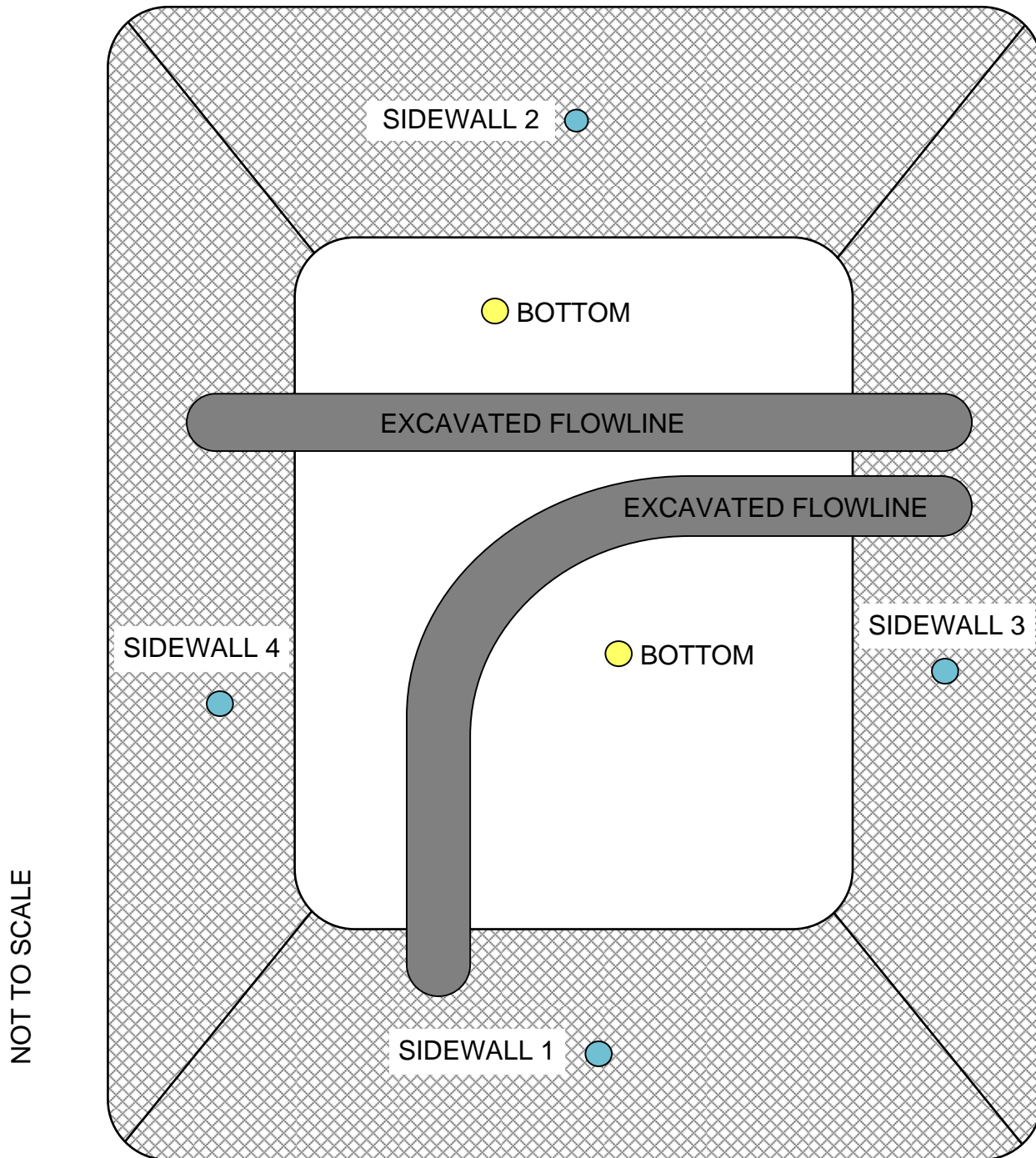


# ACCESS ROAD TO THE YCF 3-45 LOCATION



## LEGEND



COMPOSITE  
SOIL SUB-  
SAMPLE  
LOCATION



GRAB SOIL  
SAMPLE  
LOCATION

PROJECT NO: 015-0831  
DRAWN BY: JLD  
DATE: 5/4/2015

**YCF 3-45 Flowline  
Confirmation Soil Sampling Schematic**  
BOPCO, L.P.  
Section 3, Township 1S, Range 98W  
Rio Blanco County, CO



760 Horizon Drive, Suite 102  
Grand Junction, CO 81506  
TEL 970.263.7800  
FAX 970.263.7456

Figure

1

**Table 1**  
**BOPCO LINE LEAK SAMPLING**  
**Soil Sample Summary**

LABORATORY DATA SUMMARY											
Sampling Event	Initial Sampling 3/26/15			Confirmation Sampling 4/22/15						ALLOWABLE LIMITS	UNITS
Sample ID	SS1	CS1	BG1	Sidewall 1	Sidewall 2	Sidewall 3	Sidewall 4	Bottom	Backfill		
Location Description	Excavation	Excavation	Background	Excavation	Excavation	Excavation	Excavation	Excavation	Excavated Pile		
Sample Depth Below Grade	4'	3'	2-6"	4'	4'	4'	4'	6'	NA		
Sample Type	Grab	Composite	Background	Grab	Grab	Grab	Grab	Composite	Composite		
ANALYTICAL PARAMETERS											
Gasoline Range Organics	5600	61	NT	ND	ND	ND	ND	ND	58	--	mg/kg
Diesel Range Organics	6000	140	NT	33	45	32	ND	50	230	--	mg/kg
Total TPH	11600	201	NT	33	45	32	0	50	288	500	mg/kg
BTX											
Benzene	ND	ND	NT	NT	NT	NT	NT	NT	NT	0.17	mg/kg
Toluene	40	ND	NT	NT	NT	NT	NT	NT	NT	85	mg/kg
Ethylbenzene	10	ND	NT	NT	NT	NT	NT	NT	NT	100	mg/kg
Xylenes, total	390	0.230	NT	ND	ND	ND	ND	ND	ND	175	mg/kg
Organics											
Acenaphthene	ND	ND	NT	NT	NT	NT	NT	NT	NT	1,000	mg/kg
Acenaphthylene	ND	ND	NT	NT	NT	NT	NT	NT	NT	NA	mg/kg
Anthracene	ND	ND	NT	NT	NT	NT	NT	NT	NT	1,000	mg/kg
Benzo(A)anthracene	ND	ND	NT	NT	NT	NT	NT	NT	NT	0.22	mg/kg
Benzo(A)pyrene	ND	ND	NT	NT	NT	NT	NT	NT	NT	0.022	mg/kg
Benzo(B)fluoranthene	ND	ND	NT	NT	NT	NT	NT	NT	NT	0.22	mg/kg
Benzo(G,H,I)perylene	ND	ND	NT	NT	NT	NT	NT	NT	NT	NA	mg/kg
Benzo(K)fluoranthene	ND	ND	NT	NT	NT	NT	NT	NT	NT	2.2	mg/kg
Chrysene	ND	ND	NT	NT	NT	NT	NT	NT	NT	22	mg/kg
Dibenzo(A,H)anthracene	ND	ND	NT	NT	NT	NT	NT	NT	NT	0.022	mg/kg
Fluoranthene	ND	ND	NT	NT	NT	NT	NT	NT	NT	1,000	mg/kg
Flourene	1.1	ND	NT	NT	NT	NT	NT	NT	NT	1,000	mg/kg
Indeno(1,2,3,C,D)pyrene	ND	ND	NT	NT	NT	NT	NT	NT	NT	0.22	mg/kg
Naphthalene	2.9	ND	NT	NT	NT	NT	NT	NT	NT	23	mg/kg
Pyrene	ND	ND	NT	NT	NT	NT	NT	NT	NT	1,000	mg/kg
Metals											
Arsenic	5.2*	6.4*	5.7*	NT	NT	NT	NT	NT	NT	0.39	mg/kg
Barium	470	260	NT	NT	NT	NT	NT	NT	NT	15,000	mg/kg
Cadmium	ND	ND	NT	NT	NT	NT	NT	NT	NT	70	mg/kg
Chromium	39	38	NT	NT	NT	NT	NT	NT	NT	120,000	mg/kg
Copper	18	17	NT	NT	NT	NT	NT	NT	NT	3,100	mg/kg
Lead	14	13	NT	NT	NT	NT	NT	NT	NT	400	mg/kg
Mercury	0.046	ND	NT	NT	NT	NT	NT	NT	NT	23	mg/kg
Nickel	19	19	NT	NT	NT	NT	NT	NT	NT	1,600	mg/kg
Selenium	ND	ND	NT	NT	NT	NT	NT	NT	NT	390	mg/kg
Silver	ND	ND	NT	NT	NT	NT	NT	NT	NT	390	mg/kg
Zinc	65	63	NT	NT	NT	NT	NT	NT	NT	23,000	mg/kg
General Chemistry											
Chromium, Hexavalent	ND	ND	NT	NT	NT	NT	NT	NT	NT	23	mg/kg
Chromium, Trivalent	39	37	NT	NT	NT	NT	NT	NT	NT	120,000	mg/kg
Sodium Adsorption Ratio	18	21	NT	NT	NT	NT	NT	NT	NT	< 12	ratio
Electrical Conductivity	18	18	NT	NT	NT	NT	NT	NT	NT	NA	mmhos/cm
pH	8.1	7.9	NT	NT	NT	NT	NT	NT	NT	6-9	

## - Above Allowable Limit

mg/kg - milligrams per kilogram

mmhos/cm - millimhos per centimeter

ND - not detected

NT - not tested

\* Arsenic in the "Initial Sampling" samples is above allowable limits, but within a reasonable deviation from the natural background level at the site.

## Attachment 1

## Waste Characterization Plan

LANDFARM WASTE CHARACTERIZATION DATA  
GENERATOR INFORMATION

NAME: BOPCO LP WASTE INFORMATION  
ADDRESS: CR 20 PO BOX 237 Dinosaur CO 81610 Location/Place of Origin: YCF 3-45-1  
PHONE: 970 220 2236 FAX: DLONG@BASSFIS.COM Description of Waste:  
BILLING ADDRESS: PO BOX 237 Dinosaur CO 81610 Address: YCF 345-1 CR 20  
CONTACT: DALE LONG PHONE: 970 220 2236

## PROCESS GENERATING WASTE

☐ RCRA Exempt E&P Activity☐ Other Activity

## ESTIMATED VOLUME &amp; FREQUENCY

Estimated QUANTITY: 40 <sup>700's</sup> PER: \_\_\_\_\_

## REGULATORY QUESTIONS

Is there contamination other than E&amp;P exempt petroleum hydrocarbon?

☐ Yes ☒ NoFuels mixed with solids? If so, please explain below.  
(i.e. Diesel fuel added as fracing ingredient.)☐ Yes ☒ No

Is the solid waste specifically excluded from hazardous waste Regulations in 40 CFR Part 261.4(b)(5) as drilling fluids, produced water, and other wastes associated

☒ Yes ☐ No

with the exploration, development, or production of crude oil, natural gas or geothermal energy?

Does the solid waste pass a paint filter test (i.e., no free liquids) NO FREE LIQUIDS ☐ Yes ☐ NoIs the solid waste ignitable, corrosive or reactive?  
If so, please explain below.☐ Yes ☒ No

Is any of the contamination from or mixed with a non-specific source listed in 40CFR Part 261.31 (F Codes)?

☐ Yes ☒ No

Is any of the contamination from or mixed with a non-specific source listed in 40CFR Part 261.32 (K, P, U Codes)?

☐ Yes ☒ No

Are there any metal additives, filings/cuttings in the solids?

☐ Yes ☒ No

Are there any oils/grease in the solids?

☐ Yes ☐ No

COMMENTS: \_\_\_\_\_

## WASTE CONTAMINANT CHARACTERIZATION

(Required Analytical Test Methods\*)

RCRA 8 Metals (TCLP 1311): \_\_\_\_\_

Volatile Organics (EPA 8260): \_\_\_\_\_

Total Petroleum Hydrocarbons\* TVH/GRO, TEPH/DRO (8015) \_\_\_\_\_

Does the waste contain: ☒ Crude oil ☒ Petroleum Hydrocarbons ☐ Drilling additives or muds ☐ Leaded gasoline ☐ Unleaded gasoline☐ Fuel oil ☐ Diesel ☐ Kerosene ☐ Aviation fuel ☐ Used Oil  
☐ Petroleum Solvents ☐ Other Non-Petroleum Hydrocarbons  
☐ Glycols ☐ Metals ☐ Infectious Waste ☐ Pathogens  
☐ Pesticides ☐ Radioactive Materials  
☐ RCRA 8 Metals

## CONTAMINANT DETERMINATION

The information listed is based on:

☒ Knowledge of Process ☐ Independent Analysis ☐ MSDS ☐ Other☐ Non-Hazardous ☐ HazardousAnalysis attached: ☐ Yes ☒ No

\*RNI may request additional analytical tests to characterize and accept the waste.

\*As requested.

CLIENT'S AUTHORIZED SIGNATORY: I hereby certify that I have authority as generator or agent for the generator to enter into this agreement. I hereby certify that all information submitted, in this and all attached documents are complete and accurate to the best of my knowledge and ability to determine, that no deliberate or willful omission of chemical physical composition or properties exists, and that all known or suspected hazards have been disclosed. I further certify that I have read, understood and accepted all terms and conditions of this document.

SIGNATURE: Dale LongPRINT NAME: DALE LONGTITLE: Production ForemanDATE: 4-27-15

REVIEWED AND ACCEPTED BY

SIGNATURE: Terry GrinsteadPRINT NAME: Terry GrinsteadTITLE: Oper.DATE: 4-27-15

**NOTE:** Laboratory Analytical Reports must be submitted with the Characterization Data form.





WATER DISPOSAL TICKET  
RN INDUSTRIES/DALBO TRUCKING  
BOX 98 • ROOSEVELT, UT 84066  
OFFICE 435-722-2800



369564

WATER DISPOSAL TICKET  
DISPOSAL SITES

<input checked="" type="checkbox"/> PICEANCE	<input type="checkbox"/> SEEP RIDGE
<input type="checkbox"/> WONSIT	<input type="checkbox"/> DEBEQUE
<input type="checkbox"/> BLUEBELL	<input type="checkbox"/> PLEASANT VALLEY
<input type="checkbox"/> GLEN BENCH-NORTH	<input type="checkbox"/> ACE
<input type="checkbox"/> GLEN BENCH-SOUTH	<input type="checkbox"/> RANGELY
<input type="checkbox"/> CHAPITA	
DATE	4-27-15
OIL COMPANY	BOPCO
LOCATION	Yellow Cut Comp. Station
API #	Rio Blanco
TRUCK COMPANY	COS
DRIVER	Jimmy Harvett
TRUCK #	T-3 3 Belly
TRUCK TICKET #	

	#BBLs	PRICING/ BBL	TOTAL
<input type="checkbox"/> CHECK HERE IF PUT IN MUD PIT.			
<input type="checkbox"/> CATEGORY 1			
<input type="checkbox"/> PRODUCTION WATER			
<input type="checkbox"/> PIT			
<input type="checkbox"/> OTHER			
<input type="checkbox"/> CATEGORY 2 - DRILLING MUD FLUSH, CEMENT FLUSH, GEL FLUSH, CELLARS, OTHER			
<input type="checkbox"/> CATEGORY 3 - CEMENT, GEL, TREATOR, CLEAN-OUTS, SALT WATER DISPOSAL TANK CLEAN-OUTS, TANK BOTTOMS, OTHER			
<input checked="" type="checkbox"/> CATEGORY 4 - CRUDE OIL SOLIDS, CRUDE OIL & DIRT MIXED, CRUDE OIL CONTAMINATED SOIL	40 Ton		
<input type="checkbox"/> FRESH WATER PICKUP			
		TOTAL	

COMMENTS \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

DRIVER SIGNATURE Jimmy Harvett

CUSTOMER SIGNATURE \_\_\_\_\_

ROUTE OR RUN # \_\_\_\_\_

AFE# \_\_\_\_\_

USER# \_\_\_\_\_

CODE# \_\_\_\_\_



09-Apr-2015

Ken Kreie  
Olsson Associates  
760 Horizon Drive  
Suite 102  
Grand Junction, CO 81506

Re: **BopCo Line Spill**

Work Order: **15031587**

Dear Ken,

ALS Environmental received 3 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 28.

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](http://www.alsglobal.com)

RIGHT SOLUTIONS RIGHT PARTNER

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**Client:** Olsson Associates  
**Project:** BopCo Line Spill  
**Work Order:** 15031587**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>
15031587-01	SS1	Soil		3/26/2015 10:00	3/27/2015 09:30	<input type="checkbox"/>
15031587-02	CS1	Soil		3/26/2015 10:15	3/27/2015 09:30	<input type="checkbox"/>
15031587-03	BG1	Soil		3/26/2015 10:30	3/27/2015 09:30	<input type="checkbox"/>

**Client:** Olsson Associates**Project:** BopCo Line Spill**Work Order:** 15031587**Case Narrative**

---

Batch 69267, Method ICP\_6010\_S, Sample 15031587-02A MS/MSD: The MS and/or MSD recoveries were outside of the control limits for Barium, Chromium and Zinc; however, the results in the parent sample are greater than 4x the spike amount. No qualification is required.

Batch 69267, Method ICP\_6010\_S, Sample 15031587-02A MSD: The MSD recovery was above the upper control limit for Silver. However, the MS recovery and RPD between the MS and MSD were within control limits. No qualification is required.

<b><u>Qualifier</u></b>	<b><u>Description</u></b>
*	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.

<b><u>Acronym</u></b>	<b><u>Description</u></b>
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

<b><u>Units Reported</u></b>	<b><u>Description</u></b>
% of sample	Percent of Sample
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter
mmhos/cm @25°C	Millimhos-Centimeter at 25 Degrees Celcius
none	
s.u.	Standard Units



# ALS Group USA, Corp

Date: 09-Apr-15

**Client:** Olsson Associates  
**Project:** BopCo Line Spill  
**Sample ID:** SS1  
**Collection Date:** 3/26/2015 10:00 AM

**Work Order:** 15031587  
**Lab ID:** 15031587-01  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>						
			<b>SW8015M</b>		Prep: SW3541 / 4/3/15	Analyst: <b>IT</b>
<b>DRO (C10-C28)</b>	<b>6,000</b>		<b>48</b>	<b>mg/Kg-dry</b>	10	4/7/2015 05:06 PM
Surr: 4-Terphenyl-d14	74.6		39-133	%REC	10	4/7/2015 05:06 PM
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>						
			<b>SW8015D</b>		Prep: SW5035 / 3/30/15	Analyst: <b>IT</b>
<b>GRO (C6-C10)</b>	<b>5,600</b>		<b>29</b>	<b>mg/Kg-dry</b>	10	4/1/2015 01:02 AM
Surr: Toluene-d8	119		50-150	%REC	10	4/1/2015 01:02 AM
<b>MERCURY BY CVAA</b>						
			<b>SW7471B</b>		Prep: SW7471 / 3/30/15	Analyst: <b>LR</b>
<b>Mercury</b>	<b>0.046</b>		<b>0.014</b>	<b>mg/Kg-dry</b>	1	3/30/2015 09:27 PM
<b>METALS ANALYSIS BY ICP</b>						
			<b>SW846 6010C</b>		Prep: SW3050B / 3/31/15	Analyst: <b>JEC</b>
<b>Arsenic</b>	<b>5.2</b>		<b>0.46</b>	<b>mg/Kg-dry</b>	1	3/31/2015 04:06 PM
<b>Barium</b>	<b>470</b>		<b>0.46</b>	<b>mg/Kg-dry</b>	1	3/31/2015 04:06 PM
Cadmium	ND		0.46	mg/Kg-dry	1	3/31/2015 04:06 PM
<b>Chromium</b>	<b>39</b>		<b>0.46</b>	<b>mg/Kg-dry</b>	1	3/31/2015 04:06 PM
<b>Copper</b>	<b>18</b>		<b>0.46</b>	<b>mg/Kg-dry</b>	1	3/31/2015 04:06 PM
<b>Lead</b>	<b>14</b>		<b>0.46</b>	<b>mg/Kg-dry</b>	1	3/31/2015 04:06 PM
<b>Nickel</b>	<b>19</b>		<b>0.46</b>	<b>mg/Kg-dry</b>	1	3/31/2015 04:06 PM
Selenium	ND		0.46	mg/Kg-dry	1	3/31/2015 04:06 PM
Silver	ND		0.46	mg/Kg-dry	1	3/31/2015 04:06 PM
<b>Zinc</b>	<b>65</b>		<b>0.92</b>	<b>mg/Kg-dry</b>	1	3/31/2015 04:06 PM
<b>SOLUBLE CATIONS FOR SAR</b>						
			<b>SW846 6010C</b>		Prep: USDA Method 20B / 4/1/15	Analyst: <b>JEC</b>
<b>Calcium</b>	<b>1,000</b>		<b>5.0</b>	<b>mg/L</b>	10	4/1/2015 11:16 AM
<b>Magnesium</b>	<b>130</b>		<b>2.0</b>	<b>mg/L</b>	10	4/1/2015 11:16 AM
<b>Sodium</b>	<b>2,300</b>		<b>2.0</b>	<b>mg/L</b>	10	4/1/2015 11:16 AM
<b>SODIUM ADSORPTION RATIO</b>						
			<b>USDA H60 METHO</b>		Prep: USDA Method 20B / 4/1/15	Analyst: <b>JEC</b>
<b>Exchangeable Sodium Percentage</b>	<b>20</b>		<b>0.010</b>	<b>none</b>	1	4/1/2015
<b>Sodium Adsorption Ratio</b>	<b>18</b>		<b>0.010</b>	<b>none</b>	1	4/1/2015
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>						
			<b>SW846 8270D</b>		Prep: SW3541 / 4/6/15	Analyst: <b>RS</b>
Acenaphthene	ND		7.7	µg/Kg-dry	1	4/7/2015 06:42 PM
Acenaphthylene	ND		7.7	µg/Kg-dry	1	4/7/2015 06:42 PM
Anthracene	ND		7.7	µg/Kg-dry	1	4/7/2015 06:42 PM
Benzo(a)anthracene	ND		7.7	µg/Kg-dry	1	4/7/2015 06:42 PM
Benzo(a)pyrene	ND		7.7	µg/Kg-dry	1	4/7/2015 06:42 PM
Benzo(b)fluoranthene	ND		7.7	µg/Kg-dry	1	4/7/2015 06:42 PM
Benzo(g,h,i)perylene	ND		7.7	µg/Kg-dry	1	4/7/2015 06:42 PM
Benzo(k)fluoranthene	ND		7.7	µg/Kg-dry	1	4/7/2015 06:42 PM

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

# ALS Group USA, Corp

Date: 09-Apr-15

**Client:** Olsson Associates  
**Project:** BopCo Line Spill  
**Sample ID:** SS1  
**Collection Date:** 3/26/2015 10:00 AM

**Work Order:** 15031587  
**Lab ID:** 15031587-01  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Chrysene	ND		7.7	µg/Kg-dry	1	4/7/2015 06:42 PM
Dibenzo(a,h)anthracene	ND		7.7	µg/Kg-dry	1	4/7/2015 06:42 PM
Fluoranthene	ND		7.7	µg/Kg-dry	1	4/7/2015 06:42 PM
<b>Fluorene</b>	<b>1,100</b>		<b>7.7</b>	<b>µg/Kg-dry</b>	1	4/7/2015 06:42 PM
Indeno(1,2,3-cd)pyrene	ND		7.7	µg/Kg-dry	1	4/7/2015 06:42 PM
<b>Naphthalene</b>	<b>2,900</b>		<b>77</b>	<b>µg/Kg-dry</b>	10	4/8/2015 04:36 PM
Pyrene	ND		7.7	µg/Kg-dry	1	4/7/2015 06:42 PM
Surr: 2-Fluorobiphenyl	55.8		12-100	%REC	1	4/7/2015 06:42 PM
Surr: 4-Terphenyl-d14	80.7		25-137	%REC	1	4/7/2015 06:42 PM
Surr: Nitrobenzene-d5	99.4		37-107	%REC	1	4/7/2015 06:42 PM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260B</b>	Prep: SW5035 / 3/29/15		Analyst: <b>AK</b>
Benzene	ND		710	µg/Kg-dry	20	4/9/2015 02:18 AM
<b>Ethylbenzene</b>	<b>10,000</b>		<b>710</b>	<b>µg/Kg-dry</b>	20	4/9/2015 02:18 AM
<b>m,p-Xylene</b>	<b>340,000</b>		<b>7,100</b>	<b>µg/Kg-dry</b>	100	4/7/2015 09:27 PM
<b>o-Xylene</b>	<b>62,000</b>		<b>710</b>	<b>µg/Kg-dry</b>	20	4/9/2015 02:18 AM
<b>Toluene</b>	<b>40,000</b>		<b>710</b>	<b>µg/Kg-dry</b>	20	4/9/2015 02:18 AM
<b>Xylenes, Total</b>	<b>390,000</b>		<b>11,000</b>	<b>µg/Kg-dry</b>	100	4/7/2015 09:27 PM
Surr: 1,2-Dichloroethane-d4	113		70-130	%REC	20	4/9/2015 02:18 AM
Surr: 1,2-Dichloroethane-d4	108		70-130	%REC	100	4/7/2015 09:27 PM
Surr: 4-Bromofluorobenzene	99.7		70-130	%REC	20	4/9/2015 02:18 AM
Surr: 4-Bromofluorobenzene	95.2		70-130	%REC	100	4/7/2015 09:27 PM
Surr: Dibromofluoromethane	95.0		70-130	%REC	20	4/9/2015 02:18 AM
Surr: Dibromofluoromethane	90.6		70-130	%REC	100	4/7/2015 09:27 PM
Surr: Toluene-d8	99.2		70-130	%REC	20	4/9/2015 02:18 AM
Surr: Toluene-d8	94.0		70-130	%REC	100	4/7/2015 09:27 PM
<b>ELECTRICAL CONDUCTIVITY (SAR)</b>			<b>USDA H60 METHO</b>	Prep: USDA Method 20B / 4/1/15		Analyst: <b>JB</b>
<b>Electrical Conductivity @ Saturation</b>	<b>18</b>		<b>0.050</b>	<b>mmhos/cm @2</b>	10	4/1/2015 10:50 AM
<b>CHROMIUM, TRIVALENT</b>			<b>CALCULATION</b>			Analyst: <b>JJG</b>
<b>Chromium, Trivalent</b>	<b>39</b>		<b>0.59</b>	<b>mg/Kg-dry</b>	1	4/2/2015 08:17 AM
<b>CHROMIUM, HEXAVALENT</b>			<b>SW7196A</b>	Prep: SW3060A / 3/31/15		Analyst: <b>EE</b>
<b>Chromium, Hexavalent</b>	ND		1.2	mg/Kg-dry	1	3/31/2015 03:45 PM
<b>MOISTURE</b>			<b>E160.3M</b>			Analyst: <b>EVB</b>
<b>Moisture</b>	<b>15</b>		<b>0.050</b>	<b>% of sample</b>	1	4/6/2015 05:45 PM
<b>PH</b>			<b>SW9045D</b>	Prep: EXTRACT / 3/27/15		Analyst: <b>JRF</b>
<b>pH</b>	<b>8.1</b>			<b>s.u.</b>	1	3/27/2015 03:30 PM

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

# ALS Group USA, Corp

Date: 09-Apr-15

**Client:** Olsson Associates  
**Project:** BopCo Line Spill  
**Sample ID:** CS1  
**Collection Date:** 3/26/2015 10:15 AM

**Work Order:** 15031587  
**Lab ID:** 15031587-02  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>						
			<b>SW8015M</b>		Prep: SW3541 / 4/3/15	Analyst: <b>IT</b>
<b>DRO (C10-C28)</b>	<b>140</b>		<b>4.9</b>	<b>mg/Kg-dry</b>	<b>1</b>	4/3/2015 09:47 PM
Surr: 4-Terphenyl-d14	68.0		39-133	%REC	1	4/3/2015 09:47 PM
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>						
			<b>SW8015D</b>		Prep: SW5035 / 3/30/15	Analyst: <b>IT</b>
<b>GRO (C6-C10)</b>	<b>61</b>		<b>3.0</b>	<b>mg/Kg-dry</b>	<b>1</b>	4/1/2015 12:35 PM
Surr: Toluene-d8	117		50-150	%REC	1	4/1/2015 12:35 PM
<b>MERCURY BY CVAA</b>						
			<b>SW7471B</b>		Prep: SW7471 / 3/30/15	Analyst: <b>LR</b>
Mercury	ND		0.015	mg/Kg-dry	1	3/30/2015 09:30 PM
<b>METALS ANALYSIS BY ICP</b>						
			<b>SW846 6010C</b>		Prep: SW3050B / 3/31/15	Analyst: <b>JEC</b>
<b>Arsenic</b>	<b>6.4</b>		<b>0.44</b>	<b>mg/Kg-dry</b>	<b>1</b>	3/31/2015 04:12 PM
<b>Barium</b>	<b>260</b>		<b>0.44</b>	<b>mg/Kg-dry</b>	<b>1</b>	3/31/2015 04:12 PM
Cadmium	ND		0.44	mg/Kg-dry	1	3/31/2015 04:12 PM
<b>Chromium</b>	<b>38</b>		<b>0.44</b>	<b>mg/Kg-dry</b>	<b>1</b>	3/31/2015 04:12 PM
<b>Copper</b>	<b>17</b>		<b>0.44</b>	<b>mg/Kg-dry</b>	<b>1</b>	3/31/2015 04:12 PM
<b>Lead</b>	<b>13</b>		<b>0.44</b>	<b>mg/Kg-dry</b>	<b>1</b>	3/31/2015 04:12 PM
<b>Nickel</b>	<b>19</b>		<b>0.44</b>	<b>mg/Kg-dry</b>	<b>1</b>	3/31/2015 04:12 PM
Selenium	ND		0.44	mg/Kg-dry	1	3/31/2015 04:12 PM
Silver	ND		0.44	mg/Kg-dry	1	3/31/2015 04:12 PM
<b>Zinc</b>	<b>63</b>		<b>0.88</b>	<b>mg/Kg-dry</b>	<b>1</b>	3/31/2015 04:12 PM
<b>SOLUBLE CATIONS FOR SAR</b>						
			<b>SW846 6010C</b>		Prep: USDA Method 20B / 4/1/15	Analyst: <b>JEC</b>
<b>Calcium</b>	<b>680</b>		<b>5.0</b>	<b>mg/L</b>	<b>10</b>	4/1/2015 11:22 AM
<b>Magnesium</b>	<b>190</b>		<b>2.0</b>	<b>mg/L</b>	<b>10</b>	4/1/2015 11:22 AM
<b>Sodium</b>	<b>2,500</b>		<b>2.0</b>	<b>mg/L</b>	<b>10</b>	4/1/2015 11:22 AM
<b>SODIUM ADSORPTION RATIO</b>						
			<b>USDA H60 METHO</b>		Prep: USDA Method 20B / 4/1/15	Analyst: <b>JEC</b>
<b>Exchangeable Sodium Percentage</b>	<b>23</b>		<b>0.010</b>	<b>none</b>	<b>1</b>	4/1/2015
<b>Sodium Adsorption Ratio</b>	<b>21</b>		<b>0.010</b>	<b>none</b>	<b>1</b>	4/1/2015
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>						
			<b>SW846 8270D</b>		Prep: SW3541 / 4/6/15	Analyst: <b>RS</b>
Acenaphthene	ND		7.9	µg/Kg-dry	1	4/7/2015 07:04 PM
Acenaphthylene	ND		7.9	µg/Kg-dry	1	4/7/2015 07:04 PM
Anthracene	ND		7.9	µg/Kg-dry	1	4/7/2015 07:04 PM
Benzo(a)anthracene	ND		7.9	µg/Kg-dry	1	4/7/2015 07:04 PM
Benzo(a)pyrene	ND		7.9	µg/Kg-dry	1	4/7/2015 07:04 PM
Benzo(b)fluoranthene	ND		7.9	µg/Kg-dry	1	4/7/2015 07:04 PM
Benzo(g,h,i)perylene	ND		7.9	µg/Kg-dry	1	4/7/2015 07:04 PM
Benzo(k)fluoranthene	ND		7.9	µg/Kg-dry	1	4/7/2015 07:04 PM

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

# ALS Group USA, Corp

Date: 09-Apr-15

**Client:** Olsson Associates  
**Project:** BopCo Line Spill  
**Sample ID:** CS1  
**Collection Date:** 3/26/2015 10:15 AM

**Work Order:** 15031587  
**Lab ID:** 15031587-02  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Chrysene	ND		7.9	µg/Kg-dry	1	4/7/2015 07:04 PM
Dibenzo(a,h)anthracene	ND		7.9	µg/Kg-dry	1	4/7/2015 07:04 PM
Fluoranthene	ND		7.9	µg/Kg-dry	1	4/7/2015 07:04 PM
Fluorene	ND		7.9	µg/Kg-dry	1	4/7/2015 07:04 PM
Indeno(1,2,3-cd)pyrene	ND		7.9	µg/Kg-dry	1	4/7/2015 07:04 PM
Naphthalene	ND		7.9	µg/Kg-dry	1	4/7/2015 07:04 PM
Pyrene	ND		7.9	µg/Kg-dry	1	4/7/2015 07:04 PM
Surr: 2-Fluorobiphenyl	51.9		12-100	%REC	1	4/7/2015 07:04 PM
Surr: 4-Terphenyl-d14	88.4		25-137	%REC	1	4/7/2015 07:04 PM
Surr: Nitrobenzene-d5	52.9		37-107	%REC	1	4/7/2015 07:04 PM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260B</b>	Prep: SW5035 / 3/29/15	Analyst: <b>LSY</b>	
Benzene	ND		36	µg/Kg-dry	1	4/7/2015 09:02 PM
Ethylbenzene	ND		36	µg/Kg-dry	1	4/7/2015 09:02 PM
<b>m,p-Xylene</b>	<b>230</b>		<b>71</b>	<b>µg/Kg-dry</b>	1	4/7/2015 09:02 PM
o-Xylene	ND		36	µg/Kg-dry	1	4/7/2015 09:02 PM
Toluene	ND		36	µg/Kg-dry	1	4/7/2015 09:02 PM
<b>Xylenes, Total</b>	<b>230</b>		<b>110</b>	<b>µg/Kg-dry</b>	1	4/7/2015 09:02 PM
Surr: 1,2-Dichloroethane-d4	112		70-130	%REC	1	4/7/2015 09:02 PM
Surr: 4-Bromofluorobenzene	99.0		70-130	%REC	1	4/7/2015 09:02 PM
Surr: Dibromofluoromethane	95.1		70-130	%REC	1	4/7/2015 09:02 PM
Surr: Toluene-d8	94.0		70-130	%REC	1	4/7/2015 09:02 PM
<b>ELECTRICAL CONDUCTIVITY (SAR)</b>			<b>USDA H60 METHO</b>	Prep: USDA Method 20B / 4/1/15	Analyst: <b>JB</b>	
Electrical Conductivity @ Saturation	18		0.050	mmhos/cm @2	10	4/1/2015 10:50 AM
<b>CHROMIUM, TRIVALENT</b>			<b>CALCULATION</b>	Analyst: <b>JJG</b>		
Chromium, Trivalent	37		0.59	mg/Kg-dry	1	4/2/2015 08:17 AM
<b>CHROMIUM, HEXAVALENT</b>			<b>SW7196A</b>	Prep: SW3060A / 3/31/15	Analyst: <b>EE</b>	
Chromium, Hexavalent	ND		1.0	mg/Kg-dry	1	3/31/2015 03:45 PM
<b>MOISTURE</b>			<b>E160.3M</b>	Analyst: <b>EVB</b>		
Moisture	16		0.050	% of sample	1	4/6/2015 05:45 PM
<b>PH</b>			<b>SW9045D</b>	Prep: EXTRACT / 3/27/15	Analyst: <b>JRF</b>	
pH	7.9			s.u.	1	3/27/2015 03:30 PM

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

## ALS Group USA, Corp

Date: 09-Apr-15

**Client:** Olsson Associates  
**Project:** BopCo Line Spill  
**Sample ID:** BG1  
**Collection Date:** 3/26/2015 10:30 AM

**Work Order:** 15031587  
**Lab ID:** 15031587-03  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>METALS ANALYSIS BY ICP</b>						
Arsenic	5.7		<b>SW846 6010C</b> 0.40	mg/Kg-dry	1	Prep: SW3050B / 3/31/15 Analyst: <b>JEC</b> 3/31/2015 04:34 PM
<b>MOISTURE</b>						
Moisture	15		<b>E160.3M</b> 0.050	% of sample	1	Analyst: <b>EVB</b> 4/6/2015 05:45 PM

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



**Client:** Olsson Associates  
**Work Order:** 15031587  
**Project:** BopCo Line Spill

**QC BATCH REPORT**

Batch ID: **69392** Instrument ID **GC8** Method: **SW8015M**

<b>MBLK</b>		Sample ID: <b>DBLKS1-69392-69392</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>4/3/2015 06:47 PM</b>		
Client ID:		Run ID: <b>GC8_150403A</b>				SeqNo: <b>3211327</b>		Prep Date: <b>4/3/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	ND	5.0								
Surr: 4-Terphenyl-d14	1.774	0	2	0	88.7	39-133		0		

<b>LCS</b>		Sample ID: <b>DLCSS1-69392-69392</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>4/3/2015 07:17 PM</b>		
Client ID:		Run ID: <b>GC8_150403A</b>				SeqNo: <b>3211329</b>		Prep Date: <b>4/3/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	174.6	5.0	200	0	87.3	61-109		0		
Surr: 4-Terphenyl-d14	1.488	0	2	0	74.4	39-133		0		

<b>MS</b>		Sample ID: <b>1504071-04A MS</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>4/3/2015 07:47 PM</b>		
Client ID:		Run ID: <b>GC8_150403A</b>				SeqNo: <b>3211332</b>		Prep Date: <b>4/3/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	290.2	7.9	316.3	5.307	90	48-110		0		
Surr: 4-Terphenyl-d14	2.445	0	3.163	0	77.3	39-133		0		

<b>MSD</b>		Sample ID: <b>1504071-04A MSD</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>4/3/2015 08:17 PM</b>		
Client ID:		Run ID: <b>GC8_150403A</b>				SeqNo: <b>3211334</b>		Prep Date: <b>4/3/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	279.4	8.3	330	5.307	83.1	48-110	290.2	3.77	30	
Surr: 4-Terphenyl-d14	2.39	0	3.3	0	72.4	39-133	2.445	2.28	30	

The following samples were analyzed in this batch:

15031587-01A	15031587-02A
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Client: Olsson Associates  
 Work Order: 15031587  
 Project: BopCo Line Spill

# QC BATCH REPORT

Batch ID: **69254** Instrument ID **GC9** Method: **SW8015D**

<b>MBLK</b>		Sample ID: <b>MBLK-69254-69254</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>3/31/2015 05:06 PM</b>		
Client ID:		Run ID: <b>GC9_150331A</b>				SeqNo: <b>3204466</b>		Prep Date: <b>3/30/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	ND	2,500								
<i>Surr: Toluene-d8</i>	4850	0	5000	0	97	50-150	0			

<b>LCS</b>		Sample ID: <b>LCS-69254-69254</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>3/31/2015 04:41 PM</b>		
Client ID:		Run ID: <b>GC9_150331A</b>				SeqNo: <b>3204465</b>		Prep Date: <b>3/30/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	485700	2,500	500000	0	97.1	70-130	0			
<i>Surr: Toluene-d8</i>	4944	0	5000	0	98.9	50-150	0			

<b>MS</b>		Sample ID: <b>15031673-04A MS</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>3/31/2015 10:05 PM</b>		
Client ID:		Run ID: <b>GC9_150331A</b>				SeqNo: <b>3204469</b>		Prep Date: <b>3/30/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	506700	2,500	500000	0	101	70-130	0			

<b>MSD</b>		Sample ID: <b>15031673-04A MSD</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>3/31/2015 10:30 PM</b>		
Client ID:		Run ID: <b>GC9_150331A</b>				SeqNo: <b>3204470</b>		Prep Date: <b>3/30/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	519700	2,500	500000	0	104	70-130	506700	2.54	30	
<i>Surr: Toluene-d8</i>	4903	0	5000	0	98.1	50-150	5060	3.15	30	

The following samples were analyzed in this batch:

15031587-01A	15031587-02A
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Note: See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Olsson Associates  
**Work Order:** 15031587  
**Project:** BopCo Line Spill

## QC BATCH REPORT

Batch ID: **69227** Instrument ID **HG1** Method: **SW7471B**

<b>MBLK</b>		Sample ID: <b>MBLK-69227-69227</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/30/2015 09:04 PM</b>		
Client ID:		Run ID: <b>HG1_150330A</b>				SeqNo: <b>3201913</b>		Prep Date: <b>3/30/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury ND 0.020

<b>LCS</b>		Sample ID: <b>LCS-69227-69227</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/30/2015 09:06 PM</b>		
Client ID:		Run ID: <b>HG1_150330A</b>				SeqNo: <b>3201914</b>		Prep Date: <b>3/30/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury 0.1805 0.020 0.1665 0 108 80-120 0

<b>MS</b>		Sample ID: <b>15031613-05BMS</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/30/2015 09:55 PM</b>		
Client ID:		Run ID: <b>HG1_150330A</b>				SeqNo: <b>3201935</b>		Prep Date: <b>3/30/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury 0.1093 0.013 0.1046 -0.0004673 105 75-125 0

<b>MSD</b>		Sample ID: <b>15031613-05BMSD</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/30/2015 09:57 PM</b>		
Client ID:		Run ID: <b>HG1_150330A</b>				SeqNo: <b>3201936</b>		Prep Date: <b>3/30/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury 0.1046 0.012 0.1041 -0.0004673 101 75-125 0.1093 4.33 35

The following samples were analyzed in this batch:

15031587-01A	15031587-02A
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**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Olsson Associates  
**Work Order:** 15031587  
**Project:** BopCo Line Spill

## QC BATCH REPORT

Batch ID: **69193** Instrument ID **ICP2** Method: **SW846 6010C**

<b>DUP</b>		Sample ID: <b>15031612-01BDUP</b>				Units: <b>mg/L</b>		Analysis Date: <b>4/1/2015 11:33 AM</b>		
Client ID:		Run ID: <b>ICP2_150401A</b>				SeqNo: <b>3205022</b>		Prep Date: <b>4/1/2015</b>		DF: <b>10</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	363.8	5.0	0	0	0	0-0	351.2	3.5		
Magnesium	103.8	2.0	0	0	0	0-0	98.77	4.99		
Sodium	275.8	2.0	0	0	0	0-0	271.5	1.55		

<b>DUP</b>		Sample ID: <b>15031612-01BDUP</b>				Units: <b>none</b>		Analysis Date: <b>4/1/2015</b>		
Client ID:		Run ID: <b>SAR_150401A</b>				SeqNo: <b>3205073</b>		Prep Date: <b>4/1/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Exchangeable Sodium Percentage	3.459	0.010	0	0	0		3.479	0.575	50	
Sodium Adsorption Ratio	3.283	0.010	0	0	0		3.298	0.441	50	

The following samples were analyzed in this batch:

15031587-01B	15031587-02B
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**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 15031587  
 Project: BopCo Line Spill

# QC BATCH REPORT

Batch ID: 69267 Instrument ID ICP2 Method: SW846 6010C

<b>MBLK</b>		Sample ID: <b>MBLK-69267-69267</b>				Units: <b>mg/L</b>		Analysis Date: <b>3/31/2015 03:49 PM</b>		
Client ID:		Run ID: <b>ICP2_150331B</b>				SeqNo: <b>3203927</b>		Prep Date: <b>3/31/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	0.25								
Barium	ND	0.25								
Cadmium	ND	0.50								
Chromium	ND	0.25								
Copper	ND	0.50								
Lead	ND	0.25								
Nickel	ND	0.25								
Selenium	ND	0.50								
Silver	ND	0.25								
Zinc	ND	0.50								

<b>LCS</b>		Sample ID: <b>LCS-69267-69267</b>				Units: <b>mg/L</b>		Analysis Date: <b>3/31/2015 03:55 PM</b>		
Client ID:		Run ID: <b>ICP2_150331B</b>				SeqNo: <b>3203930</b>		Prep Date: <b>3/31/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	5.073	0.25	5	0	101	80-120	0			
Barium	4.966	0.25	5	0	99.3	80-120	0			
Cadmium	4.775	0.50	5	0	95.5	80-120	0			
Chromium	5.119	0.25	5	0	102	80-120	0			
Copper	5.226	0.50	5	0	105	80-120	0			
Lead	5.382	0.25	5	0	108	80-120	0			
Nickel	5.066	0.25	5	0	101	80-120	0			
Selenium	5.107	0.50	5	0	102	80-120	0			
Silver	5.681	0.25	5	0	114	80-120	0			
Zinc	5.323	0.50	5	0	106	80-120	0			

<b>MS</b>		Sample ID: <b>15031587-02AMS</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/31/2015 04:17 PM</b>		
Client ID: <b>CS1</b>		Run ID: <b>ICP2_150331B</b>				SeqNo: <b>3203939</b>		Prep Date: <b>3/31/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	13.75	0.37	7.463	5.352	113	75-125	0			
Barium	274.1	0.37	7.463	216.3	775	75-125	0			SO
Cadmium	7.128	0.75	7.463	-0.1088	97	75-125	0			
Chromium	40.75	0.37	7.463	31.79	120	75-125	0			O
Copper	22.33	0.75	7.463	14.65	103	75-125	0			
Lead	18.76	0.37	7.463	11.06	103	75-125	0			
Nickel	23.41	0.37	7.463	15.65	104	75-125	0			
Selenium	7.744	0.75	7.463	-0.151	106	75-125	0			
Silver	9.417	0.37	7.463	-0.1577	128	75-125	0			S
Zinc	61.91	0.75	7.463	52.7	123	75-125	0			O

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



**Client:** Olsson Associates  
**Work Order:** 15031587  
**Project:** BopCo Line Spill

## QC BATCH REPORT

Batch ID: **69267**

Instrument ID **ICP2**

Method: **SW846 6010C**

MSD		Sample ID: <b>15031587-02AMSD</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/31/2015 04:23 PM</b>		
Client ID: <b>CS1</b>		Run ID: <b>ICP2_150331B</b>				SeqNo: <b>3203940</b>		Prep Date: <b>3/31/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	14.02	0.37	7.353	5.352	118	75-125	13.75	1.93	20	
Barium	249.4	0.37	7.353	216.3	450	75-125	274.1	9.45	20	SO
Cadmium	7.065	0.74	7.353	-0.1088	97.6	75-125	7.128	0.883	20	
Chromium	41.65	0.37	7.353	31.79	134	75-125	40.75	2.19	20	SO
Copper	22.2	0.74	7.353	14.65	103	75-125	22.33	0.613	20	
Lead	18.56	0.37	7.353	11.06	102	75-125	18.76	1.06	20	
Nickel	23.59	0.37	7.353	15.65	108	75-125	23.41	0.753	20	
Selenium	7.482	0.74	7.353	-0.151	104	75-125	7.744	3.44	20	
Silver	9.421	0.37	7.353	-0.1577	130	75-125	9.417	0.0494	20	S
Zinc	61.93	0.74	7.353	52.7	126	75-125	61.91	0.027	20	SO

The following samples were analyzed in this batch:

15031587-01A

15031587-02A

15031587-03A

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

Client: Olsson Associates  
 Work Order: 15031587  
 Project: BopCo Line Spill

## QC BATCH REPORT

Batch ID: 69451 Instrument ID SVMS5 Method: SW846 8270D

MBLK		Sample ID: SBLKS1-69451-69451				Units: µg/Kg		Analysis Date: 4/6/2015 08:14 PM		
Client ID:		Run ID: SVMS5_150406A				SeqNo: 3214450		Prep Date: 4/6/2015		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	ND	6.7								
Acenaphthylene	ND	6.7								
Anthracene	ND	6.7								
Benzo(a)anthracene	ND	6.7								
Benzo(a)pyrene	ND	6.7								
Benzo(b)fluoranthene	ND	6.7								
Benzo(g,h,i)perylene	ND	6.7								
Benzo(k)fluoranthene	ND	6.7								
Chrysene	ND	6.7								
Dibenzo(a,h)anthracene	ND	6.7								
Fluoranthene	ND	6.7								
Fluorene	ND	6.7								
Indeno(1,2,3-cd)pyrene	ND	6.7								
Naphthalene	ND	6.7								
Pyrene	ND	6.7								
Surr: 2-Fluorobiphenyl	1254	0	1667	0	75.2	12-100	0			
Surr: 4-Terphenyl-d14	2036	0	1667	0	122	25-137	0			
Surr: Nitrobenzene-d5	1288	0	1667	0	77.3	37-107	0			

LCS		Sample ID: SLCSS1-69451-69451				Units: µg/Kg		Analysis Date: 4/6/2015 08:36 PM		
Client ID:		Run ID: SVMS5_150406A				SeqNo: 3214451		Prep Date: 4/6/2015		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	499.7	6.7	666.7	0	74.9	45-110	0			
Acenaphthylene	516	6.7	666.7	0	77.4	45-105	0			
Anthracene	604.3	6.7	666.7	0	90.6	55-105	0			
Benzo(a)anthracene	591.7	6.7	666.7	0	88.7	50-110	0			
Benzo(a)pyrene	553	6.7	666.7	0	82.9	50-110	0			
Benzo(b)fluoranthene	541.3	6.7	666.7	0	81.2	45-115	0			
Benzo(g,h,i)perylene	509.7	6.7	666.7	0	76.4	40-125	0			
Benzo(k)fluoranthene	546.7	6.7	666.7	0	82	45-115	0			
Chrysene	615.3	6.7	666.7	0	92.3	55-110	0			
Dibenzo(a,h)anthracene	561.3	6.7	666.7	0	84.2	40-125	0			
Fluoranthene	557	6.7	666.7	0	83.5	55-115	0			
Fluorene	522.7	6.7	666.7	0	78.4	50-110	0			
Indeno(1,2,3-cd)pyrene	537.7	6.7	666.7	0	80.6	40-120	0			
Naphthalene	492.7	6.7	666.7	0	73.9	40-105	0			
Pyrene	675	6.7	666.7	0	101	45-125	0			
Surr: 2-Fluorobiphenyl	1131	0	1667	0	67.9	12-100	0			
Surr: 4-Terphenyl-d14	1740	0	1667	0	104	25-137	0			
Surr: Nitrobenzene-d5	1213	0	1667	0	72.8	37-107	0			

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

Client: Olsson Associates  
 Work Order: 15031587  
 Project: BopCo Line Spill

# QC BATCH REPORT

Batch ID: 69451 Instrument ID SVMS5 Method: SW846 8270D

MS				Sample ID: 1504123-01B MS			Units: µg/Kg		Analysis Date: 4/7/2015 12:52 PM		
Client ID:		Run ID: SVMS5_150406A			SeqNo: 3214454		Prep Date: 4/6/2015		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Acenaphthene	883.2	13	1323	0	66.7	45-110	0				
Acenaphthylene	951.3	13	1323	0	71.9	45-105	0				
Anthracene	1115	13	1323	0	84.3	55-105	0				
Benzo(a)anthracene	1076	13	1323	0	81.3	50-110	0				
Benzo(a)pyrene	1090	13	1323	0	82.3	50-110	0				
Benzo(b)fluoranthene	1103	13	1323	0	83.3	45-115	0				
Benzo(g,h,i)perylene	1066	13	1323	0	80.5	40-125	0				
Benzo(k)fluoranthene	1095	13	1323	0	82.7	45-115	0				
Chrysene	1107	13	1323	0	83.7	55-110	0				
Dibenzo(a,h)anthracene	1058	13	1323	0	79.9	40-125	0				
Fluoranthene	1015	13	1323	0	76.7	55-115	0				
Fluorene	988.4	13	1323	0	74.7	50-110	0				
Indeno(1,2,3-cd)pyrene	976.4	13	1323	0	73.8	40-120	0				
Naphthalene	835.5	13	1323	0	63.1	40-105	0				
Pyrene	1252	13	1323	0	94.6	45-125	0				
Surr: 2-Fluorobiphenyl	2001	0	3308	0	60.5	12-100	0				
Surr: 4-Terphenyl-d14	3310	0	3308	0	100	25-137	0				
Surr: Nitrobenzene-d5	1961	0	3308	0	59.3	37-107	0				

MSD				Sample ID: 1504123-01B MSD			Units: µg/Kg		Analysis Date: 4/7/2015 01:14 AM		
Client ID:			Run ID: SVMS5_150406A			SeqNo: 3214452		Prep Date: 4/6/2015		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Acenaphthene	943.8	13	1309	0	72.1	45-110	883.2	6.63	30		
Acenaphthylene	965.4	13	1309	0	73.7	45-105	951.3	1.47	30		
Anthracene	1135	13	1309	0	86.7	55-105	1115	1.73	30		
Benzo(a)anthracene	1099	13	1309	0	83.9	50-110	1076	2.07	30		
Benzo(a)pyrene	1082	13	1309	0	82.6	50-110	1090	0.709	30		
Benzo(b)fluoranthene	1097	13	1309	0	83.8	45-115	1103	0.534	30		
Benzo(g,h,i)perylene	1020	13	1309	0	77.9	40-125	1066	4.42	30		
Benzo(k)fluoranthene	1069	13	1309	0	81.6	45-115	1095	2.41	30		
Chrysene	1118	13	1309	0	85.4	55-110	1107	0.938	30		
Dibenzo(a,h)anthracene	1041	13	1309	0	79.5	40-125	1058	1.57	30		
Fluoranthene	1054	13	1309	0	80.5	55-115	1015	3.76	30		
Fluorene	993.5	13	1309	0	75.9	50-110	988.4	0.521	30		
Indeno(1,2,3-cd)pyrene	1024	13	1309	0	78.2	40-120	976.4	4.72	30		
Naphthalene	951	13	1309	0	72.6	40-105	835.5	12.9	30		
Pyrene	1313	13	1309	0	100	45-125	1252	4.72	30		
Surr: 2-Fluorobiphenyl	2150	0	3273	0	65.7	12-100	2001	7.17	40		
Surr: 4-Terphenyl-d14	3156	0	3273	0	96.4	25-137	3310	4.78	40		
Surr: Nitrobenzene-d5	2312	0	3273	0	70.6	37-107	1961	16.4	40		

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

**Client:** Olsson Associates  
**Work Order:** 15031587  
**Project:** BopCo Line Spill

## QC BATCH REPORT

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Batch ID: **69451** Instrument ID **SVMS5** Method: **SW846 8270D**

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The following samples were analyzed in this batch:

15031587-01A	15031587-02A
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**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 15031587  
 Project: BopCo Line Spill

# QC BATCH REPORT

Batch ID: 69186 Instrument ID VMS6 Method: SW8260B

MBLK				Sample ID: MBLK-69186-69186			Units: µg/Kg		Analysis Date: 3/29/2015 12:18 PM		
Client ID:			Run ID: VMS6_150329A			SeqNo: 3200454		Prep Date: 3/29/2015		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	ND	30									
Ethylbenzene	ND	30									
m,p-Xylene	ND	60									
o-Xylene	ND	30									
Toluene	ND	30									
Xylenes, Total	ND	90									
Surr: 1,2-Dichloroethane-d4	1007	0	1000	0	101	70-130		0			
Surr: 4-Bromofluorobenzene	982	0	1000	0	98.2	70-130		0			
Surr: Dibromofluoromethane	981.5	0	1000	0	98.2	70-130		0			
Surr: Toluene-d8	979.5	0	1000	0	98	70-130		0			

LCS				Sample ID: LCS-69186-69186			Units: µg/Kg		Analysis Date: 3/29/2015 11:00 AM		
Client ID:			Run ID: VMS6_150329A			SeqNo: 3200453		Prep Date: 3/29/2015		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	1003	30	1000	0	100	75-125	0				
Ethylbenzene	1017	30	1000	0	102	75-125	0				
m,p-Xylene	2039	60	2000	0	102	80-125	0				
o-Xylene	997	30	1000	0	99.7	75-125	0				
Toluene	991	30	1000	0	99.1	70-125	0				
Xylenes, Total	3036	90	3000	0	101	75-125	0				
Surr: 1,2-Dichloroethane-d4	984.5	0	1000	0	98.4	70-130	0				
Surr: 4-Bromofluorobenzene	1016	0	1000	0	102	70-130	0				
Surr: Dibromofluoromethane	1043	0	1000	0	104	70-130	0				
Surr: Toluene-d8	983	0	1000	0	98.3	70-130	0				

MS				Sample ID: 15031545-01A MS				Units: µg/Kg		Analysis Date: 4/2/2015 02:43 AM	
Client ID:			Run ID: VMS6_150401A			SeqNo: 3206791		Prep Date: 3/29/2015		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	933.5	30	1000	0	93.4	75-125	0				
Ethylbenzene	1040	30	1000	0	104	75-125	0				
m,p-Xylene	2072	60	2000	0	104	80-125	0				
o-Xylene	1010	30	1000	0	101	75-125	0				
Toluene	995.5	30	1000	0	99.6	70-125	0				
Xylenes, Total	3083	90	3000	0	103	75-125	0				
Surr: 1,2-Dichloroethane-d4	1012	0	1000	0	101	70-130	0				
Surr: 4-Bromofluorobenzene	1009	0	1000	0	101	70-130	0				
Surr: Dibromofluoromethane	978.5	0	1000	0	97.8	70-130	0				
Surr: Toluene-d8	1086	0	1000	0	109	70-130	0				

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



Client: Olsson Associates  
 Work Order: 15031587  
 Project: BopCo Line Spill

## QC BATCH REPORT

Batch ID: **69186** Instrument ID **VMS6** Method: **SW8260B**

MSD				Sample ID: 15031545-01A MSD			Units: µg/Kg		Analysis Date: 4/2/2015 03:10 AM		
Client ID:			Run ID: VMS6_150401A			SeqNo: 3206793		Prep Date: 3/29/2015		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	890	30	1000	0	89	75-125	933.5	4.77	30		
Ethylbenzene	999.5	30	1000	0	100	75-125	1040	3.92	30		
m,p-Xylene	2004	60	2000	0	100	80-125	2072	3.39	30		
o-Xylene	976.5	30	1000	0	97.6	75-125	1010	3.42	30		
Toluene	950	30	1000	0	95	70-125	995.5	4.68	30		
Xylenes, Total	2980	90	3000	0	99.3	75-125	3083	3.4	30		
Surr: 1,2-Dichloroethane-d4	988.5	0	1000	0	98.8	70-130	1012	2.4	30		
Surr: 4-Bromofluorobenzene	1005	0	1000	0	100	70-130	1009	0.397	30		
Surr: Dibromofluoromethane	997.5	0	1000	0	99.8	70-130	978.5	1.92	30		
Surr: Toluene-d8	1090	0	1000	0	109	70-130	1086	0.368	30		

The following samples were analyzed in this batch:

15031587-01A

15031587-02A

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

**Client:** Olsson Associates  
**Work Order:** 15031587  
**Project:** BopCo Line Spill

## QC BATCH REPORT

Batch ID: **69166** Instrument ID **WETCHEM** Method: **SW9045D**

LCS		Sample ID: LCS-69166-69166					Units: s.u.		Analysis Date: 3/27/2015 03:30 PM		
Client ID:		Run ID: WETCHEM_150327I				SeqNo: 3199082		Prep Date: 3/27/2015		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	

pH 4.02 0 4 0 100 90-110 0

DUP		Sample ID: 15031588-01B DUP				Units: s.u.		Analysis Date: 3/27/2015 03:30 PM		
Client ID:		Run ID: WETCHEM_150327I				SeqNo: 3199094		Prep Date: 3/27/2015		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

pH 7.2 0 0 0 0 0-0 7.26 0.83 20

DUP				Sample ID: 15031612-01B DUP				Units: s.u.			Analysis Date: 3/27/2015 03:30 PM			
Client ID:				Run ID: WETCHEM_150327I				SeqNo: 3199096			Prep Date: 3/27/2015		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual				

pH 8.07 0 0 0 0 0-0 8.08 0.124 20

The following samples were analyzed in this batch:

15031587-01A	15031587-02A
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**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Olsson Associates  
**Work Order:** 15031587  
**Project:** BopCo Line Spill

## QC BATCH REPORT

Batch ID: **69193** Instrument ID **WETCHEM** Method: **USDA H60 Metho**

DUP				Sample ID: 15031612-01B DUP				Units: mmhos/cm @25°		Analysis Date: 4/1/2015 10:50 AM	
Client ID:			Run ID: WETCHEM_150401B			SeqNo: 3204647		Prep Date: 4/1/2015		DF: 10	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Electrical Conductivity @ Saturation	4.53	0.050	0	0	0		4.36	3.82	50		

The following samples were analyzed in this batch:

15031587-01B	15031587-02B
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**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Olsson Associates  
 Work Order: 15031587  
 Project: BopCo Line Spill

## QC BATCH REPORT

Batch ID: **69287** Instrument ID **WETCHEM** Method: **SW7196A**

<b>MBLK</b>		Sample ID: <b>MBLK-69287-69287</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/31/2015 03:45 PM</b>		
Client ID:		Run ID: <b>WETCHEM_150331J</b>		SeqNo: <b>3203694</b>		Prep Date: <b>3/31/2015</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.13	1.0								J

<b>LCS</b>		Sample ID: <b>LCS-69287-69287</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/31/2015 03:45 PM</b>		
Client ID:		Run ID: <b>WETCHEM_150331J</b>		SeqNo: <b>3203695</b>		Prep Date: <b>3/31/2015</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	4.66	1.0	5	0	93.2	80-120	0			

<b>MS</b>		Sample ID: <b>15031441-01A MS</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/31/2015 03:45 PM</b>		
Client ID:		Run ID: <b>WETCHEM_150331J</b>		SeqNo: <b>3203697</b>		Prep Date: <b>3/31/2015</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.7826	0.87	4.348	0.1354	14.9	75-125	0			JS

<b>MS</b>		Sample ID: <b>15031441-01A MSI</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/31/2015 03:45 PM</b>		
Client ID:		Run ID: <b>WETCHEM_150331J</b>		SeqNo: <b>3203699</b>		Prep Date: <b>3/31/2015</b>		DF: <b>100</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	1888	100	1994	0.1354	94.6	75-125	0			

<b>MSD</b>		Sample ID: <b>15031441-01A MSD</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>3/31/2015 03:45 PM</b>		
Client ID:		Run ID: <b>WETCHEM_150331J</b>		SeqNo: <b>3203698</b>		Prep Date: <b>3/31/2015</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.713	0.93	4.63	0.1354	12.5	75-125	0.7826	0	20	JS

The following samples were analyzed in this batch:

15031587-01A	15031587-02A
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Note: See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Olsson Associates  
**Work Order:** 15031587  
**Project:** BopCo Line Spill

## QC BATCH REPORT

Batch ID: **R160710** Instrument ID **MOIST** Method: **E160.3M**

<b>MBLK</b>		Sample ID: <b>WBLKS-R160710</b>				Units: % of sample		Analysis Date: <b>4/6/2015 05:45 PM</b>		
Client ID:		Run ID: <b>MOIST_150406C</b>				SeqNo: <b>3214018</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture ND 0.050

<b>LCS</b>		Sample ID: <b>LCS-R160710</b>				Units: % of sample		Analysis Date: <b>4/6/2015 05:45 PM</b>		
Client ID:		Run ID: <b>MOIST_150406C</b>				SeqNo: <b>3214017</b>		Prep Date:		DF: <b>1</b>
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

<b>DUP</b>		Sample ID: <b>1504260-03B DUP</b>				Units: % of sample		Analysis Date: <b>4/6/2015 05:45 PM</b>		
Client ID:		Run ID: <b>MOIST_150406C</b>				SeqNo: <b>3214014</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 18.63 0.050 0 0 0 17.81 4.5 20

The following samples were analyzed in this batch:

15031587-01A	15031587-02A	15031587-03A
--------------	--------------	--------------

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



**Environmental**

# Chain of Custody Form

Page 1 of 2

COC ID: 123456

☐ 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

☐ Houston, TX  
+1 281 530 5656

☐ Middletown, PA  
+1 717 944 5541

☐ Salt Lake City, UT  
+1 801 266 7700

☐ Spring City, PA  
+1 610 944 4903

☐ York, PA  
+1 717 505 5280

Customer Information		Project Information		Parameter/Method Request for Analysis															
Purchase Order		Project Name	BopCo Line Spill	A TPH (GRO)															
Work Order		Project Number		B TPH (DRO)															
Company Name	Olsson Associates	Bill To Company		C BTEX															
Send Report To	Ken Kreie	Invoice Attn.	Ken Kreie	D PAH (See List 1)															
Address	760 Horizon Drive, Suite 102	Address		E Electrical Conductivity															
City/State/Zip	Grand Junction, CO 81506	City/State/Zip		F SAR															
Phone	970.263.7800	Phone		G pH															
Fax	970.263.7456	Fax		H Metals (See List 2)															
e-Mail Address	kkreie@olssonassociates.com	e-Mail Address		I Arsenic Only															
				J															
No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold		
1	SS1	3/26/15	1000	SO	-	2	X	X	X	X	X	X	X	X					
2	CS1	3/26/15	1015	SO	-	2	X	X	X	X	X	X	X	X					
3	BG1	3/26/15	1030	SO	-	1									X				
4																			
5																			
6																			
7																			
8																			
9																			
10																			

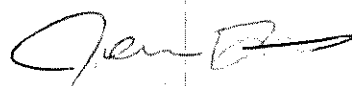
Sampler(s): Please Print & Sign Jessica Dilka <i>[Signature]</i>		Shipment Method:	Required Turnaround Time: <input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour	Other: <input type="checkbox"/>	Results Due Date:
Refringished by: <i>[Signature]</i>	Date: 3/26/15	Time: 1500	Received by: FED EX		Notes:
Refringished by: FED EX	Date: 3/27/15	Time: 0930	Received by Laboratory: <i>[Signature]</i>		QC Package: (Check Box Below)
Logged by (Laboratory): DFS	Date: 3/27/15	Time: 1100	Checked by (Laboratory): <i>[Signature]</i>		Level II: Standard QC
					Level III: Std QC + Raw Data
					Level IV: SW846 CLP-Like
Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035					Other: _____

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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List 1 - Acenaphthene, Anthracene, Benzo(A)anthracene, Benzo(B)fluoranthene, Benzo(K)fluoranthene, Benzo(A)pyrene, Chrysene, Dibenzo(A,H)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3,C,D)pyrene, Napthalene, Pyrene

List 2 - As, B, Ba, Cd, Cr3, Cr6, Cu, Pb, Hg, Ni, Se, Ag, Zn

 3/26/15

3/28/2015

From: (970) 263-7800  
Jessica Dika  
Olsson Associates  
760 Horizon Drive, Suite 102

GRAND JUNCTION, CO 81506

Origin ID: GJTA

FedEx  
Express



JH51215022303UV

BILL RECIPIENT

SHIP TO: (616) 399-6978  
Sample Receiving  
ALS Environmental  
3352 128th Avenue

HOLLAND, MI 49424

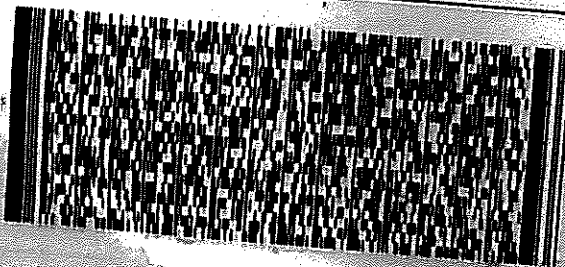
FedEx Ship Manager - Print Your Label(s)

Ship Date: 28MAR15  
ActWgt: 20.0 LB  
CAD: 5436974/INET3610

Delivery Address Bar Code



Ref #  
Invoice #  
PO #  
Dept #  
BopCo Line Spill

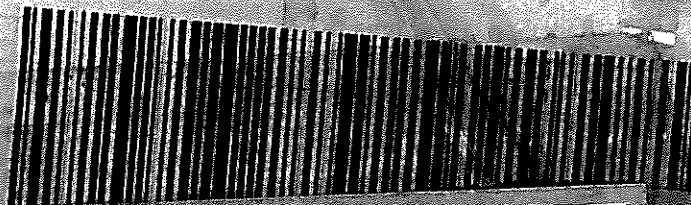


TRK# 7732 2458 0421  
02811

FRI - 27 MAR 3:00P  
STANDARD OVERNIGHT

XX HLMA

49424  
MI-US  
GRR



	<b>ALS Environmental</b>		<b>TODY SEAL</b>		Seal Broken By:
	3352 128th Avenue Holland, Michigan 49424 Tel. +1 616 393 6070 Fax. +1 616 399 6185		Date: 3/28/15 Name: <i>[Signature]</i> Company: <i>[Signature]</i>	Time: 1:50 Date:	

135/11



Sample Receipt Checklist

Client Name: **OLSSON**

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

Work Order: **15031587**

Received by: **DS**

Checklist completed by Diane Shaw 27-Mar-15  
eSignature Date

Reviewed by: Chad Whelton 27-Mar-15  
eSignature 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 checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input 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 11:07:56 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:



28-Apr-2015

Ken Kreie  
Olsson Associates  
760 Horizon Drive  
Suite 102  
Grand Junction, CO 81506

Re: **BopCo Line Spill**

Work Order: **15041479**

Dear Ken,

ALS Environmental received 6 samples on 24-Apr-2015 10:00 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 16.

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

Sincerely,

A handwritten signature in cursive script that reads "Les Arnold".

Electronically approved by: Les Arnold

Les Arnold  
Senior 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 The ALS logo, a stylized blue triangle with a yellow flame inside.

[www.alsglobal.com](http://www.alsglobal.com)

RIGHT SOLUTIONS RIGHT PARTNER

---

**Client:** Olsson Associates  
**Project:** BopCo Line Spill  
**Work Order:** 15041479

**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>
15041479-01	Sidewall 1	Soil		4/22/2015 11:00	4/24/2015 10:00	<input type="checkbox"/>
15041479-02	Sidewall 2	Soil		4/22/2015 11:20	4/24/2015 10:00	<input type="checkbox"/>
15041479-03	Sidewall 3	Soil		4/22/2015 11:40	4/24/2015 10:00	<input type="checkbox"/>
15041479-04	Sidewall 4	Soil		4/22/2015 12:00	4/24/2015 10:00	<input type="checkbox"/>
15041479-05	Bottom	Soil		4/22/2015 12:10	4/24/2015 10:00	<input type="checkbox"/>
15041479-06	Backfill	Soil		4/22/2015 12:20	4/24/2015 10:00	<input type="checkbox"/>

**Client:** Olsson Associates  
**Project:** BopCo Line Spill  
**WorkOrder:** 15041479

## **QUALIFIERS, ACRONYMS, UNITS**

<b><u>Qualifier</u></b>	<b><u>Description</u></b>
*	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.

<b><u>Acronym</u></b>	<b><u>Description</u></b>
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

<b><u>Units Reported</u></b>	<b><u>Description</u></b>
% 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: 28-Apr-15

**Client:** Olsson Associates  
**Project:** BopCo Line Spill  
**Sample ID:** Sidewall 1  
**Collection Date:** 4/22/2015 11:00 AM

**Work Order:** 15041479  
**Lab ID:** 15041479-01  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>						
			<b>SW8015M</b>		Prep Date: <b>4/27/2015</b>	Analyst: <b>IT</b>
<b>DRO (C10-C28)</b>	<b>33</b>		<b>5.0</b>	<b>mg/Kg-dry</b>	1	4/28/2015 01:11 PM
Surr: 4-Terphenyl-d14	63.7		39-133	%REC	1	4/28/2015 01:11 PM
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>						
			<b>SW8015D</b>		Prep Date: <b>4/25/2015</b>	Analyst: <b>IT</b>
GRO (C6-C10)	ND		3.0	mg/Kg-dry	1	4/27/2015 03:31 PM
Surr: Toluene-d8	107		50-150	%REC	1	4/27/2015 03:31 PM
<b>VOLATILE ORGANIC COMPOUNDS</b>						
			<b>SW8260B</b>		Prep Date: <b>4/25/2015</b>	Analyst: <b>LSY</b>
m,p-Xylene	ND		73	µg/Kg-dry	1	4/28/2015 05:28 PM
o-Xylene	ND		36	µg/Kg-dry	1	4/28/2015 05:28 PM
Xylenes, Total	ND		110	µg/Kg-dry	1	4/28/2015 05:28 PM
Surr: 1,2-Dichloroethane-d4	97.2		70-130	%REC	1	4/28/2015 05:28 PM
Surr: 4-Bromofluorobenzene	99.4		70-130	%REC	1	4/28/2015 05:28 PM
Surr: Dibromofluoromethane	92.8		70-130	%REC	1	4/28/2015 05:28 PM
Surr: Toluene-d8	95.4		70-130	%REC	1	4/28/2015 05:28 PM
<b>MOISTURE</b>						
			<b>E160.3M</b>			Analyst: <b>EVB</b>
Moisture	18		0.050	% of sample	1	4/27/2015 04:45 PM

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

# ALS Group USA, Corp

Date: 28-Apr-15

**Client:** Olsson Associates  
**Project:** BopCo Line Spill  
**Sample ID:** Sidewall 2  
**Collection Date:** 4/22/2015 11:20 AM

**Work Order:** 15041479  
**Lab ID:** 15041479-02  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>						
<b>DRO (C10-C28)</b>	<b>45</b>		<b>SW8015M</b>		Prep Date: <b>4/27/2015</b>	Analyst: <b>IT</b>
			<b>4.8</b>	<b>mg/Kg-dry</b>	1	4/28/2015 12:41 PM
Surr: 4-Terphenyl-d14	67.5		39-133	%REC	1	4/28/2015 12:41 PM
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>						
<b>GRO (C6-C10)</b>	<b>ND</b>		<b>SW8015D</b>		Prep Date: <b>4/25/2015</b>	Analyst: <b>IT</b>
			<b>2.9</b>	<b>mg/Kg-dry</b>	1	4/27/2015 03:55 PM
Surr: Toluene-d8	101		50-150	%REC	1	4/27/2015 03:55 PM
<b>VOLATILE ORGANIC COMPOUNDS</b>						
<b>SW8260B</b>					Prep Date: <b>4/25/2015</b>	Analyst: <b>LSY</b>
m,p-Xylene	ND		70	µg/Kg-dry	1	4/28/2015 05:54 PM
o-Xylene	ND		35	µg/Kg-dry	1	4/28/2015 05:54 PM
Xylenes, Total	ND		110	µg/Kg-dry	1	4/28/2015 05:54 PM
Surr: 1,2-Dichloroethane-d4	98.9		70-130	%REC	1	4/28/2015 05:54 PM
Surr: 4-Bromofluorobenzene	100		70-130	%REC	1	4/28/2015 05:54 PM
Surr: Dibromofluoromethane	93.6		70-130	%REC	1	4/28/2015 05:54 PM
Surr: Toluene-d8	96.4		70-130	%REC	1	4/28/2015 05:54 PM
<b>MOISTURE</b>						
<b>E160.3M</b>						Analyst: <b>EVB</b>
<b>Moisture</b>	<b>14</b>		<b>0.050</b>	<b>% of sample</b>	1	4/27/2015 04:45 PM

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

# ALS Group USA, Corp

Date: 28-Apr-15

**Client:** Olsson Associates  
**Project:** BopCo Line Spill  
**Sample ID:** Sidewall 3  
**Collection Date:** 4/22/2015 11:40 AM

**Work Order:** 15041479  
**Lab ID:** 15041479-03  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>						
<b>DRO (C10-C28)</b>	<b>32</b>		<b>SW8015M</b>		Prep Date: <b>4/27/2015</b>	Analyst: <b>IT</b>
			<b>4.8</b>	<b>mg/Kg-dry</b>	1	4/28/2015 01:41 PM
Surr: 4-Terphenyl-d14	69.6		39-133	%REC	1	4/28/2015 01:41 PM
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>						
<b>GRO (C6-C10)</b>	<b>ND</b>		<b>SW8015D</b>		Prep Date: <b>4/25/2015</b>	Analyst: <b>IT</b>
			<b>2.9</b>	<b>mg/Kg-dry</b>	1	4/27/2015 04:20 PM
Surr: Toluene-d8	103		50-150	%REC	1	4/27/2015 04:20 PM
<b>VOLATILE ORGANIC COMPOUNDS</b>						
<b>SW8260B</b>					Prep Date: <b>4/25/2015</b>	Analyst: <b>AK</b>
m,p-Xylene	ND		71	µg/Kg-dry	1	4/28/2015 04:21 PM
o-Xylene	ND		35	µg/Kg-dry	1	4/28/2015 04:21 PM
Xylenes, Total	ND		110	µg/Kg-dry	1	4/28/2015 04:21 PM
Surr: 1,2-Dichloroethane-d4	100		70-130	%REC	1	4/28/2015 04:21 PM
Surr: 4-Bromofluorobenzene	97.9		70-130	%REC	1	4/28/2015 04:21 PM
Surr: Dibromofluoromethane	98.2		70-130	%REC	1	4/28/2015 04:21 PM
Surr: Toluene-d8	96.0		70-130	%REC	1	4/28/2015 04:21 PM
<b>MOISTURE</b>						
<b>E160.3M</b>						Analyst: <b>EVB</b>
<b>Moisture</b>	<b>15</b>		<b>0.050</b>	<b>% of sample</b>	1	4/27/2015 04:45 PM

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

# ALS Group USA, Corp

Date: 28-Apr-15

Client: Olsson Associates

Project: BopCo Line Spill

Sample ID: Sidewall 4

Collection Date: 4/22/2015 12:00 PM

Work Order: 15041479

Lab ID: 15041479-04

Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>			<b>SW8015M</b>		Prep Date: <b>4/27/2015</b>	Analyst: <b>IT</b>
DRO (C10-C28)	ND		4.9	mg/Kg-dry	1	4/28/2015 02:11 PM
Surr: 4-Terphenyl-d14	68.9		39-133	%REC	1	4/28/2015 02:11 PM
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>			<b>SW8015D</b>		Prep Date: <b>4/25/2015</b>	Analyst: <b>IT</b>
GRO (C6-C10)	ND		3.0	mg/Kg-dry	1	4/27/2015 04:45 PM
Surr: Toluene-d8	100		50-150	%REC	1	4/27/2015 04:45 PM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260B</b>		Prep Date: <b>4/25/2015</b>	Analyst: <b>LSY</b>
m,p-Xylene	ND		72	µg/Kg-dry	1	4/28/2015 06:19 PM
o-Xylene	ND		36	µg/Kg-dry	1	4/28/2015 06:19 PM
Xylenes, Total	ND		110	µg/Kg-dry	1	4/28/2015 06:19 PM
Surr: 1,2-Dichloroethane-d4	101		70-130	%REC	1	4/28/2015 06:19 PM
Surr: 4-Bromofluorobenzene	101		70-130	%REC	1	4/28/2015 06:19 PM
Surr: Dibromofluoromethane	95.7		70-130	%REC	1	4/28/2015 06:19 PM
Surr: Toluene-d8	96.7		70-130	%REC	1	4/28/2015 06:19 PM
<b>MOISTURE</b>			<b>E160.3M</b>			Analyst: <b>EVB</b>
Moisture	16		0.050	% of sample	1	4/27/2015 04:45 PM

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



# ALS Group USA, Corp

Date: 28-Apr-15

**Client:** Olsson Associates  
**Project:** BopCo Line Spill  
**Sample ID:** Bottom  
**Collection Date:** 4/22/2015 12:10 PM

**Work Order:** 15041479  
**Lab ID:** 15041479-05  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>						
<b>DRO (C10-C28)</b>	<b>50</b>		<b>SW8015M</b>		Prep Date: <b>4/27/2015</b>	Analyst: <b>IT</b>
			<b>4.8</b>	<b>mg/Kg-dry</b>	<b>1</b>	4/28/2015 02:41 PM
Surr: 4-Terphenyl-d14	67.9		39-133	%REC	1	4/28/2015 02:41 PM
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>						
<b>GRO (C6-C10)</b>	<b>ND</b>		<b>SW8015D</b>		Prep Date: <b>4/25/2015</b>	Analyst: <b>IT</b>
			<b>2.9</b>	<b>mg/Kg-dry</b>	<b>1</b>	4/27/2015 05:10 PM
Surr: Toluene-d8	104		50-150	%REC	1	4/27/2015 05:10 PM
<b>VOLATILE ORGANIC COMPOUNDS</b>						
<b>SW8260B</b>			Prep Date: <b>4/25/2015</b>		Analyst: <b>AK</b>	
m,p-Xylene	ND		69	µg/Kg-dry	1	4/28/2015 04:45 PM
o-Xylene	ND		35	µg/Kg-dry	1	4/28/2015 04:45 PM
Xylenes, Total	ND		100	µg/Kg-dry	1	4/28/2015 04:45 PM
Surr: 1,2-Dichloroethane-d4	98.2		70-130	%REC	1	4/28/2015 04:45 PM
Surr: 4-Bromofluorobenzene	99.6		70-130	%REC	1	4/28/2015 04:45 PM
Surr: Dibromofluoromethane	94.7		70-130	%REC	1	4/28/2015 04:45 PM
Surr: Toluene-d8	98.1		70-130	%REC	1	4/28/2015 04:45 PM
<b>MOISTURE</b>						
<b>E160.3M</b>			Analyst: <b>EVB</b>			
<b>Moisture</b>	<b>13</b>		<b>0.050</b>	<b>% of sample</b>	<b>1</b>	4/27/2015 04:45 PM

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

# ALS Group USA, Corp

Date: 28-Apr-15

**Client:** Olsson Associates  
**Project:** BopCo Line Spill  
**Sample ID:** Backfill  
**Collection Date:** 4/22/2015 12:20 PM

**Work Order:** 15041479  
**Lab ID:** 15041479-06  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>DIESEL RANGE ORGANICS BY GC-FID</b>						
			<b>SW8015M</b>		Prep Date: <b>4/27/2015</b>	Analyst: <b>IT</b>
<b>DRO (C10-C28)</b>	<b>230</b>		<b>4.8</b>	<b>mg/Kg-dry</b>	1	4/28/2015 03:11 PM
Surr: 4-Terphenyl-d14	79.6		39-133	%REC	1	4/28/2015 03:11 PM
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>						
			<b>SW8015D</b>		Prep Date: <b>4/25/2015</b>	Analyst: <b>IT</b>
<b>GRO (C6-C10)</b>	<b>58</b>		<b>2.9</b>	<b>mg/Kg-dry</b>	1	4/27/2015 06:00 PM
Surr: Toluene-d8	120		50-150	%REC	1	4/27/2015 06:00 PM
<b>VOLATILE ORGANIC COMPOUNDS</b>						
			<b>SW8260B</b>		Prep Date: <b>4/25/2015</b>	Analyst: <b>AK</b>
m,p-Xylene	ND		70	µg/Kg-dry	1	4/28/2015 05:10 PM
o-Xylene	ND		35	µg/Kg-dry	1	4/28/2015 05:10 PM
Xylenes, Total	ND		100	µg/Kg-dry	1	4/28/2015 05:10 PM
Surr: 1,2-Dichloroethane-d4	100		70-130	%REC	1	4/28/2015 05:10 PM
Surr: 4-Bromofluorobenzene	101		70-130	%REC	1	4/28/2015 05:10 PM
Surr: Dibromofluoromethane	95.8		70-130	%REC	1	4/28/2015 05:10 PM
Surr: Toluene-d8	96.7		70-130	%REC	1	4/28/2015 05:10 PM
<b>MOISTURE</b>						
			<b>E160.3M</b>			Analyst: <b>EVB</b>
<b>Moisture</b>	<b>14</b>		<b>0.050</b>	<b>% of sample</b>	1	4/27/2015 04:45 PM

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

Client: Olsson Associates  
 Work Order: 15041479  
 Project: BopCo Line Spill

**QC BATCH REPORT**Batch ID: **70318**Instrument ID **GC8**Method: **SW8015M**

<b>MBLK</b>		Sample ID: <b>DBLKS1-70318-70318</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>4/28/2015 10:41 AM</b>		
Client ID:		Run ID: <b>GC8_150428A</b>				SeqNo: <b>3247162</b>		Prep Date: <b>4/27/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	ND	5.0								
Surr: 4-Terphenyl-d14	1.533	0	2	0	76.7	39-133		0		

<b>LCS</b>		Sample ID: <b>DLCSS1-70318-70318</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>4/28/2015 11:11 AM</b>		
Client ID:		Run ID: <b>GC8_150428A</b>				SeqNo: <b>3247163</b>		Prep Date: <b>4/27/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	177.7	5.0	200	0	88.9	61-109		0		
Surr: 4-Terphenyl-d14	1.326	0	2	0	66.3	39-133		0		

<b>MS</b>		Sample ID: <b>15041479-02B MS</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>4/28/2015 11:41 AM</b>		
Client ID: <b>Sidewall 2</b>		Run ID: <b>GC8_150428A</b>				SeqNo: <b>3247164</b>		Prep Date: <b>4/27/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	348.6	8.3	331.8	38.83	93.4	48-110		0		
Surr: 4-Terphenyl-d14	2.365	0	3.318	0	71.3	39-133		0		

<b>MSD</b>		Sample ID: <b>15041479-02B MSD</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>4/28/2015 12:11 PM</b>		
Client ID: <b>Sidewall 2</b>		Run ID: <b>GC8_150428A</b>				SeqNo: <b>3247165</b>		Prep Date: <b>4/27/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

DRO (C10-C28)	277	7.9	314.3	38.83	75.8	48-110	348.6	22.9	30	
Surr: 4-Terphenyl-d14	1.927	0	3.143	0	61.3	39-133	2.365	20.4	30	

The following samples were analyzed in this batch:

15041479-01B	15041479-02B	15041479-03B
15041479-04B	15041479-05B	15041479-06B

Client: Olsson Associates  
 Work Order: 15041479  
 Project: BopCo Line Spill

# QC BATCH REPORT

Batch ID: **70316** Instrument ID **GC9** Method: **SW8015D**

<b>MBLK</b>		Sample ID: <b>MBLK-70316-70316</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>4/27/2015 01:48 PM</b>		
Client ID:		Run ID: <b>GC9_150427A</b>				SeqNo: <b>3245858</b>		Prep Date: <b>4/25/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	ND	2,500								
Surr: Toluene-d8	4868	0	5000	0	97.4	50-150	0			

<b>LCS</b>		Sample ID: <b>LCS-70316-70316</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>4/27/2015 01:23 PM</b>		
Client ID:		Run ID: <b>GC9_150427A</b>				SeqNo: <b>3245857</b>		Prep Date: <b>4/25/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	434800	2,500	500000	0	87	70-130	0			
Surr: Toluene-d8	5182	0	5000	0	104	50-150	0			

<b>MS</b>		Sample ID: <b>15041479-01A MS</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>4/27/2015 06:25 PM</b>		
Client ID: <b>Sidewall 1</b>		Run ID: <b>GC9_150427A</b>				SeqNo: <b>3245866</b>		Prep Date: <b>4/25/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	493600	2,500	500000	0	98.7	70-130	0			
Surr: Toluene-d8	4335	0	5000	0	86.7	50-150	0			

<b>MSD</b>		Sample ID: <b>15041479-01A MSD</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>4/27/2015 06:50 PM</b>		
Client ID: <b>Sidewall 1</b>		Run ID: <b>GC9_150427A</b>				SeqNo: <b>3245867</b>		Prep Date: <b>4/25/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	455100	2,500	500000	0	91	70-130	493600	8.12	30	
Surr: Toluene-d8	4472	0	5000	0	89.4	50-150	4335	3.11	30	

The following samples were analyzed in this batch:

15041479-01A	15041479-02A	15041479-03A
15041479-04A	15041479-05A	15041479-06A

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

Client: Olsson Associates  
 Work Order: 15041479  
 Project: BopCo Line Spill

# QC BATCH REPORT

Batch ID: **70293** Instrument ID **VMS5** Method: **SW8260B**

MBLK		Sample ID: <b>MBLK-70293-70293</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>4/26/2015 02:04 PM</b>		
Client ID:		Run ID: <b>VMS5_150426A</b>				SeqNo: <b>3243424</b>		Prep Date: <b>4/25/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
m,p-Xylene	ND	60								
o-Xylene	ND	30								
Xylenes, Total	ND	90								
Surr: 1,2-Dichloroethane-d4	999.5	0	1000	0	100	70-130	0			
Surr: 4-Bromofluorobenzene	983.5	0	1000	0	98.4	70-130	0			
Surr: Dibromofluoromethane	992	0	1000	0	99.2	70-130	0			
Surr: Toluene-d8	979	0	1000	0	97.9	70-130	0			

LCS		Sample ID: <b>LCS-70293-70293</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>4/26/2015 12:46 PM</b>		
Client ID:		Run ID: <b>VMS5_150426A</b>				SeqNo: <b>3243423</b>		Prep Date: <b>4/25/2015</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
m,p-Xylene	2253	60	2000	0	113	80-125	0			
o-Xylene	1096	30	1000	0	110	75-125	0			
Xylenes, Total	3348	90	3000	0	112	75-125	0			
Surr: 1,2-Dichloroethane-d4	940	0	1000	0	94	70-130	0			
Surr: 4-Bromofluorobenzene	1006	0	1000	0	101	70-130	0			
Surr: Dibromofluoromethane	975	0	1000	0	97.5	70-130	0			
Surr: Toluene-d8	994.5	0	1000	0	99.4	70-130	0			

The following samples were analyzed in this batch:

15041479-01A	15041479-02A	15041479-03A
15041479-04A	15041479-05A	15041479-06A

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

**Client:** Olsson Associates  
**Work Order:** 15041479  
**Project:** BopCo Line Spill

## QC BATCH REPORT

Batch ID: **R162219** Instrument ID **MOIST** Method: **E160.3M**

<b>MBLK</b>		Sample ID: <b>WBLKS-R162219</b>				Units: % of sample		Analysis Date: <b>4/27/2015 04:45 PM</b>		
Client ID:		Run ID: <b>MOIST_150427C</b>				SeqNo: <b>3246175</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture ND 0.050

<b>LCS</b>		Sample ID: <b>LCS-R162219</b>				Units: % of sample		Analysis Date: <b>4/27/2015 04:45 PM</b>		
Client ID:		Run ID: <b>MOIST_150427C</b>				SeqNo: <b>3246174</b>		Prep Date:		DF: <b>1</b>
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

<b>DUP</b>		Sample ID: <b>15041392-01A DUP</b>				Units: % of sample		Analysis Date: <b>4/27/2015 04:45 PM</b>		
Client ID:		Run ID: <b>MOIST_150427C</b>				SeqNo: <b>3246159</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 18.47 0.050 0 0 0 18.7 1.24 20

<b>DUP</b>		Sample ID: <b>15041479-01B DUP</b>				Units: % of sample		Analysis Date: <b>4/27/2015 04:45 PM</b>		
Client ID: <b>Sidewall 1</b>		Run ID: <b>MOIST_150427C</b>				SeqNo: <b>3246167</b>		Prep Date:		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Moisture 17.83 0.050 0 0 0 17.67 0.901 20

The following samples were analyzed in this batch:

15041479-01B	15041479-02B	15041479-03B
15041479-04B	15041479-05B	15041479-06B

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



**Environmental**

# Chain of Custody Form

Page 1 of 1

COC ID: 123456

☐ 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

☐ Houston, TX  
+1 281 530 5656

☐ Middletown, PA  
+1 717 944 5541

☐ Salt Lake City, UT  
+1 801 266 7700

☐ Spring City, PA  
+1 610 948 4903

☐ York, PA  
+1 717 505 5280

Customer Information		Project Information		Parameter/Method Request for Analysis															
Purchase Order		Project Name	BopCo Line Spill	A TPH (GRO)															
Work Order		Project Number		B TPH (DRO)															
Company Name	Olsson Associates	Bill To Company		C Total Xylenes															
Send Report To	Ken Kreie	Invoice Attn	Ken Kreie	D															
Address	760 Horizon Drive, Suite 102	Address		E															
City/State/Zip	Grand Junction, CO 81506	City/State/Zip		F															
Phone	970.263.7800	Phone		G															
Fax	970.263.7456	Fax		H															
e-Mail Address	kkreie@olssonassociates.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	SIDEWALL 1	4/22/15	1100	SO	—		X	X	X										
2	SIDEWALL 2		1120				X	X	X										
3	SIDEWALL 3		1140				X	X	X										
4	SIDEWALL 4		1200				X	X	X										
5	BOTTOM		1210				X	X	X										
6	BACKFILL	4/22/15	1220	SO	—		X	X	X										
7																			
8																			
9																			
10																			

Sampler(s): Please Print & Sign Jessica Dilka <i>[Signature]</i>		Shipment Method:	Required Turnaround Time: <input type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input checked="" type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour	Results Due Date:
Relinquished by: <i>[Signature]</i>	Date: 4/23/15	Time: 0815	Received by: <i>[Signature]</i>	Notes:
Relinquished by: <i>[Signature]</i>	Date: 4-23-15	Time: 1300	Received by (Laboratory): <i>[Signature]</i> 4/24/15 1000	Cooler Temp.: 28 °C
Logged by (Laboratory): <i>[Signature]</i>	Date: 4/24/15	Time: 1400	Checked by (Laboratory): <i>[Signature]</i>	QC Package: (Check Box Below) <input type="checkbox"/> Level II: Standard QC <input type="checkbox"/> Level III: Std QC + Raw Data <input type="checkbox"/> Level IV: SW846 CLP-Like
Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035				Other:

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

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From: (616) 298-1033  
 Nick Martinez  
 ALS Environmental  
 127 E. 1st Street

Origin ID: RILA



J151215022303uw

PARACHUTE, CO 81635

Ship Date: 23APR15  
 ActWgt: 57.0 LB  
 CAD: 2264840/NET3810

Dims: 14 X 22 X 13 IN

SHIP TO: (616) 399-6070  
 sample receiving  
 ALS Laboratory Group  
 3352 128TH AVE

BILL SENDER

HOLLAND, MI 49424

Delivery Address Bar Code



Ref # 042315-1  
 Invoice #  
 PO # Parachute  
 Dept #

1 of 2  
 FRI - 24 APR 10:30A  
 PRIORITY OVERNIGHT

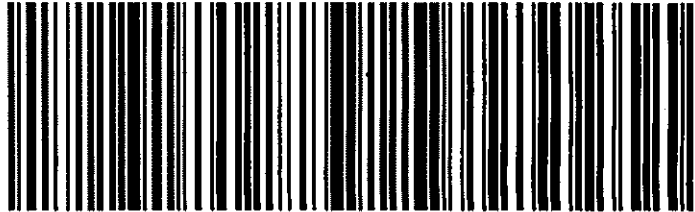
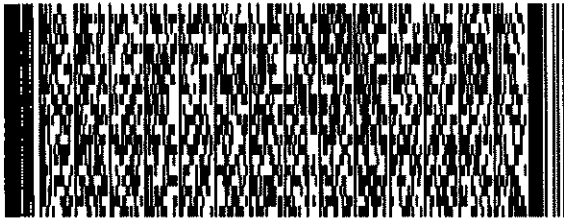
TRK# 7734 4550 5858

0201

## MASTER ##

XX HLMA

49424  
 MI-US  
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537J26FCS/EE4B

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

**Warning:** Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

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ALS #

Custody Seal

Time

Date 4/23/15

Name



Sample Receipt Checklist

Client Name: **OLSSON**

Date/Time Received: **24-Apr-15 10:00**

Work Order: **15041479**

Received by: **DS**

Checklist completed by Diane Shaw 24-Apr-15  
eSignature Date

Reviewed by: Chad Whelton 24-Apr-15  
eSignature Date

Matrices: **Soil**

Carrier name: **FedEx**

Shipping container/cooler in good condition? Yes ☒ No ☐ Not Present ☐

Custody seals intact on shipping container/cooler? Yes ☒ No ☐ Not Present ☐

Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☒

Chain of custody present? Yes ☒ No ☐

Chain of custody signed when relinquished and received? Yes ☒ No ☐

Chain of custody agrees with sample labels? Yes ☒ No ☐

Samples in proper container/bottle? Yes ☒ No ☐

Sample containers intact? Yes ☒ No ☐

Sufficient sample volume for indicated test? Yes ☒ No ☐

All samples received within holding time? Yes ☒ No ☐

Container/Temp Blank temperature in compliance? Yes ☒ No ☐

Sample(s) received on ice? Yes ☒ No ☐

Temperature(s)/Thermometer(s): 2.8 c SR2

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage: 4/24/2015 2:19:44 PM

Water - VOA vials have zero headspace? Yes ☐ No ☐ No VOA vials submitted ☒

Water - pH acceptable upon receipt? Yes ☐ No ☐ N/A ☒

pH adjusted? Yes ☐ No ☐ N/A ☒

pH adjusted by:

Login Notes:

-----

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction: