



18-Dec-2019

Natalie Steiner
XTO Energy
21459 CR5
Rifle, CO 81650

Re: **YCF 3-45-1**

Work Order: **19120991**

Dear Natalie,

ALS Environmental received 6 samples on 13-Dec-2019 09:15 AM for the analyses presented in the following report.

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

Sample results are compliant with industry accepted practices and Quality Control 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 15.

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

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

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

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

Report of Laboratory Analysis

Certificate No: MN 026-999-449

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

Environmental 

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Client: XTO Energy
Project: YCF 3-45-1
Work Order: 19120991

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>
19120991-01	#1	Soil		12/11/2019 09:30	12/13/2019 09:15	<input type="checkbox"/>
19120991-02	#2	Soil		12/11/2019 09:30	12/13/2019 09:15	<input type="checkbox"/>
19120991-03	#3	Soil		12/11/2019 09:36	12/13/2019 09:15	<input type="checkbox"/>
19120991-04	#4	Soil		12/11/2019 09:40	12/13/2019 09:15	<input type="checkbox"/>
19120991-05	#5	Soil		12/11/2019 09:40	12/13/2019 09:15	<input type="checkbox"/>
19120991-06	#6	Soil		12/11/2019 09:45	12/13/2019 09:15	<input type="checkbox"/>

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
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 Reporting Limit, 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
mmhos/cm @25°C	Millimhos-Centimeter at 25 Degrees Celcius

ALS Group, USA

Date: 18-Dec-19

Client: XTO Energy

Project: YCF 3-45-1

Sample ID: #1

Collection Date: 12/11/2019 09:30 AM

Work Order: 19120991

Lab ID: 19120991-01

Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<hr/>							
METALS BY ICP-MS			Method: SW6020A		Prep: SW3050B / 12/16/19		Analyst: STP
Arsenic	6.8		0.058	0.48	mg/Kg-dry	1	12/16/2019 22:00
ELECTRICAL CONDUCTIVITY (SAR)			Method: USDA H60 METHOD 2		Prep: USDA Method 20B / 12/18/19		Analyst: DD
Electrical Conductivity @ Saturation	1.1		0.011	0.10	mmhos/cm @25°	20	12/18/2019 16:50
MOISTURE			Method: SW3550C				Analyst: KTP
Moisture	22		0.10	0.10	% of sample	1	12/13/2019 15:24

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

ALS Group, USA

Date: 18-Dec-19

Client: XTO Energy

Project: YCF 3-45-1

Sample ID: #2

Collection Date: 12/11/2019 09:30 AM

Work Order: 19120991

Lab ID: 19120991-02

Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			Method: SW6020A		Prep: SW3050B / 12/16/19	Analyst: STP	
Arsenic	6.3		0.062	0.52	mg/Kg-dry	1	12/16/2019 22:02
ELECTRICAL CONDUCTIVITY (SAR)			Method: USDA H60 METHOD 2		Prep: USDA Method 20B / 12/18/19	Analyst: DD	
Electrical Conductivity @ Saturation	0.39		0.011	0.10	mmhos/cm @25°	20	12/18/2019 16:50
MOISTURE			Method: SW3550C			Analyst: KTP	
Moisture	22		0.10	0.10	% of sample	1	12/13/2019 15:24

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

ALS Group, USA

Date: 18-Dec-19

Client: XTO Energy

Project: YCF 3-45-1

Sample ID: #3

Collection Date: 12/11/2019 09:36 AM

Work Order: 19120991

Lab ID: 19120991-03

Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			Method: SW6020A		Prep: SW3050B / 12/16/19	Analyst: STP	
Arsenic	4.8		0.057	0.48	mg/Kg-dry	1	12/16/2019 22:04
ELECTRICAL CONDUCTIVITY (SAR)			Method: USDA H60 METHOD 2		Prep: USDA Method 20B / 12/18/19	Analyst: DD	
Electrical Conductivity @ Saturation	0.97		0.011	0.10	mmhos/cm @25°	20	12/18/2019 16:50
MOISTURE			Method: SW3550C			Analyst: KTP	
Moisture	21		0.10	0.10	% of sample	1	12/13/2019 15:24

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

ALS Group, USA

Date: 18-Dec-19

Client: XTO Energy

Project: YCF 3-45-1

Sample ID: #4

Collection Date: 12/11/2019 09:40 AM

Work Order: 19120991

Lab ID: 19120991-04

Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS			Method: SW6020A		Prep: SW3050B / 12/16/19	Analyst: STP	
Arsenic	4.8		0.049	0.41	mg/Kg-dry	1	12/16/2019 22:06
ELECTRICAL CONDUCTIVITY (SAR)			Method: USDA H60 METHOD 2		Prep: USDA Method 20B / 12/18/19	Analyst: DD	
Electrical Conductivity @ Saturation	0.79		0.011	0.10	mmhos/cm @25°	20	12/18/2019 16:50
MOISTURE			Method: SW3550C			Analyst: KTP	
Moisture	19		0.10	0.10	% of sample	1	12/13/2019 15:24

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

ALS Group, USA

Date: 18-Dec-19

Client: XTO Energy

Project: YCF 3-45-1

Sample ID: #5

Collection Date: 12/11/2019 09:40 AM

Work Order: 19120991

Lab ID: 19120991-05

Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<hr/>							
METALS BY ICP-MS			Method: SW6020A		Prep: SW3050B / 12/16/19		Analyst: STP
Arsenic	2.9		0.059	0.49	mg/Kg-dry	1	12/16/2019 22:08
ELECTRICAL CONDUCTIVITY (SAR)			Method: USDA H60 METHOD 2		Prep: USDA Method 20B / 12/18/19		Analyst: DD
Electrical Conductivity @ Saturation	0.77		0.011	0.10	mmhos/cm @25°	20	12/18/2019 16:50
MOISTURE			Method: SW3550C				Analyst: KTP
Moisture	20		0.10	0.10	% of sample	1	12/16/2019 10:13

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

ALS Group, USA

Date: 18-Dec-19

Client: XTO Energy

Project: YCF 3-45-1

Sample ID: #6

Collection Date: 12/11/2019 09:45 AM

Work Order: 19120991

Lab ID: 19120991-06

Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS							
Arsenic	4.7		Method: SW6020A 0.054	0.45	mg/Kg-dry	Prep: SW3050B / 12/16/19 1	Analyst: STP 12/16/2019 22:43
ELECTRICAL CONDUCTIVITY (SAR)							
Electrical Conductivity @ Saturation	0.61		Method: USDA H60 METHOD 2 0.011	0.10	mmhos/cm @25°	Prep: USDA Method 20B / 12/18/19 20	Analyst: DD 12/18/2019 16:50
MOISTURE							
Moisture	19		Method: SW3550C 0.10	0.10	% of sample	1	Analyst: KTP 12/16/2019 10:13

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

Client: XTO Energy
Work Order: 19120991
Project: YCF 3-45-1

QC BATCH REPORT

Batch ID: **147192** Instrument ID **ICPMS3** Method: **SW6020A**

MBLK		Sample ID: MBLK-147192-147192				Units: mg/Kg		Analysis Date: 12/16/2019 09:18 P		
Client ID:		Run ID: ICPMS3_191216B				SeqNo: 6131742		Prep Date: 12/16/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Arsenic U 0.25

LCS		Sample ID: LCS-147192-147192				Units: mg/Kg		Analysis Date: 12/16/2019 09:20 P		
Client ID:		Run ID: ICPMS3_191216B				SeqNo: 6131743		Prep Date: 12/16/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Arsenic 5.005 0.25 5 0 100 80-120 0

MS		Sample ID: 19120991-06AMS				Units: mg/Kg		Analysis Date: 12/16/2019 10:45 P		
Client ID: #6		Run ID: ICPMS3_191216B				SeqNo: 6131793		Prep Date: 12/16/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Arsenic 9.926 0.36 7.184 3.807 85.2 75-125 0

MSD		Sample ID: 19120991-06AMSD				Units: mg/Kg		Analysis Date: 12/16/2019 10:47 P		
Client ID: #6		Run ID: ICPMS3_191216B				SeqNo: 6131794		Prep Date: 12/16/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Arsenic 9.716 0.36 7.225 3.807 81.8 75-125 9.926 2.14 20

The following samples were analyzed in this batch:

19120991-01A	19120991-02A	19120991-03A
19120991-04A	19120991-05A	19120991-06A

Client: XTO Energy
 Work Order: 19120991
 Project: YCF 3-45-1

QC BATCH REPORT

Batch ID: **147311** Instrument ID **WETCHEM** Method: **USDA H60 Metho**

MBLK		Sample ID: MB-R277989-147311				Units: mmhos/cm @25°		Analysis Date: 12/18/2019 04:50 P		
Client ID:		Run ID: WETCHEM_191218[SeqNo: 6139428		Prep Date: 12/18/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Electrical Conductivity @ Saturation U 0.0050

DUP		Sample ID: 19120991-02A DUP				Units: mmhos/cm @25°		Analysis Date: 12/18/2019 04:50 P		
Client ID: #2		Run ID: WETCHEM_191218[SeqNo: 6139432		Prep Date: 12/18/2019		DF: 20
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Electrical Conductivity @ Saturation 0.426 0.10 0 0 0 0.391 8.57 50

LCS1		Sample ID: LCS 1-147311				Units: mmhos/cm @25°		Analysis Date: 12/18/2019 04:50 P		
Client ID:		Run ID: WETCHEM_191218[SeqNo: 6139429		Prep Date: 12/18/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Electrical Conductivity @ Saturation 0.01508 0.0050 0.0149 0 101 92-111 0

LCS2		Sample ID: LCS 2-147311				Units: mmhos/cm @25°		Analysis Date: 12/18/2019 04:50 P		
Client ID:		Run ID: WETCHEM_191218[SeqNo: 6139437		Prep Date: 12/18/2019		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Electrical Conductivity @ Saturation 0.611 0.0050 0.592 0 103 88-114 0

The following samples were analyzed in this batch:

19120991-01A	19120991-02A	19120991-03A
19120991-04A	19120991-05A	19120991-06A

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

Client: XTO Energy
 Work Order: 19120991
 Project: YCF 3-45-1

QC BATCH REPORT

Batch ID: **R277662** Instrument ID **MOIST** Method: **SW3550C**

MBLK		Sample ID: WBLKS-R277662				Units: % of sample		Analysis Date: 12/13/2019 03:24 P		
Client ID:		Run ID: MOIST_191213C				SeqNo: 6129240		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture U 0.10

LCS		Sample ID: LCS-R277662				Units: % of sample		Analysis Date: 12/13/2019 03:24 P		
Client ID:		Run ID: MOIST_191213C				SeqNo: 6129239		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 99.99 0.10 100 0 100 98-102 0

DUP		Sample ID: 19120991-03A DUP				Units: % of sample		Analysis Date: 12/13/2019 03:24 P		
Client ID: #3		Run ID: MOIST_191213C				SeqNo: 6129236		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 21.34 0.10 0 0 0 0-0 20.87 2.23 10

The following samples were analyzed in this batch:

19120991-01A	19120991-02A	19120991-03A
19120991-04A		

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

Client: XTO Energy
Work Order: 19120991
Project: YCF 3-45-1

QC BATCH REPORT

Batch ID: **R277803** Instrument ID **MOIST** Method: **SW3550C**

MBLK		Sample ID: WBLKS-R277803				Units: % of sample		Analysis Date: 12/16/2019 10:13 A		
Client ID:		Run ID: MOIST_191216A				SeqNo: 6134314		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture U 0.10

LCS		Sample ID: LCS-R277803				Units: % of sample		Analysis Date: 12/16/2019 10:13 A		
Client ID:		Run ID: MOIST_191216A			SeqNo: 6134313		Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 100 0.10 100 0 100 98-102 0

DUP				Sample ID: 19120894-01A DUP				Units: % of sample			Analysis Date: 12/16/2019 10:13 A												
Client ID:				Run ID: MOIST_191216A				SeqNo: 6134293			Prep Date:		DF: 1										
Analyte				Result		PQL		SPK Val		SPK Ref Value		%REC		Control Limit		RPD Ref Value		%RPD		RPD Limit		Qual	

Moisture 83.74 0.10 0 0 0 0-0 83.82 0.0955 10

DUP		Sample ID: 19121078-01A DUP				Units: % of sample		Analysis Date: 12/16/2019 10:13 A		
Client ID:		Run ID: MOIST_191216A		SeqNo: 6134303		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 91.35 0.10 0 0 0 0-0 90.98 0.406 10

The following samples were analyzed in this batch:

19120991-05A	19120991-06A
--------------	--------------

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

CHAIN OF CUSTODY

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

COC number (for client tracking)

COC number (for client tracking)
19120991

Page 1 of 1

[illegible]

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

ALS 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@alsglobal.com

SR2 3.2~

Sample Receipt Checklist

Client Name: **XTO - CO**

Date/Time Received: **13-Dec-19 09:15**

Work Order: **19120991**

Received by: **DS**

Checklist completed by Diane Shaw
eSignature

13-Dec-19
Date

Reviewed by: Chad Whelton
eSignature

13-Dec-19
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>3.2/3.2 c</u>		<u>SR2</u>
Cooler(s)/Kit(s):	<u></u>		
Date/Time sample(s) sent to storage:	<u>12/13/2019 10:33:52 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: