



13-May-2016

Brett Middleton
Encana Oil and Gas (USA) Inc.
143 Diamond Avenue
Parachute, CO 81635

Re: **Soil Analysis**

Work Order: **1605460**

Dear Brett,

ALS Environmental received 1 sample on 07-May-2016 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 9.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Chad Whelton".

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager



Certificate No: MN 998501

Report of Laboratory Analysis

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

Environmental The ALS logo, a stylized 'A' with a flame-like shape inside.

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RIGHT SOLUTIONS RIGHT PARTNER

Client: Encana Oil and Gas (USA) Inc.
Project: Soil Analysis
Work Order: 1605460

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1605460-01	20160504-Fed 36-2 (CS 8')	Soil		5/4/2016 10:50	5/7/2016 09:30	<input type="checkbox"/>

Client: Encana Oil and Gas (USA) Inc.
Project: Soil Analysis
WorkOrder: 1605460

QUALIFIERS, ACRONYMS, UNITS

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and PQL, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
% of sample	Percent of Sample
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp**Date:** 13-May-16**Client:** Encana Oil and Gas (USA) Inc.**Project:** Soil Analysis**Sample ID:** 20160504-Fed 36-2 (CS 8')**Collection Date:** 5/4/2016 10:50 AM**Work Order:** 1605460**Lab ID:** 1605460-01**Matrix:** SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID							
			Method: SW8015M		Prep: SW3541 / 5/9/16		Analyst: IT
DRO (C10-C28)	5.3		0.79	5.0	mg/Kg-dry	1	5/10/2016 21:46
Surr: 4-Terphenyl-d14	67.0			39-133	%REC	1	5/10/2016 21:46
GASOLINE RANGE ORGANICS BY GC-FID							
			Method: SW8015D		Prep: SW5035 / 5/10/16		Analyst: IT
GRO (C6-C10)	U		2,000	3,600	µg/Kg-dry	1	5/10/2016 15:00
Surr: Toluene-d8	97.7			50-150	%REC	1	5/10/2016 15:00
MOISTURE							
			Method: SW3550C				Analyst: ED
Moisture	18		0.025	0.050	% of sample	1	5/9/2016 19:09

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 13-May-16

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1605460
Project: Soil Analysis

QC BATCH REPORT

Batch ID: **85785** Instrument ID **GC8** Method: **SW8015M**

MBLK		Sample ID: DBLKS1-85785-85785				Units: mg/Kg		Analysis Date: 5/10/2016 10:17 AM		
Client ID:		Run ID: GC8_160510A				SeqNo: 3821134		Prep Date: 5/9/2016		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	U	5.0								
Surr: 4-Terphenyl-d14	1.387	0	2	0	69.4	39-133	0			

LCS		Sample ID: DLCSS1-85785-85785				Units: mg/Kg		Analysis Date: 5/10/2016 10:47 AM		
Client ID:		Run ID: GC8_160510A				SeqNo: 3821135		Prep Date: 5/9/2016		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	155.8	5.0	200	0	77.9	61-109	0			
Surr: 4-Terphenyl-d14	1.301	0	2	0	65	39-133	0			

MS		Sample ID: 1605395-01B MS				Units: mg/Kg		Analysis Date: 5/10/2016 11:17 AM		
Client ID:		Run ID: GC8_160510A				SeqNo: 3821136		Prep Date: 5/9/2016		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	235.4	4.2	166	64.77	103	48-110	0			
Surr: 4-Terphenyl-d14	1.234	0	1.66	0	74.3	39-133	0			

MSD		Sample ID: 1605395-01B MSD				Units: mg/Kg		Analysis Date: 5/10/2016 11:47 AM		
Client ID:		Run ID: GC8_160510A				SeqNo: 3821137		Prep Date: 5/9/2016		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	202.8	4.1	164.9	64.77	83.7	48-110	235.4	14.8	30	
Surr: 4-Terphenyl-d14	1.158	0	1.649	0	70.2	39-133	1.234	6.4	30	

The following samples were analyzed in this batch: 1605460-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.
Work Order: 1605460
Project: Soil Analysis

QC BATCH REPORT

Batch ID: **85854** Instrument ID **GC9** Method: **SW8015D**

MBLK		Sample ID: MBLK-85854-85854				Units: µg/Kg-dry		Analysis Date: 5/10/2016 02:35 PM		
Client ID:		Run ID: GC9_160510A				SeqNo: 3821894		Prep Date: 5/10/2016		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

GRO (C6-C10)	U	2,500								
Surr: Toluene-d8	5213	0	5000	0	104	50-150	0			

LCS		Sample ID: LCS-85854-85854				Units: µg/Kg-dry		Analysis Date: 5/10/2016 02:11 PM		
Client ID:		Run ID: GC9_160510A				SeqNo: 3821893		Prep Date: 5/10/2016		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

GRO (C6-C10)	503200	2,500	500000	0	101	70-130	0			
Surr: Toluene-d8	4913	0	5000	0	98.3	50-150	0			

MS		Sample ID: 1605460-01B MS				Units: µg/Kg-dry		Analysis Date: 5/10/2016 04:42 PM		
Client ID: 20160504-Fed 36-2 (CS 8')		Run ID: GC9_160510A				SeqNo: 3821898		Prep Date: 5/10/2016		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

GRO (C6-C10)	707800	3,600	719500	0	98.4	70-130	0			
Surr: Toluene-d8	6916	0	7195	0	96.1	50-150	0			

MSD		Sample ID: 1605460-01B MSD				Units: µg/Kg-dry		Analysis Date: 5/10/2016 05:07 PM		
Client ID: 20160504-Fed 36-2 (CS 8')		Run ID: GC9_160510A				SeqNo: 3821899		Prep Date: 5/10/2016		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

GRO (C6-C10)	741000	3,600	719500	0	103	70-130	707800	4.59	30	
Surr: Toluene-d8	7103	0	7195	0	98.7	50-150	6916	2.67	30	

The following samples were analyzed in this batch:

1605460-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Encana Oil and Gas (USA) Inc.

Work Order: 1605460

Project: Soil Analysis

QC BATCH REPORT

Batch ID: **R187164**

Instrument ID **MOIST**

Method: **SW3550C**

MBLK		Sample ID: WBLKS-R187164				Units: % of sample		Analysis Date: 5/9/2016 07:09 PM		
Client ID:		Run ID: MOIST_160509C				SeqNo: 3820023		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture U 0.050

LCS		Sample ID: LCS-R187164				Units: % of sample		Analysis Date: 5/9/2016 07:09 PM		
Client ID:		Run ID: MOIST_160509C				SeqNo: 3820022		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 100 0.050 100 0 100 99.5-100.5 0

DUP		Sample ID: 1605443-03B DUP				Units: % of sample		Analysis Date: 5/9/2016 07:09 PM		
Client ID:		Run ID: MOIST_160509C				SeqNo: 3820003		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 20.37 0.050 0 0 0 20.59 1.07 20

DUP		Sample ID: 1605457-02B DUP				Units: % of sample		Analysis Date: 5/9/2016 07:09 PM		
Client ID:		Run ID: MOIST_160509C				SeqNo: 3820006		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 27.97 0.050 0 0 0 27.73 0.862 20

The following samples were analyzed in this batch:

1605460-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.



Cincinnati, OH
+1 513 733 5336

Everett, WA
+1 425 356 2600

Fort Collins, CO
+1 970 490 1511

Holland, MI
+1 616 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 24967

Houston, TX
+1 281 530 5656

Middletown, PA
+1 717 944 5541

Spring City, PA
+1 610 948 4903

Salt Lake City, UT
+1 801 266 7700

South Charleston, WV
+1 304 356 3168

York, PA
+1 717 505 5280

Environmental

Customer Information		Project Information		Parameter/Method Request for Analysis																
Purchase Order		Project Name		A	TPH (GLO + H2O)															
Work Order		Project Number		B																
Company Name	ENCANA	Bill To Company	ENCANA	C																
Send Report To	Brett Middleton	Invoice Attn		D																
Address		Address		E																
City/State/Zip	Parachute Co	City/State/Zip		F																
Phone		Phone		G																
Fax		Fax		H																
e-Mail Address	brett.middleton@encana.com	e-Mail Address		I																
J																				
No.	Sample Description	Date	Time	Matrix	Pres.	#Bottles	A	B	C	D	E	F	G	H	I	J	Hold			
1	20160504-F-CD 36-2 (CS 8')	5/4/16	1050	SS	-	2	X													
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
Sampler(s) Please Print & Sign		Shipment Method		Required Turnaround Time: (Check Box)				Other				Results Due Date:								
MAST KRETZSO				<input type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour				S10 5 day												
Relinquished by:	Date: 5/6/16	Time: 1800	Received by:				Notes:													
Relinquished by:	Date: 5-6-16	Time: 1800	Received by (Laboratory):				Cooler ID	Cooler Temp	QC Package: (Check One Box Below)											
Logged by (Laboratory):	Date: 5/7/16	Time: 1120	Checked by (Laboratory):					3.0°C	<input type="checkbox"/> Level II Std QC <input type="checkbox"/> TRRP Checklist <input type="checkbox"/> Level III Std QC/Raw Data <input type="checkbox"/> TRRP Level IV <input type="checkbox"/> Level IV SW646/CLP <input type="checkbox"/> Other											
Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other 8-4°C 9-5035																				

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.

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Sample Receipt Checklist

Client Name: ENCANA2

Date/Time Received: 07-May-16 09:30

Work Order: 1605460

Received by: KRW

Checklist completed by Keith Wurenga
eSignature

07-May-16
Date

Reviewed by: Chad Whelton
eSignature

09-May-16
Date

Matrices: Soil

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample(s) received on ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	<u>3.0/3.0 C</u>		<u>SR2</u>
Cooler(s)/Kit(s):	<u></u>		
Date/Time sample(s) sent to storage:	<u>5/7/2016 11:30:42 AM</u>		
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted by:	<u>-</u>		

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction: