	PO #:	Turnaround Time <input type="checkbox"/> 1 day <input type="checkbox"/> 3 day <input type="checkbox"/> 2 day <input checked="" type="checkbox"/> Regular
E-mail:	Date Required: _____	

REG 153/04 <input type="checkbox"/> REG 406/19 <input type="checkbox"/>		Other Regulation	Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)		Required Analysis																	
<input type="checkbox"/> Table 1 <input type="checkbox"/> Res/Park <input type="checkbox"/> Med/Fine	<input type="checkbox"/> REG,558	<input type="checkbox"/> PWQO	Matrix	Sample Taken	LEAD	ZINC	PHCF2-F4	PAH	HOLD													
<input checked="" type="checkbox"/> Table 2 <input type="checkbox"/> Ind/Comm <input type="checkbox"/> Coarse	<input type="checkbox"/> CCME	<input type="checkbox"/> MISA																			Air Volume	# of Containers
<input type="checkbox"/> Table 3 <input type="checkbox"/> Agri/Other	<input type="checkbox"/> SU - Sani	<input type="checkbox"/> SU - Storm																				
<input type="checkbox"/> Table _____	Mun: _____	Other: _____																				
For RSC: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																						
1	TP6-1 TP6-1	S			DEC 10	AM	X	X	X	X												
2	TP7-1 TP7-1	S					X	X	X	X												
3	TP8-1 TP8-1	S					X	X	X	X												
4	TP9-1 TP9-1	S					X	X	X	X												
5	TP10-1 TP10-1	S					X	X	X	X												
6	TP11-1 TP11-1	S					X	X	X	X												
7	TP6-2																				X	
8	TP7-2																				X	
9	TP8-2																				X	
10	TP9-2																				X	

Comments:		Method of Delivery: walk in	
Relinquished By (Sign): <i>Josey Caputo</i>	Received By Driver/Depot: <i>Blomenc</i>	Received at Lab: <i>C-114</i>	Verified By: BB
Relinquished By (Print): JOSEY CAPUTO	Date/Time: 10 Dec 21 14:15	Date/Time: Dec 15/21 8:03	Date/Time: Dec 13/21 10:09
Date/Time: 10 Dec 21 14:10	Temperature: 11.1 °C	Temperature: 6.9 °C	pH Verified: <input type="checkbox"/> By: NA



Parcel ID: 2151022



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Parcel Order Number (Lab Use Only) 2151022	Chain Of Custody (Lab Use Only) No 63516
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Client Name: Hallex Environmental Ltd.
 Contact Name: Contact: Kevin Christian
 Address: 4999 Victoria Ave.
 Niagara Falls, ON L2E 4C9
 Ph: 905-988-8030
 Telephone:

Project Ref: **E-21-68-2**
 Quote #:
 PO #:
 E-mail:

Page **2** of **2**
 Turnaround Time
 1 day 3 day
 2 day Regular
 Date Required: _____

REG 153/04 REG 406/19 Other Regulation

Table 1 Res/Park Med/Fine REG,SS8 PWQO
 Table 2 Ind/Comm Coarse CCME MISA
 Table 3 Agri/Other SU - Sani SU - Storm
 Table _____
 For RSC: Yes No Other: _____

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

Required Analysis

Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken		HOLD	Required Analysis												
				Date	Time														
1 TP10-2	S			DEC 10	AM	X													
2 TP11-2	S			↓	↓	X													
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Comments: _____ Method of Delivery: **drop walk in**

Relinquished By (Sign): Judy	Received By Driver/Depot: Bromenue	Received at Lab: 6-14	Verified By: BB
Relinquished By (Print): JUDY CAPUTO	Date/Time: 10 Dec 21 1415	Date/Time: DEC 15/21 8:23	Date/Time: Dec 13/21 10:09
Date/Time: 10 Dec 21 1410	Temperature: _____ °C	Temperature: 6.9 °C	pH Verified: <input type="checkbox"/> By: NA

Certificate of Analysis

Hallex Environmental Ltd.

4999 Victoria Ave
Niagara Falls, ON L2E 4C9
Attn: Kevin Christian

Client PO:
Project: E-21-68-2
Custody: 56341, (63515, 63516)

Report Date: 21-Dec-2021
Order Date: 13-Dec-2021

Order #: 2151438

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

Parcel ID	Client ID
2151438-01	TP6-2
2151438-02	TP7-2
2151438-03	TP8-2
2151438-04	TP9-2
2151438-05	TP10-2
2151438-06	TP11-2

Approved By:



Alex Enfield, MSc
Lab Manager

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 any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 21-Dec-2021

Client: Hallex Environmental Ltd.

Order Date: 13-Dec-2021

Client PO:

Project Description: E-21-68-2

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Metals, ICP-MS	EPA 6020 - Digestion - ICP-MS	20-Dec-21	21-Dec-21
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	20-Dec-21	20-Dec-21
Solids, %	Gravimetric, calculation	20-Dec-21	21-Dec-21

Certificate of Analysis

Report Date: 21-Dec-2021

Client: Hallex Environmental Ltd.

Order Date: 13-Dec-2021

Client PO:

Project Description: E-21-68-2

Client ID:	TP6-2	TP7-2	TP8-2	TP9-2
Sample Date:	10-Dec-21 09:00	10-Dec-21 09:00	10-Dec-21 09:00	10-Dec-21 09:00
Sample ID:	2151438-01	2151438-02	2151438-03	2151438-04
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	83.6	81.2	83.4	83.5
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Metals

Lead	1 ug/g dry	8	10	9	20
Zinc	20 ug/g dry	46	57	51	244

Semi-Volatiles

Acenaphthene	0.02 ug/g dry	<0.02	-	-	-
Acenaphthylene	0.02 ug/g dry	<0.02	-	-	-
Anthracene	0.02 ug/g dry	<0.02	-	-	-
Benzo [a] anthracene	0.02 ug/g dry	<0.02	-	-	-
Benzo [a] pyrene	0.02 ug/g dry	<0.02	-	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	-	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	-	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	-	-	-
Chrysene	0.02 ug/g dry	<0.02	-	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	-	-	-
Fluoranthene	0.02 ug/g dry	<0.02	-	-	-
Fluorene	0.02 ug/g dry	<0.02	-	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	-	-	-
1-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	-
2-Methylnaphthalene	0.02 ug/g dry	<0.02	-	-	-
Methylnaphthalene (1&2)	0.03 ug/g dry	<0.03	-	-	-
Naphthalene	0.01 ug/g dry	<0.01	-	-	-
Phenanthrene	0.02 ug/g dry	<0.02	-	-	-
Pyrene	0.02 ug/g dry	<0.02	-	-	-
2-Fluorobiphenyl	Surrogate	26.9% [3]	-	-	-
Terphenyl-d14	Surrogate	85.4%	-	-	-

Client ID:	TP10-2	TP11-2	-	-
Sample Date:	10-Dec-21 09:00	10-Dec-21 09:00	-	-
Sample ID:	2151438-05	2151438-06	-	-
MDL/Units	Soil	Soil	-	-

Physical Characteristics

% Solids	0.1 % by Wt.	83.3	81.8	-	-
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Metals

Lead	1 ug/g dry	9	12	-	-
Zinc	20 ug/g dry	55	61	-	-

Certificate of Analysis

Report Date: 21-Dec-2021

Client: Hallex Environmental Ltd.

Order Date: 13-Dec-2021

Client PO:

Project Description: E-21-68-2

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Lead	ND	1	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						
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	0.03	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	0.0839		ug/g		42.2	50-140			
Surrogate: Terphenyl-d14	0.196		ug/g		98.2	50-140			

Certificate of Analysis

Report Date: 21-Dec-2021

Client: Hallex Environmental Ltd.

Order Date: 13-Dec-2021

Client PO:

Project Description: E-21-68-2

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Lead	19.4	1	ug/g dry	21.6			11.0	30	
Zinc	76.0	20	ug/g dry	84.7			10.9	30	
Physical Characteristics									
% Solids	88.1	0.1	% by Wt.	88.1			0.0	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g dry	ND			NC	40	
Acenaphthylene	ND	0.02	ug/g dry	ND			NC	40	
Anthracene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [a] anthracene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [a] pyrene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [b] fluoranthene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [g,h,i] perylene	ND	0.02	ug/g dry	ND			NC	40	
Benzo [k] fluoranthene	ND	0.02	ug/g dry	ND			NC	40	
Chrysene	ND	0.02	ug/g dry	ND			NC	40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g dry	ND			NC	40	
Fluoranthene	ND	0.02	ug/g dry	ND			NC	40	
Fluorene	ND	0.02	ug/g dry	ND			NC	40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g dry	ND			NC	40	
1-Methylnaphthalene	ND	0.02	ug/g dry	ND			NC	40	
2-Methylnaphthalene	ND	0.02	ug/g dry	ND			NC	40	
Naphthalene	ND	0.01	ug/g dry	ND			NC	40	
Phenanthrene	ND	0.02	ug/g dry	ND			NC	40	
Pyrene	ND	0.02	ug/g dry	ND			NC	40	
Surrogate: 2-Fluorobiphenyl	0.119		ug/g dry		49.2	50-140			S-GC
Surrogate: Terphenyl-d14	0.242		ug/g dry		99.8	50-140			

Certificate of Analysis

Report Date: 21-Dec-2021

Client: Hallex Environmental Ltd.

Order Date: 13-Dec-2021

Client PO:

Project Description: E-21-68-2

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Lead	132	1	ug/g	21.6	88.1	70-130			
Zinc	180	20	ug/g	84.7	76.1	70-130			
Semi-Volatiles									
Acenaphthene	0.049	0.02	ug/g	ND	40.5	50-140			QM-07
Acenaphthylene	0.042	0.02	ug/g	ND	34.8	50-140			QM-07
Anthracene	0.070	0.02	ug/g	ND	57.4	50-140			
Benzo [a] anthracene	0.085	0.02	ug/g	ND	70.3	50-140			
Benzo [a] pyrene	0.107	0.02	ug/g	ND	88.4	50-140			
Benzo [b] fluoranthene	0.111	0.02	ug/g	ND	91.3	50-140			
Benzo [g,h,i] perylene	0.101	0.02	ug/g	ND	82.9	50-140			
Benzo [k] fluoranthene	0.112	0.02	ug/g	ND	92.2	50-140			
Chrysene	0.097	0.02	ug/g	ND	79.7	50-140			
Dibenzo [a,h] anthracene	0.093	0.02	ug/g	ND	76.9	50-140			
Fluoranthene	0.085	0.02	ug/g	ND	70.1	50-140			
Fluorene	0.062	0.02	ug/g	ND	51.0	50-140			
Indeno [1,2,3-cd] pyrene	0.089	0.02	ug/g	ND	73.7	50-140			
1-Methylnaphthalene	0.036	0.02	ug/g	ND	29.8	50-140			QM-07
2-Methylnaphthalene	0.034	0.02	ug/g	ND	27.8	50-140			QM-07
Naphthalene	0.033	0.01	ug/g	ND	27.3	50-140			QM-07
Phenanthrene	0.076	0.02	ug/g	ND	62.8	50-140			
Pyrene	0.094	0.02	ug/g	ND	77.4	50-140			
Surrogate: 2-Fluorobiphenyl	0.0893		ug/g		37.0	50-140			S-GC
Surrogate: Terphenyl-d14	0.217		ug/g		89.6	50-140			

Certificate of Analysis

Report Date: 21-Dec-2021

Client: Hallex Environmental Ltd.

Order Date: 13-Dec-2021

Client PO:

Project Description: E-21-68-2

Qualifier Notes:

Sample Qualifiers :

3 : Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

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.

QS-02 : Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

S-GC : Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

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

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.

