

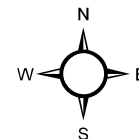


### Legend

- Soil Sample Location
- Spill Path Area

0 50 100 200 Feet

1 inch = 84 feet



PROJECT NO:	018-065
DRAWN BY:	TPD
DATE:	08/27/2020

COLLECTION STATION 5  
SPILL RESPONSE  
CHEVRON USA, INC  
RIO BLANCO COUNTY, COLORADO  
SENE S23 T2N R103W



330 GRAND AVENUE, SUITE C  
GRAND JUNCTION, CO 81501  
TEL 970.549.1015

FIGURE

1

Table 1  
Collection Station 5 Spill  
Soil Data Summary

SAMPLE SUMMARY							
Location Description	Chevron Collection Station 5						
Sample Type	Grab Soil						

LABORATORY DATA SUMMARY							
Sample ID	CS5-SS1	CS5-SS1	LNA10 X BG1	LNA10 X BG2	LNA10 X BG3	COGCC TABLE 910-1 CONCENTRATION LEVELS	UNITS
Depth	0-6"	0-6"	0-6"	0-6"	0-6"		
Sample Date	8/21/2014	10/6/2017	11/8/2012	11/8/2012	11/8/2012		
Analytical Parameters							
TPH							
TPH Gasoline Range Organics	<3.2	NT	NT	NT	NT	500	mg/kg
TPH Diesel Range Organics	<10	NT	NT	NT	NT		
BTEX							
Benzene	<0.039	NT	NT	NT	NT	0.17	mg/kg
Toluene	<0.039	NT	NT	NT	NT	85	mg/kg
Ethylbenzene	<0.039	NT	NT	NT	NT	100	mg/kg
Total Xylene	<0.120	NT	NT	NT	NT	175	mg/kg
Metals							
Arsenic	4.6	NT	6.04	6.38	6.26	0.39	mg/kg
Barium	110	NT	119	NT	NT	15,000	mg/kg
Cadmium	<0.70	NT	0.264 J	NT	NT	70	mg/kg
Chromium	8	NT	10.2	NT	NT	NA	mg/kg
Copper	8.5	NT	12.4	NT	NT	3,100	mg/kg
Lead	8	NT	14.3	NT	NT	400	mg/kg
Mercury	<0.016	NT	0.0122	NT	NT	23	mg/kg
Nickel	9.7	NT	14.4	NT	NT	1,600	mg/kg
Selenium	<1.8	NT	1.44	NT	NT	390	mg/kg
Silver	<1.8	NT	0.0936 J	NT	NT	390	mg/kg
Zinc	33	NT	62.3	NT	NT	23,000	mg/kg
SAR Metals Analysis							
Calcium	430	NT	190	NT	NT	NA	mg/L
Magnesium	530	NT	47.2	NT	NT	NA	mg/L
Sodium	1100	NT	93.8	NT	NT	NA	mg/L
Sodium Adsorption Ratio	8.6	NT	1.58	NT	NT	<12	ratio
Polynuclear Aromatic Hyrdrocarbons							
Acenaphthene	<0.016	NT	NT	NT	NT	1,000	mg/kg
Anthracene	<0.016	NT	NT	NT	NT	1,000	mg/kg
Benzo(a)anthracene	<0.035	NT	NT	NT	NT	0.22	mg/kg
Benzo(a)pyrene	<0.016	NT	NT	NT	NT	0.022	mg/kg
Benzo(b)fluoranthene	<0.016	NT	NT	NT	NT	0.22	mg/kg
Benzo(k)fluoranthene	<0.016	NT	NT	NT	NT	2.2	mg/kg
Chrysene	<0.016	NT	NT	NT	NT	22	mg/kg
Dibenzo(a,h)anthracene	<0.016	NT	NT	NT	NT	0.022	mg/kg
Fluoranthene	<0.016	NT	NT	NT	NT	1,000	mg/kg
Fluorene	<0.016	NT	NT	NT	NT	1,000	mg/kg
Indeno(1,2,3-cd)pyrene	<0.016	NT	NT	NT	NT	0.22	mg/kg
Napthalene	<0.016	NT	NT	NT	NT	23	mg/kg
Pyrene	<0.016	NT	NT	NT	NT	1,000	mg/kg
General Chemistry							
Chromium, Hexavalent	<0.64	NT	<2.0	NT	NT	23	mg/kg
Chromium, Trivalent	7.6	NT	10.2	NT	NT	120,000	mg/kg
Specific Conductivity	13.0	0.34	3.39	NT	NT	<4 or 2 x the background	mmhos/cm
pH	8.0	NT	8.56	NT	NT	6-9	su

mg/kg - milligrams per kilogram  
mg/L - milligrams per liter  
J - indicates an estimated value  
mmhos/cm - millimhos per centimeter  
mv - millivolts  
su - standard units  
NA - not applicable  
NT - parameter was not tested

Over COGCC Table 910-1 concentration levels but under BACKGROUND level.  
Over COGCC Table 910-1 concentration levels and not within BACKGROUND level.  
Over COGCC Table 910-1 concentration levels



02-Sep-2014

Tim Dobransky  
Olsson Associates  
760 Horizon Drive  
Suite 102  
Grand Junction, CO 81506

Re: **Chevron CS5 Spill 8.21.14**

Work Order: **14081254**

Dear Tim,

ALS Environmental received 1 sample on 23-Aug-2014 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 23.

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

Sincerely,

A handwritten signature in cursive script that reads "Ann Preston".

Electronically approved by: Ann Preston

Ann Preston  
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:** Chevron CS5 Spill 8.21.14  
**Work Order:** 14081254

**Work Order Sample Summary**

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<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>
14081254-01	CS5-SS1	Soil		8/21/2014 09:25	8/23/2014 10:00	<input type="checkbox"/>

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**Client:** Olsson Associates  
**Project:** Chevron CS5 Spill 8.21.14  
**Work Order:** 14081254

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**Case Narrative**

Batch 62023 MS/MSD data for Metals is not related to this project's samples. No data requires qualification.

Batch 62156 LCS recoveries for Anthracene and Indeno(1,2,3-cd)pyrene were above the upper control limits. All samples associated with this LCS were non-detect for these compounds. No data requires qualification.

Batch 62157 MS/MSD data for DRO is not related to this project's samples. No data requires qualification.

Batch 62193 MS/MSD data for Hexavalent Chromium is not related to this project's samples. No data requires qualification.

<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

<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: 02-Sep-14

**Client:** Olsson Associates  
**Project:** Chevron CS5 Spill 8.21.14  
**Sample ID:** CS5-SS1  
**Collection Date:** 8/21/2014 09:25 AM

**Work Order:** 14081254  
**Lab ID:** 14081254-01  
**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 / 8/28/14	Analyst: <b>IT</b>
DRO (C10-C28)	ND		10	mg/Kg-dry	1	8/29/2014 12:59 PM
Surr: 4-Terphenyl-d14	82.6		39-133	%REC	1	8/29/2014 12:59 PM
<b>GASOLINE RANGE ORGANICS BY GC-FID</b>						
			<b>SW8015</b>		Prep: SW5035 / 8/27/14	Analyst: <b>IT</b>
GRO (C6-C10)	ND		3.2	mg/Kg-dry	1	8/28/2014 03:38 AM
Surr: Toluene-d8	116		50-150	%REC	1	8/28/2014 03:38 AM
<b>MERCURY BY CVAA</b>						
			<b>SW7471</b>		Prep: SW7471 / 8/25/14	Analyst: <b>LR</b>
Mercury	ND		0.016	mg/Kg-dry	1	8/25/2014 09:45 PM
<b>SOLUBLE CATIONS FOR SAR</b>						
			<b>SW846 6010C</b>		Prep: USDA Method 20B / 8/27/14	Analyst: <b>JEJ</b>
Calcium	430		5.0	mg/L	10	8/27/2014 04:24 PM
Magnesium	530		2.0	mg/L	10	8/27/2014 04:24 PM
Sodium	1,100		2.0	mg/L	10	8/27/2014 04:24 PM
<b>METALS BY ICP-MS</b>						
			<b>SW6020A</b>		Prep: SW3050B / 8/25/14	Analyst: <b>ML</b>
Arsenic	4.6		1.8	mg/Kg-dry	4	8/25/2014 09:00 PM
Barium	110		1.8	mg/Kg-dry	4	8/25/2014 09:00 PM
Cadmium	ND		0.70	mg/Kg-dry	4	8/25/2014 09:00 PM
Chromium	7.6		1.8	mg/Kg-dry	4	8/25/2014 09:00 PM
Copper	8.5		1.8	mg/Kg-dry	4	8/25/2014 09:00 PM
Lead	8.4		1.8	mg/Kg-dry	4	8/25/2014 09:00 PM
Nickel	9.7		1.8	mg/Kg-dry	4	8/25/2014 09:00 PM
Selenium	ND		1.8	mg/Kg-dry	4	8/25/2014 09:00 PM
Silver	ND		1.8	mg/Kg-dry	4	8/25/2014 09:00 PM
Zinc	33		3.5	mg/Kg-dry	4	8/25/2014 09:00 PM
<b>SODIUM ADSORPTION RATIO</b>						
			<b>USDA H60 METHOD</b>		Prep: USDA Method 20B / 8/27/14	Analyst: <b>JEJ</b>
Sodium Adsorption Ratio	8.6		0.010	none	1	8/27/2014
<b>SEMI-VOLATILE ORGANIC COMPOUNDS</b>						
			<b>SW846 8270D</b>		Prep: SW3541 / 8/28/14	Analyst: <b>MK</b>
Acenaphthene	ND		16	µg/Kg-dry	1	8/30/2014 04:33 PM
Anthracene	ND		16	µg/Kg-dry	1	8/30/2014 04:33 PM
Benzo(a)anthracene	35		16	µg/Kg-dry	1	8/30/2014 04:33 PM
Benzo(a)pyrene	ND		16	µg/Kg-dry	1	8/30/2014 04:33 PM
Benzo(b)fluoranthene	ND		16	µg/Kg-dry	1	8/30/2014 04:33 PM
Benzo(k)fluoranthene	ND		16	µg/Kg-dry	1	8/30/2014 04:33 PM
Chrysene	ND		16	µg/Kg-dry	1	8/30/2014 04:33 PM
Dibenzo(a,h)anthracene	ND		16	µg/Kg-dry	1	8/30/2014 04:33 PM
Fluoranthene	ND		16	µg/Kg-dry	1	8/30/2014 04:33 PM

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

# ALS Group USA, Corp

Date: 02-Sep-14

**Client:** Olsson Associates  
**Project:** Chevron CS5 Spill 8.21.14  
**Sample ID:** CS5-SS1  
**Collection Date:** 8/21/2014 09:25 AM

**Work Order:** 14081254  
**Lab ID:** 14081254-01  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Fluorene	ND		16	µg/Kg-dry	1	8/30/2014 04:33 PM
Indeno(1,2,3-cd)pyrene	ND		16	µg/Kg-dry	1	8/30/2014 04:33 PM
Naphthalene	ND		16	µg/Kg-dry	1	8/30/2014 04:33 PM
Pyrene	ND		16	µg/Kg-dry	1	8/30/2014 04:33 PM
Surr: 2-Fluorobiphenyl	75.9		12-100	%REC	1	8/30/2014 04:33 PM
Surr: 4-Terphenyl-d14	89.6		25-137	%REC	1	8/30/2014 04:33 PM
Surr: Nitrobenzene-d5	59.1		37-107	%REC	1	8/30/2014 04:33 PM
<b>VOLATILE ORGANIC COMPOUNDS</b>			<b>SW8260B</b>	Prep: SW5035 / 8/25/14		Analyst: <b>AK</b>
Benzene	ND		39	µg/Kg-dry	1	8/29/2014 07:02 AM
Ethylbenzene	ND		39	µg/Kg-dry	1	8/29/2014 07:02 AM
m,p-Xylene	ND		78	µg/Kg-dry	1	8/29/2014 07:02 AM
o-Xylene	ND		39	µg/Kg-dry	1	8/29/2014 07:02 AM
Toluene	ND		39	µg/Kg-dry	1	8/29/2014 07:02 AM
Xylenes, Total	ND		120	µg/Kg-dry	1	8/29/2014 07:02 AM
Surr: 1,2-Dichloroethane-d4	82.2		70-130	%REC	1	8/29/2014 07:02 AM
Surr: 4-Bromofluorobenzene	101		70-130	%REC	1	8/29/2014 07:02 AM
Surr: Dibromofluoromethane	90.6		70-130	%REC	1	8/29/2014 07:02 AM
Surr: Toluene-d8	93.8		70-130	%REC	1	8/29/2014 07:02 AM
<b>ELECTRICAL CONDUCTIVITY (SAR)</b>			<b>USDA H60 METHOD</b>	Prep: USDA Method 20B / 8/27/14		Analyst: <b>MELB</b>
Electrical Conductivity @ Saturation	13		0.050	mmhos/cm @25	10	8/27/2014 12:30 PM
<b>CHROMIUM, TRIVALENT</b>			<b>CALCULATION</b>			Analyst: <b>JJG</b>
Chromium, Trivalent	7.6		0.65	mg/Kg-dry	1	8/29/2014 04:54 PM
<b>CHROMIUM, HEXAVALENT</b>			<b>SW7196A</b>	Prep: SW3060A / 8/27/14		Analyst: <b>MB</b>
Chromium, Hexavalent	ND		0.64	mg/Kg-dry	1	8/28/2014 04:00 PM
<b>MOISTURE</b>			<b>A2540 G</b>			Analyst: <b>MELB</b>
Moisture	23		0.050	% of sample	1	8/26/2014 07:45 PM
<b>PH</b>			<b>SW9045D</b>	Prep: EXTRACT / 8/27/14		Analyst: <b>STP</b>
pH	8.0			s.u.	1	8/27/2014 12:50 PM

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



Client: Olsson Associates

## QC BATCH REPORT

Work Order: 14081254

Project: Chevron CS5 Spill 8.21.14

Batch ID: 62157

Instrument ID GC8

Method: SW8015M

<b>MBLK</b>		Sample ID: <b>DBLKS1-62157-62157</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>8/28/2014 06:55 PM</b>		
Client ID:		Run ID: <b>GC8_140828A</b>				SeqNo: <b>2910006</b>		Prep Date: <b>8/28/2014</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	4.2								
Surr: 4-Terphenyl-d14	1.114	0	1.667	0	66.8	39-133	0			

<b>LCS</b>		Sample ID: <b>DLCSS1-62157-62157</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>8/28/2014 07:25 PM</b>		
Client ID:		Run ID: <b>GC8_140828A</b>				SeqNo: <b>2910010</b>		Prep Date: <b>8/28/2014</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)	146.1	4.2	166.7	0	87.7	61-109	0			
Surr: 4-Terphenyl-d14	1.118	0	1.667	0	67.1	39-133	0			

<b>MS</b>		Sample ID: <b>14081222-01A MS</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>8/28/2014 07:55 PM</b>		
Client ID:		Run ID: <b>GC8_140828A</b>				SeqNo: <b>2910013</b>		Prep Date: <b>8/28/2014</b>		DF: <b>5</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	2647	160	325.1	2053	183	48-110	0			SO
Surr: 4-Terphenyl-d14	1.846	0	3.251	0	56.8	39-133	0			

<b>MSD</b>		Sample ID: <b>14081222-01A MSD</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>8/28/2014 08:25 PM</b>		
Client ID:		Run ID: <b>GC8_140828A</b>				SeqNo: <b>2910017</b>		Prep Date: <b>8/28/2014</b>		DF: <b>5</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	2256	160	314.7	2053	64.5	48-110	2647	16	30	O
Surr: 4-Terphenyl-d14	1.662	0	3.147	0	52.8	39-133	1.846	10.5	30	

The following samples were analyzed in this batch: 14081254-01A

Client: Olsson Associates  
 Work Order: 14081254  
 Project: Chevron CS5 Spill 8.21.14

## QC BATCH REPORT

Batch ID: **62132** Instrument ID **GC9** Method: **SW8015**

MBLK		Sample ID: MBLK-62132-62132					Units: µg/Kg		Analysis Date: 8/27/2014 09:46 PM		
Client ID:			Run ID: GC9_140827B			SeqNo:2907814		Prep Date: 8/27/2014		DF: 1	
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	5028	0	5000	0	101	50-150	0				

LCS				Sample ID: LCS-62132-62132				Units: µg/Kg			Analysis Date: 8/27/2014 09:21 PM			
Client ID:				Run ID: GC9_140827B				SeqNo:2907813			Prep Date: 8/27/2014		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual			
GRO (C6-C10)		518300	2,500	500000	0	104	70-130	0						
Surr: Toluene-d8		5566	0	5000	0	111	50-150	0						

MS		Sample ID: 14081391-05A MS				Units: µg/Kg		Analysis Date: 8/28/2014 02:48 AM		
Client ID:		Run ID: GC9_140827B			SeqNo:2907823		Prep Date: 8/27/2014		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	478100	2,500	500000	0	95.6	70-130	0			
Surr: Toluene-d8	5614	0	5000	0	112	50-150	0			

MSD		Sample ID: 14081391-05A MSD				Units: µg/Kg		Analysis Date: 8/28/2014 03:13 AM		
Client ID:		Run ID: GC9_140827B			SeqNo:2907824		Prep Date: 8/27/2014		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	478400	2,500	500000	0	95.7	70-130	478100	0.0757	30	
Surr: Toluene-d8	5811	0	5000	0	116	50-150	5614	3.46	30	

The following samples were analyzed in this batch:

14081254-01A

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

**Client:** Olsson Associates  
**Work Order:** 14081254  
**Project:** Chevron CS5 Spill 8.21.14

## QC BATCH REPORT

Batch ID: **61981**      Instrument ID **HG1**      Method: **SW7471**

<b>MBLK</b>				Sample ID: <b>MBLK-61981-61981</b>				Units: <b>mg/Kg</b>			Analysis Date: <b>8/25/2014 09:26 PM</b>												
Client ID:				Run ID: <b>HG1_140825A</b>				SeqNo: <b>2903036</b>			Prep Date: <b>8/25/2014</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

LCS		Sample ID: LCS-61981-61981				Units:mg/Kg		Analysis Date: 8/25/2014 09:28 PM		
Client ID:		Run ID: HG1_140825A			SeqNo:2903037		Prep Date: 8/25/2014		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Mercury      0.1687      0.020      0.1665      0      101      80-120      0

MS				Sample ID: 14081254-01AMS				Units:mg/Kg			Analysis Date: 8/25/2014 09:47 PM		
Client ID: CS5-SS1				Run ID: HG1_140825A				SeqNo:2903045		Prep Date: 8/25/2014		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual		

Mercury      0.1151      0.012      0.1024      0.01049      102      75-125      0

MSD				Sample ID: 14081254-01AMSD				Units:mg/Kg		Analysis Date: 8/25/2014 09:56 PM			
Client ID: CS5-SS1				Run ID: HG1_140825A				SeqNo:2903049		Prep Date: 8/25/2014		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual		

Mercury      0.1145      0.012      0.1018      0.01049      102      75-125      0.1151      0.511      35

The following samples were analyzed in this batch:

14081254-01A

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

Client: Olsson Associates  
 Work Order: 14081254  
 Project: Chevron CS5 Spill 8.21.14

## QC BATCH REPORT

Batch ID: **62023** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK		Sample ID: <b>MBLK-62023-62023</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>8/25/2014 08:11 PM</b>		
Client ID:		Run ID: <b>ICPMS1_140825A</b>				SeqNo: <b>2903634</b>		Prep Date: <b>8/25/2014</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	0.03108	0.25								J
Cadmium	ND	0.10								
Chromium	ND	0.25								
Copper	ND	0.25								
Lead	0.001014	0.25								J
Nickel	ND	0.25								
Selenium	ND	0.25								
Silver	ND	0.25								
Zinc	0.08685	0.50								J

LCS		Sample ID: <b>LCS-62023-62023</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>8/25/2014 08:35 PM</b>		
Client ID:		Run ID: <b>ICPMS1_140825A</b>				SeqNo: <b>2903638</b>		Prep Date: <b>8/25/2014</b>		DF: <b>1</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	4.502	0.25	5	0	90	80-120	0			
Barium	4.706	0.25	5	0	94.1	80-120	0			
Cadmium	4.652	0.10	5	0	93	80-120	0			
Chromium	4.588	0.25	5	0	91.8	80-120	0			
Copper	4.45	0.25	5	0	89	80-120	0			
Lead	4.678	0.25	5	0	93.6	80-120	0			
Nickel	4.526	0.25	5	0	90.5	80-120	0			
Selenium	4.428	0.25	5	0	88.6	80-120	0			
Silver	4.622	0.25	5	0	92.4	80-120	0			
Zinc	4.468	0.50	5	0	89.4	80-120	0			

MS		Sample ID: <b>14081269-02AMS</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>8/25/2014 09:18 PM</b>		
Client ID:		Run ID: <b>ICPMS1_140825A</b>				SeqNo: <b>2903657</b>		Prep Date: <b>8/25/2014</b>		DF: <b>4</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	20.86	1.5	7.541	17.48	44.8	75-125	0			S
Barium	50.92	1.5	7.541	65.32	-191	75-125	0			SO
Cadmium	7.306	0.60	7.541	0.2006	94.2	75-125	0			
Chromium	13.16	1.5	7.541	5.295	104	75-125	0			
Copper	9.897	1.5	7.541	3.225	88.5	75-125	0			
Lead	15.66	1.5	7.541	12.37	43.6	75-125	0			S
Nickel	10.97	1.5	7.541	4.319	88.2	75-125	0			
Selenium	7.982	1.5	7.541	0.6921	96.7	75-125	0			
Silver	6.965	1.5	7.541	0.05432	91.6	75-125	0			
Zinc	30.44	3.0	7.541	29.12	17.5	75-125	0			S

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

Client: Olsson Associates  
 Work Order: 14081254  
 Project: Chevron CS5 Spill 8.21.14

## QC BATCH REPORT

Batch ID: 62023 Instrument ID ICPMS1 Method: SW6020A

MS					Sample ID: 14081270-07AMS		Units:mg/Kg		Analysis Date: 8/25/2014 11:33 PM		
Client ID:			Run ID: ICPMS1_140825A			SeqNo:2903699		Prep Date: 8/25/2014		DF: 4	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Arsenic	7.884	1.3	6.418	1.726	95.9	75-125	0				
Barium	29.14	1.3	6.418	20.85	129	75-125	0			S	
Cadmium	6.475	0.51	6.418	0.4562	93.8	75-125	0				
Chromium	8.822	1.3	6.418	2.763	94.4	75-125	0				
Copper	12.66	1.3	6.418	5.565	110	75-125	0				
Lead	15.5	1.3	6.418	10.76	74	75-125	0			S	
Nickel	8.008	1.3	6.418	1.943	94.5	75-125	0				
Selenium	6.28	1.3	6.418	0.9623	82.8	75-125	0				
Silver	5.805	1.3	6.418	0.03216	89.9	75-125	0				
Zinc	24.01	2.6	6.418	15.45	133	75-125	0			S	

MSD				Sample ID: 14081269-02AMSD			Units:mg/Kg		Analysis Date: 8/25/2014 09:24 PM		
Client ID:			Run ID: ICPMS1_140825A			SeqNo:2903659		Prep Date: 8/25/2014		DF: 4	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Arsenic	18.77	1.5	7.657	17.48	16.9	75-125	20.86	10.5	25	S	
Barium	54.61	1.5	7.657	65.32	-140	75-125	50.92	6.99	25	SO	
Cadmium	7.538	0.61	7.657	0.2006	95.8	75-125	7.306	3.12	25		
Chromium	13.88	1.5	7.657	5.295	112	75-125	13.16	5.39	25		
Copper	9.868	1.5	7.657	3.225	86.8	75-125	9.897	0.295	25		
Lead	15.57	1.5	7.657	12.37	41.8	75-125	15.66	0.583	25	S	
Nickel	11.18	1.5	7.657	4.319	89.6	75-125	10.97	1.9	25		
Selenium	8.242	1.5	7.657	0.6921	98.6	75-125	7.982	3.21	25		
Silver	7.103	1.5	7.657	0.05432	92.1	75-125	6.965	1.95	25		
Zinc	30.36	3.1	7.657	29.12	16.2	75-125	30.44	0.27	25	S	

MSD					Sample ID: 14081270-07AMSD		Units:mg/Kg		Analysis Date: 8/25/2014 11:40 PM		
Client ID:			Run ID: ICPMS1_140825A			SeqNo:2903701		Prep Date: 8/25/2014		DF: 4	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Arsenic	8.018	1.3	6.494	1.726	96.9	75-125	7.884	1.68	25		
Barium	31.84	1.3	6.494	20.85	169	75-125	29.14	8.87	25	S	
Cadmium	7.049	0.52	6.494	0.4562	102	75-125	6.475	8.49	25		
Chromium	9.74	1.3	6.494	2.763	107	75-125	8.822	9.9	25		
Copper	14.66	1.3	6.494	5.565	140	75-125	12.66	14.7	25	S	
Lead	17.26	1.3	6.494	10.76	100	75-125	15.5	10.7	25		
Nickel	8.597	1.3	6.494	1.943	102	75-125	8.008	7.1	25		
Selenium	6.86	1.3	6.494	0.9623	90.8	75-125	6.28	8.83	25		
Silver	6.21	1.3	6.494	0.03216	95.1	75-125	5.805	6.75	25		
Zinc	28.55	2.6	6.494	15.45	202	75-125	24.01	17.3	25	S	

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

**Client:** Olsson Associates  
**Work Order:** 14081254  
**Project:** Chevron CS5 Spill 8.21.14

## QC BATCH REPORT

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Batch ID: **62023**      Instrument ID **ICPMS1**      Method: **SW6020A**

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The following samples were analyzed in this batch:

14081254-01A
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**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Olsson Associates  
**Work Order:** 14081254  
**Project:** Chevron CS5 Spill 8.21.14

## QC BATCH REPORT

Batch ID: **62046** Instrument ID **SAR** Method: **USDA H60 Method**

DUP				Sample ID: 14081254-01BDUP				Units: none			Analysis Date: 8/27/2014			
Client ID: CS5-SS1				Run ID: SAR_140827A				SeqNo: 2908981			Prep Date: 8/27/2014		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual				
Sodium Adsorption Ratio	9.259	0.010	0	0	0		8.569	7.74	50					

The following samples were analyzed in this batch:

14081254-01B

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



Client: Olsson Associates  
 Work Order: 14081254  
 Project: Chevron CS5 Spill 8.21.14

## QC BATCH REPORT

Batch ID: 62156 Instrument ID SVMS4 Method: SW846 8270D

Sample ID: SBLKS1-62156-62156				Units: µg/Kg			Analysis Date: 8/29/2014 01:18 PM			
Client ID:		Run ID: SVMS4_140829A			SeqNo:2910848		Prep Date: 8/28/2014		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	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(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	1229	0	1667	0	73.8	12-100	0			
Surr: 4-Terphenyl-d14	1654	0	1667	0	99.2	25-137	0			
Surr: Nitrobenzene-d5	988	0	1667	0	59.3	37-107	0			

LCS		Sample ID: SLCSS1-62156-62156				Units: µg/Kg		Analysis Date: 8/29/2014 01:43 PM		
Client ID:		Run ID: SVMS4_140829A			SeqNo:2910849		Prep Date: 8/28/2014		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	611.3	6.7	666.7	0	91.7	45-110	0			
Anthracene	704.3	6.7	666.7	0	106	55-105	0			S
Benzo(a)anthracene	681.3	6.7	666.7	0	102	50-110	0			
Benzo(a)pyrene	692.7	6.7	666.7	0	104	50-110	0			
Benzo(b)fluoranthene	692	6.7	666.7	0	104	45-115	0			
Benzo(k)fluoranthene	668.3	6.7	666.7	0	100	45-115	0			
Chrysene	667	6.7	666.7	0	100	55-110	0			
Dibenzo(a,h)anthracene	767	6.7	666.7	0	115	40-125	0			
Fluoranthene	667.7	6.7	666.7	0	100	55-115	0			
Fluorene	703.3	6.7	666.7	0	105	50-110	0			
Indeno(1,2,3-cd)pyrene	840.3	6.7	666.7	0	126	40-120	0			S
Naphthalene	631.3	6.7	666.7	0	94.7	40-105	0			
Pyrene	718.3	6.7	666.7	0	108	45-125	0			
Surr: 2-Fluorobiphenyl	1457	0	1667	0	87.4	12-100	0			
Surr: 4-Terphenyl-d14	1716	0	1667	0	103	25-137	0			
Surr: Nitrobenzene-d5	1226	0	1667	0	73.6	37-107	0			

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

Client: Olsson Associates  
 Work Order: 14081254  
 Project: Chevron CS5 Spill 8.21.14

## QC BATCH REPORT

Batch ID: 62156 Instrument ID SVMS4 Method: SW846 8270D

MS				Sample ID: 14081270-07A MS				Units: µg/Kg		Analysis Date: 8/29/2014 02:08 PM	
Client ID:		Run ID: SVMS4_140829A			SeqNo:2910850		Prep Date: 8/28/2014		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Acenaphthene	1738	20	1975	0	88	45-110	0				
Anthracene	2049	20	1975	0	104	55-105	0				
Benzo(a)anthracene	1909	20	1975	0	96.7	50-110	0				
Benzo(a)pyrene	1914	20	1975	0	96.9	50-110	0				
Benzo(b)fluoranthene	1951	20	1975	0	98.8	45-115	0				
Benzo(k)fluoranthene	1877	20	1975	0	95	45-115	0				
Chrysene	1912	20	1975	0	96.8	55-110	0				
Dibenzo(a,h)anthracene	2054	20	1975	0	104	40-125	0				
Fluoranthene	1887	20	1975	0	95.5	55-115	0				
Fluorene	1957	20	1975	0	99.1	50-110	0				
Indeno(1,2,3-cd)pyrene	2207	20	1975	0	112	40-120	0				
Naphthalene	1600	20	1975	0	81	40-105	0				
Pyrene	1865	20	1975	0	94.4	45-125	0				
Surr: 2-Fluorobiphenyl	4079	0	4936	0	82.6	12-100	0				
Surr: 4-Terphenyl-d14	4559	0	4936	0	92.4	25-137	0				
Surr: Nitrobenzene-d5	3278	0	4936	0	66.4	37-107	0				

MSD				Sample ID: 14081270-07A MSD				Units: µg/Kg		Analysis Date: 8/29/2014 02:33 PM	
Client ID:			Run ID: SVMS4_140829A			SeqNo:2910862		Prep Date: 8/28/2014		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Acenaphthene	1614	20	1958	0	82.4	45-110	1738	7.38	30		
Anthracene	1912	20	1958	0	97.7	55-105	2049	6.87	30		
Benzo(a)anthracene	1824	20	1958	0	93.2	50-110	1909	4.55	30		
Benzo(a)pyrene	1808	20	1958	0	92.3	50-110	1914	5.72	30		
Benzo(b)fluoranthene	1872	20	1958	0	95.6	45-115	1951	4.1	30		
Benzo(k)fluoranthene	1778	20	1958	0	90.8	45-115	1877	5.38	30		
Chrysene	1808	20	1958	0	92.3	55-110	1912	5.62	30		
Dibenzo(a,h)anthracene	1948	20	1958	0	99.5	40-125	2054	5.29	30		
Fluoranthene	1735	20	1958	0	88.6	55-115	1887	8.36	30		
Fluorene	1895	20	1958	0	96.8	50-110	1957	3.21	30		
Indeno(1,2,3-cd)pyrene	2142	20	1958	0	109	40-120	2207	2.99	30		
Naphthalene	1380	20	1958	0	70.5	40-105	1600	14.8	30		
Pyrene	1797	20	1958	0	91.8	45-125	1865	3.71	30		
Surr: 2-Fluorobiphenyl	3459	0	4894	0	70.7	12-100	4079	16.5	40		
Surr: 4-Terphenyl-d14	4305	0	4894	0	88	25-137	4559	5.74	40		
Surr: Nitrobenzene-d5	2585	0	4894	0	52.8	37-107	3278	23.6	40		

The following samples were analyzed in this batch:

14081254-01A

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

Client: Olsson Associates  
 Work Order: 14081254  
 Project: Chevron CS5 Spill 8.21.14

## QC BATCH REPORT

Batch ID: **62013** Instrument ID **VMS8** Method: **SW8260B**

MBLK				Sample ID: MBLK-62013-62013				Units: µg/Kg			Analysis Date: 8/26/2014 02:01 AM		
Client ID:			Run ID: VMS8_140825A				SeqNo:2903848			Prep Date: 8/25/2014		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	996	0	1000	0	99.6	70-130		0					
Surr: 4-Bromofluorobenzene	980	0	1000	0	98	70-130		0					
Surr: Dibromofluoromethane	981.5	0	1000	0	98.2	70-130		0					
Surr: Toluene-d8	960.5	0	1000	0	96	70-130		0					

LCS				Sample ID: LCS-62013-62013			Units: µg/Kg		Analysis Date: 8/25/2014 11:34 PM		
Client ID:		Run ID: VMS8_140825A			SeqNo:2903847		Prep Date: 8/25/2014		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	1004	30	1000	0	100	75-125	0				
Ethylbenzene	1018	30	1000	0	102	75-125	0				
m,p-Xylene	2014	60	2000	0	101	80-125	0				
o-Xylene	1018	30	1000	0	102	75-125	0				
Toluene	1020	30	1000	0	102	70-125	0				
Xylenes, Total	3032	90	3000	0	101	75-125	0				
Surr: 1,2-Dichloroethane-d4	1007	0	1000	0	101	70-130	0				
Surr: 4-Bromofluorobenzene	998	0	1000	0	99.8	70-130	0				
Surr: Dibromofluoromethane	990	0	1000	0	99	70-130	0				
Surr: Toluene-d8	1000	0	1000	0	100	70-130	0				

MS				Sample ID: 14081188-56A MS				Units: µg/Kg			Analysis Date: 8/30/2014 09:23 PM		
Client ID:			Run ID: VMS7_140830A				SeqNo:2912006			Prep Date: 8/25/2014		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual			
Benzene	918.5	30	1000	0	91.8	75-125	0						
Ethylbenzene	845	30	1000	0	84.5	75-125	0						
m,p-Xylene	1640	60	2000	0	82	80-125	0						
o-Xylene	844	30	1000	0	84.4	75-125	0						
Toluene	829	30	1000	0	82.9	70-125	0						
Xylenes, Total	2484	90	3000	0	82.8	75-125	0						
Surr: 1,2-Dichloroethane-d4	821.5	0	1000	0	82.2	70-130	0						
Surr: 4-Bromofluorobenzene	1016	0	1000	0	102	70-130	0						
Surr: Dibromofluoromethane	927.5	0	1000	0	92.8	70-130	0						
Surr: Toluene-d8	931.5	0	1000	0	93.2	70-130	0						

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

**Client:** Olsson Associates  
**Work Order:** 14081254  
**Project:** Chevron CS5 Spill 8.21.14

## QC BATCH REPORT

Batch ID: **62013**      Instrument ID **VMS8**      Method: **SW8260B**

MSD				Sample ID: 14081188-56A MSD				Units: µg/Kg		Analysis Date: 8/30/2014 09:48 PM	
Client ID:			Run ID: VMS7_140830A			SeqNo: 2912007		Prep Date: 8/25/2014		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Benzene	896	30	1000	0	89.6	75-125	918.5	2.48	30		
Ethylbenzene	832.5	30	1000	0	83.2	75-125	845	1.49	30		
m,p-Xylene	1620	60	2000	0	81	80-125	1640	1.23	30		
o-Xylene	838.5	30	1000	0	83.8	75-125	844	0.654	30		
Toluene	818	30	1000	0	81.8	70-125	829	1.34	30		
Xylenes, Total	2458	90	3000	0	81.9	75-125	2484	1.03	30		
Surr: 1,2-Dichloroethane-d4	830.5	0	1000	0	83	70-130	821.5	1.09	30		
Surr: 4-Bromofluorobenzene	1005	0	1000	0	100	70-130	1016	1.04	30		
Surr: Dibromofluoromethane	936.5	0	1000	0	93.6	70-130	927.5	0.966	30		
Surr: Toluene-d8	931	0	1000	0	93.1	70-130	931.5	0.0537	30		

The following samples were analyzed in this batch: 14081254-01A

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

**Client:** Olsson Associates  
**Work Order:** 14081254  
**Project:** Chevron CS5 Spill 8.21.14

## QC BATCH REPORT

Batch ID: **62046** Instrument ID **WETCHEM** Method: **USDA H60 Method**

<b>DUP</b>		Sample ID: <b>14081254-01BDUP</b>				Units: <b>mmhos/cm @25°C</b>		Analysis Date: <b>8/27/2014 12:30 PM</b>		
Client ID: <b>CS5-SS1</b>		Run ID: <b>WETCHEM_140827G</b>				SeqNo: <b>2906463</b>		Prep Date: <b>8/27/2014</b>		DF: <b>10</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Electrical Conductivity @ Saturation	12.84	0.050	0	0	0		12.73	0.86	50	

The following samples were analyzed in this batch:

14081254-01B

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

**Client:** Olsson Associates  
**Work Order:** 14081254  
**Project:** Chevron CS5 Spill 8.21.14

## QC BATCH REPORT

Batch ID: **62111** Instrument ID **WETCHEM** Method: **SW9045D**

LCS					Sample ID: LCS-62111-62111					Units:s.u.			Analysis Date: 8/27/2014 12:50 PM				
Client ID:					Run ID: WETCHEM_140827L					SeqNo:2906816			Prep Date: 8/27/2014			DF: 1	
Analyte					Result		PQL	SPK Val	SPK Ref Value	%REC		Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
pH					3.95		0	4	0	98.8		90-110	0				

DUP					Sample ID: 14081019-06B DUP					Units: s.u.		Analysis Date: 8/27/2014 12:50 PM		
Client ID:				Run ID: WETCHEM_140827L				SeqNo: 2906820			Prep Date: 8/27/2014		DF: 1	
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual			
pH		5.6	0	0	0	0	0-0	5.81	3.68	20				

<b>DUP</b>				Sample ID: <b>14081276-01A DUP</b>				Units: <b>s.u.</b>		Analysis Date: <b>8/27/2014 12:50 PM</b>			
Client ID:				Run ID: <b>WETCHEM_140827L</b>				SeqNo: <b>2906829</b>		Prep Date: <b>8/27/2014</b>		DF: <b>1</b>	
Analyte				Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH				8.41	0	0	0	0	0-0	8.18	2.77	20	

The following samples were analyzed in this batch:

14081254-01A

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

Client: Olsson Associates  
 Work Order: 14081254  
 Project: Chevron CS5 Spill 8.21.14

## QC BATCH REPORT

Batch ID: **62193** Instrument ID **WETCHEM** Method: **SW7196A**

<b>MBLK</b>		Sample ID: <b>MBLK-62193-62193</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>8/28/2014 04:00 PM</b>		
Client ID:		Run ID: <b>WETCHEM_140828P</b>				SeqNo: <b>2909053</b>		Prep Date: <b>8/27/2014</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 ND 0.50

<b>LCS</b>		Sample ID: <b>LCS-62193-62193</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>8/28/2014 04:00 PM</b>		
Client ID:		Run ID: <b>WETCHEM_140828P</b>				SeqNo: <b>2909052</b>		Prep Date: <b>8/27/2014</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 1.768 0.50 2 0 88.4 80-120 0

<b>MS</b>		Sample ID: <b>14081320-51B MSI</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>8/28/2014 04:00 PM</b>		
Client ID:		Run ID: <b>WETCHEM_140828P</b>				SeqNo: <b>2909038</b>		Prep Date: <b>8/27/2014</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 1070 50 1263 0 84.7 75-125 0

<b>MS</b>		Sample ID: <b>14081320-51BMS</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>8/28/2014 04:00 PM</b>		
Client ID:		Run ID: <b>WETCHEM_140828P</b>				SeqNo: <b>2909040</b>		Prep Date: <b>8/27/2014</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 0.9524 0.50 1.984 0 48 75-125 0 S

<b>MSD</b>		Sample ID: <b>14081320-51BMSD</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>8/28/2014 04:00 PM</b>		
Client ID:		Run ID: <b>WETCHEM_140828P</b>				SeqNo: <b>2909041</b>		Prep Date: <b>8/27/2014</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 0.2024 0.50 1.984 0 10.2 75-125 0.9524 0 20 JS

The following samples were analyzed in this batch:

14081254-01A

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



Client: Olsson Associates  
 Work Order: 14081254  
 Project: Chevron CS5 Spill 8.21.14

## QC BATCH REPORT

Batch ID: **R147049** Instrument ID **MOIST** Method: **A2540 G**

<b>MBLK</b>		Sample ID: <b>WBLKS1-140827-R147049</b>				Units: % of sample		Analysis Date: <b>8/26/2014 07:45 PM</b>		
Client ID:		Run ID: <b>MOIST_140826J</b>				SeqNo: <b>2907132</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>WLCSS1-140827-R147049</b>				Units: % of sample		Analysis Date: <b>8/26/2014 07:45 PM</b>		
Client ID:		Run ID: <b>MOIST_140826J</b>				SeqNo: <b>2907133</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 99.92 0.050 100 0 99.9 99.5-100.5 0

<b>DUP</b>		Sample ID: <b>14081188-30B DUP</b>				Units: % of sample		Analysis Date: <b>8/26/2014 07:45 PM</b>		
Client ID:		Run ID: <b>MOIST_140826J</b>				SeqNo: <b>2907117</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 2.56 0.050 0 0 0 0-0 2.53 1.18 20

<b>DUP</b>		Sample ID: <b>14081221-04B DUP</b>				Units: % of sample		Analysis Date: <b>8/26/2014 07:45 PM</b>		
Client ID:		Run ID: <b>MOIST_140826J</b>				SeqNo: <b>2907120</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 6.09 0.050 0 0 0 0-0 5.96 2.16 20

The following samples were analyzed in this batch:

14081254-01A

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



## Chain of Custody Form

Page 1 of 1

**COC ID: 123456**

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Cincinnati, OH<br>+1 513 733 5336   | <input checked="" type="checkbox"/> Holland, MI<br>+1 616 399 6070 | <input type="checkbox"/> Salt Lake City, UT<br>+1 801 266 7700 |
| <input type="checkbox"/> Everett, WA<br>+1 425 356 2600      | <input type="checkbox"/> Houston, TX<br>+1 281 530 5456            | <input type="checkbox"/> Spring City, PA<br>+1 610 948 4903    |
| <input type="checkbox"/> Fort Collins, CO<br>+1 970 490 1511 | <input type="checkbox"/> Middletown, PA<br>+1 717 944 5541         | <input type="checkbox"/> York, PA<br>+1 717 505 5280           |

[illegible]

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

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Sample Receipt Checklist

Client Name: **OLSSON**

Date/Time Received: **23-Aug-14 10:00**

Work Order: **14081254**

Received by: **KRW**

Checklist completed by <u>Keith Wurenga</u>	25-Aug-14	Reviewed by: <u>Ann Preston</u>	25-Aug-14
eSignature	Date	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 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>3.4 C</u>		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	<u>8/25/2014 8:43:11 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:			

Login Notes:

-----

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:



18-Oct-2017

Tim Dobransky  
Olsson Associates  
760 Horizon Drive  
Suite 102  
Grand Junction, CO 81506

Re: **Collection Station 5 Resample**

Work Order: **1710611**

Dear Tim,

ALS Environmental received 1 sample on 10-Oct-2017 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 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 7.

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

Sincerely,

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

Electronically approved by: Chad Whelton

Chad Whelton  
Project Manager

Certificate No: MN 998501

### Report of Laboratory Analysis

ADDRESS 3352 128th Ave Holland, Michigan 49424 | 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

**Client:** Olsson Associates  
**Project:** Collection Station 5 Resample  
**Work Order:** 1710611

## 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>
1710611-01	CS5-SS1	Soil		10/6/2017 13:15	10/10/2017 09:30	<input type="checkbox"/>

**Client:** Olsson Associates  
**Project:** Collection Station 5 Resample  
**WorkOrder:** 1710611

## QUALIFIERS, ACRONYMS, UNITS

<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
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>
mmhos/cm @25°C	Millimhos-Centimeter at 25 Degrees Celcius

# ALS Group, USA

Date: 18-Oct-17

**Client:** Olsson Associates  
**Project:** Collection Station 5 Resample  
**Sample ID:** CS5-SS1  
**Collection Date:** 10/6/2017 01:15 PM

**Work Order:** 1710611  
**Lab ID:** 1710611-01  
**Matrix:** SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
<b>ELECTRICAL CONDUCTIVITY (SAR)</b>							
				Method: <b>USDA H60 METHOD 2</b>		Prep: USDA Method 20B / 10/13/17	Analyst: <b>JB</b>
Electrical Conductivity @ Saturation	0.34		0.028	0.25	mmhos/cm @25°	50	10/16/2017 12:30

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



Client: Olsson Associates

Work Order: 1710611

Project: Collection Station 5 Resample

## QC BATCH REPORT

Batch ID: 108993

Instrument ID WETCHEM

Method: USDA H60 Metho

DUP		Sample ID: 1710598-01A DUP				Units: mmhos/cm @25°		Analysis Date: 10/16/2017 12:30 PM		
Client ID:		Run ID: WETCHEM_171016F			SeqNo: 4702093		Prep Date: 10/13/2017		DF: 50	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Electrical Conductivity @ Saturation	1.39	0.25	0	0	0		1.39	0	50	

The following samples were analyzed in this batch:

1710611-01A



**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	Collection Station 5 Resample					A	TPH (GRO & DRO)										
Work Order		Project Number	013.3287.400.400004					B	BTEX										
Company Name	Olsson Associates	Bill To Company	Olsson Associates					C	PAH (See Attached List) CO Table 910										
Send Report To	Tim Dobransky	Invoice Attn.	Tim Dobransky					D	Electrical Conductivity										
Address	760 Horizon Drive, Ste. 102	Address	760 Horizon Drive, Ste. 102					E	Sodium Adsorption Ratio										
City/State/Zip	Grand Junction, CO 81508	City/State/Zip	Grand Junction, CO 81508					F	pH										
Phone	970.263.7800	Phone	970.263.7800					G	Metals (See Attached List) CO Table 910										
Fax	970.263.7456	Fax	970.263.7456					H	Arsenic Only										
e-Mail Address	tdobransky@oaconsulting.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	CS5-SS1	10/06/17	1315	Soil	8	1				-X									
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Sampler(s): Please Print & Sign Tim Dobransky		Shipment Method: FedEx		Required Turnaround Time: <input type="checkbox"/> STD 10 Wk Days <input checked="" type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour		Results Due Date:	
Relinquished by: <i>TD</i>		Date: 10-7-17	Time: 1130	Received by: <i>[Signature]</i>		Notes: Chevron Pricing Applies - Per Bruce Schlatter	
Relinquished by: <i>[Signature]</i>		Date: 10-9-17	Time: 1830	Received by (Laboratory): <i>[Signature]</i> 10/10/17 0930		QC Package: (Check Box Below)	
Logged by (Laboratory): <i>DES</i>		Date: 10/10/17	Time: 1215	Checked by (Laboratory): <i>[Signature]</i>		Cooler Temp. 3.6°C	<input checked="" type="checkbox"/> Level II: Standard QC <input type="checkbox"/> Level III: Std QC + Raw Data <input type="checkbox"/> Level IV: SW846 CLP-Like Other:
Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035							

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

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Sample Receipt Checklist

Client Name: **OLSSON**

Date/Time Received: **10-Oct-17 09:30**

Work Order: **1710611**

Received by: **DS**

Checklist completed by Diane Shaw 10-Oct-17  
eSignature Date

Reviewed by: Chad Whelton 11-Oct-17  
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 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>3.6/3.6 c</u>		<u>SR2</u>
Cooler(s)/Kit(s):	<u></u>		
Date/Time sample(s) sent to storage:	<u>10/10/2017 12:18:51 PM</u>		
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted by:	<u>-</u>		

Login Notes:

-----

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction:



November 15, 2012

Tim Dobransky  
Olsson Associates  
826 21 1/2 Road  
Grand Junction, Colorado 81505

Tel: (970) 263-7800  
Fax: (970) 263-7456

Re: LN Hagood A10 X Spill

Work Order: **1211572**

Dear Tim,

ALS Environmental received 5 samples on 15-Nov-2012 09:20 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. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 3F.

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

Sincerely,

A handwritten signature in cursive script that reads "Patricia L. Lynch".

Electronically approved by: Jumoke M. Lawal

Patricia L. Lynch  
Project Manager



Certificate No: T104704231-09A-TX

ADDRESS 10450 Stancliff Rd, Suite 210 Houston, Texas 77099-4338 | PHONE (281) 530-5656 | FAX (281) 530-5887

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**Client:** Olsson Associates  
**Project:** LN Hagood A10 X Spill  
**Work Order:** 1211572

---

**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>
1211572-01	LNA10 X - SS1	Soil		11/8/2012 12:35	11/15/2012 09:20	<input type="checkbox"/>
1211572-02	LNA10 X - SS2	Soil		11/8/2012 12:45	11/15/2012 09:20	<input type="checkbox"/>
1211572-03	LNA10 X - BG1	Soil		11/8/2012 12:55	11/15/2012 09:20	<input type="checkbox"/>
1211572-04	LNA10 X- BG2	Soil		11/8/2012 13:00	11/15/2012 09:20	<input type="checkbox"/>
1211572-05	LNA10 X - BG3	Soil		11/8/2012 13:05	11/15/2012 09:20	<input type="checkbox"/>

---

---

**Client:** Olsson Associates  
**Project:** LN Hagood A10 X Spill  
**Work Order:** 1211572

---

**Case Narrative**

TPH(DRO) surrogate is diluted out in sample LN Hagood A 10 X Spill.

Batch 65874a, TPH (DRO): MS/MSD recoveries and RPD in sample LNA10 X - SS1 are outside the control limits due to the matrix. Results are flagged with E and O based on the high concentration in the background sample. The associated LCS recovery is in control.

Batch 65883, Metals: MS/MSD recoveries are outside the control limits in sample LNA10 X - BG1 for numerous metals due to the matrix. The results for barium and zinc are flagged with O. The associated LCS recoveries and MS/MSD RPDs are in control.

Batch 65932, Hexavalent Chromium: MS recovery is marginally below the control limits in sample LNA10 X - SS2, but the associated LCS/LCSD recoveries are in control.

# ALS Environmental

Date: 07-Dec-12

**Client:** Olsson Associates  
**Project:** LN Hagood A10 X Spill  
**Sample ID:** LNA10 X - SS1  
**Collection Date:** 11/8/2012 12:35 PM

**Work Order:** 1211572  
**Lab ID:** 1211572-01  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Prep	Date Analyzed
<b>TPH (DRO) - 8015C</b>			<b>SW8015M</b>				Analyst: <b>KMB</b>
DRO (>C10 - C28)	270		34 mg/Kg		20	11/19/2012	11/20/2012 09:41 PM
Surr: 2-Fluorobiphenyl	0	S	60-135 %REC		20	11/19/2012	11/20/2012 09:41 PM
<b>GASOLINE RANGE ORGANICS - SW8015C</b>			<b>SW8015</b>				Analyst: <b>KKP</b>
Gasoline Range Organics	3.5		0.50 mg/Kg		10		11/16/2012 06:16 PM
Surr: 4-Bromofluorobenzene	87.1		70-130 %REC		10		11/16/2012 06:16 PM
<b>TRIVALENT CHROMIUM</b>			<b>CALCULATION</b>				Analyst: <b>SKS</b>
Chromium, Trivalent	9.79		5.00 mg/Kg		1		11/26/2012
<b>MERCURY - SW7471B</b>			<b>SW7471A</b>				Analyst: <b>OFO</b>
Mercury	0.0367		0.00357 mg/Kg		1	11/20/2012	11/20/2012 12:43 PM
<b>METALS</b>			<b>SW6020</b>				Analyst: <b>ALR</b>
Arsenic	5.65		0.467 mg/Kg		1	11/19/2012	11/20/2012 09:31 PM
Barium	127		0.467 mg/Kg		1	11/19/2012	11/20/2012 09:31 PM
Cadmium	0.199	J	0.467 mg/Kg		1	11/19/2012	11/20/2012 09:31 PM
Chromium	9.79		0.467 mg/Kg		1	11/19/2012	11/20/2012 09:31 PM
Copper	9.95		0.467 mg/Kg		1	11/19/2012	11/20/2012 09:31 PM
Lead	12.5		0.467 mg/Kg		1	11/19/2012	11/20/2012 09:31 PM
Nickel	12.1		0.467 mg/Kg		1	11/19/2012	11/20/2012 09:31 PM
Selenium	1.23		0.467 mg/Kg		1	11/19/2012	11/20/2012 09:31 PM
Silver	U		0.467 mg/Kg		1	11/19/2012	11/20/2012 09:31 PM
Zinc	52.8		0.467 mg/Kg		1	11/19/2012	11/20/2012 09:31 PM
<b>LA29B SODIUM ADSORPTION RATIO</b>			<b>LA29B SAR</b>				Analyst: <b>ALR</b>
Sodium Adsorption Ratio	54.6		0.0100 meq/meq		1	11/20/2012	11/26/2012
<b>LA 29B - 1:1 SOLUBLE CATIONS FOR SAR</b>			<b>LA29B-6020</b>				Analyst: <b>ALR</b>
Calcium	405		4.99 mg/L		10	11/20/2012	11/22/2012 02:23 AM
Magnesium	64.8		4.99 mg/L		10	11/20/2012	11/22/2012 02:23 AM
Sodium	4,490		25.0 mg/L		50	11/20/2012	11/26/2012 01:15 PM
<b>LOW-LEVEL PAHS</b>			<b>SW8270</b>				Analyst: <b>LG</b>
Acenaphthene	U		0.0066 mg/Kg		1	11/20/2012	11/20/2012 09:18 PM
Anthracene	U		0.0066 mg/Kg		1	11/20/2012	11/20/2012 09:18 PM
<b>Benz(a)anthracene</b>	0.018		0.0066 mg/Kg		1	11/20/2012	11/20/2012 09:18 PM
Benzo(a)pyrene	U		0.0066 mg/Kg		1	11/20/2012	11/20/2012 09:18 PM
Benzo(b)fluoranthene	U		0.0066 mg/Kg		1	11/20/2012	11/20/2012 09:18 PM
Benzo(k)fluoranthene	U		0.0066 mg/Kg		1	11/20/2012	11/20/2012 09:18 PM
<b>Chrysene</b>	0.037		0.0066 mg/Kg		1	11/20/2012	11/20/2012 09:18 PM
Dibenz(a,h)anthracene	U		0.0066 mg/Kg		1	11/20/2012	11/20/2012 09:18 PM
Fluoranthene	U		0.0066 mg/Kg		1	11/20/2012	11/20/2012 09:18 PM

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

# ALS Environmental

Date: 07-Dec-12

**Client:** Olsson Associates  
**Project:** LN Hagood A10 X Spill  
**Sample ID:** LNA10 X - SS1  
**Collection Date:** 11/8/2012 12:35 PM

**Work Order:** 1211572  
**Lab ID:** 1211572-01  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Prep	Date Analyzed
<b>Fluorene</b>	<b>0.027</b>		<b>0.0066</b>	<b>mg/Kg</b>	1	11/20/2012	11/20/2012 09:18 PM
Indeno(1,2,3-cd)pyrene	U		0.0066	mg/Kg	1	11/20/2012	11/20/2012 09:18 PM
<b>Naphthalene</b>	<b>0.030</b>		<b>0.0066</b>	<b>mg/Kg</b>	1	11/20/2012	11/20/2012 09:18 PM
Pyrene	U		0.0066	mg/Kg	1	11/20/2012	11/20/2012 09:18 PM
Surr: 2-Fluorobiphenyl	81.4		43-125	%REC	1	11/20/2012	11/20/2012 09:18 PM
Surr: 4-Terphenyl-d14	75.3		32-125	%REC	1	11/20/2012	11/20/2012 09:18 PM
Surr: Nitrobenzene-d5	60.9		37-125	%REC	1	11/20/2012	11/20/2012 09:18 PM
<b>VOLATILES - SW8260C</b>			<b>SW8260</b>				Analyst: <b>WLR</b>
Benzene	U		0.0050	mg/Kg	1		11/20/2012 07:06 PM
Ethylbenzene	U		0.0050	mg/Kg	1		11/20/2012 07:06 PM
m,p-Xylene	U		0.010	mg/Kg	1		11/20/2012 07:06 PM
<b>o-Xylene</b>	<b>0.0017</b>	J	<b>0.0050</b>	<b>mg/Kg</b>	1		11/20/2012 07:06 PM
Toluene	U		0.0050	mg/Kg	1		11/20/2012 07:06 PM
Xylenes, Total	U		0.015	mg/Kg	1		11/20/2012 07:06 PM
Surr: 1,2-Dichloroethane-d4	87.3		70-128	%REC	1		11/20/2012 07:06 PM
Surr: 4-Bromofluorobenzene	95.5		73-126	%REC	1		11/20/2012 07:06 PM
Surr: Dibromofluoromethane	97.3		71-128	%REC	1		11/20/2012 07:06 PM
Surr: Toluene-d8	104		73-127	%REC	1		11/20/2012 07:06 PM
<b>HEXAVALENT CHROMIUM - SW7196A</b>			<b>SW7196</b>				Analyst: <b>EDG</b>
Chromium, Hexavalent	U		1.95	mg/Kg	1	11/20/2012	11/20/2012 10:15 AM
<b>LA29B ELECTRICAL CONDUCTIVITY</b>			<b>LADNR-29B EC</b>				Analyst: <b>VAN</b>
Electrical Conductivity @ saturation	40.2		0.0100	mmhos/cm @25	1		11/21/2012 05:00 PM
Electrical Conductivity, 1:1 aqueous	20.3		0.0100	mmhos/cm @25	1		11/21/2012 05:00 PM
<b>LA29B SATURATION POINT</b>			<b>LADNR-29B SP</b>				Analyst: <b>KAH</b>
Saturation Point	0.505		0.100	% Saturation as	1		11/21/2012 11:30 AM
<b>MOISTURE</b>			<b>SW3550</b>				Analyst: <b>KAH</b>
Percent Moisture	18.3		0.0100	wt%	1		11/20/2012 05:10 PM
<b>PH - SOIL - SW9045D</b>			<b>SW9045B</b>				Analyst: <b>KL</b>
pH	8.11		0.100	pH Units	1		11/17/2012 03:15 PM

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



# ALS Environmental

Date: 07-Dec-12

**Client:** Olsson Associates  
**Project:** LN Hagood A10 X Spill  
**Sample ID:** LNA10 X - SS2  
**Collection Date:** 11/8/2012 12:45 PM

**Work Order:** 1211572  
**Lab ID:** 1211572-02  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Prep	Date Analyzed
<b>TPH (DRO) - 8015C</b>			<b>SW8015M</b>				Analyst: <b>KMB</b>
DRO (>C10 - C28)	0.57	J	1.7	mg/Kg	1	11/19/2012	11/20/2012 07:31 PM
Surr: 2-Fluorobiphenyl	68.0		60-135	%REC	1	11/19/2012	11/20/2012 07:31 PM
<b>GASOLINE RANGE ORGANICS - SW8015C</b>			<b>SW8015</b>				Analyst: <b>KKP</b>
Gasoline Range Organics	0.51		0.050	mg/Kg	1		11/21/2012 01:40 PM
Surr: 4-Bromofluorobenzene	82.8		70-130	%REC	1		11/21/2012 01:40 PM
<b>TRIVALENT CHROMIUM</b>			<b>CALCULATION</b>				Analyst: <b>SKS</b>
Chromium, Trivalent	9.84		5.00	mg/Kg	1		11/26/2012
<b>MERCURY - SW7471B</b>			<b>SW7471A</b>				Analyst: <b>OFO</b>
Mercury	0.0118		0.00341	mg/Kg	1	11/20/2012	11/20/2012 12:45 PM
<b>METALS</b>			<b>SW6020</b>				Analyst: <b>ALR</b>
Arsenic	5.17		0.427	mg/Kg	1	11/19/2012	11/20/2012 09:35 PM
Barium	108		0.427	mg/Kg	1	11/19/2012	11/20/2012 09:35 PM
Cadmium	0.223	J	0.427	mg/Kg	1	11/19/2012	11/20/2012 09:35 PM
Chromium	9.84		0.427	mg/Kg	1	11/19/2012	11/20/2012 09:35 PM
Copper	11.0		0.427	mg/Kg	1	11/19/2012	11/20/2012 09:35 PM
Lead	12.6		0.427	mg/Kg	1	11/19/2012	11/20/2012 09:35 PM
Nickel	12.1		0.427	mg/Kg	1	11/19/2012	11/20/2012 09:35 PM
Selenium	1.21		0.427	mg/Kg	1	11/19/2012	11/20/2012 09:35 PM
Silver	U		0.427	mg/Kg	1	11/19/2012	11/20/2012 09:35 PM
Zinc	55.2		0.427	mg/Kg	1	11/19/2012	11/20/2012 09:35 PM
<b>LA29B SODIUM ADSORPTION RATIO</b>			<b>LA29B SAR</b>				Analyst: <b>ALR</b>
Sodium Adsorption Ratio	36.9		0.0100	meq/meq	1	11/20/2012	11/26/2012
<b>LA 29B - 1:1 SOLUBLE CATIONS FOR SAR</b>			<b>LA29B-6020</b>				Analyst: <b>ALR</b>
Calcium	264		5.00	mg/L	10	11/20/2012	11/22/2012 02:42 AM
Magnesium	44.5		5.00	mg/L	10	11/20/2012	11/22/2012 02:42 AM
Sodium	2,460		25.0	mg/L	50	11/20/2012	11/26/2012 01:34 PM
<b>LOW-LEVEL PAHS</b>			<b>SW8270</b>				Analyst: <b>LG</b>
Acenaphthene	U		0.0066	mg/Kg	1	11/20/2012	11/24/2012 05:10 PM
Anthracene	U		0.0066	mg/Kg	1	11/20/2012	11/24/2012 05:10 PM
Benz(a)anthracene	0.0016	J	0.0066	mg/Kg	1	11/20/2012	11/24/2012 05:10 PM
Benzo(a)pyrene	0.0021	J	0.0066	mg/Kg	1	11/20/2012	11/24/2012 05:10 PM
Benzo(b)fluoranthene	0.0020	J	0.0066	mg/Kg	1	11/20/2012	11/24/2012 05:10 PM
Benzo(k)fluoranthene	0.0027	J	0.0066	mg/Kg	1	11/20/2012	11/24/2012 05:10 PM
Chrysene	0.0077		0.0066	mg/Kg	1	11/20/2012	11/24/2012 05:10 PM
Dibenz(a,h)anthracene	U		0.0066	mg/Kg	1	11/20/2012	11/24/2012 05:10 PM
Fluoranthene	0.0042	J	0.0066	mg/Kg	1	11/20/2012	11/24/2012 05:10 PM

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

# ALS Environmental

Date: 07-Dec-12

**Client:** Olsson Associates  
**Project:** LN Hagood A10 X Spill  
**Sample ID:** LNA10 X - SS2  
**Collection Date:** 11/8/2012 12:45 PM

**Work Order:** 1211572  
**Lab ID:** 1211572-02  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Prep	Date Analyzed
<b>Fluorene</b>	<b>0.0018</b>	J	<b>0.0066</b>	<b>mg/Kg</b>	1	11/20/2012	11/24/2012 05:10 PM
Indeno(1,2,3-cd)pyrene	U		0.0066	mg/Kg	1	11/20/2012	11/24/2012 05:10 PM
<b>Naphthalene</b>	<b>0.0031</b>	J	<b>0.0066</b>	<b>mg/Kg</b>	1	11/20/2012	11/24/2012 05:10 PM
<b>Pyrene</b>	<b>0.0043</b>	J	<b>0.0066</b>	<b>mg/Kg</b>	1	11/20/2012	11/24/2012 05:10 PM
Surr: 2-Fluorobiphenyl	78.7		43-125	%REC	1	11/20/2012	11/24/2012 05:10 PM
Surr: 4-Terphenyl-d14	95.9		32-125	%REC	1	11/20/2012	11/24/2012 05:10 PM
Surr: Nitrobenzene-d5	72.8		37-125	%REC	1	11/20/2012	11/24/2012 05:10 PM
<b>VOLATILES - SW8260C</b>			<b>SW8260</b>				Analyst: <b>WLR</b>
Benzene	U		0.0050	mg/Kg	1		11/20/2012 07:29 PM
Ethylbenzene	U		0.0050	mg/Kg	1		11/20/2012 07:29 PM
m,p-Xylene	U		0.010	mg/Kg	1		11/20/2012 07:29 PM
o-Xylene	U		0.0050	mg/Kg	1		11/20/2012 07:29 PM
Toluene	U		0.0050	mg/Kg	1		11/20/2012 07:29 PM
Xylenes, Total	U		0.015	mg/Kg	1		11/20/2012 07:29 PM
Surr: 1,2-Dichloroethane-d4	94.4		70-128	%REC	1		11/20/2012 07:29 PM
Surr: 4-Bromofluorobenzene	100		73-126	%REC	1		11/20/2012 07:29 PM
Surr: Dibromofluoromethane	98.0		71-128	%REC	1		11/20/2012 07:29 PM
Surr: Toluene-d8	105		73-127	%REC	1		11/20/2012 07:29 PM
<b>HEXAVALENT CHROMIUM - SW7196A</b>			<b>SW7196</b>				Analyst: <b>EDG</b>
Chromium, Hexavalent	U		1.95	mg/Kg	1	11/20/2012	11/20/2012 10:15 AM
<b>LA29B ELECTRICAL CONDUCTIVITY</b>			<b>LADNR-29B EC</b>				Analyst: <b>VAN</b>
Electrical Conductivity @ saturation	21.2		0.0100	mmhos/cm @25	1		11/21/2012 05:00 PM
Electrical Conductivity, 1:1 aqueous	11.5		0.0100	mmhos/cm @25	1		11/21/2012 05:00 PM
<b>LA29B SATURATION POINT</b>			<b>LADNR-29B SP</b>				Analyst: <b>KAH</b>
Saturation Point	0.543		0.100	% Saturation as	1		11/21/2012 11:30 AM
<b>MOISTURE</b>			<b>SW3550</b>				Analyst: <b>KAH</b>
Percent Moisture	17.9		0.0100	wt%	1		11/20/2012 05:10 PM
<b>PH - SOIL - SW9045D</b>			<b>SW9045B</b>				Analyst: <b>KL</b>
pH	8.43		0.100	pH Units	1		11/17/2012 03:15 PM

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

# ALS Environmental

Date: 07-Dec-12

Client: Olsson Associates  
Project: LN Hagood A10 X Spill  
Sample ID: LNA10 X - BG1  
Collection Date: 11/8/2012 12:55 PM

Work Order: 1211572  
Lab ID: 1211572-03  
Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Prep	Date Analyzed
<b>TRIVALENT CHROMIUM</b>			<b>CALCULATION</b>				Analyst: <b>SKS</b>
Chromium, Trivalent	10.2		5.00	mg/Kg	1		11/26/2012
<b>MERCURY - SW7471B</b>			<b>SW7471A</b>				Analyst: <b>OFO</b>
Mercury	0.0122		0.00337	mg/Kg	1	11/20/2012	11/20/2012 12:47 PM
<b>METALS</b>			<b>SW6020</b>				Analyst: <b>ALR</b>
Arsenic	6.04		0.461	mg/Kg	1	11/19/2012	11/20/2012 04:37 PM
Barium	119		0.461	mg/Kg	1	11/19/2012	11/20/2012 04:37 PM
Cadmium	0.264	J	0.461	mg/Kg	1	11/19/2012	11/20/2012 04:37 PM
Chromium	10.2		0.461	mg/Kg	1	11/19/2012	11/20/2012 04:37 PM
Copper	12.4		0.461	mg/Kg	1	11/19/2012	11/20/2012 04:37 PM
Lead	14.3		0.461	mg/Kg	1	11/19/2012	11/20/2012 04:37 PM
Nickel	14.4		0.461	mg/Kg	1	11/19/2012	11/20/2012 04:37 PM
Selenium	1.44		0.461	mg/Kg	1	11/19/2012	11/20/2012 04:37 PM
Silver	0.0936	J	0.461	mg/Kg	1	11/19/2012	11/20/2012 04:37 PM
Zinc	62.3		0.461	mg/Kg	1	11/19/2012	11/20/2012 04:37 PM
<b>LA29B SODIUM ADSORPTION RATIO</b>			<b>LA29B SAR</b>				Analyst: <b>ALR</b>
Sodium Adsorption Ratio	1.58		0.0100	meq/meq	1	11/20/2012	11/26/2012
<b>LA 29B - 1:1 SOLUBLE CATIONS FOR SAR</b>			<b>LA29B-6020</b>				Analyst: <b>ALR</b>
Calcium	190		5.00	mg/L	10	11/20/2012	11/22/2012 02:47 AM
Magnesium	47.2		5.00	mg/L	10	11/20/2012	11/22/2012 02:47 AM
Sodium	93.8		5.00	mg/L	10	11/20/2012	11/22/2012 02:47 AM
<b>HEXAVALENT CHROMIUM - SW7196A</b>			<b>SW7196</b>				Analyst: <b>EDG</b>
Chromium, Hexavalent	U		2.00	mg/Kg	1	11/20/2012	11/20/2012 10:15 AM
<b>LA29B ELECTRICAL CONDUCTIVITY</b>			<b>LADNR-29B EC</b>				Analyst: <b>VAN</b>
Electrical Conductivity @ saturation	3.39		0.0100	mmhos/cm @25	1		11/21/2012 05:00 PM
Electrical Conductivity, 1:1 aqueous	1.41		0.0100	mmhos/cm @25	1		11/21/2012 05:00 PM
<b>LA29B SATURATION POINT</b>			<b>LADNR-29B SP</b>				Analyst: <b>KAH</b>
Saturation Point	0.416		0.100	% Saturation as	1		11/21/2012 11:30 AM
<b>MOISTURE</b>			<b>SW3550</b>				Analyst: <b>KAH</b>
Percent Moisture	1.51		0.0100	wt%	1		11/20/2012 05:10 PM
<b>PH - SOIL - SW9045D</b>			<b>SW9045B</b>				Analyst: <b>KL</b>
pH	8.56		0.100	pH Units	1		11/17/2012 03:15 PM

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

## ALS Environmental

Date: 07-Dec-12

**Client:** Olsson Associates  
**Project:** LN Hagood A10 X Spill  
**Sample ID:** LNA10 X- BG2  
**Collection Date:** 11/8/2012 01:00 PM

**Work Order:** 1211572  
**Lab ID:** 1211572-04  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Prep	Date Analyzed
<b>METALS</b>			<b>SW6020</b>				Analyst: <b>ALR</b>
Arsenic	6.38		0.494	mg/Kg	1	11/19/2012	11/20/2012 09:40 PM
<b>MOISTURE</b>			<b>SW3550</b>				Analyst: <b>KAH</b>
Percent Moisture	2.52		0.0100	wt%	1		11/20/2012 05:10 PM

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

## ALS Environmental

Date: 07-Dec-12

**Client:** Olsson Associates  
**Project:** LN Hagood A10 X Spill  
**Sample ID:** LNA10 X - BG3  
**Collection Date:** 11/8/2012 01:05 PM

**Work Order:** 1211572  
**Lab ID:** 1211572-05  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Prep	Date Analyzed
<b>METALS</b>			<b>SW6020</b>				Analyst: <b>ALR</b>
Arsenic	6.26		0.462	mg/Kg	1	11/19/2012	11/20/2012 09:45 PM
<b>MOISTURE</b>			<b>SW3550</b>				Analyst: <b>KAH</b>
Percent Moisture	2.08		0.0100	wt%	1		11/20/2012 05:10 PM

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

# ALS Environmental

Date: 07-Dec-12

**Client:** Olsson Associates  
**Work Order:** 1211572  
**Project:** LN Hagood A10 X Spill

## QC BATCH REPORT

Batch ID: **65874a** Instrument ID **FID-7** Method: **SW8015M**

<b>MBLK</b>	Sample ID: <b>FBLKS1-121119-65874a</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>11/20/2012 04:20 PM</b>			
Client ID:	Run ID: <b>FID-7_121120B</b>				SeqNo: <b>3025556</b>		Prep Date: <b>11/19/2012</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)	U	1.7								
<i>Surr: 2-Fluorobiphenyl</i>	3.331	0	3.3	0	101	60-135	0			

<b>LCS</b>	Sample ID: <b>FLCSS1-121119-65874a</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>11/20/2012 04:41 PM</b>			
Client ID:	Run ID: <b>FID-7_121120B</b>				SeqNo: <b>3025557</b>		Prep Date: <b>11/19/2012</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)	31.34	1.7	33.3	0	94.1	70-130	0			
<i>Surr: 2-Fluorobiphenyl</i>	3.472	0	3.3	0	105	60-135	0			

<b>MS</b>	Sample ID: <b>1211572-01AMS</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>11/20/2012 05:24 PM</b>			
Client ID: <b>LNA10 X - SS1</b>	Run ID: <b>FID-7_121120B</b>				SeqNo: <b>3025560</b>		Prep Date: <b>11/19/2012</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)	243.8	1.7	33.29	324.2	-242	70-130	0			SEO
<i>Surr: 2-Fluorobiphenyl</i>	4.633	0	3.299	0	140	60-135	0			S

<b>MSD</b>	Sample ID: <b>1211572-01AMSD</b>				Units: <b>mg/Kg</b>		Analysis Date: <b>11/20/2012 05:45 PM</b>			
Client ID: <b>LNA10 X - SS1</b>	Run ID: <b>FID-7_121120B</b>				SeqNo: <b>3025561</b>		Prep Date: <b>11/19/2012</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)	1154	1.7	33.29	324.2	2490	70-130	243.8	130	30	SREO
<i>Surr: 2-Fluorobiphenyl</i>	4.199	0	3.299	0	127	60-135	4.633	9.83	30	

The following samples were analyzed in this batch: 

1211572-01A	1211572-02A
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**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 1 of 17

Client: Olsson Associates  
 Work Order: 1211572  
 Project: LN Hagood A10 X Spill

## QC BATCH REPORT

Batch ID: **R138494** Instrument ID **FID-9** Method: **SW8015**

**MBLK** Sample ID: **GBLKS1-121116-R138494** Units: **mg/Kg** Analysis Date: **11/16/2012 05:39 PM**

Client ID: Run ID: **FID-9\_121116B** SeqNo: **3021517** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	U	0.050								
Surr: 4-Bromofluorobenzene	0.09139	0.0050	0.1	0	91.4	70-130	0			

**LCS** Sample ID: **GLCSS1-121116-R138494** Units: **mg/Kg** Analysis Date: **11/16/2012 05:01 PM**

Client ID: Run ID: **FID-9\_121116B** SeqNo: **3021515** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.818	0.050	1	0	81.8	70-130	0			
Surr: 4-Bromofluorobenzene	0.09967	0.0050	0.1	0	99.7	70-130	0			

**LCSD** Sample ID: **GLCSDS1-121116-R138494** Units: **mg/Kg** Analysis Date: **11/16/2012 05:20 PM**

Client ID: Run ID: **FID-9\_121116B** SeqNo: **3021516** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.8324	0.050	1	0	83.2	70-130	0.818	1.75	30	
Surr: 4-Bromofluorobenzene	0.09538	0.0050	0.1	0	95.4	70-130	0.09967	4.4	30	

**MS** Sample ID: **1211222-11ZMS** Units: **mg/Kg** Analysis Date: **11/16/2012 07:32 PM**

Client ID: Run ID: **FID-9\_121116B** SeqNo: **3021520** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.8344	0.050	1	0	83.4	70-130	0			
Surr: 4-Bromofluorobenzene	0.08655	0.0050	0.1	0	86.5	70-130	0			

**MSD** Sample ID: **1211222-11ZMSD** Units: **mg/Kg** Analysis Date: **11/16/2012 07:51 PM**

Client ID: Run ID: **FID-9\_121116B** SeqNo: **3021526** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.8219	0.050	1	0	82.2	70-130	0.8344	1.5	30	
Surr: 4-Bromofluorobenzene	0.08645	0.0050	0.1	0	86.4	70-130	0.08655	0.118	30	

The following samples were analyzed in this batch: 1211572-01A

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

Client: Olsson Associates  
 Work Order: 1211572  
 Project: LN Hagood A10 X Spill

## QC BATCH REPORT

Batch ID: **R138661** Instrument ID **FID-9** Method: **SW8015**

**MBLK** Sample ID: **GBLKS1-121121-R138661** Units: **mg/Kg** Analysis Date: **11/21/2012 12:54 PM**

Client ID: Run ID: **FID-9\_121121A** SeqNo: **3025871** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	U	0.050								
Surr: 4-Bromofluorobenzene	0.0842	0.0050	0.1	0	84.2	70-130	0			

**LCS** Sample ID: **GLCSS1-121121-R138661** Units: **mg/Kg** Analysis Date: **11/21/2012 12:02 PM**

Client ID: Run ID: **FID-9\_121121A** SeqNo: **3025869** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.9775	0.050	1	0	97.8	70-130	0			
Surr: 4-Bromofluorobenzene	0.08428	0.0050	0.1	0	84.3	70-130	0			

**LCSD** Sample ID: **GLCSDS1-121121-R138661** Units: **mg/Kg** Analysis Date: **11/21/2012 12:35 PM**

Client ID: Run ID: **FID-9\_121121A** SeqNo: **3025870** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.9335	0.050	1	0	93.4	70-130	0.9775	4.61	30	
Surr: 4-Bromofluorobenzene	0.08532	0.0050	0.1	0	85.3	70-130	0.08428	1.22	30	

**MS** Sample ID: **1211714-01AMS** Units: **mg/Kg** Analysis Date: **11/21/2012 03:02 PM**

Client ID: Run ID: **FID-9\_121121A** SeqNo: **3025875** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.9449	0.050	1	0	94.5	70-130	0			
Surr: 4-Bromofluorobenzene	0.08366	0.0050	0.1	0	83.7	70-130	0			

**MSD** Sample ID: **1211714-01AMSD** Units: **mg/Kg** Analysis Date: **11/21/2012 03:20 PM**

Client ID: Run ID: **FID-9\_121121A** SeqNo: **3025876** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.9388	0.050	1	0	93.9	70-130	0.9449	0.639	30	
Surr: 4-Bromofluorobenzene	0.08476	0.0050	0.1	0	84.8	70-130	0.08366	1.31	30	

The following samples were analyzed in this batch: | 1211572-02A |

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



**Client:** Olsson Associates  
**Work Order:** 1211572  
**Project:** LN Hagood A10 X Spill

## QC BATCH REPORT

Batch ID: **65883** Instrument ID **ICPMS03** Method: **SW6020**

**MBLK** Sample ID: **MBLKS1-111912-65883** Units: **mg/Kg** Analysis Date: **11/20/2012 03:54 PM**

Client ID: Run ID: **ICPMS03\_121120A** SeqNo: **3024267** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.50								
Barium	U	0.50								
Cadmium	U	0.50								
Chromium	U	0.50								
Lead	0.06159	0.50								J
Nickel	U	0.50								
Selenium	U	0.50								
Silver	U	0.50								
Zinc	U	0.50								

**LCS** Sample ID: **MLCSS1-111912-65883** Units: **mg/Kg** Analysis Date: **11/20/2012 03:59 PM**

Client ID: Run ID: **ICPMS03\_121120A** SeqNo: **3024268** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	8.846	0.50	10	0	88.5	80-120	0			
Barium	9.028	0.50	10	0	90.3	80-120	0			
Cadmium	8.945	0.50	10	0	89.4	80-120	0			
Chromium	9.063	0.50	10	0	90.6	80-120	0			
Lead	8.93	0.50	10	0	89.3	80-120	0			
Nickel	9.134	0.50	10	0	91.3	80-120	0			
Selenium	8.907	0.50	10	0	89.1	80-120	0			
Silver	9.191	0.50	10	0	91.9	80-120	0			
Zinc	9.123	0.50	10	0	91.2	80-120	0			

**MS** Sample ID: **1211572-03AMS** Units: **mg/Kg** Analysis Date: **11/20/2012 04:51 PM**

Client ID: **LNA10 X - BG1** Run ID: **ICPMS03\_121120A** SeqNo: **3024391** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	13.54	0.45	9.081	6.041	82.6	75-125	0			
Barium	137.2	0.45	9.081	118.7	204	75-125	0			SO
Cadmium	8.157	0.45	9.081	0.2645	86.9	75-125	0			
Chromium	19.57	0.45	9.081	10.17	104	75-125	0			
Lead	22.74	0.45	9.081	14.35	92.4	75-125	0			
Nickel	22.3	0.45	9.081	14.36	87.4	75-125	0			
Selenium	8.763	0.45	9.081	1.437	80.7	75-125	0			
Silver	7.939	0.45	9.081	0.09363	86.4	75-125	0			
Zinc	70.37	0.45	9.081	62.27	89.2	75-125	0			O

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

Client: Olsson Associates  
 Work Order: 1211572  
 Project: LN Hagood A10 X Spill

## QC BATCH REPORT

Batch ID: **65883** Instrument ID **ICPMS03** Method: **SW6020**

**MSD** Sample ID: **1211572-03AMSD** Units: **mg/Kg** Analysis Date: **11/20/2012 04:55 PM**  
 Client ID: **LNA10 X - BG1** Run ID: **ICPMS03\_121120A** SeqNo: **3024392** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	12.01	0.45	9.007	6.041	66.2	75-125	13.54	12	25	S
Barium	148.3	0.45	9.007	118.7	328	75-125	137.2	7.74	25	SO
Cadmium	7.55	0.45	9.007	0.2645	80.9	75-125	8.157	7.73	25	
Chromium	16.67	0.45	9.007	10.17	72.2	75-125	19.57	16	25	S
Lead	20.72	0.45	9.007	14.35	70.7	75-125	22.74	9.31	25	S
Nickel	19.62	0.45	9.007	14.36	58.3	75-125	22.3	12.8	25	S
Selenium	7.918	0.45	9.007	1.437	72	75-125	8.763	10.1	25	S
Silver	7.336	0.45	9.007	0.09363	80.4	75-125	7.939	7.9	25	
Zinc	61.99	0.45	9.007	62.27	-3.11	75-125	70.37	12.7	25	SO

**DUP** Sample ID: **1211572-03ADUP** Units: **mg/Kg** Analysis Date: **11/20/2012 04:41 PM**  
 Client ID: **LNA10 X - BG1** Run ID: **ICPMS03\_121120A** SeqNo: **3024389** Prep Date: **11/19/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	5.573	0.46	0	0	0	0-0	6.041	8.06	25	
Barium	115.8	0.46	0	0	0	0-0	118.7	2.47	25	
Cadmium	0.278	0.46	0	0	0	0-0	0.2645	0	25	J
Chromium	9.899	0.46	0	0	0	0-0	10.17	2.66	25	
Lead	13.92	0.46	0	0	0	0-0	14.35	3.04	25	
Nickel	14.05	0.46	0	0	0	0-0	14.36	2.18	25	
Selenium	1.444	0.46	0	0	0	0-0	1.437	0.449	25	
Silver	0.08991	0.46	0	0	0	0-0	0.09363	0	25	J
Zinc	59.67	0.46	0	0	0	0-0	62.27	4.26	25	

The following samples were analyzed in this batch:

1211572-01A	1211572-02A	1211572-03A
1211572-04A	1211572-05A	

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

**Client:** Olsson Associates  
**Work Order:** 1211572  
**Project:** LN Hagood A10 X Spill

## QC BATCH REPORT

Batch ID: **65897** Instrument ID **HG02** Method: **SW7471A**

**MBLK** Sample ID: **GBLKS1-112012-65897** Units: **µg/Kg** Analysis Date: **11/20/2012 12:01 PM**

Client ID: Run ID: **HG02\_121120A** SeqNo: **3024057** Prep Date: **11/20/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	3.3								

**LCS** Sample ID: **GLCSS1-112012-65897** Units: **µg/Kg** Analysis Date: **11/20/2012 12:03 PM**

Client ID: Run ID: **HG02\_121120A** SeqNo: **3024058** Prep Date: **11/20/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	326	3.3	333.3	0	97.8	85-115	0			

**MS** Sample ID: **1211558-01BMS** Units: **µg/Kg** Analysis Date: **11/20/2012 12:09 PM**

Client ID: Run ID: **HG02\_121120A** SeqNo: **3024061** Prep Date: **11/20/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	324	3.5	350.6	-0.2815	92.5	85-115	0			

**MSD** Sample ID: **1211558-01BMSD** Units: **µg/Kg** Analysis Date: **11/20/2012 12:11 PM**

Client ID: Run ID: **HG02\_121120A** SeqNo: **3024062** Prep Date: **11/20/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	335.4	3.5	350.1	-0.2815	95.9	85-115	324	3.47	20	

**DUP** Sample ID: **1211558-01BDUP** Units: **µg/Kg** Analysis Date: **11/20/2012 12:07 PM**

Client ID: Run ID: **HG02\_121120A** SeqNo: **3024060** Prep Date: **11/20/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.9136	3.5	0	0	0		-0.2815	0	20	J

The following samples were analyzed in this batch:

1211572-01A	1211572-02A	1211572-03A
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**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Olsson Associates  
**Work Order:** 1211572  
**Project:** LN Hagood A10 X Spill

## QC BATCH REPORT

Batch ID: **65930** Instrument ID **ICPMS04** Method: **La29B-6020**

<b>MBLK</b>	Sample ID: <b>BLK-112012-SAR-65930</b>				Units: <b>mg/L</b>		Analysis Date: <b>11/22/2012 02:14 A</b>			
Client ID:	Run ID: <b>ICPMS04_121121A</b>				SeqNo: <b>3027171</b>		Prep Date: <b>11/20/2012</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	U	0.50								
Magnesium	U	0.50								
Sodium	U	0.50								

<b>LCS</b>	Sample ID: <b>LCS-112012-SAR-65930</b>				Units: <b>mg/L</b>		Analysis Date: <b>11/22/2012 02:19 A</b>			
Client ID:	Run ID: <b>ICPMS04_121121A</b>				SeqNo: <b>3027172</b>		Prep Date: <b>11/20/2012</b>		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	5.052	0.50	5	0	101	80-120	0			
Magnesium	4.941	0.50	5	0	98.8	80-120	0			
Sodium	4.919	0.50	5	0	98.4	80-120	0			

<b>DUP</b>	Sample ID: <b>1211572-01BDUP</b>				Units: <b>mg/L</b>		Analysis Date: <b>11/22/2012 02:28 A</b>			
Client ID: <b>LNA10 X - SS1</b>	Run ID: <b>ICPMS04_121121A</b>				SeqNo: <b>3027174</b>		Prep Date: <b>11/20/2012</b>		DF: <b>10</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	406.2	5.0	0	0	0		405.3	0.23	30	
Magnesium	66.03	5.0	0	0	0		64.76	1.94	30	

<b>DUP</b>	Sample ID: <b>1211572-01BDUP</b>				Units: <b>mg/L</b>		Analysis Date: <b>11/26/2012 01:20 PM</b>			
Client ID: <b>LNA10 X - SS1</b>	Run ID: <b>ICPMS04_121126A</b>				SeqNo: <b>3028047</b>		Prep Date: <b>11/20/2012</b>		DF: <b>50</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	4374	25	0	0	0		4489	2.61	30	

The following samples were analyzed in this batch:

1211572-01B	1211572-02B	1211572-03B
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**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Olsson Associates  
**Work Order:** 1211572  
**Project:** LN Hagood A10 X Spill

## QC BATCH REPORT

Batch ID: **65930A** Instrument ID **MISC-Metals** Method: **La29B SAR**

**DUP** Sample ID: **1211572-01BDUP** Units: **meq/meq** Analysis Date: **11/26/2012**  
Client ID: **LNA10 X - SS1** Run ID: **MISC-METALS\_121126** SeqNo: **3028136** Prep Date: **11/20/2012** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium Adsorption Ratio	53.04	0.010	0	0	0		54.65	2.99	30	

The following samples were analyzed in this batch:

1211572-01B	1211572-02B	1211572-03B
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**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Olsson Associates  
**Work Order:** 1211572  
**Project:** LN Hagood A10 X Spill

## QC BATCH REPORT

Batch ID: **65875**      Instrument ID **SV-4**      Method: **SW8270**

**MBLK**      Sample ID: **SBLKS1-121120-65875**      Units: **µg/Kg**      Analysis Date: **11/20/2012 05:56 PM**  
 Client ID:      Run ID: **SV-4\_121120B**      SeqNo: **3026159**      Prep Date: **11/20/2012**      DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	U	6.6								
Anthracene	U	6.6								
Benz(a)anthracene	U	6.6								
Benzo(a)pyrene	U	6.6								
Benzo(b)fluoranthene	U	6.6								
Benzo(k)fluoranthene	U	6.6								
Chrysene	U	6.6								
Dibenz(a,h)anthracene	U	6.6								
Fluoranthene	U	6.6								
Fluorene	U	6.6								
Indeno(1,2,3-cd)pyrene	U	6.6								
Naphthalene	U	6.6								
Pyrene	U	6.6								
<i>Surr: 2-Fluorobiphenyl</i>	150.5	6.6	166.7	0	90.3	43-125	0			
<i>Surr: 4-Terphenyl-d14</i>	180	6.6	166.7	0	108	32-125	0			
<i>Surr: Nitrobenzene-d5</i>	130.9	6.6	166.7	0	78.5	37-125	0			

**LCS**      Sample ID: **SLCSS1-121120-65875**      Units: **µg/Kg**      Analysis Date: **11/20/2012 06:16 PM**  
 Client ID:      Run ID: **SV-4\_121120B**      SeqNo: **3026160**      Prep Date: **11/20/2012**      DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	135	6.6	166.7	0	81	50-120	0			
Anthracene	140.1	6.6	166.7	0	84.1	50-123	0			
Benz(a)anthracene	168	6.6	166.7	0	101	50-131	0			
Benzo(a)pyrene	155.7	6.6	166.7	0	93.4	50-130	0			
Benzo(b)fluoranthene	167	6.6	166.7	0	100	50-137	0			
Benzo(k)fluoranthene	141.4	6.6	166.7	0	84.9	50-143	0			
Chrysene	160.8	6.6	166.7	0	96.5	50-130	0			
Dibenz(a,h)anthracene	158.5	6.6	166.7	0	95.1	50-130	0			
Fluoranthene	160.4	6.6	166.7	0	96.2	50-131	0			
Fluorene	152.4	6.6	166.7	0	91.5	50-125	0			
Indeno(1,2,3-cd)pyrene	159.5	6.6	166.7	0	95.7	45-139	0			
Naphthalene	151.7	6.6	166.7	0	91	50-125	0			
Pyrene	150.9	6.6	166.7	0	90.5	45-130	0			
<i>Surr: 2-Fluorobiphenyl</i>	155.8	6.6	166.7	0	93.5	43-125	0			
<i>Surr: 4-Terphenyl-d14</i>	181.6	6.6	166.7	0	109	32-125	0			
<i>Surr: Nitrobenzene-d5</i>	127.9	6.6	166.7	0	76.8	37-125	0			

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

Client: Olsson Associates  
 Work Order: 1211572  
 Project: LN Hagood A10 X Spill

## QC BATCH REPORT

Batch ID: **65875** Instrument ID **SV-4** Method: **SW8270**

MS		Sample ID: <b>1211572-01AMS</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>11/20/2012 09:43 PM</b>		
Client ID: <b>LNA10 X - SS1</b>		Run ID: <b>SV-4_121120B</b>				SeqNo: <b>3026162</b>		Prep Date: <b>11/20/2012</b>		DF: <b>5</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	104.7	33	166.5	0	62.9	50-120	0			
Anthracene	108.2	33	166.5	0	65	50-123	0			
Benz(a)anthracene	122	33	166.5	0	73.3	50-131	0			
Benzo(a)pyrene	115.5	33	166.5	0	69.3	50-130	0			
Benzo(b)fluoranthene	104.3	33	166.5	0	62.7	50-137	0			
Benzo(k)fluoranthene	119.5	33	166.5	0	71.8	50-143	0			
Chrysene	193.3	33	166.5	73.19	72.2	50-130	0			
Dibenz(a,h)anthracene	119.4	33	166.5	0	71.7	50-130	0			
Fluoranthene	136	33	166.5	0	81.7	50-131	0			
Fluorene	105	33	166.5	16.84	53	50-125	0			
Indeno(1,2,3-cd)pyrene	183.7	33	166.5	0	110	45-139	0			
Naphthalene	120.1	33	166.5	31.56	53.2	50-125	0			
Pyrene	130.7	33	166.5	0	78.5	45-130	0			
Surr: 2-Fluorobiphenyl	121.1	33	166.5	0	72.8	43-125	0			
Surr: 4-Terphenyl-d14	116.7	33	166.5	0	70.1	32-125	0			
Surr: Nitrobenzene-d5	85.71	33	166.5	0	51.5	37-125	0			

MSD		Sample ID: <b>1211572-01AMSD</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>11/20/2012 10:02 PM</b>		
Client ID: <b>LNA10 X - SS1</b>		Run ID: <b>SV-4_121120B</b>				SeqNo: <b>3026163</b>		Prep Date: <b>11/20/2012</b>		DF: <b>5</b>
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	100.5	33	166.6	0	60.3	50-120	104.7	4.07	30	
Anthracene	118.9	33	166.6	0	71.4	50-123	108.2	9.39	30	
Benz(a)anthracene	151.4	33	166.6	0	90.9	50-131	122	21.5	30	
Benzo(a)pyrene	144.1	33	166.6	0	86.5	50-130	115.5	22.1	30	
Benzo(b)fluoranthene	118.9	33	166.6	0	71.4	50-137	104.3	13.1	30	
Benzo(k)fluoranthene	147.4	33	166.6	0	88.5	50-143	119.5	21	30	
Chrysene	168.3	33	166.6	73.19	57.1	50-130	193.3	13.8	30	
Dibenz(a,h)anthracene	159.4	33	166.6	0	95.7	50-130	119.4	28.7	30	
Fluoranthene	142.9	33	166.6	0	85.8	50-131	136	4.99	30	
Fluorene	118.5	33	166.6	16.84	61	50-125	105	12	30	
Indeno(1,2,3-cd)pyrene	181.3	33	166.6	0	109	45-139	183.7	1.32	30	
Naphthalene	123.6	33	166.6	31.56	55.3	50-125	120.1	2.84	30	
Pyrene	138.6	33	166.6	0	83.2	45-130	130.7	5.83	30	
Surr: 2-Fluorobiphenyl	117.2	33	166.6	0	70.4	43-125	121.1	3.31	30	
Surr: 4-Terphenyl-d14	157.5	33	166.6	0	94.6	32-125	116.7	29.7	30	
Surr: Nitrobenzene-d5	83.93	33	166.6	0	50.4	37-125	85.71	2.09	30	

The following samples were analyzed in this batch:

1211572-01A 1211572-02A

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

**Client:** Olsson Associates  
**Work Order:** 1211572  
**Project:** LN Hagood A10 X Spill

## QC BATCH REPORT

Batch ID: **R138554**      Instrument ID **VOA5**      Method: **SW8260**

<b>MBLK</b>	Sample ID: <b>VBLKS1-112012-R138554</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>11/20/2012 09:53 A</b>			
Client ID:	Run ID: <b>VOA5_121120A</b>				SeqNo: <b>3023123</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
Benzene	U	5.0								
Ethylbenzene	U	5.0								
m,p-Xylene	U	10								
o-Xylene	U	5.0								
Toluene	U	5.0								
Xylenes, Total	U	15								
<i>Surr: 1,2-Dichloroethane-d4</i>	43.65	0	50	0	87.3	70-128	0			
<i>Surr: 4-Bromofluorobenzene</i>	48.83	0	50	0	97.7	73-126	0			
<i>Surr: Dibromofluoromethane</i>	47.29	0	50	0	94.6	71-128	0			
<i>Surr: Toluene-d8</i>	52.57	0	50	0	105	73-127	0			

<b>LCS</b>	Sample ID: <b>VLCSS1-112012-R138554</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>11/20/2012 08:44 A</b>			
Client ID:	Run ID: <b>VOA5_121120A</b>				SeqNo: <b>3023122</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
Benzene	54.35	5.0	50	0	109	79-120	0			
Ethylbenzene	53.35	5.0	50	0	107	80-122	0			
m,p-Xylene	110.3	10	100	0	110	79-122	0			
o-Xylene	54.81	5.0	50	0	110	80-123	0			
Toluene	54.76	5.0	50	0	110	79-120	0			
Xylenes, Total	165.1	15	150	0	110	80-120	0			
<i>Surr: 1,2-Dichloroethane-d4</i>	49.41	0	50	0	98.8	70-128	0			
<i>Surr: 4-Bromofluorobenzene</i>	50.4	0	50	0	101	73-126	0			
<i>Surr: Dibromofluoromethane</i>	48.79	0	50	0	97.6	71-128	0			
<i>Surr: Toluene-d8</i>	50.98	0	50	0	102	73-127	0			

<b>MS</b>	Sample ID: <b>1211467-01ZMS</b>				Units: <b>µg/Kg</b>		Analysis Date: <b>11/20/2012 12:56 PM</b>			
Client ID:	Run ID: <b>VOA5_121120A</b>				SeqNo: <b>3023951</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
Benzene	49.37	5.0	50	0	98.7	79-120	0			
Ethylbenzene	45.87	5.0	50	0	91.7	80-122	0			
m,p-Xylene	93.47	10	100	0	93.5	79-122	0			
o-Xylene	47.3	5.0	50	0	94.6	80-123	0			
Toluene	49.23	5.0	50	0	98.5	79-120	0			
Xylenes, Total	140.8	15	150	0	93.8	80-120	0			
<i>Surr: 1,2-Dichloroethane-d4</i>	45.46	0	50	0	90.9	70-128	0			
<i>Surr: 4-Bromofluorobenzene</i>	49.81	0	50	0	99.6	73-126	0			
<i>Surr: Dibromofluoromethane</i>	49.55	0	50	0	99.1	71-128	0			
<i>Surr: Toluene-d8</i>	50.81	0	50	0	102	73-127	0			

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



**Client:** Olsson Associates  
**Work Order:** 1211572  
**Project:** LN Hagood A10 X Spill

## QC BATCH REPORT

Batch ID: **R138554** Instrument ID **VOA5** Method: **SW8260**

<b>MSD</b>	Sample ID: <b>1211467-01ZMSD</b>				Units: <b>µg/Kg</b>			Analysis Date: <b>11/20/2012 02:08 PM</b>		
Client ID:	Run ID: <b>VOA5_121120A</b>				SeqNo: <b>3023952</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
Benzene	48.31	5.0	50	0	96.6	79-120	49.37	2.16	30	
Ethylbenzene	46.24	5.0	50	0	92.5	80-122	45.87	0.811	30	
m,p-Xylene	93.15	10	100	0	93.2	79-122	93.47	0.335	30	
o-Xylene	48.33	5.0	50	0	96.7	80-123	47.3	2.16	30	
Toluene	48.75	5.0	50	0	97.5	79-120	49.23	0.973	30	
Xylenes, Total	141.5	15	150	0	94.3	80-120	140.8	0.509	30	
Surr: 1,2-Dichloroethane-d4	48.96	0	50	0	97.9	70-128	45.46	7.43	30	
Surr: 4-Bromofluorobenzene	51.12	0	50	0	102	73-126	49.81	2.6	30	
Surr: Dibromofluoromethane	49.97	0	50	0	99.9	71-128	49.55	0.837	30	
Surr: Toluene-d8	52.91	0	50	0	106	73-127	50.81	4.06	30	

The following samples were analyzed in this batch:

1211572-01A 1211572-02A

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

**Client:** Olsson Associates  
**Work Order:** 1211572  
**Project:** LN Hagood A10 X Spill

## QC BATCH REPORT

Batch ID: **65932**      Instrument ID **UV-2450**      Method: **SW7196**      **(Dissolve)**

<b>MBLK</b>	Sample ID: <b>WBLKS1-112012-65932</b>				Units: <b>mg/kg</b>		Analysis Date: <b>11/20/2012 10:15 A</b>			
Client ID:	Run ID: <b>UV-2450_121120E</b>				SeqNo: <b>3024330</b>		Prep Date: <b>11/20/2012</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	U	2.0								

<b>LCS</b>	Sample ID: <b>WLCSS1-112012-65932</b>				Units: <b>mg/kg</b>		Analysis Date: <b>11/20/2012 10:15 A</b>			
Client ID:	Run ID: <b>UV-2450_121120E</b>				SeqNo: <b>3024331</b>		Prep Date: <b>11/20/2012</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	10.88	2.0	10	0	109	80-120	0			

<b>LCSD</b>	Sample ID: <b>WLCSDS1-112012-65932</b>				Units: <b>mg/kg</b>		Analysis Date: <b>11/20/2012 10:15 A</b>			
Client ID:	Run ID: <b>UV-2450_121120E</b>				SeqNo: <b>3024335</b>		Prep Date: <b>11/20/2012</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	10.56	2.0	10	0	106	80-120	10.88	2.99	20	

<b>MS</b>	Sample ID: <b>1211572-02AMS</b>				Units: <b>mg/kg</b>		Analysis Date: <b>11/20/2012 10:15 A</b>			
Client ID: <b>LNA10 X - SS2</b>	Run ID: <b>UV-2450_121120E</b>				SeqNo: <b>3024336</b>		Prep Date: <b>11/20/2012</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	6.772	2.0	9.843	0	68.8	75-125	0			S

The following samples were analyzed in this batch:

1211572-01A	1211572-02A	1211572-03A
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**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Olsson Associates  
**Work Order:** 1211572  
**Project:** LN Hagood A10 X Spill

## QC BATCH REPORT

Batch ID: **R138481** Instrument ID **WetChem** Method: **SW9045B (Dissolve)**

**LCS** Sample ID: **WLCSS3-121117-R138481** Units: **pH Units** Analysis Date: **11/17/2012 03:15 PM**

Client ID: Run ID: **WETCHEM\_121117F** SeqNo: **3021125** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	6.04	0.10	6	0	101	90-110	0			

**DUP** Sample ID: **1211542-21BDUP** Units: **pH Units** Analysis Date: **11/17/2012 03:15 PM**

Client ID: Run ID: **WETCHEM\_121117F** SeqNo: **3021130** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	7.82	0.10	0	0	0	0-0	7.81	0.128	20	

The following samples were analyzed in this batch:

1211572-01A	1211572-02A	1211572-03A
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**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Olsson Associates  
**Work Order:** 1211572  
**Project:** LN Hagood A10 X Spill

## QC BATCH REPORT

Batch ID: **R138637** Instrument ID **Balance1** Method: **SW3550** **(Dissolve)**

**DUP** Sample ID: **1211572-05ADUP** Units: **wt%** Analysis Date: **11/20/2012 05:10 PM**

Client ID: **LNA10 X - BG3** Run ID: **BALANCE1\_121120B** SeqNo: **3025190** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Percent Moisture	2.107	0.010	0	0	0	0-0	2.078	1.39	20	

The following samples were analyzed in this batch:

1211572-01A	1211572-02A	1211572-03A
1211572-04A	1211572-05A	

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

**Client:** Olsson Associates  
**Work Order:** 1211572  
**Project:** LN Hagood A10 X Spill

## QC BATCH REPORT

Batch ID: **R138682** Instrument ID **Balance1** Method: **LaDNR-29B SP (Dissolve)**

<b>DUP</b>	Sample ID: <b>1211572-01BDUP</b>				Units: % <b>Saturation as D</b>			Analysis Date: <b>11/21/2012 11:30 A</b>		
Client ID: <b>LNA10 X - SS1</b>		Run ID: <b>BALANCE1_121121C</b>			SeqNo: <b>3026228</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
Saturation Point	0.485	0.10	0	0	0		0.505	4.04	30	

The following samples were analyzed in this batch:

1211572-01B	1211572-02B	1211572-03B
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**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Olsson Associates  
**Work Order:** 1211572  
**Project:** LN Hagood A10 X Spill

## QC BATCH REPORT

Batch ID: **R138684** Instrument ID **BALANCE1** Method: **LaDNR-29B EC (Dissolve)**

**MBLK** Sample ID: **WBLKW1-112112-R138684** Units: **mmhos/cm @25°** Analysis Date: **11/21/2012 05:00 PM**

Client ID: Run ID: **BALANCE1\_121121D** SeqNo: **3026232** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Electrical Conductivity @ saturation	U	0.010								
Electrical Conductivity, 1:1 aqueous	U	0.010								

**LCS** Sample ID: **WLCSW1-112112-R138684** Units: **mmhos/cm @25°** Analysis Date: **11/21/2012 05:00 PM**

Client ID: Run ID: **BALANCE1\_121121D** SeqNo: **3026233** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Electrical Conductivity, 1:1 aqueous	1.43	0.010	1.412	0	101	90-110	0			

**DUP** Sample ID: **1211572-01BDUP** Units: **mmhos/cm @25°** Analysis Date: **11/21/2012 05:00 PM**

Client ID: **LNA10 X - SS1** Run ID: **BALANCE1\_121121D** SeqNo: **3026240** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Electrical Conductivity @ saturation	41.42	0.010	0	0	0		40.16	3.09	20	
Electrical Conductivity, 1:1 aqueous	20.1	0.010	0	0	0		20.3	0.99	20	

The following samples were analyzed in this batch:

1211572-01B	1211572-02B	1211572-03B
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**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

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<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 detected below quantitation limit
M	Manually integrated, see raw data for justification
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

<b><u>Acronym</u></b>	<b><u>Description</u></b>
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

<b><u>Units Reported</u></b>	<b><u>Description</u></b>
aturation as Dec	
meq/meq	
mg/Kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
mhoh/cm @25°	
pH Units	
wt%	

## Sample Receipt Checklist

Client Name: **OLSSON ASSOC - GRAND JUNC**

Date/Time Received: **15-Nov-12 09:20**

Work Order: **1211572**

Received by: **PMG**

Checklist completed by Johannie B. Allen  
eSignature

16-Nov-12  
Date

Reviewed by: Patricia L. Lynch  
eSignature

07-Dec-12  
Date

Matrices: sludge/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"/>	
Temperature(s)/Thermometer(s):	<u>2.7 C/uc</u> <u>005</u>		
Cooler(s)/Kit(s):	<u>Large Red/White</u>		
Date/Time sample(s) sent to storage:	<u>11/16/12 16:10</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:

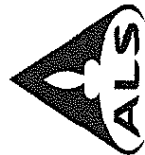
Contacted By:

Regarding:

Comments:

CorrectiveAction:





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

1211572

OLSSON ASSOC - GRAND JUNCTION: Olsson Associates

Project: LN Hagood A10 X Spill



ALS Project Manager:

Customer Information				Project Information				Parameter/Method request for Analysis											
Purchase Order	Project Name			LN Hagood A10X Spill			A	TPH (GRO & DRO)											
Work Order	Project Number			9.0082.202.202004			B	BTEX											
Company Name	Bill To Company			Olsson Associates			C	PAH (See Attached List)											
Send Report To	Invoice Attn:			Tim Dobransky			D	Electrical Conductivity											
Address	Address			826 21 1/2 Road			E	Sodium Adsorption Ratio											
	City/State/Zip			Grand Junction, CO			F	pH											
Phone	City/State/Zip			Grand Junction, CO			G	Metals (See Attached List)											
Fax	Phone			970.263.7800			H	Arsenic Only											
e-Mail Address	Fax			970.263.7456			I												
	e-Mail Address						J												
No.	Sample Description	Date	Time	Matrix	Pres	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold		
1	LNA10X-SS1	11/08/12	1235	Soil	NA	2	X	X	X	X	X	X	X	X	X	X			
2	LNA10X-SS2	11/08/12	1245	Soil	NA	2	X	X	X	X	X	X	X	X	X	X			
3	LNA10X-BG1	11/08/12	1255	Soil	NA	2				X	X	X	X	X	X	X			
4	LNA10X-BG2	11/08/12	1300	Soil	NA	1								X					
5	LNA10X-BG3	11/08/12	1305	Soil	NA	1								X					
6																			
7																			
8																			
9																			
10																			

Sampler(s): Please Print & Sign Tim Dobransky	Shipment Method: FedEx	Required Turnaround Time: <input checked="" type="checkbox"/> STD 10 WK Days <input type="checkbox"/> 5 WK Days <input type="checkbox"/> 24 Hour	Results Due Date:
Relinquished by: 	Received by: 	Notes: Chevron Pricing Applies - Per Bruce Schlatter	
Relinquished by: 	Received by (Laboratory): OK 11-15-12 0920	QC Package: (Check Box Below)	
Logged by (Laboratory):	Checked by (Laboratory):	Cooler Temp.	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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C-E

11/14/12  
1700

ORIGIN ID: GJTA (970) 270-2986  
TIM DOBRANSKY  
OLSSON ASSOCIATES, INC.  
826 21 ROAD

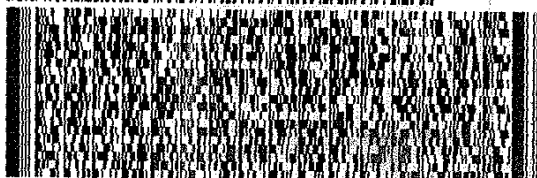
SHIP DATE: 14NOV12  
ACTWGT: 45.0 LB MAN  
CAD: 3900B2/CAFE2605

GRAND JUNCTION, CO 81505  
UNITED STATES US

BILL SENDER

TO SAMPLE RECEIVING  
ALS ENVIRONMENTAL  
10450 STANCLIFF ROAD  
SUITE 210  
HOUSTON TX 770994338  
(281) 575-2162  
PO: 9.0082.202.202004

512C3/EE39/CF80



FedEx  
Express



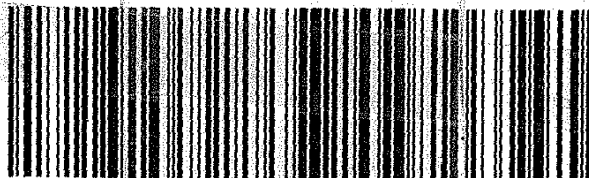
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TRK# 9660 0452 6144  
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THU - 15 NOV A1  
PRIORITY OVERNIGHT

XH SGRA

77099  
TX-US IAH



Part of 155143-156, NEST 09-07