



10-Apr-2015

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

Re: **Shire Gulch Federal 36-2 Pit Assessment**

Work Order: **15031628**

Dear Christopher,

ALS Environmental received 4 samples on 27-Mar-2015 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 11.

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

Sincerely,

Chad Whelton

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager



Certificate No: MN 532786

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 

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Client: Encana Oil and Gas (USA) Inc.
Project: Shire Gulch Federal 36-2 Pit Assessment
Work Order: 15031628

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>
15031628-01	20150325-SG Federal 36-2 (PITS01) 2.5-4'	Soil		3/25/2015 09:15	3/27/2015 09:30	<input type="checkbox"/>
15031628-02	20150325-SG Federal 36-2 (PITS01) 17-19'	Soil		3/25/2015 09:25	3/27/2015 09:30	<input type="checkbox"/>
15031628-03	20150325-SG Federal 36-2 (PITS02) 5-7'	Soil		3/25/2015 09:25	3/27/2015 09:30	<input type="checkbox"/>
15031628-04	20150325-SG Federal 36-2 (PITS02) 15-17'	Soil		3/25/2015 09:45	3/27/2015 09:30	<input type="checkbox"/>

Client: Encana Oil and Gas (USA) Inc.
Project: Shire Gulch Federal 36-2 Pit Assessment
WorkOrder: 15031628

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
mg/Kg-dry	Milligrams per Kilogram Dry Weight

ALS Group USA, Corp**Date:** 10-Apr-15

Client: Encana Oil and Gas (USA) Inc.
Project: Shire Gulch Federal 36-2 Pit Assessment
Sample ID: 20150325-SG Federal 36-2 (PITS01) 2.5-4'
Collection Date: 3/25/2015 09:15 AM

Work Order: 15031628
Lab ID: 15031628-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<hr/>							
DIESEL RANGE ORGANICS BY GC-FID			Method: SW8015M		Prep: SW3541 / 3/30/15		Analyst: IT
DRO (C10-C28)	18		1.6	4.9	mg/Kg-dry	1	3/31/2015 16:37
Surr: 4-Terphenyl-d14	57.4			39-133	%REC	1	3/31/2015 16:37
MOISTURE			Method: E160.3M				Analyst: EVB
Moisture	18		0.025	0.050	% of sample	1	4/1/2015 14:00

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

ALS Group USA, Corp

Date: 10-Apr-15

Client: Encana Oil and Gas (USA) Inc.
Project: Shire Gulch Federal 36-2 Pit Assessment
Sample ID: 20150325-SG Federal 36-2 (PITS01) 17-19'
Collection Date: 3/25/2015 09:25 AM

Work Order: 15031628
Lab ID: 15031628-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<hr/>							
DIESEL RANGE ORGANICS BY GC-FID			Method: SW8015M		Prep: SW3541 / 3/30/15		Analyst: IT
DRO (C10-C28)	7.3		1.6	4.7	mg/Kg-dry	1	3/31/2015 17:07
Surr: 4-Terphenyl-d14	72.5			39-133	%REC	1	3/31/2015 17:07
MOISTURE			Method: E160.3M				Analyst: EVB
Moisture	13		0.025	0.050	% of sample	1	4/1/2015 14:00

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

ALS Group USA, Corp

Date: 10-Apr-15

Client: Encana Oil and Gas (USA) Inc.
Project: Shire Gulch Federal 36-2 Pit Assessment
Sample ID: 20150325-SG Federal 36-2 (PITS02) 5-7'
Collection Date: 3/25/2015 09:25 AM

Work Order: 15031628
Lab ID: 15031628-03
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<hr/>							
DIESEL RANGE ORGANICS BY GC-FID			Method: SW8015M		Prep: SW3541 / 3/30/15		Analyst: IT
DRO (C10-C28)	13		1.6	4.7	mg/Kg-dry	1	3/31/2015 17:37
Surr: 4-Terphenyl-d14	63.0			39-133	%REC	1	3/31/2015 17:37
MOISTURE			Method: E160.3M				Analyst: EVB
Moisture	15		0.025	0.050	% of sample	1	4/1/2015 14:00

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

ALS Group USA, Corp

Date: 10-Apr-15

Client: Encana Oil and Gas (USA) Inc.
Project: Shire Gulch Federal 36-2 Pit Assessment
Sample ID: 20150325-SG Federal 36-2 (PITS02) 15-17'
Collection Date: 3/25/2015 09:45 AM

Work Order: 15031628
Lab ID: 15031628-04
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<hr/>							
DIESEL RANGE ORGANICS BY GC-FID			Method: SW8015M		Prep: SW3541 / 3/30/15		Analyst: IT
DRO (C10-C28)	11		1.5	4.6	mg/Kg-dry	1	3/31/2015 18:07
Surr: 4-Terphenyl-d14	62.0			39-133	%REC	1	3/31/2015 18:07
MOISTURE			Method: E160.3M				Analyst: EVB
Moisture	10		0.025	0.050	% of sample	1	4/1/2015 14:00

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

ALS Group USA, Corp

Date: 10-Apr-15

Client: Encana Oil and Gas (USA) Inc.
Work Order: 15031628
Project: Shire Gulch Federal 36-2 Pit Assessment

QC BATCH REPORT

Batch ID: **69205** Instrument ID **GC8** Method: **SW8015M**

MBLK		Sample ID: DBLKS1-69205-69205				Units: mg/Kg		Analysis Date: 3/31/2015 10:06 AM		
Client ID:		Run ID: GC8_150331A				SeqNo: 3203681		Prep Date: 3/30/2015		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	1.557	0	2	0	77.8	39-133	0			

LCS		Sample ID: DLCSS1-69205-69205				Units: mg/Kg		Analysis Date: 3/31/2015 10:36 AM		
Client ID:		Run ID: GC8_150331A				SeqNo: 3203682		Prep Date: 3/30/2015		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	173.2	5.0	200	0	86.6	61-109	0			
Surr: 4-Terphenyl-d14	1.278	0	2	0	63.9	39-133	0			

MS		Sample ID: 15031629-01A MS				Units: mg/Kg		Analysis Date: 3/31/2015 11:07 AM		
Client ID:		Run ID: GC8_150331A				SeqNo: 3203683		Prep Date: 3/30/2015		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	305.5	8.3	331	0	92.3	48-110	0			
Surr: 4-Terphenyl-d14	2.228	0	3.31	0	67.3	39-133	0			

MSD		Sample ID: 15031629-01A MSD				Units: mg/Kg		Analysis Date: 3/31/2015 11:36 AM		
Client ID:		Run ID: GC8_150331A				SeqNo: 3203684		Prep Date: 3/30/2015		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	270.9	7.8	312.8	0	86.6	48-110	305.5	12	30	
Surr: 4-Terphenyl-d14	1.983	0	3.128	0	63.4	39-133	2.228	11.7	30	

The following samples were analyzed in this batch:

15031628-01A	15031628-02A	15031628-03A
15031628-04A		

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

Client: Encana Oil and Gas (USA) Inc.
Work Order: 15031628
Project: Shire Gulch Federal 36-2 Pit Assessment

QC BATCH REPORT

Batch ID: **R160388** Instrument ID **MOIST** Method: **E160.3M**

MBLK		Sample ID: WBLKS-R160388				Units: % of sample		Analysis Date: 4/1/2015 02:00 PM		
Client ID:		Run ID: MOIST_150401A				SeqNo: 3206632		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-R160388				Units: % of sample		Analysis Date: 4/1/2015 02:00 PM		
Client ID:		Run ID: MOIST_150401A				SeqNo: 3206631		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: 15031626-01A DUP				Units: % of sample		Analysis Date: 4/1/2015 02:00 PM		
Client ID:		Run ID: MOIST_150401A				SeqNo: 3206589		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 14.61 0.050 0 0 0 14.88 1.83 20

DUP		Sample ID: 15031629-04A DUP				Units: % of sample		Analysis Date: 4/1/2015 02:00 PM		
Client ID:		Run ID: MOIST_150401A				SeqNo: 3206615		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 17.6 0.050 0 0 0 17.48 0.684 20

The following samples were analyzed in this batch:

15031628-01A	15031628-02A	15031628-03A
15031628-04A		

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

15031628

**ALS Laboratory Group**

CHAIN OF CUSTODY

Failure to complete all section of this form may delay analysis.

COC number (for client tracking)

Page 1 of 1

[illegible]

te: (a) DW (Drinking water), SW (Surface water), GW (Ground water), WW (Waste water), S (Soil), SL (Sludge), SE (Sediment), OS (Other solid material)

S Technichem (HK) Pty Ltd Address: 11/F, Chung Shun Knitting Centre, 1-3 Wing Yip Street, Kwai Chung, N.T., Hong Kong Tel: +852 2610 1044 Fax: +852 2610 2021 Email: HongKong@elsglobal.com

4.27

Sample Receipt Checklist

Client Name: **ENCANA2**

Date/Time Received: **27-Mar-15 09:30**

Work Order: **15031628**

Received by: **KRW**

Checklist completed by Keith Wurenga
eSignature

27-Mar-15
Date

Reviewed by: Chad Whelton
eSignature

27-Mar-15
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>4.2 C</u>		<u>SR2</u>
Cooler(s)/Kit(s):	<u></u>		
Date/Time sample(s) sent to storage:	<u>3/27/2015 1:46:28 PM</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: