




PARKS CANADA AGENCY  
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Date Received: 01-JUN-20  
Report Date: 10-JUN-20 16:51 (MT)  
Version: FINAL

Client Phone: 867-445-1680

## Certificate of Analysis

Lab Work Order #: L2454664  
Project P.O. #: NOT SUBMITTED  
Job Reference:  
C of C Numbers:  
Legal Site Desc:

  
\_\_\_\_\_  
Oliver Gregg  
Account Manager

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# ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	Description	Sampled Date	Sampled Time	Client ID		
		L2454664-8	SOIL	28-MAY-20				
		L2454664-9	SOIL	28-MAY-20				
		L2454664-10	SOIL	28-MAY-20				
		1 ZIPLOC BAG WHITE GREEN TRIM NORTH END NEAR HOUSE (#1)	1 ZIPLOC BAG RED, BROWN SHED EAST OF WHITE SHED (#2)	1 ZIPLOC BAG WHITE SHED CENTRE PROPERTY WHITE SIDE (#3)				
Grouping	Analyte							
<b>BULK</b>								
Metals	Lead (Pb) (mg/kg)	13.3	<5.0	6960				

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L2454664-1 SOIL 28-MAY-20  1 SOIL JAR LABELLED CENTRAL SHED	L2454664-2 SOIL 28-MAY-20  1 SOIL JAR LABELLED OLD OIL TANKS	L2454664-3 SOIL 28-MAY-20  1 METHANOL VIAL LABELLED 1 (OIL TANK SITE)	L2454664-6 SOIL 28-MAY-20  1 METHANOL VIAL LABELLED 4 (OIL TANK SITE)	L2454664-7 SOIL 28-MAY-20  1 METHANOL VIAL LABELLED 5 (OIL TANK SITE)
Grouping	Analyte					
<b>SOIL</b>						
<b>Physical Tests</b>	% Moisture (%)	30.4	21.2	21.2	21.2	21.2
<b>Volatile Organic Compounds</b>	Benzene (mg/kg)			<0.0050	<0.0050	<0.0050
	Ethylbenzene (mg/kg)			<0.010	<0.010	<0.010
	Toluene (mg/kg)			<0.050	<0.050	<0.050
	o-Xylene (mg/kg)			<0.050	<0.050	<0.050
	m+p-Xylene (mg/kg)			<0.050	<0.050	<0.050
	Xylenes (mg/kg)			<0.10	<0.10	<0.10
	F1(C6-C10) (mg/kg)			<10	<10	<10
	F1-BTEX (mg/kg)			<10	<10	<10
	Surrogate: 4-Bromofluorobenzene (SS) (%)			70.8	71.3	106.9
	Surrogate: 3,4-Dichlorotoluene (SS) (%)			90.5	81.3	75.1
	Surrogate: 1,4-Difluorobenzene (SS) (%)			86.0	86.8	102.7
<b>Hydrocarbons</b>	F2 (C10-C16) (mg/kg)	<20	1060			
	F3 (C16-C34) (mg/kg)	79	969			
	F4 (C34-C50) (mg/kg)	48	44			
	Chrom. to baseline at nC50	YES	YES			
	Surrogate: 2-Bromobenzotrifluoride (%)	93.0	85.2			

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L2454664-11 SOIL 28-MAY-20 1 METHANOL VIAL CENTRAL SHED WHITE WITH RED DOORS #1	L2454664-12 SOIL 28-MAY-20 1 METHANOL VIAL LABELLED CENTRAL SHED #2 LEFT			
Grouping	Analyte					
SOIL						
Physical Tests	% Moisture (%)	30.4	30.4			
Volatile Organic Compounds	Benzene (mg/kg)	<0.0050	<0.0050			
	Ethylbenzene (mg/kg)	<0.010	<0.010			
	Toluene (mg/kg)	<0.050	<0.050			
	o-Xylene (mg/kg)	<0.050	<0.050			
	m+p-Xylene (mg/kg)	<0.050	<0.050			
	Xylenes (mg/kg)	<0.10	<0.10			
	F1(C6-C10) (mg/kg)	<10	<10			
	F1-BTEX (mg/kg)	<10	<10			
	Surrogate: 4-Bromofluorobenzene (SS) (%)	82.0	77.0			
	Surrogate: 3,4-Dichlorotoluene (SS) (%)	N.R.	74.0			
	Surrogate: 1,4-Difluorobenzene (SS) (%)	78.0	86.5			
Hydrocarbons	F2 (C10-C16) (mg/kg)					
	F3 (C16-C34) (mg/kg)					
	F4 (C34-C50) (mg/kg)					
	Chrom. to baseline at nC50					
	Surrogate: 2-Bromobenzotrifluoride (%)					

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

# Reference Information

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
SOL:MI	Surrogate recovery outside acceptable limits due to matrix interference

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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**BTXS,F1-MEOH-ED** Soil BTEX and F1 EPA 8260C/5021A and CWS PHC Tier 1

This analysis involves the extraction of a subsample of the sediment/soil with methanol added in the field at the time of subsampling. The soil methanol extract is added to water and reagents, then heated in a sealed vial to equilibrium. The headspace from the vial is transferred into a gas chromatograph. BTX Target compound concentrations are measured using mass spectrometry detection. The instrumental portion of F1 analysis is carried out in accordance with the Canada Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method (2001).

**ETL-TVH,TEH-CCME-ED** Soil CCME Total Hydrocarbons CCME CWS-PHC, Pub #1310, Dec 2001

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

**F2-4-TMB-ED** Soil CCME Total Extractable Hydrocarbons CCME CWS-PHC, Pub #1310, Dec 2001

This analysis is carried out in accordance with the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method, Canadian Council of Ministers of the Environment" For C10 to C50 hydrocarbons (F2, F3, F4) and gravimetric heavy hydrocarbons (F4G-sg), a subsample of the sediment/soil is extracted with 1:1 hexane:acetone using a rotary extractor. The extract undergoes a silica-gel clean-up to remove polar compounds. F2, F3 & F4 are analyzed by on-column GC/FID, and F4G-sg is analyzed gravimetrically.

Notes:

1. F2 (C10-C16): Sum of all hydrocarbons that elute between nC10 and nC16.
2. F3 (C16-C34): Sum of all hydrocarbons that elute between nC16 and nC34.
3. F4 (C34-C50): Sum of all hydrocarbons that elute between nC34 and nC50.
4. F4G: Gravimetric Heavy Hydrocarbons
5. F4G-sg: Gravimetric Heavy Hydrocarbons (F4G) after silica gel treatment.
6. Where F4 (C34-C50) and F4G-sg results are reported for a sample, the larger of the reported values is used for comparison against the relevant CCME standard for F4.
7. The gravimetric heavy hydrocarbon results (F4G-sg), cannot be added to the C6 to C50 hydrocarbon results.
8. This method is validated for use.
9. Data from analysis of quality control samples is available upon request.
10. Reported results are expressed as milligrams per dry kilogram.

**PB-PAINT-MS-VA** Bulk Lead in Paint by ICPMS EPA 200.2/6020A (mod)

This method uses a heated strong acid digestion with HNO<sub>3</sub> and HCl and is intended to liberate metals that may be environmentally available. Silicate minerals are not solubilized. Analysis is by Collision/Reaction Cell ICPMS.

**PREP-MOISTURE-ED** Soil % Moisture CCME PHC in Soil - Tier 1 (mod)

The weighed portion of soil is placed in a 105°C oven to dry to a constant weight; the drying time will vary based on the moisture content of the soil. The dried soil weight is then used to calculate % moisture.

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
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## Reference Information

ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

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### Chain of Custody Numbers:

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#### GLOSSARY OF REPORT TERMS

*Surrogate* - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

*mg/kg* - milligrams per kilogram based on dry weight of sample.

*mg/kg ww* - milligrams per kilogram based on wet weight of sample.

*mg/kg lwt* - milligrams per kilogram based on lipid-adjusted weight of sample.

*mg/L* - milligrams per litre.

*<* - Less than.

*D.L.* - The reported Detection Limit, also known as the Limit of Reporting (LOR).

*N/A* - Result not available. Refer to qualifier code and definition for explanation.

*Test results reported relate only to the samples as received by the laboratory.*

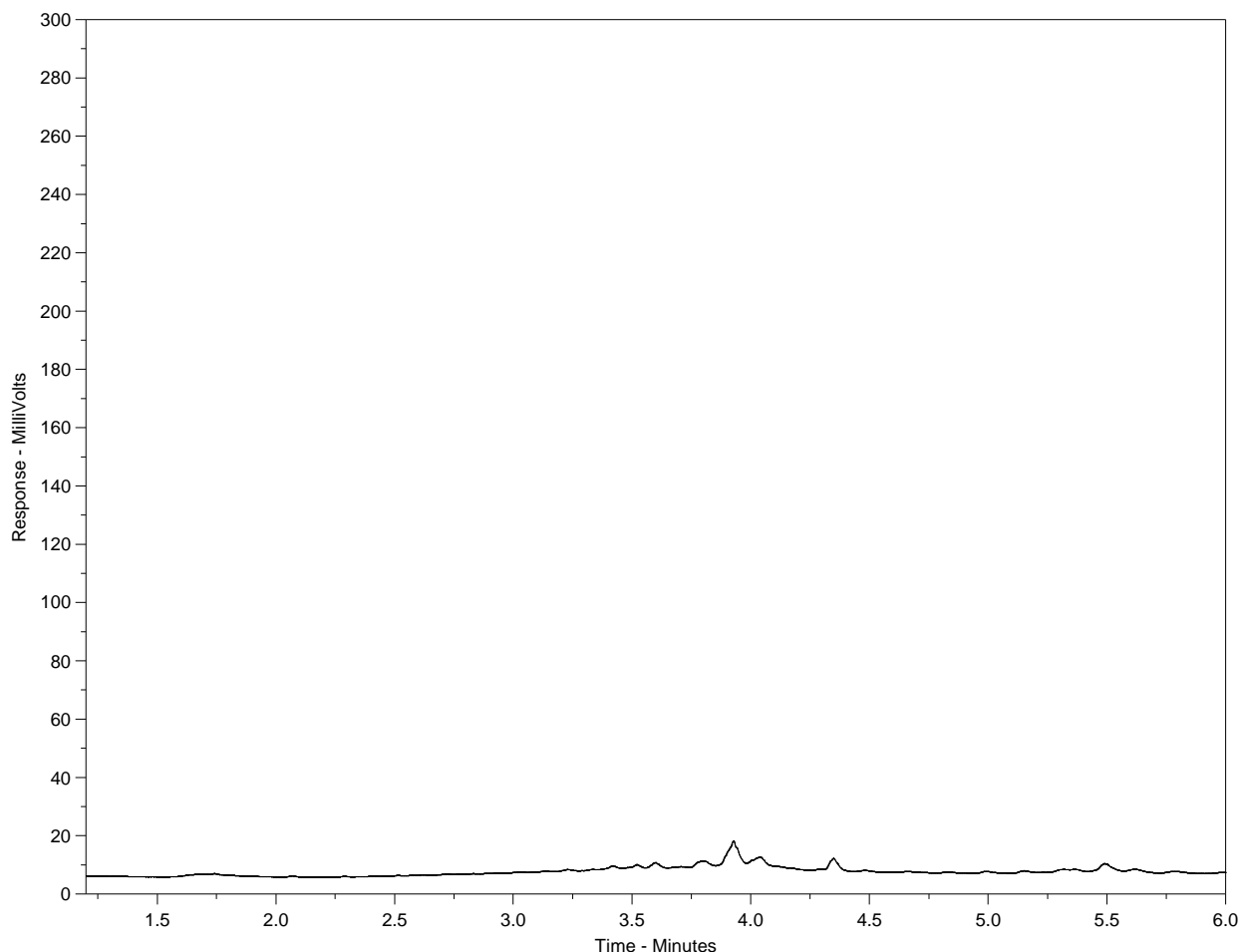
**UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.**

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*

# Hydrocarbon Distribution Report



ALS Sample ID: L2454664-1  
 Client ID: 1 SOIL JAR LABELLED CENTRAL SHED



F2		F3		F4		> F4
nC10	nC16		nC34		nC50	
174°C	287°C		481°C		575°C	
346°F	549°F		898°F		1067°F	
Gasoline		Motor Oils/ Lube Oils/ Grease				
Diesel/ Jet Fuels						

The Canada Wide Standard Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products as well as a number of specified n-alkane hydrocarbon marker compounds. Comparison of this report with those of reference standards may also assist in characterizing hydrocarbons present in the sample.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

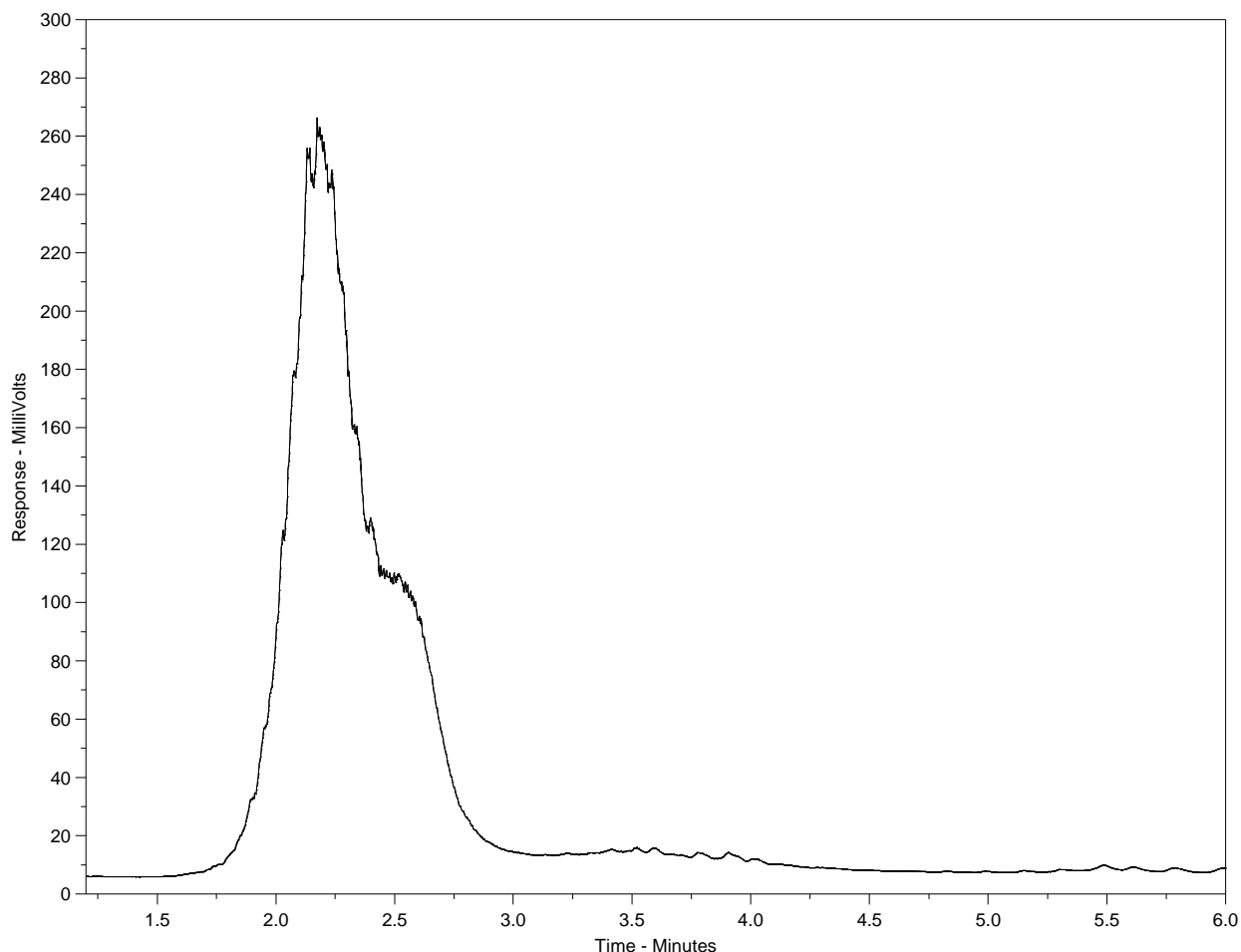
**Note:**

This chromatogram was produced with a high temperature GC method that is specific to the Canada-Wide Standard method. Note that retention times and distribution profiles from reports produced using different GC programs will differ.

# Hydrocarbon Distribution Report



ALS Sample ID: L2454664-2  
 Client ID: 1 SOIL JAR LABELLED OLD OIL TANKS



F2		F3		F4		> F4
nC10	nC16		nC34		nC50	
174°C	287°C		481°C		575°C	
346°F	549°F		898°F		1067°F	
Gasoline		Motor Oils/ Lube Oils/ Grease				
Diesel/ Jet Fuels						

The Canada Wide Standard Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products as well as a number of specified n-alkane hydrocarbon marker compounds. Comparison of this report with those of reference standards may also assist in characterizing hydrocarbons present in the sample.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

**Note:**

This chromatogram was produced with a high temperature GC method that is specific to the Canada-Wide Standard method. Note that retention times and distribution profiles from reports produced using different GC programs will differ.





Page of

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1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW CDC form.