

State of Colorado
Oil and Gas Conservation Commission



1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109

FOR OGCC USE ONLY

OGCC Employee:

Spill Complaint
 Inspection NOAV

Tracking No: _____

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

Spill or Release Plug & Abandon Central Facility Closure Site/Facility Closure Other (describe): _____

OGCC Operator Number: <u>96155</u>	Contact Name and Telephone: _____
Name of Operator: <u>Whiting Oil and Gas Corporation</u>	<u>Mark Keyes; mark.keyes@whiting.com</u>
Address: <u>1700 Broadway, Suite 2300</u>	No: <u>970-407-3007</u>
City: <u>Denver</u> State: <u>CO</u> Zip: <u>80290</u>	Fax: _____
API Number: <u>05-103-11178</u> County: <u>Rio Blanco - #103</u>	
Facility Name: _____ Facility Number: <u>335705</u>	
Well Name: <u>Federal</u> Well Number: <u>397-3K-K3</u>	
Location: (QtrQtr, Sec, Twp, Rng, Meridian): <u>NE/4 SW/4 Sec. 3-T3S-R97W, 6th</u> Latitude: <u>39.815241</u> Longitude: <u>-108.269338</u>	

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): produced water

Site Conditions: Is location within a sensitive area (according to Rule 901e)? Y N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Rangeland

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Forelle Loam

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Buildings

Description of Impact (if previously provided, refer to that form or document): Form 19

Impacted Media (check):	Extent of Impact:	How Determined:
<input checked="" type="checkbox"/> Soils	<u>Estimated 50' x 50' x 10-12' bgl</u>	<u>soil sampling</u>
<input type="checkbox"/> Vegetation	_____	_____
<input type="checkbox"/> Groundwater	_____	_____
<input type="checkbox"/> Surface Water	_____	_____

REMEDATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):
The release was investigated, soil samples were collected and the pit was closed. (refer to previously provided Form 19)

Describe how source is to be removed:
Impacted material was treated for hydrocarbon removal on site and the pit will be permanently closed.

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:
A Screen Machine 621T (Shredder) with an internal spray system delivering hydrogen peroxide for the purpose of chemical oxidation was used to accomplish soil remediation of hydrocarbons on site.

FORM
27
Rev 6/99

State of Colorado
Oil and Gas Conservation Commission
1120 Lincoln Street, Suite 801, Denver, Colorado 80203
(303)894-2100 Fax: (303)894-2109



Tracking Number: _____
Name of Operator: Whiting Oil and Gas Corporation
OGCC Operator No: 96155
Received Date: _____
Well Name & No: Federal 3979-3K-K3
Facility Name & No: 335705

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REMEDIATION WORKPLAN (Cont.)

OGCC Employee: Stan Spencer

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

Groundwater has not been impacted.

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

Treated soils were reused and backfilled to grade. Any further re-vegetation activities will be performed by Whiting Oil and Gas Corporation.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? Y N If yes, describe:

Remediation of soils is complete. Confirmation soil samples were collected from the sidewalls and floor of the pit in addition to treated soils returned to the pit. None of the final confirmation soil samples contained analyte concentrations in excess of COGCC Table 910-1 standards, except arsenic. Elevated arsenic concentrations were also present in one of the background samples. Laboratory analytical results are provided as an attachment to this Form 27. A total of 1,000 cubic yards were treated at the site.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

Material was treated and reused on site.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 11-2013 Date Site Investigation Completed: 11-2013 Date Remediation Plan Submitted: 7-2014
Remediation Start Date: 8-9/2014 Anticipated Completion Date: est. 8-9/2014 Actual Completion Date: 11/18/2014

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: _____ Signed: _____

Title: _____ Date: _____

OGCC Approved: _____ Title: _____ Date: _____


Whiting Petroleum Corporation

**Federal 397-3K-K3
Pad K Form 19 Map
Sec 3, T3S R97W**

February 3, 2015

Explanation:

 Sample Location

 Whiting Well Location



Apex Companies, LLC · 4808 S.
Garnett Road, Suite 100 · Tulsa, OK
74146 · T 918.610.3543 · F
918.610.3556 · apexcos.com

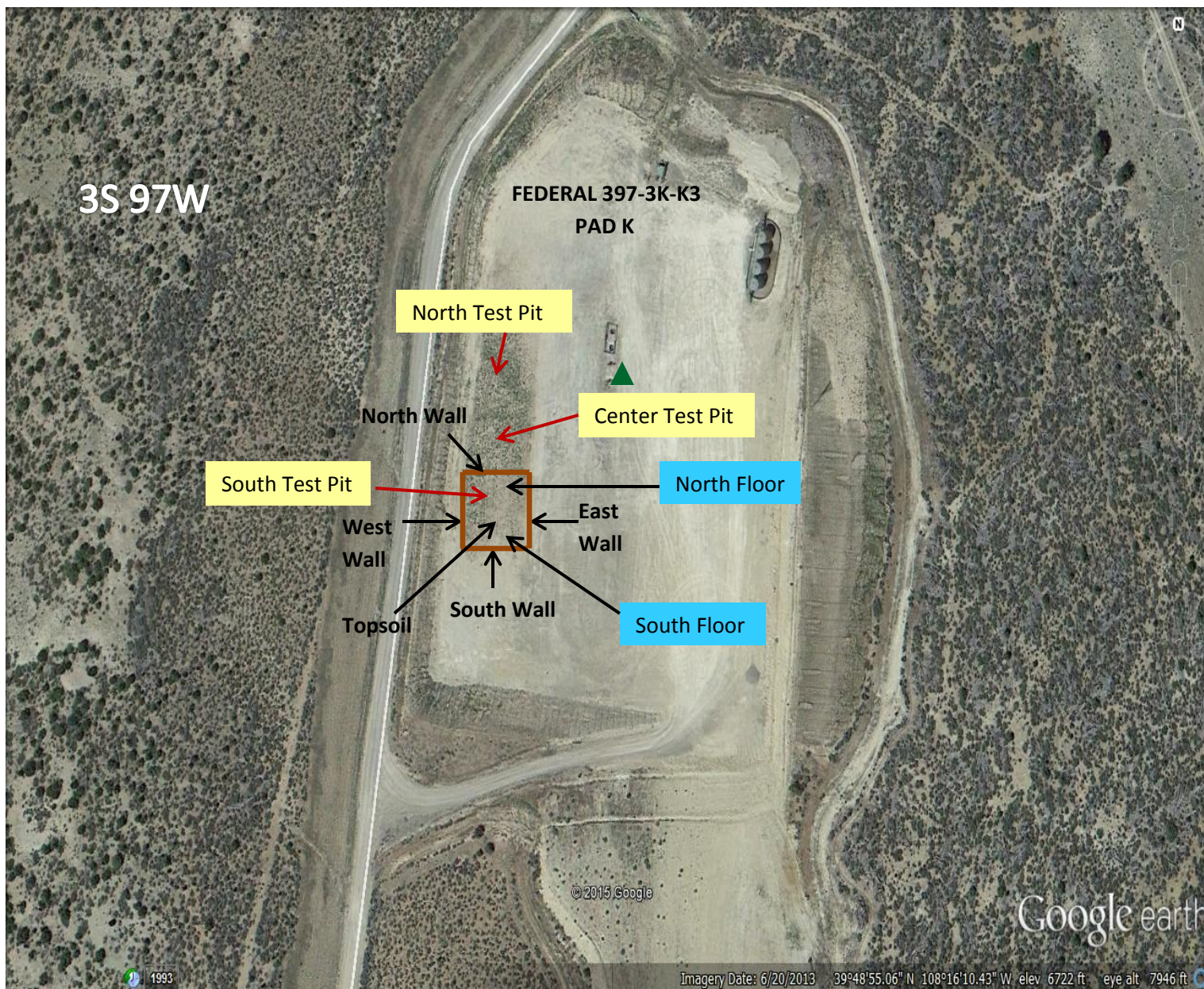


Table 1
 Summary of Soil Analytical Results Prior to Treatment
 Whiting Petroleum Company
 Whiting Petroleum Colorado Pits
 County of Rio Blanco, Colorado - Federal 397-3K-K3

		Location	North Test Pit	Center Test Pit	South Test Pit	Top Soil
		Date of Sample	October 31, 2014			November 10, 2014
Unit	Unit of Measurement	Table 910-1 Concentration Levels				
Benzene	mg/kg	0.17 mg/kg	ND	ND	0.43	<0.02
Toulene	mg/kg	85 mg/kg	ND	ND	2.6	<0.02
Ethylbenzene	mg/kg	100 mg/kg	0.11	ND	0.26	<0.02
Xylene	mg/kg	175 mg/kg	0.34	0.05	2.73	<0.02
TPH	mg/kg	500 mg/kg	346	275	1400	<50.0
Gasoline	mg/kg		ND	ND	ND	<50.0
Diesel	mg/kg		346	275	1400	<50.0
Residual Range Organics	mg/kg		ND	ND	ND	-
Electrical Conductivity	Ratio	<4 mmhos/cm or 2x background	-	-	-	0.388
pH	s.u.	6 - 9	-	-	-	9.62
SAR		<12	-	-	-	2.36
Total Silver	mg/kg	390 mg/kg	-	-	-	<0.500
Total Arsenic	mg/kg	0.36 mg/kg	-	-	-	3.24
Total Barium	mg/kg	15000 mg/kg	-	-	-	2310
Total Cadmium	mg/kg	2 mg/l	-	-	-	1.94
Total Chromium	mg/kg	70 mg/kg	-	-	-	27.6
Total Mercury	mg/kg	23 mg/kg	-	-	-	<0.0250
Total Lead	mg/kg	400 mg/kg	-	-	-	8.24
Total Selenium	mg/kg	390 mg/kg	-	-	-	<2.00

BTEX analysis by EPA Method 8260B
 TPH Analysis by TX1005 Method

Table 2
 Summary of Background Soil Analytical Results
 Whiting Petroleum Company
 Whiting Petroleum Colorado Pits
 County of Rio Blanco, Colorado - Federal 397-3K-K3

		Location	Background South	Background North	Background East
		Date of Sample	October 28, 2014		
Unit	Unit of Measurement	Table 910-1 Concentration Levels	Background South	Background North	Background East
Benzene	mg/kg	0.17 mg/kg	<0.02	<0.02	<0.02
Toulene	mg/kg	85 mg/kg	<0.02	<0.02	<0.02
Ethylbenzene	mg/kg	100 mg/kg	<0.02	<0.02	<0.02
Xylene	mg/kg	175 mg/kg	<0.02	<0.02	<0.02
TPH	mg/kg	500 mg/kg	<50.0	<50.0	<50.0
Gasoline	mg/kg		-	-	-
Diesel	mg/kg		-	-	-
Residual Range Organics	mg/kg		-	-	-
Electrical Conductivity	Ratio	<4 mmhos/cm or 2x background	0.0931	0.229	0.39
pH	s.u.	6 - 9	9	9.46	10
SAR		<12	0.446	0.882	3.81
Total Silver	mg/kg	390 mg/kg	<0.500	<0.500	<0.500
Total Arsenic	mg/kg	0.36 mg/kg	<2.00	<2.00	5.9
Total Barium	mg/kg	15000 mg/kg	2300	1070	2130
Total Cadmium	mg/kg	2 mg/l	1.45	1.33	1.49
Total Chromium	mg/kg	70 mg/kg	27.7	26.6	32
Total Mercury	mg/kg	23 mg/kg	<0.0250	<0.0250	<0.0250
Total Lead	mg/kg	400 mg/kg	6.05	6.02	4.06
Total Selenium	mg/kg	390 mg/kg	<2.00	<2.00	<2.00

BTEX analysis by EPA Method 8260B
 TPH Analysis by TX1005 Method

Table 3
 Summary of Soil Analytical Results After Treatment
 Whiting Petroleum Company
 Whiting Petroleum Colorado Pits
 County of Rio Blanco, Colorado - Federal 397-3K-K3

		Location	North Wall	South Wall	East Wall	West Wall	North Floor	South Floor	Treated Soil
		Date of Sample	November 10, 2014						November 18, 2014
Unit	Unit of Measurement	Table 910-1 Concentration Levels							
Benzene	mg/kg	0.17 mg/kg	<0.02	<0.02	0.0822	<0.02	<0.02	<0.02	ND
Toulene	mg/kg	85 mg/kg	<0.02	<0.02	<0.04	<0.02	<0.02	<0.02	ND
Ethylbenzene	mg/kg	100 mg/kg	<0.02	<0.02	0.358	<0.02	<0.02	<0.02	ND
Xylene	mg/kg	175 mg/kg	<0.02	<0.02	0.533	<0.02	<0.02	<0.02	0.006
TPH	mg/kg	500 mg/kg	<50.0	<50.0	100	<50.0	<50.0	123	310
Gasoline	mg/kg		-	-	-	-	-	-	ND
Diesel	mg/kg		-	-	-	-	-	-	310
Residual Range Organics	mg/kg		-	-	-	-	-	-	ND
Electrical Conductivity	Ratio	<4 mmhos/cm or 2x background	-	-	-	-	-	-	-
pH	s.u.	6 - 9	-	-	-	-	-	-	-
SAR		<12	-	-	-	-	-	-	-
Total Silver	mg/kg	390 mg/kg	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.219
Total Arsenic	mg/kg	0.36 mg/kg	4.16	<2.00	3.48	<2.00	4.1	3.92	4.89
Total Barium	mg/kg	15000 mg/kg	4020	1190	5200	2770	482	4840	4520
Total Cadmium	mg/kg	2 mg/l	2.1	1.7	1.6	1.9	1.94	1.63	ND
Total Chromium	mg/kg	70 mg/kg	41.2	25.7	29.5	34.8	47.6	29.2	34.8
Total Mercury	mg/kg	23 mg/kg	0.0324	<0.0250	0.035	<0.0250	<0.0250	0.0495	0.0243
Total Lead	mg/kg	400 mg/kg	9.56	10.6	9.71	9.65	6.68	10.2	13.9
Total Selenium	mg/kg	390 mg/kg	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	ND

BTEX analysis by EPA Method 8260B

TPH Analysis by TX1005 Method



6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800-378-1296 806-794-1296 FAX 806-794-1298
 200 East Sunset Road, Suite E El Paso, Texas 79922 915-585-3443 FAX 915-585-4944
 5002 Basin Street, Suite A1 Midland, Texas 79703 432-689-6301 FAX 432-689-6313
 (BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972-242-7750
 E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

Clint Ward
 APEX Companies, LLC - Tulsa
 4608 South Garnett
 Suite 100
 Tulsa, OK, 74146

Report Date: November 14, 2014

Work Order: 14111226



Project Location: Rifle Co.
 Project Name: Federal 397-3K-K3
 Project Number: 452711.001

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
379240	North Wall	soil	2014-11-10	14:49	2014-11-12
379241	South Wall	soil	2014-11-10	14:35	2014-11-12
379242	East Wall	soil	2014-11-10	14:57	2014-11-12
379243	West Wall	soil	2014-11-10	14:43	2014-11-12
379244	North Floor	soil	2014-11-10	15:12	2014-11-12
379245	South Floor	soil	2014-11-10	15:06	2014-11-12
379246	Top Soil	soil	2014-11-10	15:17	2014-11-12

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 36 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Blair Leftwich

Dr. Blair Leftwich, Director
James Taylor, Assistant Director
Brian Pellam, Operations Manager

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Case Narrative

Samples for project Federal 397-3K-K3 were received by TraceAnalysis, Inc. on 2014-11-12 and assigned to work order 14111226. Samples for work order 14111226 were received intact at a temperature of 5.8 C.

Samples were analyzed for the following tests using their respective methods.

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
Ag, Total	S 6010C	99028	2014-11-12 at 15:37	117161	2014-11-13 at 10:34
As, Total	S 6010C	99028	2014-11-12 at 15:37	117161	2014-11-13 at 10:34
Ba, Total	S 6010C	99028	2014-11-12 at 15:37	117161	2014-11-13 at 10:34
BTEX	S 8021B	99077	2014-11-13 at 16:01	117184	2014-11-13 at 16:01
Ca, Extractable	S 6010C	99029	2014-11-12 at 16:19	117158	2014-11-13 at 10:34
Cd, Total	S 6010C	99028	2014-11-12 at 15:37	117161	2014-11-13 at 10:34
Conductivity	SM 2510B	99044	2014-11-13 at 08:00	117145	2014-11-13 at 10:35
Cr, Total	S 6010C	99028	2014-11-12 at 15:37	117161	2014-11-13 at 10:34
Hg, Total	S 7471 B	99071	2014-11-13 at 08:45	117179	2014-11-13 at 17:00
Mg, Extractable	S 6010C	99029	2014-11-12 at 16:19	117158	2014-11-13 at 10:34
Na, Extractable	S 6010C	99029	2014-11-12 at 16:19	117158	2014-11-13 at 10:34
Pb, Total	S 6010C	99028	2014-11-12 at 15:37	117161	2014-11-13 at 10:34
pH	S 9045C	99045	2014-11-13 at 11:05	117147	2014-11-13 at 11:10
SAR	USDA 60	99029	2014-11-12 at 16:19	117158	2014-11-13 at 10:34
Se, Total	S 6010C	99028	2014-11-12 at 15:37	117161	2014-11-13 at 10:34
TX1005 Extended - NEW	TX1005	99050	2014-11-13 at 09:00	117155	2014-11-13 at 09:00

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 14111226 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Sample: 379240 - North Wall

Laboratory: Lubbock	Analytical Method: S 8021B	Prep Method: S 5035
Analysis: BTEX	Date Analyzed: 2014-11-13	Analyzed By: JS
QC Batch: 117184	Sample Preparation: 2014-11-13	Prepared By: JS
Prep Batch: 99077		

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Toluene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Xylene		1,2,3,4,5	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		5	2.03	mg/Kg	1	2.00	102	70 - 130
4-Bromofluorobenzene (4-BFB)		5	1.92	mg/Kg	1	2.00	96	70 - 130

Sample: 379240 - North Wall

Laboratory: Lubbock	Analytical Method: S 6010C	Prep Method: S 3050B
Analysis: Total 8 Metals	Date Analyzed: 2014-11-13	Analyzed By: LM
QC Batch: 117161	Sample Preparation: 2014-11-12	Prepared By: LM
Prep Batch: 99028		
Laboratory: Lubbock	Analytical Method: S 7471 B	Prep Method: N/A
Analysis: Total 8 Metals	Date Analyzed: 2014-11-13	Analyzed By: TP
QC Batch: 117179	Sample Preparation: 2014-11-13	Prepared By: TP
Prep Batch: 99071		

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Silver	U	1,2,3,4,5	<0.500	mg/Kg	1	0.500
Total Arsenic		1,2,3,4,5	4.16	mg/Kg	1	2.00
Total Barium	Qs	1,2,3,4,5	4020	mg/Kg	100	1.00
Total Cadmium		1,2,3,4,5	2.10	mg/Kg	1	0.500
Total Chromium	Qs	1,2,3,4,5	41.2	mg/Kg	1	0.500
Total Mercury		1,2,3,4,5	0.0324	mg/Kg	1	0.0250
Total Lead	Qs	1,2,3,4,5	9.56	mg/Kg	1	1.00
Total Selenium	U	1,2,3,4,5	<2.00	mg/Kg	1	2.00

Report Date: November 14, 2014
452711.001

Work Order: 14111226
Federal 397-3K-K3

Page Number: 7 of 36
Rifle Co.

Sample: 379240 - North Wall

Laboratory: Lubbock
Analysis: TX1005 Extended - NEW Analytical Method: TX1005 Prep Method: N/A
QC Batch: 117155 Date Analyzed: 2014-11-13 Analyzed By: SM
Prep Batch: 99050 Sample Preparation: 2014-11-13 Prepared By: SM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
C6-C12	jb	1	<50.0	mg/Kg	1	50.0
>C12-C35		1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane			95.8	mg/Kg	1	100	96	70 - 130
n-Octane			97.0	mg/Kg	1	100	97	70 - 130
n-Tricosane			92.2	mg/Kg	1	100	92	70 - 130

Sample: 379241 - South Wall

Laboratory: Lubbock
Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5035
QC Batch: 117184 Date Analyzed: 2014-11-13 Analyzed By: JS
Prep Batch: 99077 Sample Preparation: 2014-11-13 Prepared By: JS

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Toluene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Xylene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		5	2.02	mg/Kg	1	2.00	101	70 - 130
4-Bromofluorobenzene (4-BFB)		5	1.96	mg/Kg	1	2.00	98	70 - 130

Sample: 379241 - South Wall

Laboratory: Lubbock					
Analysis: Total 8 Metals	Analytical Method: S 6010C	Prep Method: S 3050B			
QC Batch: 117161	Date Analyzed: 2014-11-13	Analyzed By: LM			
Prep Batch: 99028	Sample Preparation: 2014-11-12	Prepared By: LM			
Laboratory: Lubbock					
Analysis: Total 8 Metals	Analytical Method: S 7471 B	Prep Method: N/A			
QC Batch: 117179	Date Analyzed: 2014-11-13	Analyzed By: TP			
Prep Batch: 99071	Sample Preparation: 2014-11-13	Prepared By: TP			

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Silver	U	1,2,3,4,5	<0.500	mg/Kg	1	0.500
Total Arsenic		1,2,3,4,5	<2.00	mg/Kg	1	2.00
Total Barium	Qs	1,2,3,4,5	1190	mg/Kg	10	1.00
Total Cadmium		1,2,3,4,5	1.70	mg/Kg	1	0.500
Total Chromium	Qs	1,2,3,4,5	25.7	mg/Kg	1	0.500
Total Mercury		1,2,3,4,5	<0.0250	mg/Kg	1	0.0250
Total Lead	Qs	1,2,3,4,5	10.6	mg/Kg	1	1.00
Total Selenium	U	1,2,3,4,5	<2.00	mg/Kg	1	2.00

Sample: 379241 - South Wall

Laboratory: Lubbock				
Analysis: TX1005 Extended - NEW	Analytical Method: TX1005	Prep Method: N/A		
QC Batch: 117155	Date Analyzed: 2014-11-13	Analyzed By: SM		
Prep Batch: 99050	Sample Preparation: 2014-11-13	Prepared By: SM		

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
C6-C12	Jb	1	<50.0	mg/Kg	1	50.0
>C12-C35		1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane			94.2	mg/Kg	1	100	94	70 - 130
n-Octane			94.4	mg/Kg	1	100	94	70 - 130
n-Tricosane			91.5	mg/Kg	1	100	92	70 - 130

Sample: 379242 - East Wall

Laboratory: Lubbock	Analytical Method: S 8021B	Prep Method: S 5035
Analysis: BTEX	Date Analyzed: 2014-11-13	Analyzed By: JS
QC Batch: 117184	Sample Preparation: 2014-11-13	Prepared By: JS
Prep Batch: 99077		

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene		1,2,3,4,5	0.0822	mg/Kg	2	0.0200
Toluene	u	1,2,3,4,5	<0.0400	mg/Kg	2	0.0200
Ethylbenzene		1,2,3,4,5	0.358	mg/Kg	2	0.0200
Xylene		1,2,3,4,5	0.533	mg/Kg	2	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		5	4.00	mg/Kg	2	4.00	100	70 - 130
4-Bromofluorobenzene (4-BFB)		5	4.06	mg/Kg	2	4.00	102	70 - 130

Sample: 379242 - East Wall

Laboratory: Lubbock	Analytical Method: S 6010C	Prep Method: S 3050B
Analysis: Total 8 Metals	Date Analyzed: 2014-11-13	Analyzed By: LM
QC Batch: 117161	Sample Preparation: 2014-11-12	Prepared By: LM
Prep Batch: 99028		
Laboratory: Lubbock	Analytical Method: S 7471 B	Prep Method: N/A
Analysis: Total 8 Metals	Date Analyzed: 2014-11-13	Analyzed By: TP
QC Batch: 117179	Sample Preparation: 2014-11-13	Prepared By: TP
Prep Batch: 99071		

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Silver	u	1,2,3,4,5	<0.500	mg/Kg	1	0.500
Total Arsenic		1,2,3,4,5	3.48	mg/Kg	1	2.00
Total Barium	qs	1,2,3,4,5	5200	mg/Kg	100	1.00
Total Cadmium		1,2,3,4,5	1.60	mg/Kg	1	0.500
Total Chromium	qs	1,2,3,4,5	29.5	mg/Kg	1	0.500
Total Mercury		1,2,3,4,5	0.0350	mg/Kg	1	0.0250
Total Lead	qs	1,2,3,4,5	9.71	mg/Kg	1	1.00
Total Selenium	u	1,2,3,4,5	<2.00	mg/Kg	1	2.00

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Sample: 379242 - East Wall

Laboratory: Lubbock
Analysis: TX1005 Extended - NEW Analytical Method: TX1005 Prep Method: N/A
QC Batch: 117155 Date Analyzed: 2014-11-13 Analyzed By: SM
Prep Batch: 99050 Sample Preparation: 2014-11-13 Prepared By: SM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
C6-C12	jb	1	<50.0	mg/Kg	1	50.0
>C12-C35		1	100	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane			95.4	mg/Kg	1	100	95	70 - 130
n-Octane			95.0	mg/Kg	1	100	95	70 - 130
n-Tricosane			92.8	mg/Kg	1	100	93	70 - 130

Sample: 379243 - West Wall

Laboratory: Lubbock
Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5035
QC Batch: 117184 Date Analyzed: 2014-11-13 Analyzed By: JS
Prep Batch: 99077 Sample Preparation: 2014-11-13 Prepared By: JS

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Toluene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Xylene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		5	2.04	mg/Kg	1	2.00	102	70 - 130
4-Bromofluorobenzene (4-BFB)		5	1.92	mg/Kg	1	2.00	96	70 - 130

Sample: 379243 - West Wall

Laboratory: Lubbock					
Analysis: Total 8 Metals	Analytical Method: S 6010C	Prep Method: S 3050B			
QC Batch: 117161	Date Analyzed: 2014-11-13	Analyzed By: LM			
Prep Batch: 99028	Sample Preparation: 2014-11-12	Prepared By: LM			
Laboratory: Lubbock					
Analysis: Total 8 Metals	Analytical Method: S 7471 B	Prep Method: N/A			
QC Batch: 117179	Date Analyzed: 2014-11-13	Analyzed By: TP			
Prep Batch: 99071	Sample Preparation: 2014-11-13	Prepared By: TP			

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Silver	U	1,2,3,4,5	<0.500	mg/Kg	1	0.500
Total Arsenic		1,2,3,4,5	<2.00	mg/Kg	1	2.00
Total Barium	Qs	1,2,3,4,5	2770	mg/Kg	100	1.00
Total Cadmium		1,2,3,4,5	1.90	mg/Kg	1	0.500
Total Chromium	Qs	1,2,3,4,5	34.8	mg/Kg	1	0.500
Total Mercury		1,2,3,4,5	<0.0250	mg/Kg	1	0.0250
Total Lead	Qs	1,2,3,4,5	9.65	mg/Kg	1	1.00
Total Selenium	U	1,2,3,4,5	<2.00	mg/Kg	1	2.00

Sample: 379243 - West Wall

Laboratory: Lubbock				
Analysis: TX1005 Extended - NEW	Analytical Method: TX1005	Prep Method: N/A		
QC Batch: 117155	Date Analyzed: 2014-11-13	Analyzed By: SM		
Prep Batch: 99050	Sample Preparation: 2014-11-13	Prepared By: SM		

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
C6-C12	Jb	1	<50.0	mg/Kg	1	50.0
>C12-C35		1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane			90.8	mg/Kg	1	100	91	70 - 130
n-Octane			91.8	mg/Kg	1	100	92	70 - 130
n-Tricosane			87.5	mg/Kg	1	100	88	70 - 130

Sample: 379244 - North Floor

Laboratory: Lubbock	Analytical Method: S 8021B	Prep Method: S 5035
Analysis: BTEX	Date Analyzed: 2014-11-13	Analyzed By: JS
QC Batch: 117184	Sample Preparation: 2014-11-13	Prepared By: JS
Prep Batch: 99077		

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Toluene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Xylene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		5	2.02	mg/Kg	1	2.00	101	70 - 130
4-Bromofluorobenzene (4-BFB)		5	1.84	mg/Kg	1	2.00	92	70 - 130

Sample: 379244 - North Floor

Laboratory: Lubbock	Analytical Method: S 6010C	Prep Method: S 3050B
Analysis: Total 8 Metals	Date Analyzed: 2014-11-13	Analyzed By: LM
QC Batch: 117161	Sample Preparation: 2014-11-12	Prepared By: LM
Prep Batch: 99028		
Laboratory: Lubbock	Analytical Method: S 7471 B	Prep Method: N/A
Analysis: Total 8 Metals	Date Analyzed: 2014-11-13	Analyzed By: TP
QC Batch: 117179	Sample Preparation: 2014-11-13	Prepared By: TP
Prep Batch: 99071		

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Silver	U	1,2,3,4,5	<0.500	mg/Kg	1	0.500
Total Arsenic		1,2,3,4,5	4.10	mg/Kg	1	2.00
Total Barium	Qs	1,2,3,4,5	482	mg/Kg	10	1.00
Total Cadmium		1,2,3,4,5	1.94	mg/Kg	1	0.500
Total Chromium	Qs	1,2,3,4,5	47.6	mg/Kg	1	0.500
Total Mercury		1,2,3,4,5	<0.0250	mg/Kg	1	0.0250
Total Lead	Qs	1,2,3,4,5	6.68	mg/Kg	1	1.00
Total Selenium	U	1,2,3,4,5	<2.00	mg/Kg	1	2.00

Sample: 379244 - North Floor

Laboratory: Lubbock
 Analysis: TX1005 Extended - NEW Analytical Method: TX1005 Prep Method: N/A
 QC Batch: 117155 Date Analyzed: 2014-11-13 Analyzed By: SM
 Prep Batch: 99050 Sample Preparation: 2014-11-13 Prepared By: SM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
C6-C12	jb	1	<50.0	mg/Kg	1	50.0
>C12-C35		1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane			94.4	mg/Kg	1	100	94	70 - 130
n-Octane			95.4	mg/Kg	1	100	95	70 - 130
n-Tricosane			90.9	mg/Kg	1	100	91	70 - 130

Sample: 379245 - South Floor

Laboratory: Lubbock
 Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5035
 QC Batch: 117184 Date Analyzed: 2014-11-13 Analyzed By: JS
 Prep Batch: 99077 Sample Preparation: 2014-11-13 Prepared By: JS

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Toluene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Xylene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		5	2.06	mg/Kg	1	2.00	103	70 - 130
4-Bromofluorobenzene (4-BFB)		5	1.80	mg/Kg	1	2.00	90	70 - 130

Sample: 379245 - South Floor

Laboratory: Lubbock					
Analysis: Total 8 Metals	Analytical Method: S 6010C	Prep Method: S 3050B			
QC Batch: 117161	Date Analyzed: 2014-11-13	Analyzed By: LM			
Prep Batch: 99028	Sample Preparation: 2014-11-12	Prepared By: LM			
Laboratory: Lubbock					
Analysis: Total 8 Metals	Analytical Method: S 7471 B	Prep Method: N/A			
QC Batch: 117179	Date Analyzed: 2014-11-13	Analyzed By: TP			
Prep Batch: 99071	Sample Preparation: 2014-11-13	Prepared By: TP			

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Silver	U	1,2,3,4,5	<0.500	mg/Kg	1	0.500
Total Arsenic		1,2,3,4,5	3.92	mg/Kg	1	2.00
Total Barium	Qs	1,2,3,4,5	4840	mg/Kg	100	1.00
Total Cadmium		1,2,3,4,5	1.63	mg/Kg	1	0.500
Total Chromium	Qs	1,2,3,4,5	29.2	mg/Kg	1	0.500
Total Mercury		1,2,3,4,5	0.0495	mg/Kg	1	0.0250
Total Lead	Qs	1,2,3,4,5	10.2	mg/Kg	1	1.00
Total Selenium	U	1,2,3,4,5	<2.00	mg/Kg	1	2.00

Sample: 379245 - South Floor

Laboratory: Lubbock				
Analysis: TX1005 Extended - NEW	Analytical Method: TX1005	Prep Method: N/A		
QC Batch: 117155	Date Analyzed: 2014-11-13	Analyzed By: SM		
Prep Batch: 99050	Sample Preparation: 2014-11-13	Prepared By: SM		

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
C6-C12	Jb	1	<50.0	mg/Kg	1	50.0
>C12-C35		1	123	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane			94.6	mg/Kg	1	100	95	70 - 130
n-Octane			93.7	mg/Kg	1	100	94	70 - 130
n-Tricosane			93.3	mg/Kg	1	100	93	70 - 130

Sample: 379246 - Top Soil

Laboratory: Lubbock	Analytical Method: S 8021B	Prep Method: S 5035
Analysis: BTEX	Date Analyzed: 2014-11-13	Analyzed By: JS
QC Batch: 117184	Sample Preparation: 2014-11-13	Prepared By: JS
Prep Batch: 99077		

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	u	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Toluene	u	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	u	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Xylene	u	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		5	2.02	mg/Kg	1	2.00	101	70 - 130
4-Bromofluorobenzene (4-BFB)		5	1.90	mg/Kg	1	2.00	95	70 - 130

Sample: 379246 - Top Soil

Laboratory: Lubbock	Analytical Method: S 6010C	Prep Method: S 3005A
Analysis: Ca, Extractable	Date Analyzed: 2014-11-13	Analyzed By: LM
QC Batch: 117158	Sample Preparation: 2014-11-12	Prepared By: LM
Prep Batch: 99029		

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Extractable Calcium		4	1740	mg/Kg	10	1.00

Sample: 379246 - Top Soil

Laboratory: Lubbock	Analytical Method: SM 2510B	Prep Method: N/A
Analysis: Conductivity	Date Analyzed: 2014-11-13	Analyzed By: RL
QC Batch: 117145	Sample Preparation:	Prepared By: RL
Prep Batch: 99044		

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Specific Conductance		1,3,4,5	388	uMHOS/cm	1	0.00

Sample: 379246 - Top Soil

Laboratory: Lubbock
Analysis: Mg, Extractable Analytical Method: S 6010C Prep Method: S 3005A
QC Batch: 117158 Date Analyzed: 2014-11-13 Analyzed By: LM
Prep Batch: 99029 Sample Preparation: 2014-11-12 Prepared By: LM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Extractable Magnesium		4	360	mg/Kg	10	1.00

Sample: 379246 - Top Soil

Laboratory: Lubbock
Analysis: Na, Extractable Analytical Method: S 6010C Prep Method: S 3005A
QC Batch: 117158 Date Analyzed: 2014-11-13 Analyzed By: LM
Prep Batch: 99029 Sample Preparation: 2014-11-12 Prepared By: LM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Extractable Sodium		4	415	mg/Kg	10	1.00

Sample: 379246 - Top Soil

Laboratory: Lubbock
Analysis: pH Analytical Method: S 9045C Prep Method: N/A
QC Batch: 117147 Date Analyzed: 2014-11-13 Analyzed By: AT
Prep Batch: 99045 Sample Preparation: 2014-11-13 Prepared By: AT

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
pH		1,2,3,4,5	9.62	s.u.	1	2.00

Sample: 379246 - Top Soil

Laboratory: Lubbock
Analysis: SAR Analytical Method: USDA 60 Prep Method: N/A
QC Batch: 117158 Date Analyzed: 2014-11-13 Analyzed By: LM
Prep Batch: 99029 Sample Preparation: 2014-11-12 Prepared By: LM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
SAR			2.36		10	0.00

Sample: 379246 - Top Soil

Laboratory: Lubbock					
Analysis: Total 8 Metals	Analytical Method: S 6010C	Prep Method: S 3050B			
QC Batch: 117161	Date Analyzed: 2014-11-13	Analyzed By: LM			
Prep Batch: 99028	Sample Preparation: 2014-11-12	Prepared By: LM			
Laboratory: Lubbock					
Analysis: Total 8 Metals	Analytical Method: S 7471 B	Prep Method: N/A			
QC Batch: 117179	Date Analyzed: 2014-11-13	Analyzed By: TP			
Prep Batch: 99071	Sample Preparation: 2014-11-13	Prepared By: TP			

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Silver	U	1,2,3,4,5	<0.500	mg/Kg	1	0.500
Total Arsenic		1,2,3,4,5	3.24	mg/Kg	1	2.00
Total Barium	Qs	1,2,3,4,5	2310	mg/Kg	100	1.00
Total Cadmium		1,2,3,4,5	1.94	mg/Kg	1	0.500
Total Chromium	Qs	1,2,3,4,5	27.6	mg/Kg	1	0.500
Total Mercury		1,2,3,4,5	<0.0250	mg/Kg	1	0.0250
Total Lead	Qs	1,2,3,4,5	8.24	mg/Kg	1	1.00
Total Selenium	U	1,2,3,4,5	<2.00	mg/Kg	1	2.00

Sample: 379246 - Top Soil

Laboratory: Lubbock				
Analysis: TX1005 Extended - NEW	Analytical Method: TX1005	Prep Method: N/A		
QC Batch: 117155	Date Analyzed: 2014-11-13	Analyzed By: SM		
Prep Batch: 99050	Sample Preparation: 2014-11-13	Prepared By: SM		

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
C6-C12	Jb	1	<50.0	mg/Kg	1	50.0
>C12-C35		1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane			92.1	mg/Kg	1	100	92	70 - 130
n-Octane			89.8	mg/Kg	1	100	90	70 - 130
n-Tricosane			89.6	mg/Kg	1	100	90	70 - 130

Method Blanks

Method Blank (1) QC Batch: 117145

QC Batch: 117145 Date Analyzed: 2014-11-13 Analyzed By: RL
Prep Batch: 99044 QC Preparation: 2014-11-13 Prepared By: RL

Parameter	Flag	Cert	MDL Result	Units	RL
Specific Conductance		1,3,4,5	1.97	uMHOS/cm	

Method Blank (1) QC Batch: 117155

QC Batch: 117155 Date Analyzed: 2014-11-13 Analyzed By: SM
Prep Batch: 99050 QC Preparation: 2014-11-13 Prepared By: SM

Parameter	Flag	Cert	MDL Result	Units	RL
C6-C12		1	11.3	mg/Kg	50
>C12-C35		1	<10.7	mg/Kg	50

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane			104	mg/Kg	1	100	104	70 - 130
n-Octane			113	mg/Kg	1	100	113	70 - 130
n-Tricosane			105	mg/Kg	1	100	105	70 - 130

Method Blank (1) QC Batch: 117158

QC Batch: 117158 Date Analyzed: 2014-11-13 Analyzed By: LM
Prep Batch: 99029 QC Preparation: 2014-11-12 Prepared By: PM

Parameter	Flag	Cert	MDL Result	Units	RL
Extractable Magnesium		4	<0.0225	mg/Kg	1

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Method Blank (1) QC Batch: 117158

QC Batch: 117158 Date Analyzed: 2014-11-13 Analyzed By: LM
Prep Batch: 99029 QC Preparation: 2014-11-12 Prepared By: PM

Parameter	Flag	Cert	MDL Result	Units	RL
Extractable Calcium		4	<0.0847	mg/Kg	1

Method Blank (1) QC Batch: 117158

QC Batch: 117158 Date Analyzed: 2014-11-13 Analyzed By: LM
Prep Batch: 99029 QC Preparation: 2014-11-12 Prepared By: PM

Parameter	Flag	Cert	MDL Result	Units	RL
Extractable Sodium		4	<0.0184	mg/Kg	1

Method Blank (1) QC Batch: 117161

QC Batch: 117161 Date Analyzed: 2014-11-13 Analyzed By: LM
Prep Batch: 99028 QC Preparation: 2014-11-12 Prepared By: PM

Parameter	Flag	Cert	MDL Result	Units	RL
Total Silver		1,2,3,4,5	<0.0344	mg/Kg	0.5
Total Arsenic		1,2,3,4,5	<0.432	mg/Kg	2
Total Barium		1,2,3,4,5	<0.0501	mg/Kg	1
Total Cadmium		1,2,3,4,5	<0.0320	mg/Kg	0.5
Total Chromium		1,2,3,4,5	<0.0512	mg/Kg	0.5
Total Lead		1,2,3,4,5	<0.263	mg/Kg	1
Total Selenium		1,2,3,4,5	<0.422	mg/Kg	2

Method Blank (1) QC Batch: 117179

QC Batch: 117179 Date Analyzed: 2014-11-13 Analyzed By: TP
Prep Batch: 99071 QC Preparation: 2014-11-13 Prepared By: TP

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Parameter	Flag	Cert	MDL Result	Units	RL
Total Mercury		1,2,3,4,5	<0.00177	mg/Kg	0.025

Method Blank (1) QC Batch: 117184

QC Batch: 117184
Prep Batch: 99077

Date Analyzed: 2014-11-13
QC Preparation: 2014-11-13

Analyzed By: JS
Prepared By: JS

Parameter	Flag	Cert	MDL Result	Units	RL
Benzene		1,2,3,4,5	<0.00296	mg/Kg	0.02
Toluene		1,2,3,4,5	<0.00351	mg/Kg	0.02
Ethylbenzene		1,2,3,4,5	<0.00312	mg/Kg	0.02
Xylene		1,2,3,4,5	<0.00310	mg/Kg	0.02

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		5	1.96	mg/Kg	1	2.00	98	70 - 130
4-Bromofluorobenzene (4-BFB)		5	1.91	mg/Kg	1	2.00	96	70 - 130

Duplicates

Duplicates (1) Duplicated Sample: 379246

QC Batch: 117145
Prep Batch: 99044

Date Analyzed: 2014-11-13
QC Preparation: 2014-11-13

Analyzed By: RL
Prepared By: RL

Param		Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Specific Conductance	1,3,4,5	405	388	uMHOS/cm	1	4	20

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 117155
Prep Batch: 99050

Date Analyzed: 2014-11-13
QC Preparation: 2014-11-13

Analyzed By: SM
Prepared By: SM

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
C6-C12		1	225	mg/Kg	1	250	11.3	85	75 - 125
>C12-C35		1	229	mg/Kg	1	250	<10.7	92	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
C6-C12		1	218	mg/Kg	1	250	11.3	83	75 - 125	3	20
>C12-C35		1	233	mg/Kg	1	250	<10.7	93	75 - 125	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Triacontane	95.5	94.9	mg/Kg	1	100	96	95	70 - 130
n-Octane	99.6	99.9	mg/Kg	1	100	100	100	70 - 130
n-Tricosane	95.9	95.6	mg/Kg	1	100	96	96	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 117158
Prep Batch: 99029

Date Analyzed: 2014-11-13
QC Preparation: 2014-11-12

Analyzed By: LM
Prepared By: PM

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Extractable Magnesium		4	49.9	mg/Kg	1	50.0	<0.0225	100	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Extractable Magnesium		4	47.5	mg/Kg	1	50.0	<0.0225	95	85 - 115	5	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

control spikes continued . . .

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Cadmium		1,2,3,4,5	26.1	mg/Kg	1	25.0	<0.0320	104	85 - 115
Total Chromium		1,2,3,4,5	9.94	mg/Kg	1	10.0	<0.0512	99	85 - 115
Total Lead		1,2,3,4,5	54.7	mg/Kg	1	50.0	<0.263	109	85 - 115
Total Selenium		1,2,3,4,5	49.4	mg/Kg	1	50.0	<0.422	99	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Total Silver		1,2,3,4,5	12.8	mg/Kg	1	12.5	<0.0344	102	85 - 115	0	20
Total Arsenic		1,2,3,4,5	51.6	mg/Kg	1	50.0	<0.432	103	85 - 115	1	20
Total Barium		1,2,3,4,5	107	mg/Kg	1	100	<0.0501	107	85 - 115	0	20
Total Cadmium		1,2,3,4,5	26.4	mg/Kg	1	25.0	<0.0320	106	85 - 115	1	20
Total Chromium		1,2,3,4,5	9.88	mg/Kg	1	10.0	<0.0512	99	85 - 115	1	20
Total Lead		1,2,3,4,5	54.8	mg/Kg	1	50.0	<0.263	110	85 - 115	0	20
Total Selenium		1,2,3,4,5	49.3	mg/Kg	1	50.0	<0.422	99	85 - 115	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 117179
Prep Batch: 99071

Date Analyzed: 2014-11-13
QC Preparation: 2014-11-13

Analyzed By: TP
Prepared By: TP

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Mercury		1,2,3,4,5	0.250	mg/Kg	1	0.250	<0.00177	100	80 - 120

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Total Mercury		1,2,3,4,5	0.243	mg/Kg	1	0.250	<0.00177	97	80 - 120	3	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 117184
Prep Batch: 99077

Date Analyzed: 2014-11-13
QC Preparation: 2014-11-13

Analyzed By: JS
Prepared By: JS

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1,2,3,4,5	1.89	mg/Kg	1	2.00	<0.00296	94	70 - 130
Toluene		1,2,3,4,5	1.95	mg/Kg	1	2.00	<0.00351	98	70 - 130
Ethylbenzene		1,2,3,4,5	1.94	mg/Kg	1	2.00	<0.00312	97	70 - 130
Xylene		1,2,3,4,5	5.96	mg/Kg	1	6.00	<0.00310	99	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1,2,3,4,5	1.92	mg/Kg	1	2.00	<0.00296	96	70 - 130	2	20
Toluene		1,2,3,4,5	1.94	mg/Kg	1	2.00	<0.00351	97	70 - 130	0	20
Ethylbenzene		1,2,3,4,5	1.94	mg/Kg	1	2.00	<0.00312	97	70 - 130	0	20
Xylene		1,2,3,4,5	5.96	mg/Kg	1	6.00	<0.00310	99	70 - 130	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	F	C	LCS Result	LCS Result	Units	Dil.	Spike Amount	LCS Rec.	LCS Rec.	Rec. Limit
Trifluorotoluene (TFT)		5	2.00	1.98	mg/Kg	1	2.00	100	99	70 - 130
4-Bromofluorobenzene (4-BFB)		5	1.91	1.90	mg/Kg	1	2.00	96	95	70 - 130

Matrix Spikes

Matrix Spike (MS-1) Spiked Sample: 379235

QC Batch: 117155
Prep Batch: 99050

Date Analyzed: 2014-11-13
QC Preparation: 2014-11-13

Analyzed By: SM
Prepared By: SM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
C6-C12		1	2370	mg/Kg	1	250	2130	96	70 - 130
>C12-C35		1	1010	mg/Kg	1	250	791	88	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
C6-C12		1	2380	mg/Kg	1	250	2130	100	70 - 130	0	20
>C12-C35		1	1000	mg/Kg	1	250	791	84	70 - 130	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Triacontane	98.1	98.2	mg/Kg	1	100	98	98	70 - 130
n-Octane	113	114	mg/Kg	1	100	113	114	70 - 130
n-Tricosane	101	100	mg/Kg	1	100	101	100	70 - 130

Matrix Spike (MS-1) Spiked Sample: 379235

QC Batch: 117158
Prep Batch: 99029

Date Analyzed: 2014-11-13
QC Preparation: 2014-11-12

Analyzed By: LM
Prepared By: PM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Extractable Magnesium		4	5350	mg/Kg	10	5000	33	106	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Extractable Magnesium		4	6020	mg/Kg	10	5000	33	120	75 - 125	12	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 379235

QC Batch: 117158 Date Analyzed: 2014-11-13 Analyzed By: LM
Prep Batch: 99029 QC Preparation: 2014-11-12 Prepared By: PM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Extractable Calcium		4	5470	mg/Kg	10	5000	89.71	108	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Extractable Calcium		4	6160	mg/Kg	10	5000	89.71	121	75 - 125	12	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 379235

QC Batch: 117158 Date Analyzed: 2014-11-13 Analyzed By: LM
Prep Batch: 99029 QC Preparation: 2014-11-12 Prepared By: PM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Extractable Sodium		4	5210	mg/Kg	10	5000	93.14	102	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Extractable Sodium		4	5970	mg/Kg	10	5000	93.14	118	75 - 125	14	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (xMS-1) Spiked Sample: 378805

QC Batch: 117161 Date Analyzed: 2014-11-13 Analyzed By: LM
Prep Batch: 99028 QC Preparation: 2014-11-12 Prepared By: PM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	
Total Silver		1,2,3,4,5	11.2	mg/Kg	1	12.5	<0.0344	90	75 - 125	
Total Arsenic		1,2,3,4,5	37.9	mg/Kg	1	50.0	<0.432	76	75 - 125	
Total Barium	Qs	Qs	1,2,3,4,5	2790	mg/Kg	1	100	2946	-156	75 - 125

continued . . .

matrix spikes continued ...

Param	F	C	MS		Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
			Result	Units					
Total Cadmium		1,2,3,4,5	21.9	mg/Kg	1	25.0	<0.0320	88	75 - 125
Total Chromium	Qs	Qs	59.5	mg/Kg	1	10.0	52.41	71	75 - 125
Total Lead	Qs	Qs	35.3	mg/Kg	1	50.0	<0.263	71	75 - 125
Total Selenium		1,2,3,4,5	41.3	mg/Kg	1	50.0	<0.422	83	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD		Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
			Result	Units							
Total Silver		1,2,3,4,5	12.1	mg/Kg	1	12.5	<0.0344	97	75 - 125	8	20
Total Arsenic		1,2,3,4,5	40.7	mg/Kg	1	50.0	<0.432	81	75 - 125	7	20
Total Barium	Qs	Qs	2790	mg/Kg	1	100	2946	-156	75 - 125	0	20
Total Cadmium		1,2,3,4,5	23.0	mg/Kg	1	25.0	<0.0320	92	75 - 125	5	20
Total Chromium	Qs	Qs	57.3	mg/Kg	1	10.0	52.41	49	75 - 125	4	20
Total Lead		1,2,3,4,5	37.6	mg/Kg	1	50.0	<0.263	75	75 - 125	6	20
Total Selenium		1,2,3,4,5	42.4	mg/Kg	1	50.0	<0.422	85	75 - 125	3	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 379240

QC Batch: 117179
Prep Batch: 99071

Date Analyzed: 2014-11-13
QC Preparation: 2014-11-13

Analyzed By: TP
Prepared By: TP

Param	F	C	MS		Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
			Result	Units					
Total Mercury		1,2,3,4,5	0.279	mg/Kg	1	0.250	0.0324	99	80 - 120

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD		Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
			Result	Units							
Total Mercury		1,2,3,4,5	0.268	mg/Kg	1	0.250	0.0324	94	80 - 120	4	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 379252

QC Batch: 117184
Prep Batch: 99077

Date Analyzed: 2014-11-13
QC Preparation: 2014-11-13

Analyzed By: JS
Prepared By: JS

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1,2,3,4,5	1.98	mg/Kg	1	2.00	<0.00296	99	70 - 130
Toluene		1,2,3,4,5	2.00	mg/Kg	1	2.00	<0.00351	100	70 - 130
Ethylbenzene		1,2,3,4,5	2.08	mg/Kg	1	2.00	0.0335	102	70 - 130
Xylene		1,2,3,4,5	6.50	mg/Kg	1	6.00	0.0763	107	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1,2,3,4,5	1.93	mg/Kg	1	2.00	<0.00296	96	70 - 130	3	20
Toluene		1,2,3,4,5	2.06	mg/Kg	1	2.00	<0.00351	103	70 - 130	3	20
Ethylbenzene		1,2,3,4,5	2.12	mg/Kg	1	2.00	0.0335	104	70 - 130	2	20
Xylene		1,2,3,4,5	6.57	mg/Kg	1	6.00	0.0763	108	70 - 130	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	F	C	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)		5	2.04	2.04	mg/Kg	1	2	102	102	70 - 130
4-Bromofluorobenzene (4-BFB)		5	2.07	2.13	mg/Kg	1	2	104	106	70 - 130

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Silver		1,2,3,4,5	mg/Kg	0.125	0.124	99	90 - 110	2014-11-13
Total Arsenic		1,2,3,4,5	mg/Kg	1.00	1.01	101	90 - 110	2014-11-13
Total Barium		1,2,3,4,5	mg/Kg	1.00	0.988	99	90 - 110	2014-11-13
Total Cadmium		1,2,3,4,5	mg/Kg	1.00	1.01	101	90 - 110	2014-11-13
Total Chromium		1,2,3,4,5	mg/Kg	1.00	1.05	105	90 - 110	2014-11-13
Total Lead		1,2,3,4,5	mg/Kg	1.00	1.02	102	90 - 110	2014-11-13
Total Selenium		1,2,3,4,5	mg/Kg	1.00	1.02	102	90 - 110	2014-11-13

Standard (CCV-1)

QC Batch: 117161

Date Analyzed: 2014-11-13

Analyzed By: LM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Silver		1,2,3,4,5	mg/Kg	0.125	0.125	100	90 - 110	2014-11-13
Total Arsenic		1,2,3,4,5	mg/Kg	1.00	1.02	102	90 - 110	2014-11-13
Total Barium		1,2,3,4,5	mg/Kg	1.00	1.01	101	90 - 110	2014-11-13
Total Cadmium		1,2,3,4,5	mg/Kg	1.00	1.02	102	90 - 110	2014-11-13
Total Chromium		1,2,3,4,5	mg/Kg	1.00	1.07	107	90 - 110	2014-11-13
Total Lead		1,2,3,4,5	mg/Kg	1.00	1.04	104	90 - 110	2014-11-13
Total Selenium		1,2,3,4,5	mg/Kg	1.00	1.04	104	90 - 110	2014-11-13

Standard (CCV-1)

QC Batch: 117179

Date Analyzed: 2014-11-13

Analyzed By: TP

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		1,2,3,4,5	mg/L	0.0100	0.00948	95	90 - 110	2014-11-13

Standard (CCV-2)

QC Batch: 117179

Date Analyzed: 2014-11-13

Analyzed By: TP

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		1,2,3,4,5	mg/L	0.0100	0.00935	94	90 - 110	2014-11-13

Standard (CCV-1)

QC Batch: 117184

Date Analyzed: 2014-11-13

Analyzed By: JS

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1,2,3,4,5	mg/kg	0.100	0.0974	97	80 - 120	2014-11-13
Toluene		1,2,3,4,5	mg/kg	0.100	0.0994	99	80 - 120	2014-11-13
Ethylbenzene		1,2,3,4,5	mg/kg	0.100	0.0992	99	80 - 120	2014-11-13
Xylene		1,2,3,4,5	mg/kg	0.300	0.304	101	80 - 120	2014-11-13

Standard (CCV-2)

QC Batch: 117184

Date Analyzed: 2014-11-13

Analyzed By: JS

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1,2,3,4,5	mg/kg	0.100	0.102	102	80 - 120	2014-11-13
Toluene		1,2,3,4,5	mg/kg	0.100	0.102	102	80 - 120	2014-11-13
Ethylbenzene		1,2,3,4,5	mg/kg	0.100	0.101	101	80 - 120	2014-11-13
Xylene		1,2,3,4,5	mg/kg	0.300	0.309	103	80 - 120	2014-11-13

Standard (CCV-3)

QC Batch: 117184

Date Analyzed: 2014-11-13

Analyzed By: JS

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1,2,3,4,5	mg/kg	0.100	0.0991	99	80 - 120	2014-11-13
Toluene		1,2,3,4,5	mg/kg	0.100	0.0981	98	80 - 120	2014-11-13
Ethylbenzene		1,2,3,4,5	mg/kg	0.100	0.0951	95	80 - 120	2014-11-13
Xylene		1,2,3,4,5	mg/kg	0.300	0.289	96	80 - 120	2014-11-13

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	PJLA	L14-93	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-14-10	Lubbock
5		2014-018	Lubbock

Standard Flags

F	Description
B	Analyte detected in the corresponding method blank above the method detection limit
H	Analyzed out of hold time
J	Estimated concentration
Jb	The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less than ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
Je	Estimated concentration exceeding calibration range.
MI1	Split peak or shoulder peak
MI2	Instrument software did not integrate
MI3	Instrument software misidentified the peak
MI4	Instrument software integrated improperly
MI5	Baseline correction
Qc	Calibration check outside of laboratory limits.
Qr	RPD outside of laboratory limits
Qs	Spike recovery outside of laboratory limits.
Qsr	Surrogate recovery outside of laboratory limits.

F Description

U The analyte is not detected above the SDL

Attachments

The scanned attachments will follow this page.
Please note, each attachment may consist of more than one page.

LAB Order ID # 14111826

TraceAnalysis, Inc.

6701 Aberdeen Avenue, Suite 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

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Fax (915) 585-4944
1 (888) 588-3443

Brandon & Clark
3403 Industrial Blvd.
Hobbs, NM 88240
Tel (575) 392-7561
Fax (575) 392-4508

email: lab@traceanalysis.com

Company Name: **APX Cos. LLC** Phone #: **918-610-3543**
Address: (Street, City, Zip) **4608 So. Garnett Rd. Suite 200 Tulsa, OK 74146**
Contact Person: **Clint Ward** E-mail: **cward@apx.com**
Invoice to: (If different from above)

Project #: **452711.001**
Project Location (including state): **Rt 2 Co**
Project Name: **Federal 397-3K**
Sampler Signature: *[Signature]*

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume / Amount	MATRIX			PRESERVATIVE METHOD				SAMPLING		Turn Around Time if different from standard	
				WATER	SOIL	AIR	SLUDGE	HCl	HNO ₃	H ₂ SO ₄	NaOH	ICE		NONE
37240	North wall	2		X					X			11/10	1449	X
241	South wall	2		X					X			}	1435	X
242	East wall	2		X					X				1457	X
243	West wall	2		X					X			1443	X	X
244	North Floor	2		X					X			1572	X	X
245	South Floor	2		X					X			1504	X	X
246	Top soil	2		X					X			1517	X	X

ANALYSIS REQUEST (Circle or Specify Method No.)

<input type="checkbox"/>	MTBE 8021 / 602 / 8260 / 624	<input checked="" type="checkbox"/>
<input type="checkbox"/>	BTEX 8021 / 602 / 8260 / 624	<input checked="" type="checkbox"/>
<input type="checkbox"/>	TPH 418.1 / TX1005 / TX1005 EX(C35)	<input checked="" type="checkbox"/>
<input type="checkbox"/>	TPH 8015 GRO / DRO / TVHC	<input checked="" type="checkbox"/>
<input type="checkbox"/>	PAH 8270 / 625	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Total Metals Ag As Ba Cd Cr Pb Se Hg 8010/200.7	<input checked="" type="checkbox"/>
<input type="checkbox"/>	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	<input checked="" type="checkbox"/>
<input type="checkbox"/>	TCLP Volatiles	<input checked="" type="checkbox"/>
<input type="checkbox"/>	TCLP Semi Volatiles	<input checked="" type="checkbox"/>
<input type="checkbox"/>	TCLP Pesticides	<input checked="" type="checkbox"/>
<input type="checkbox"/>	RCI	<input checked="" type="checkbox"/>
<input type="checkbox"/>	GC/MS Vol. 8260 / 624	<input checked="" type="checkbox"/>
<input type="checkbox"/>	GC/MS Semi. Vol. 8270 / 625	<input checked="" type="checkbox"/>
<input type="checkbox"/>	PCB's 8082 / 608	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Pesticides 8081 / 608	<input checked="" type="checkbox"/>
<input type="checkbox"/>	BOD, TSS, PH	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Moisture Content	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Cl, F, SO ₄ , NO ₃ -N, NO ₂ -N, PO ₄ -P, Alkalinity	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Na, Ca, Mg, K, TDS, EC	<input checked="" type="checkbox"/>
<input type="checkbox"/>	SAR	<input checked="" type="checkbox"/>
<input type="checkbox"/>	EC Direct Reading	<input checked="" type="checkbox"/>

Relinquished by: *[Signature]* Company: **APX** Date: **11/14/14** Time: **1130**

Received by: *[Signature]* Company: **APX** Date: **11-12-14** Time: **930**

INST: **1130** OBS: **5:28** COR: **5:18**

REMARKS: **24 Hour TAT**

LAB USE ONLY

Dry Weight Basis Required
TRRP Report Required
Check if Special Reporting Limits Are Needed

Carrier # **FX 8036 9302 8063**

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C. O. C.

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Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

Mike Holder
 Apex Companies, LLC
 307 East Danforth Road
 Suite 160
 Edmond, OK, 73034

Report Date: November 3, 2014

Work Order: 14103018



Project Location: Rifle Co.
 Project Name: Federal 397-3K-K3
 Project Number: 452711.002

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
378259	Background So.	soil	2014-10-28	14:52	2014-10-30
378260	Background No.	soil	2014-10-28	14:57	2014-10-30
378261	Background East	soil	2014-10-28	15:01	2014-10-30

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 33 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Blair Leftwich

Dr. Blair Leftwich, Director
James Taylor, Assistant Director
Brian Pellam, Operations Manager

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Case Narrative

Samples for project Federal 397-3K-K3 were received by TraceAnalysis, Inc. on 2014-10-30 and assigned to work order 14103018. Samples for work order 14103018 were received damaged at a temperature of 5.9 C. One broken soil jar for BG East

Samples were analyzed for the following tests using their respective methods.

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
Ag, Total	S 6010C	98763	2014-10-30 at 14:42	116862	2014-10-31 at 12:03
As, Total	S 6010C	98763	2014-10-30 at 14:42	116862	2014-10-31 at 12:03
Ba, Total	S 6010C	98763	2014-10-30 at 14:42	116862	2014-10-31 at 12:03
BTEX	S 8021B	98773	2014-10-30 at 14:23	116822	2014-10-30 at 14:23
Ca, Extractable	S 6010C	98764	2014-10-30 at 14:59	116849	2014-10-31 at 12:03
Cd, Total	S 6010C	98763	2014-10-30 at 14:42	116862	2014-10-31 at 12:03
Conductivity	SM 2510B	98760	2014-10-30 at 13:00	116811	2014-10-30 at 14:40
Cr, Total	S 6010C	98763	2014-10-30 at 14:42	116862	2014-10-31 at 12:03
Hg, Total	S 7471 B	98801	2014-10-31 at 09:45	116865	2014-10-31 at 16:23
Mg, Extractable	S 6010C	98764	2014-10-30 at 14:59	116849	2014-10-31 at 12:03
Na, Extractable	S 6010C	98764	2014-10-30 at 14:59	116849	2014-10-31 at 12:03
Pb, Total	S 6010C	98763	2014-10-30 at 14:42	116862	2014-10-31 at 12:03
pH	S 9045C	98769	2014-10-30 at 09:00	116815	2014-10-30 at 15:28
SAR	USDA 60	98764	2014-10-30 at 14:59	116849	2014-10-31 at 12:03
Se, Total	S 6010C	98763	2014-10-30 at 14:42	116862	2014-10-31 at 12:03
TX1005 Extended - NEW	TX1005	98780	2014-10-30 at 14:00	116840	2014-10-31 at 11:13

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 14103018 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Sample: 378259 - Background So.

Laboratory: Lubbock
 Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5035
 QC Batch: 116822 Date Analyzed: 2014-10-30 Analyzed By: JS
 Prep Batch: 98773 Sample Preparation: 2014-10-30 Prepared By: JS

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Toluene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Xylene	U	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		5	2.28	mg/Kg	1	2.00	114	70 - 130
4-Bromofluorobenzene (4-BFB)		5	2.10	mg/Kg	1	2.00	105	70 - 130

Sample: 378259 - Background So.

Laboratory: Lubbock
 Analysis: Ca, Extractable Analytical Method: S 6010C Prep Method: S 3005A
 QC Batch: 116849 Date Analyzed: 2014-10-31 Analyzed By: LM
 Prep Batch: 98764 Sample Preparation: 2014-10-31 Prepared By: LM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Extractable Calcium	Qs	4	1800	mg/Kg	10	1.00

Sample: 378259 - Background So.

Laboratory: Lubbock
 Analysis: Conductivity Analytical Method: SM 2510B Prep Method: N/A
 QC Batch: 116811 Date Analyzed: 2014-10-30 Analyzed By: RL
 Prep Batch: 98760 Sample Preparation: Prepared By: RL

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Specific Conductance		1,3,4,5	93.1	uMHOS/cm	1	0.00

Sample: 378259 - Background So.

Laboratory: Lubbock
Analysis: Mg, Extractable Analytical Method: S 6010C Prep Method: S 3005A
QC Batch: 116849 Date Analyzed: 2014-10-31 Analyzed By: LM
Prep Batch: 98764 Sample Preparation: 2014-10-31 Prepared By: LM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Extractable Magnesium		4	526	mg/Kg	10	1.00

Sample: 378259 - Background So.

Laboratory: Lubbock
Analysis: Na, Extractable Analytical Method: S 6010C Prep Method: S 3005A
QC Batch: 116849 Date Analyzed: 2014-10-31 Analyzed By: LM
Prep Batch: 98764 Sample Preparation: 2014-10-31 Prepared By: LM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Extractable Sodium		4	83.6	mg/Kg	10	1.00

Sample: 378259 - Background So.

Laboratory: Lubbock
Analysis: pH Analytical Method: S 9045C Prep Method: N/A
QC Batch: 116815 Date Analyzed: 2014-10-30 Analyzed By: AT
Prep Batch: 98769 Sample Preparation: 2014-10-30 Prepared By: AT

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
pH		1,2,3,4,5	9.00	s.u.	1	2.00

Sample: 378259 - Background So.

Laboratory: Lubbock
Analysis: SAR Analytical Method: USDA 60 Prep Method: N/A
QC Batch: 116849 Date Analyzed: 2014-10-31 Analyzed By: LM
Prep Batch: 98764 Sample Preparation: 2014-10-31 Prepared By: LM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
SAR			0.446		10	0.00

Sample: 378259 - Background So.

Laboratory: Lubbock			
Analysis: Total 8 Metals	Analytical Method: S 6010C	Prep Method: S 3050B	
QC Batch: 116862	Date Analyzed: 2014-10-31	Analyzed By: LM	
Prep Batch: 98763	Sample Preparation: 2014-10-31	Prepared By: LM	
Laboratory: Lubbock			
Analysis: Total 8 Metals	Analytical Method: S 7471 B	Prep Method: N/A	
QC Batch: 116865	Date Analyzed: 2014-10-31	Analyzed By: TP	
Prep Batch: 98801	Sample Preparation: 2014-10-31	Prepared By: TP	

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Silver	U	1,2,3,4,5	<0.500	mg/Kg	1	0.500
Total Arsenic		1,2,3,4,5	<2.00	mg/Kg	1	2.00
Total Barium	Qr,Qs	1,2,3,4,5	2300	mg/Kg	100	1.00
Total Cadmium		1,2,3,4,5	1.45	mg/Kg	1	0.500
Total Chromium	Qr,Qs	1,2,3,4,5	27.7	mg/Kg	1	0.500
Total Mercury		1,2,3,4,5	<0.0250	mg/Kg	1	0.0250
Total Lead		1,2,3,4,5	6.05	mg/Kg	1	1.00
Total Selenium	U	1,2,3,4,5	<2.00	mg/Kg	1	2.00

Sample: 378259 - Background So.

Laboratory: Lubbock			
Analysis: TX1005 Extended - NEW	Analytical Method: TX1005	Prep Method: N/A	
QC Batch: 116840	Date Analyzed: 2014-10-31	Analyzed By: SM	
Prep Batch: 98780	Sample Preparation: 2014-10-30	Prepared By: SM	

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
C6-C12	Jb	1	<50.0	mg/Kg	1	50.0
>C12-C35	U	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane			98.8	mg/Kg	1	100	99	70 - 130
n-Octane			88.2	mg/Kg	1	100	88	70 - 130
n-Tricosane			89.2	mg/Kg	1	100	89	70 - 130

Sample: 378260 - Background No.

Laboratory: Lubbock
 Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5035
 QC Batch: 116822 Date Analyzed: 2014-10-30 Analyzed By: JS
 Prep Batch: 98773 Sample Preparation: 2014-10-30 Prepared By: JS

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	u	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Toluene	u	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	u	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Xylene	u	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		5	2.24	mg/Kg	1	2.00	112	70 - 130
4-Bromofluorobenzene (4-BFB)		5	2.08	mg/Kg	1	2.00	104	70 - 130

Sample: 378260 - Background No.

Laboratory: Lubbock
 Analysis: Ca, Extractable Analytical Method: S 6010C Prep Method: S 3005A
 QC Batch: 116849 Date Analyzed: 2014-10-31 Analyzed By: LM
 Prep Batch: 98764 Sample Preparation: 2014-10-31 Prepared By: LM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Extractable Calcium	qs	4	4590	mg/Kg	10	1.00

Sample: 378260 - Background No.

Laboratory: Lubbock
 Analysis: Conductivity Analytical Method: SM 2510B Prep Method: N/A
 QC Batch: 116811 Date Analyzed: 2014-10-30 Analyzed By: RL
 Prep Batch: 98760 Sample Preparation: Prepared By: RL

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Specific Conductance		1,3,4,5	229	uMHOS/cm	1	0.00

Sample: 378260 - Background No.

Laboratory: Lubbock
Analysis: Mg, Extractable Analytical Method: S 6010C Prep Method: S 3005A
QC Batch: 116849 Date Analyzed: 2014-10-31 Analyzed By: LM
Prep Batch: 98764 Sample Preparation: 2014-10-31 Prepared By: LM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Extractable Magnesium		4	527	mg/Kg	10	1.00

Sample: 378260 - Background No.

Laboratory: Lubbock
Analysis: Na, Extractable Analytical Method: S 6010C Prep Method: S 3005A
QC Batch: 116849 Date Analyzed: 2014-10-31 Analyzed By: LM
Prep Batch: 98764 Sample Preparation: 2014-10-31 Prepared By: LM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Extractable Sodium		4	237	mg/Kg	10	1.00

Sample: 378260 - Background No.

Laboratory: Lubbock
Analysis: pH Analytical Method: S 9045C Prep Method: N/A
QC Batch: 116815 Date Analyzed: 2014-10-30 Analyzed By: AT
Prep Batch: 98769 Sample Preparation: 2014-10-30 Prepared By: AT

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
pH		1,2,3,4,5	9.46	s.u.	1	2.00

Sample: 378260 - Background No.

Laboratory: Lubbock
Analysis: SAR Analytical Method: USDA 60 Prep Method: N/A
QC Batch: 116849 Date Analyzed: 2014-10-31 Analyzed By: LM
Prep Batch: 98764 Sample Preparation: 2014-10-31 Prepared By: LM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
SAR			0.882		10	0.00

Sample: 378260 - Background No.

Laboratory: Lubbock					
Analysis: Total 8 Metals	Analytical Method: S 6010C	Prep Method: S 3050B			
QC Batch: 116862	Date Analyzed: 2014-10-31	Analyzed By: LM			
Prep Batch: 98763	Sample Preparation: 2014-10-31	Prepared By: LM			
Laboratory: Lubbock					
Analysis: Total 8 Metals	Analytical Method: S 7471 B	Prep Method: N/A			
QC Batch: 116865	Date Analyzed: 2014-10-31	Analyzed By: TP			
Prep Batch: 98801	Sample Preparation: 2014-10-31	Prepared By: TP			

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Silver	U	1,2,3,4,5	<0.500	mg/Kg	1	0.500
Total Arsenic		1,2,3,4,5	<2.00	mg/Kg	1	2.00
Total Barium	Qr,Qs	1,2,3,4,5	1070	mg/Kg	100	1.00
Total Cadmium		1,2,3,4,5	1.33	mg/Kg	1	0.500
Total Chromium	Qr,Qs	1,2,3,4,5	26.6	mg/Kg	1	0.500
Total Mercury		1,2,3,4,5	<0.0250	mg/Kg	1	0.0250
Total Lead		1,2,3,4,5	6.02	mg/Kg	1	1.00
Total Selenium	U	1,2,3,4,5	<2.00	mg/Kg	1	2.00

Sample: 378260 - Background No.

Laboratory: Lubbock				
Analysis: TX1005 Extended - NEW	Analytical Method: TX1005	Prep Method: N/A		
QC Batch: 116840	Date Analyzed: 2014-10-31	Analyzed By: SM		
Prep Batch: 98780	Sample Preparation: 2014-10-30	Prepared By: SM		

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
C6-C12	Jb	1	<50.0	mg/Kg	1	50.0
>C12-C35	Jb	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane			99.5	mg/Kg	1	100	100	70 - 130
n-Octane			89.0	mg/Kg	1	100	89	70 - 130
n-Tricosane			89.6	mg/Kg	1	100	90	70 - 130

Sample: 378261 - Background East

Laboratory: Lubbock
 Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5035
 QC Batch: 116822 Date Analyzed: 2014-10-30 Analyzed By: JS
 Prep Batch: 98773 Sample Preparation: 2014-10-30 Prepared By: JS

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	u	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Toluene	u	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	u	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200
Xylene	u	1,2,3,4,5	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		5	2.29	mg/Kg	1	2.00	114	70 - 130
4-Bromofluorobenzene (4-BFB)		5	2.08	mg/Kg	1	2.00	104	70 - 130

Sample: 378261 - Background East

Laboratory: Lubbock
 Analysis: Ca, Extractable Analytical Method: S 6010C Prep Method: S 3005A
 QC Batch: 116849 Date Analyzed: 2014-10-31 Analyzed By: LM
 Prep Batch: 98764 Sample Preparation: 2014-10-31 Prepared By: LM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Extractable Calcium	Qs	4	1380	mg/Kg	10	1.00

Sample: 378261 - Background East

Laboratory: Lubbock
 Analysis: Conductivity Analytical Method: SM 2510B Prep Method: N/A
 QC Batch: 116811 Date Analyzed: 2014-10-30 Analyzed By: RL
 Prep Batch: 98760 Sample Preparation: Prepared By: RL

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Specific Conductance		1,3,4,5	390	uMHOS/cm	1	0.00

Sample: 378261 - Background East

Laboratory: Lubbock
Analysis: Mg, Extractable Analytical Method: S 6010C Prep Method: S 3005A
QC Batch: 116849 Date Analyzed: 2014-10-31 Analyzed By: LM
Prep Batch: 98764 Sample Preparation: 2014-10-31 Prepared By: LM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Extractable Magnesium		4	523	mg/Kg	10	1.00

Sample: 378261 - Background East

Laboratory: Lubbock
Analysis: Na, Extractable Analytical Method: S 6010C Prep Method: S 3005A
QC Batch: 116849 Date Analyzed: 2014-10-31 Analyzed By: LM
Prep Batch: 98764 Sample Preparation: 2014-10-31 Prepared By: LM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Extractable Sodium		4	655	mg/Kg	10	1.00

Sample: 378261 - Background East

Laboratory: Lubbock
Analysis: pH Analytical Method: S 9045C Prep Method: N/A
QC Batch: 116815 Date Analyzed: 2014-10-30 Analyzed By: AT
Prep Batch: 98769 Sample Preparation: 2014-10-30 Prepared By: AT

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
pH		1,2,3,4,5	10.0	s.u.	1	2.00

Sample: 378261 - Background East

Laboratory: Lubbock
Analysis: SAR Analytical Method: USDA 60 Prep Method: N/A
QC Batch: 116849 Date Analyzed: 2014-10-31 Analyzed By: LM
Prep Batch: 98764 Sample Preparation: 2014-10-31 Prepared By: LM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
SAR			3.81		10	0.00

Sample: 378261 - Background East

Laboratory: Lubbock	Analytical Method: S 6010C	Prep Method: S 3050B
Analysis: Total 8 Metals	Date Analyzed: 2014-10-31	Analyzed By: LM
QC Batch: 116862	Sample Preparation: 2014-10-31	Prepared By: LM
Prep Batch: 98763		
Laboratory: Lubbock	Analytical Method: S 7471 B	Prep Method: N/A
Analysis: Total 8 Metals	Date Analyzed: 2014-10-31	Analyzed By: TP
QC Batch: 116865	Sample Preparation: 2014-10-31	Prepared By: TP
Prep Batch: 98801		

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Total Silver	U	1,2,3,4,5	<0.500	mg/Kg	1	0.500
Total Arsenic		1,2,3,4,5	5.90	mg/Kg	1	2.00
Total Barium	Qr,Qs	1,2,3,4,5	2130	mg/Kg	100	1.00
Total Cadmium		1,2,3,4,5	1.49	mg/Kg	1	0.500
Total Chromium	Qr,Qs	1,2,3,4,5	32.0	mg/Kg	1	0.500
Total Mercury		1,2,3,4,5	<0.0250	mg/Kg	1	0.0250
Total Lead		1,2,3,4,5	4.06	mg/Kg	1	1.00
Total Selenium	U	1,2,3,4,5	<2.00	mg/Kg	1	2.00

Sample: 378261 - Background East

Laboratory: Lubbock	Analytical Method: TX1005	Prep Method: N/A
Analysis: TX1005 Extended - NEW	Date Analyzed: 2014-10-31	Analyzed By: SM
QC Batch: 116840	Sample Preparation: 2014-10-30	Prepared By: SM
Prep Batch: 98780		

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
C6-C12	Jb	1	<50.0	mg/Kg	1	50.0
>C12-C35	Jb	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane			101	mg/Kg	1	100	101	70 - 130
n-Octane			91.1	mg/Kg	1	100	91	70 - 130
n-Tricosane			91.2	mg/Kg	1	100	91	70 - 130

Method Blanks

Method Blank (1) QC Batch: 116811

QC Batch: 116811 Date Analyzed: 2014-10-30 Analyzed By: RL
Prep Batch: 98760 QC Preparation: 2014-10-30 Prepared By: RL

Parameter	Flag	Cert	MDL Result	Units	RL
Specific Conductance		1,3,4,5	3.01	uMHOS/cm	

Method Blank (1) QC Batch: 116822

QC Batch: 116822 Date Analyzed: 2014-10-30 Analyzed By: JS
Prep Batch: 98773 QC Preparation: 2014-10-30 Prepared By: JS

Parameter	Flag	Cert	MDL Result	Units	RL
Benzene		1,2,3,4,5	<0.00296	mg/Kg	0.02
Toluene		1,2,3,4,5	<0.00351	mg/Kg	0.02
Ethylbenzene		1,2,3,4,5	<0.00312	mg/Kg	0.02
Xylene		1,2,3,4,5	<0.00310	mg/Kg	0.02

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		5	2.13	mg/Kg	1	2.00	106	70 - 130
4-Bromofluorobenzene (4-BFB)		5	1.97	mg/Kg	1	2.00	98	70 - 130

Method Blank (1) QC Batch: 116840

QC Batch: 116840 Date Analyzed: 2014-10-31 Analyzed By: SM
Prep Batch: 98780 QC Preparation: 2014-10-30 Prepared By: SM

Parameter	Flag	Cert	MDL Result	Units	RL
C6-C12		1	14.5	mg/Kg	50
>C12-C35		1	11.0	mg/Kg	50

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Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane			104	mg/Kg	1	100	104	70 - 130
n-Octane			93.8	mg/Kg	1	100	94	70 - 130
n-Tricosane			94.4	mg/Kg	1	100	94	70 - 130

Method Blank (1) QC Batch: 116849

QC Batch: 116849
Prep Batch: 98764

Date Analyzed: 2014-10-31
QC Preparation: 2014-10-30

Analyzed By: LM
Prepared By: PM

Parameter	Flag	Cert	MDL Result	Units	RL
Extractable Magnesium		4	<0.0225	mg/Kg	1

Method Blank (1) QC Batch: 116849

QC Batch: 116849
Prep Batch: 98764

Date Analyzed: 2014-10-31
QC Preparation: 2014-10-30

Analyzed By: LM
Prepared By: PM

Parameter	Flag	Cert	MDL Result	Units	RL
Extractable Calcium		4	<0.0847	mg/Kg	1

Method Blank (1) QC Batch: 116849

QC Batch: 116849
Prep Batch: 98764

Date Analyzed: 2014-10-31
QC Preparation: 2014-10-30

Analyzed By: LM
Prepared By: PM

Parameter	Flag	Cert	MDL Result	Units	RL
Extractable Sodium		4	<0.0184	mg/Kg	1

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Method Blank (1) QC Batch: 116862

QC Batch: 116862
Prep Batch: 98763

Date Analyzed: 2014-10-31
QC Preparation: 2014-10-30

Analyzed By: LM
Prepared By: PM

Parameter	Flag	Cert	MDL Result	Units	RL
Total Silver		1,2,3,4,5	<0.0344	mg/Kg	0.5
Total Arsenic		1,2,3,4,5	<0.432	mg/Kg	2
Total Barium		1,2,3,4,5	<0.0501	mg/Kg	1
Total Cadmium		1,2,3,4,5	<0.0320	mg/Kg	0.5
Total Chromium		1,2,3,4,5	<0.0512	mg/Kg	0.5
Total Lead		1,2,3,4,5	<0.263	mg/Kg	1
Total Selenium		1,2,3,4,5	<0.422	mg/Kg	2

Method Blank (1) QC Batch: 116865

QC Batch: 116865
Prep Batch: 98801

Date Analyzed: 2014-10-31
QC Preparation: 2014-10-31

Analyzed By: TP
Prepared By: TP

Parameter	Flag	Cert	MDL Result	Units	RL
Total Mercury		1,2,3,4,5	<0.00177	mg/Kg	0.025

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 116822
Prep Batch: 98773

Date Analyzed: 2014-10-30
QC Preparation: 2014-10-30

Analyzed By: JS
Prepared By: JS

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1,2,3,4,5	2.04	mg/Kg	1	2.00	<0.00296	102	70 - 130
Toluene		1,2,3,4,5	2.10	mg/Kg	1	2.00	<0.00351	105	70 - 130
Ethylbenzene		1,2,3,4,5	2.09	mg/Kg	1	2.00	<0.00312	104	70 - 130
Xylene		1,2,3,4,5	6.39	mg/Kg	1	6.00	<0.00310	106	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1,2,3,4,5	2.06	mg/Kg	1	2.00	<0.00296	103	70 - 130	1	20
Toluene		1,2,3,4,5	2.12	mg/Kg	1	2.00	<0.00351	106	70 - 130	1	20
Ethylbenzene		1,2,3,4,5	2.12	mg/Kg	1	2.00	<0.00312	106	70 - 130	1	20
Xylene		1,2,3,4,5	6.48	mg/Kg	1	6.00	<0.00310	108	70 - 130	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	F	C	LCS Result	LCS Result	Units	Dil.	Spike Amount	LCS Rec.	LCS Rec.	Rec. Limit
Trifluorotoluene (TFT)		5	2.12	2.13	mg/Kg	1	2.00	106	106	70 - 130
4-Bromofluorobenzene (4-BFB)		5	1.93	1.94	mg/Kg	1	2.00	96	97	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 116840
Prep Batch: 98780

Date Analyzed: 2014-10-31
QC Preparation: 2014-10-30

Analyzed By: SM
Prepared By: SM

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
C6-C12		1	242	mg/Kg	1	250	14.5	91	75 - 125
>C12-C35		1	248	mg/Kg	1	250	11	95	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
C6-C12		1	231	mg/Kg	1	250	14.5	87	75 - 125	5	20
>C12-C35		1	241	mg/Kg	1	250	11	92	75 - 125	3	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCS Result	Units	Dil.	Spike Amount	LCS Rec.	LCS Rec.	Rec. Limit
n-Triacontane	102	102	mg/Kg	1	100	102	102	70 - 130
n-Octane	92.8	93.1	mg/Kg	1	100	93	93	70 - 130
n-Tricosane	93.2	92.6	mg/Kg	1	100	93	93	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 116849
Prep Batch: 98764

Date Analyzed: 2014-10-31
QC Preparation: 2014-10-30

Analyzed By: LM
Prepared By: PM

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Extractable Magnesium		4	53.0	mg/Kg	1	50.0	<0.0225	106	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Extractable Magnesium		4	53.6	mg/Kg	1	50.0	<0.0225	107	85 - 115	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 116849
Prep Batch: 98764

Date Analyzed: 2014-10-31
QC Preparation: 2014-10-30

Analyzed By: LM
Prepared By: PM

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Extractable Calcium		4	50.8	mg/Kg	1	50.0	<0.0847	102	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Extractable Calcium		4	51.0	mg/Kg	1	50.0	<0.0847	102	85 - 115	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 116849
Prep Batch: 98764

Date Analyzed: 2014-10-31
QC Preparation: 2014-10-30

Analyzed By: LM
Prepared By: PM

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Extractable Sodium		4	51.8	mg/Kg	1	50.0	<0.0184	104	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Extractable Sodium		4	52.2	mg/Kg	1	50.0	<0.0184	104	85 - 115	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 116862
Prep Batch: 98763

Date Analyzed: 2014-10-31
QC Preparation: 2014-10-30

Analyzed By: LM
Prepared By: PM

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Silver		1,2,3,4,5	12.9	mg/Kg	1	12.5	<0.0344	103	85 - 115
Total Arsenic		1,2,3,4,5	52.0	mg/Kg	1	50.0	<0.432	104	85 - 115
Total Barium		1,2,3,4,5	110	mg/Kg	1	100	<0.0501	110	85 - 115
Total Cadmium		1,2,3,4,5	25.8	mg/Kg	1	25.0	<0.0320	103	85 - 115
Total Chromium		1,2,3,4,5	9.23	mg/Kg	1	10.0	<0.0512	92	85 - 115
Total Lead		1,2,3,4,5	56.8	mg/Kg	1	50.0	<0.263	114	85 - 115
Total Selenium		1,2,3,4,5	51.0	mg/Kg	1	50.0	<0.422	102	85 - 115

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Total Silver		1,2,3,4,5	13.0	mg/Kg	1	12.5	<0.0344	104	85 - 115	1	20
Total Arsenic		1,2,3,4,5	51.4	mg/Kg	1	50.0	<0.432	103	85 - 115	1	20
Total Barium		1,2,3,4,5	112	mg/Kg	1	100	<0.0501	112	85 - 115	2	20
Total Cadmium		1,2,3,4,5	26.4	mg/Kg	1	25.0	<0.0320	106	85 - 115	2	20
Total Chromium		1,2,3,4,5	9.42	mg/Kg	1	10.0	<0.0512	94	85 - 115	2	20
Total Lead		1,2,3,4,5	56.9	mg/Kg	1	50.0	<0.263	114	85 - 115	0	20
Total Selenium		1,2,3,4,5	50.3	mg/Kg	1	50.0	<0.422	101	85 - 115	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1)

QC Batch: 116865
Prep Batch: 98801

Date Analyzed: 2014-10-31
QC Preparation: 2014-10-31

Analyzed By: TP
Prepared By: TP

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Mercury		1,2,3,4,5	0.252	mg/Kg	1	0.250	<0.00177	101	80 - 120

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Total Mercury		1,2,3,4,5	0.262	mg/Kg	1	0.250	<0.00177	105	80 - 120	4	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

Matrix Spike (MS-1) Spiked Sample: 378249

QC Batch: 116822 Date Analyzed: 2014-10-30 Analyzed By: JS
Prep Batch: 98773 QC Preparation: 2014-10-30 Prepared By: JS

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1,2,3,4,5	2.00	mg/Kg	1	2.00	<0.00296	100	70 - 130
Toluene		1,2,3,4,5	2.12	mg/Kg	1	2.00	<0.00351	106	70 - 130
Ethylbenzene		1,2,3,4,5	2.21	mg/Kg	1	2.00	<0.00312	110	70 - 130
Xylene		1,2,3,4,5	6.78	mg/Kg	1	6.00	<0.00310	113	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1,2,3,4,5	2.04	mg/Kg	1	2.00	<0.00296	102	70 - 130	2	20
Toluene		1,2,3,4,5	2.15	mg/Kg	1	2.00	<0.00351	108	70 - 130	1	20
Ethylbenzene		1,2,3,4,5	2.26	mg/Kg	1	2.00	<0.00312	113	70 - 130	2	20
Xylene		1,2,3,4,5	6.97	mg/Kg	1	6.00	<0.00310	116	70 - 130	3	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	F	C	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)		5	2.24	2.25	mg/Kg	1	2	112	112	70 - 130
4-Bromofluorobenzene (4-BFB)		5	1.96	2.06	mg/Kg	1	2	98	103	70 - 130

Matrix Spike (MS-1) Spiked Sample: 378249

QC Batch: 116840 Date Analyzed: 2014-10-31 Analyzed By: SM
Prep Batch: 98780 QC Preparation: 2014-10-30 Prepared By: SM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
C6-C12		1	219	mg/Kg	1	250	16.2	81	70 - 130
>C12-C35		1	240	mg/Kg	1	250	13.1	91	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
C6-C12		1	247	mg/Kg	1	250	16.2	92	70 - 130	12	20
>C12-C35		1	253	mg/Kg	1	250	13.1	96	70 - 130	5	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Triacontane	102	104	mg/Kg	1	100	102	104	70 - 130
n-Octane	93.8	98.3	mg/Kg	1	100	94	98	70 - 130
n-Tricosane	92.0	94.5	mg/Kg	1	100	92	94	70 - 130

Matrix Spike (MS-1) Spiked Sample: 378249

QC Batch: 116849 Date Analyzed: 2014-10-31 Analyzed By: LM
Prep Batch: 98764 QC Preparation: 2014-10-30 Prepared By: PM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Extractable Magnesium		4	6070	mg/Kg	10	5000	884	104	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Extractable Magnesium		4	6290	mg/Kg	10	5000	884	108	75 - 125	4	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 378249

QC Batch: 116849 Date Analyzed: 2014-10-31 Analyzed By: LM
Prep Batch: 98764 QC Preparation: 2014-10-30 Prepared By: PM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	
Extractable Calcium	Qs	Qs	4	23400	mg/Kg	10	5000	26510	-62	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit	
Extractable Calcium	Qs	Qs	4	23400	mg/Kg	10	5000	26510	-62	75 - 125	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 378249

QC Batch: 116849 Date Analyzed: 2014-10-31 Analyzed By: LM
Prep Batch: 98764 QC Preparation: 2014-10-30 Prepared By: PM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Extractable Sodium		4	5960	mg/Kg	10	5000	755	104	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Extractable Sodium		4	6100	mg/Kg	10	5000	755	107	75 - 125	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 378254

QC Batch: 116862 Date Analyzed: 2014-10-31 Analyzed By: LM
Prep Batch: 98763 QC Preparation: 2014-10-30 Prepared By: PM

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Silver		1,2,3,4,5	11.8	mg/Kg	1	12.5	<0.0344	94	75 - 125
Total Arsenic		1,2,3,4,5	49.2	mg/Kg	1	50.0	1.62	95	75 - 125
Total Barium	Qs	Qs	333	mg/Kg	1	100	458.5	-124	75 - 125
Total Cadmium		1,2,3,4,5	24.2	mg/Kg	1	25.0	1.27	92	75 - 125
Total Chromium	Qs	Qs	22.9	mg/Kg	1	10.0	26.8	-39	75 - 125
Total Lead		1,2,3,4,5	55.0	mg/Kg	1	50.0	7.45	95	75 - 125
Total Selenium		1,2,3,4,5	54.8	mg/Kg	1	50.0	<0.422	110	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Total Silver		1,2,3,4,5	10.7	mg/Kg	1	12.5	<0.0344	86	75 - 125	10	20
Total Arsenic		1,2,3,4,5	46.8	mg/Kg	1	50.0	1.62	90	75 - 125	5	20
Total Barium	Qr, Qs	Qr, Qs	520	mg/Kg	1	100	458.5	62	75 - 125	44	20
Total Cadmium		1,2,3,4,5	23.6	mg/Kg	1	25.0	1.27	89	75 - 125	2	20
Total Chromium	Qr	Qr	38.4	mg/Kg	1	10.0	26.8	116	75 - 125	51	20
Total Lead		1,2,3,4,5	52.8	mg/Kg	1	50.0	7.45	91	75 - 125	4	20
Total Selenium		1,2,3,4,5	45.1	mg/Kg	1	50.0	<0.422	90	75 - 125	19	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) Spiked Sample: 378257

QC Batch: 116865
Prep Batch: 98801

Date Analyzed: 2014-10-31
QC Preparation: 2014-10-31

Analyzed By: TP
Prepared By: TP

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Mercury		1,2,3,4,5	0.282	mg/Kg	1	0.250	0.01833	105	80 - 120

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Total Mercury		1,2,3,4,5	0.284	mg/Kg	1	0.250	0.01833	106	80 - 120	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Standard (CCV-2)

QC Batch: 116822

Date Analyzed: 2014-10-30

Analyzed By: JS

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1,2,3,4,5	mg/kg	0.100	0.106	106	80 - 120	2014-10-30
Toluene		1,2,3,4,5	mg/kg	0.100	0.108	108	80 - 120	2014-10-30
Ethylbenzene		1,2,3,4,5	mg/kg	0.100	0.108	108	80 - 120	2014-10-30
Xylene		1,2,3,4,5	mg/kg	0.300	0.331	110	80 - 120	2014-10-30

Standard (CCV-3)

QC Batch: 116822

Date Analyzed: 2014-10-30

Analyzed By: JS

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1,2,3,4,5	mg/kg	0.100	0.109	109	80 - 120	2014-10-30
Toluene		1,2,3,4,5	mg/kg	0.100	0.110	110	80 - 120	2014-10-30
Ethylbenzene		1,2,3,4,5	mg/kg	0.100	0.110	110	80 - 120	2014-10-30
Xylene		1,2,3,4,5	mg/kg	0.300	0.336	112	80 - 120	2014-10-30

Standard (CCV-2)

QC Batch: 116840

Date Analyzed: 2014-10-31

Analyzed By: SM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
C6-C12		1	mg/Kg	250	236	94	75 - 125	2014-10-31
>C12-C35		1	mg/Kg	250	242	97	75 - 125	2014-10-31

Standard (CCV-3)

QC Batch: 116840

Date Analyzed: 2014-10-31

Analyzed By: SM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
C6-C12		1	mg/Kg	250	236	94	75 - 125	2014-10-31
>C12-C35		1	mg/Kg	250	238	95	75 - 125	2014-10-31

Standard (ICV-1)

QC Batch: 116849

Date Analyzed: 2014-10-31

Analyzed By: LM

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Extractable Magnesium		4	mg/Kg	51.0	51.4	101	90 - 110	2014-10-31

Standard (ICV-1)

QC Batch: 116849

Date Analyzed: 2014-10-31

Analyzed By: LM

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Extractable Calcium		4	mg/Kg	51.0	51.8	102	90 - 110	2014-10-31

Standard (ICV-1)

QC Batch: 116849

Date Analyzed: 2014-10-31

Analyzed By: LM

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Extractable Sodium		4	mg/Kg	51.0	50.6	99	90 - 110	2014-10-31

Standard (CCV-1)

QC Batch: 116849

Date Analyzed: 2014-10-31

Analyzed By: LM

Report Date: November 3, 2014
452711.002

Work Order: 14103018
Federal 397-3K-K3

Page Number: 30 of 33
Rifle Co.

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Extractable Magnesium		4	mg/Kg	51.0	52.1	102	90 - 110	2014-10-31

Standard (CCV-1)

QC Batch: 116849

Date Analyzed: 2014-10-31

Analyzed By: LM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Extractable Calcium		4	mg/Kg	51.0	52.1	102	90 - 110	2014-10-31

Standard (CCV-1)

QC Batch: 116849

Date Analyzed: 2014-10-31

Analyzed By: LM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Extractable Sodium		4	mg/Kg	51.0	52.4	103	90 - 110	2014-10-31

Standard (ICV-1)

QC Batch: 116862

Date Analyzed: 2014-10-31

Analyzed By: LM

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Silver		1,2,3,4,5	mg/Kg	0.125	0.123	98	90 - 110	2014-10-31
Total Arsenic		1,2,3,4,5	mg/Kg	1.00	0.999	100	90 - 110	2014-10-31
Total Barium		1,2,3,4,5	mg/Kg	1.00	0.979	98	90 - 110	2014-10-31
Total Cadmium		1,2,3,4,5	mg/Kg	1.00	0.992	99	90 - 110	2014-10-31
Total Chromium		1,2,3,4,5	mg/Kg	1.00	1.04	104	90 - 110	2014-10-31
Total Lead		1,2,3,4,5	mg/Kg	1.00	1.07	107	90 - 110	2014-10-31
Total Selenium		1,2,3,4,5	mg/Kg	1.00	1.01	101	90 - 110	2014-10-31

Standard (CCV-1)

QC Batch: 116862

Date Analyzed: 2014-10-31

Analyzed By: LM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Silver		1,2,3,4,5	mg/Kg	0.125	0.126	101	90 - 110	2014-10-31
Total Arsenic		1,2,3,4,5	mg/Kg	1.00	1.03	103	90 - 110	2014-10-31
Total Barium		1,2,3,4,5	mg/Kg	1.00	1.07	107	90 - 110	2014-10-31
Total Cadmium		1,2,3,4,5	mg/Kg	1.00	1.01	101	90 - 110	2014-10-31
Total Chromium		1,2,3,4,5	mg/Kg	1.00	1.06	106	90 - 110	2014-10-31
Total Lead		1,2,3,4,5	mg/Kg	1.00	1.10	110	90 - 110	2014-10-31
Total Selenium		1,2,3,4,5	mg/Kg	1.00	1.02	102	90 - 110	2014-10-31

Standard (CCV-1)

QC Batch: 116865

Date Analyzed: 2014-10-31

Analyzed By: TP

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		1,2,3,4,5	mg/L	0.0100	0.0100	100	90 - 110	2014-10-31

Standard (CCV-2)

QC Batch: 116865

Date Analyzed: 2014-10-31

Analyzed By: TP

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		1,2,3,4,5	mg/L	0.0100	0.0105	105	90 - 110	2014-10-31

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	PJLA	L14-93	Lubbock
2	Kansas	Kansas E-10317	Lubbock
3	LELAP	LELAP-02003	Lubbock
4	NELAP	T104704219-14-10	Lubbock
5		2014-018	Lubbock

Standard Flags

F	Description
B	Analyte detected in the corresponding method blank above the method detection limit
H	Analyzed out of hold time
J	Estimated concentration
Jb	The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less than ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
Je	Estimated concentration exceeding calibration range.
MI1	Split peak or shoulder peak
MI2	Instrument software did not integrate
MI3	Instrument software misidentified the peak
MI4	Instrument software integrated improperly
MI5	Baseline correction
Qc	Calibration check outside of laboratory limits.
Qr	RPD outside of laboratory limits
Qs	Spike recovery outside of laboratory limits.
Qsr	Surrogate recovery outside of laboratory limits.

F Description

U The analyte is not detected above the SDL

Attachments

The scanned attachments will follow this page.
Please note, each attachment may consist of more than one page.

TraceAnalysis, Inc.

6701 Aberdeen Avenue, Suite 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

200 East Sunset Rd., Suite E
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Tel (915) 585-3443
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1 (888) 588-3443

BioAquatic Testing
2501 Mayes Rd., Ste 100
Carrollton, Texas 75006
Tel (972) 242-7750

Brandon & Clark
3403 Industrial Blvd.
Hobbs, NM 88240
Tel (575) 392-7561
Fax (575) 392-4508

email: lab@traceanalysis.com

Company Name: APEX Cos. LLC Phone #: 918-740-2766
Address: 307 E. DANFORTH Rd EDWARD, OK 73034 Switk 160
Contact Person: Mike Holder E-mail: mholder@apexcos.com
Invoice to: Mike Holder

Project #: 452711.002 Project Name: Federal 397-3K K3
Project Location (including state): APCO CO Sampler Signature: [Signature]

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume / Amount	MATRIX			PRESERVATIVE METHOD					SAMPLING		
				WATER	SOIL	AIR	SLUDGE	HCl	HNO ₃	H ₂ SO ₄	NaOH	ICE	NONE	DATE
37869	BACK GROUND So.	2		X						K			10/28/14	1452
240	BACK GROUND No.	2		X						K			10/24/14	1457
241	BACK GROUND EAST	2		X						K			10/28/14	1501

ANALYSIS REQUEST

(Circle or Specify Method No.)

MTBE 8021 / 602 / 8260 / 624	BTX 8021 / 602 / 8260 / 624	TPH 418.1 / TX1005 Ex(G35)	TPH 8015 GRO / DRO / TVHC	PAH 8270 / 625	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260 / 624	GC/MS Semi. Vol. 8270 / 625	PCB's 8082 / 608	Pesticides 8081 / 608	BOD, TSS, PH	Moisture Content	Cl, F, SO ₄ , NO ₃ -N, NO ₂ -N, PO ₄ -P, Alkalinity	Na, Ca, Mg, K, TDS, EC	SAR	EC	DIRECT READING	Turn Around Time if different from standard	Hold		
		X			X									X					X					
		X			X									X					X					
		X			X									X					X					

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	INST OBS	COR	REMARKS:
<u>[Signature]</u>	<u>APEX</u>	<u>10/29/14</u>	<u>1000</u>							<u>24 Hour TAT</u>
<u>[Signature]</u>	<u>APEX</u>	<u>10/29/14</u>	<u>1000</u>							<u>378261-2 Broken</u>
<u>[Signature]</u>	<u>APEX</u>	<u>10/30/14</u>	<u>930</u>	<u>BC TA</u>	<u>BC TA</u>	<u>10-30-14</u>				<u>378261-2 Broken</u>

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C. O. C. ORIGINAL COPY

Carrier # FX 8804 4609 3684



December 18, 2014

Apex Companies, LLC
Clint Ward
3240 W. 71st Avenue, Suite 1
Westminster CO 80030

Project Name - Federal 397-3k

Project Number - 452711.001

Attached are your analytical results for Federal 397-3k received by Origins Laboratory, Inc. November 18, 2014. This project is associated with Origins project number X411186-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Apex Companies, LLC
3240 W. 71st Avenue, Suite 1
Westminster CO 80030

Clint Ward
Project Number: 452711.001
Project: Federal 397-3k

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Treated Soil	X411186-01	Soil	November 18, 2014 13:05	11/18/2014 17:30

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Companies, LLC
 3240 W. 71st Avenue, Suite 1
 Westminster CO 80030

Clint Ward
 Project Number: 452711.001
 Project: Federal 397-3k

Origins Laboratory

F-012207-01-R1
 Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: X411186

Client: Apex

Client Project ID: Federal 397-3k

Checklist Completed by: David Mathis

Shipped Via: (UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 11/18/14 1735

Airbill #: 1324

Matrix(s) Received: (Check all that apply): Soil/Solid Water Other: _____

Cooler Number/Temperature: _____ / 1.34 °C _____ / _____ °C _____ / _____ °C (Describe)

Thermometer ID: T002

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	X			
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact ⁽¹⁾ ?	X			
Was adequate sample volume provided ⁽¹⁾ ?	X			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		X		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	X			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	X			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	X			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			X	
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH <2 for samples preserved with HNO3, HCL, H2SO4) / (pH >10 for samples preserved with NaAsO2+NaOH, ZnAc+NaOH)			X	
Additional Comments (if any):				

⁽¹⁾If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

[Signature]
 Reviewed by (Project Manager)

11/18/14
 Date/Time Reviewed

Origins Laboratory, Inc.

Jefe Pellegrini

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Companies, LLC
 3240 W. 71st Avenue, Suite 1
 Westminster CO 80030

Clint Ward
 Project Number: 452711.001
 Project: Federal 397-3k

Treated Soil
11/18/2014 1:05:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	-------

Origins Laboratory, Inc.
X411186-01 (Soil)

BTEX by EPA 8260C

Benzene	ND	0.002	mg/kg	1	4K18013	11/18/2014	11/18/2014	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	
Xylenes, total	0.006	0.002	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	91.8 %	70-130			"	"	"	
Surrogate: Toluene-d8	97.3 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	98.9 %	70-130			"	"	"	

Mercury by 7471 Cold Vapor

Mercury	0.0243	0.0138	mg/kg dry	1	1444260	12/17/2014	12/18/2014	H, h
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RCRA Metals by SW846 3050B/6010C

Arsenic	4.89	3.44	mg/kg dry	1	1444290	"	12/17/2014	
Barium	4520	0.573	"	"	"	"	"	
Cadmium	ND	0.573	"	"	"	"	"	U
Chromium	34.8	0.573	"	"	"	"	"	
Lead	13.9	1.15	"	"	"	"	"	
Selenium	ND	3.44	"	"	"	"	"	U
Silver	0.219	0.573	"	"	"	"	"	J

TPH-Carbon Chain by EPA Method 8015C

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Companies, LLC
3240 W. 71st Avenue, Suite 1
Westminster CO 80030

Clint Ward
Project Number: 452711.001
Project: Federal 397-3k

Treated Soil
11/18/2014 1:05:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X411186-01 (Soil)

TPH-Carbon Chain by EPA Method 8015C

Gasoline (C6-C10)	ND	50	mg/kg	1	4K18014	11/18/2014	11/18/2014	
Diesel (C10-C28)	310	50	"	"	"	"	"	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	
TPH - Carbon Chain Total	310	50	"	"	"	"	"	
Surrogate: o-Terphenyl	68.1 %	65-146			"	"	"	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Companies, LLC
 3240 W. 71st Avenue, Suite 1
 Westminster CO 80030

Clint Ward
 Project Number: 452711.001
 Project: Federal 397-3k

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4K18013 - EPA 5030 (soil)

Blank (4K18013-BLK1)

Prepared: 11/18/2014 Analyzed: 11/18/2014

Benzene	ND	0.002	mg/kg							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Surrogate: 1,2-Dichloroethane-d4	57		ug/kg	62.5		91.7	70-130			
Surrogate: Toluene-d8	61		"	62.5		96.9	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		98.8	70-130			

Origins Laboratory, Inc.



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Apex Companies, LLC
 3240 W. 71st Avenue, Suite 1
 Westminster CO 80030

Clint Ward
 Project Number: 452711.001
 Project: Federal 397-3k

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4K18013 - EPA 5030 (soil)

LCS (4K18013-BS1)

Prepared: 11/18/2014 Analyzed: 11/18/2014

Benzene	0.104	0.002	mg/kg	0.100		104	77.1-124			
Toluene	0.102	0.002	"	0.100		102	74.5-128			
Ethylbenzene	0.099	0.002	"	0.100		99.1	66.4-127			
m,p-Xylene	0.196	0.004	"	0.200		98.0	76.6-124			
o-Xylene	0.090	0.002	"	0.100		89.7	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	54		ug/kg	62.5		86.3	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.2	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.6	70-130			

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Companies, LLC
 3240 W. 71st Avenue, Suite 1
 Westminster CO 80030

Clint Ward
 Project Number: 452711.001
 Project: Federal 397-3k

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4K18013 - EPA 5030 (soil)

Matrix Spike (4K18013-MS1)	Source: X411176-01			Prepared: 11/18/2014 Analyzed: 11/18/2014						
Benzene	0.111	0.002	mg/kg	0.100	ND	111	71.8-126			
Toluene	0.110	0.002	"	0.100	ND	110	65.1-130			
Ethylbenzene	0.106	0.002	"	0.100	ND	106	62.2-130			
m,p-Xylene	0.210	0.004	"	0.200	ND	105	46.5-137			
o-Xylene	0.102	0.002	"	0.100	ND	102	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	53		ug/kg	62.5		85.4	70-130			
Surrogate: Toluene-d8	61		"	62.5		98.0	70-130			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		97.3	70-130			

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Companies, LLC
 3240 W. 71st Avenue, Suite 1
 Westminster CO 80030

Clint Ward
 Project Number: 452711.001
 Project: Federal 397-3k

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4K18013 - EPA 5030 (soil)

Matrix Spike Dup (4K18013-MSD1)	Source: X411176-01			Prepared: 11/18/2014 Analyzed: 11/18/2014						
Benzene	0.088	0.002	mg/kg	0.100	ND	87.9	71.8-126	23.4	11.3	
Toluene	0.086	0.002	"	0.100	ND	85.8	65.1-130	24.6	15.4	
Ethylbenzene	0.084	0.002	"	0.100	ND	84.0	62.2-130	23.3	19.6	
m,p-Xylene	0.166	0.004	"	0.200	ND	82.8	46.5-137	23.6	19.2	
o-Xylene	0.075	0.002	"	0.100	ND	75.4	54.2-134	30.1	17.9	
Surrogate: 1,2-Dichloroethane-d4	57		ug/kg	62.5		90.9	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.1	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		98.4	70-130			

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Companies, LLC
 3240 W. 71st Avenue, Suite 1
 Westminster CO 80030

Clint Ward
 Project Number: 452711.001
 Project: Federal 397-3k

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Extractable Petroleum Hydrocarbons by 8015M - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4K18014 - EPA 3580

Blank (4K18014-BLK1)

Prepared: 11/18/2014 Analyzed: 11/18/2014

Gasoline (C6-C10)	ND	50	mg/kg							
Diesel (C10-C28)	ND	50	"							
Residual Range Organics (C28-C36)	ND	200	"							
TPH - Carbon Chain Total	ND	50	"							
Surrogate: <i>o</i> -Terphenyl	41.9		"	50.0		83.8	65-146			

LCS (4K18014-BS1)

Prepared: 11/18/2014 Analyzed: 11/18/2014

Gasoline (C6-C10)	980	50	mg/kg	1000		97.5	66.7-119			
Diesel (C10-C28)	1100	50	"	1000		109	70.1-127			
Residual Range Organics (C28-C36)	930	200	"	1000		93.0	54.5-139			
Surrogate: <i>o</i> -Terphenyl	40.8		"	50.0		81.5	65-146			

Matrix Spike (4K18014-MS1)

Source: X411176-02

Prepared: 11/18/2014 Analyzed: 11/18/2014

Gasoline (C6-C10)	860	50	mg/kg	1000	ND	85.6	56.4-132			
Diesel (C10-C28)	970	50	"	1000	ND	96.7	57.4-138			
Residual Range Organics (C28-C36)	810	200	"	1000	ND	80.8	47.7-129			
Surrogate: <i>o</i> -Terphenyl	33.9		"	50.0		67.8	65-146			

Matrix Spike Dup (4K18014-MSD1)

Source: X411176-02

Prepared: 11/18/2014 Analyzed: 11/18/2014

Gasoline (C6-C10)	980	50	mg/kg	1000	ND	97.8	56.4-132	13.3	22	
Diesel (C10-C28)	1100	50	"	1000	ND	112	57.4-138	14.3	18.3	
Residual Range Organics (C28-C36)	970	200	"	1000	ND	96.7	47.7-129	17.9	30.1	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Companies, LLC
 3240 W. 71st Avenue, Suite 1
 Westminster CO 80030

Clint Ward
 Project Number: 452711.001
 Project: Federal 397-3k

Extractable Petroleum Hydrocarbons by 8015M - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4K18014 - EPA 3580

Matrix Spike Dup (4K18014-MSD1)

Source: X411176-02

Prepared: 11/18/2014 Analyzed: 11/18/2014

Surrogate: o-Terphenyl	39.2		mg/kg	50.0		78.4	65-146			
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Origins Laboratory, Inc.



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Apex Companies, LLC
 3240 W. 71st Avenue, Suite 1
 Westminster CO 80030

Clint Ward
 Project Number: 452711.001
 Project: Federal 397-3k

Mercury by 7471 Cold Vapor - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1444260 - SW846 7471A Prep										
BLANK (1203230642-BLK)					Prepared: 12/17/2014 Analyzed: 12/18/2014					
Mercury	ND	0.012	mg/kg				-			U
LCS (1203230643-BKS)					Prepared: 12/17/2014 Analyzed: 12/18/2014					
Mercury	7.21	0.594	mg/kg	7.69		93.7	71.4-129			

Origins Laboratory, Inc.



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Apex Companies, LLC
 3240 W. 71st Avenue, Suite 1
 Westminster CO 80030

Clint Ward
 Project Number: 452711.001
 Project: Federal 397-3k

RCRA Metals by SW846 3050B/6010C - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1444290 - SW846 3050B

BLANK (1203230725-BLK)

Prepared: 12/17/2014 Analyzed: 12/17/2014

Silver	ND	0.498	mg/kg				-			U
Selenium	ND	2.99	"				-			U
Lead	ND	0.996	"				-			U
Chromium	ND	0.498	"				-			U
Cadmium	ND	0.498	"				-			U
Arsenic	ND	2.99	"				-			U
Barium	ND	0.498	"				-			U

LCS (1203230726-BKS)

Prepared: 12/17/2014 Analyzed: 12/17/2014

Lead	47.9	0.960	mg/kg	48.0	99.8	80-120				
Silver	45.5	0.480	"	48.0	94.9	80-120				
Selenium	53.1	2.88	"	48.0	111	80-120				
Arsenic	48.8	2.88	"	48.0	102	80-120				
Barium	47.3	0.480	"	48.0	98.7	80-120				
Cadmium	47.7	0.480	"	48.0	99.4	80-120				
Chromium	47.1	0.480	"	48.0	98.2	80-120				

DUP (1203230727 D)

Source: X411186-01

Prepared: 12/17/2014 Analyzed: 12/17/2014

Lead	13.5	1.16	mg/kg dry	13.9	0-20	3.28	20			
Selenium	ND	3.48	"	<0.580	0-20	35.8	20			U
Chromium	35.8	0.580	"	34.8	0-20	2.97	20			
Cadmium	ND	0.580	"	<0.116	0-20	45.9	20			U
Barium	4720	0.580	"	4520	0-20	4.47	20			
Arsenic	5.11	3.48	"	4.89	0-20	4.38	20			
Silver	0.169	0.580	"	0.219	0-20	25.9	20			J

MS (1203230728 S)

Source: X411186-01

Prepared: 12/17/2014 Analyzed: 12/17/2014

Origins Laboratory, Inc.



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 Westminster CO 80030

Clint Ward
 Project Number: 452711.001
 Project: Federal 397-3k

RCRA Metals by SW846 3050B/6010C - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1444290 - SW846 3050B

MS (1203230728 S)	Source: X411186-01			Prepared: 12/17/2014 Analyzed: 12/17/2014						
Silver	52.5	0.574	mg/kg dry	57.4	0.219	91	75-125			
Arsenic	59.0	3.45	"	57.4	4.89	94.2	75-125			
Barium	4110	0.574	"	57.4	4520	0	75-125			
Cadmium	48.8	0.574	"	57.4	<0.115	85	75-125			
Chromium	85.9	0.574	"	57.4	34.8	88.9	75-125			
Lead	66.6	1.15	"	57.4	13.9	91.7	75-125			
Selenium	56.8	3.45	"	57.4	<0.574	98.2	75-125			

Origins Laboratory, Inc.



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Apex Companies, LLC
3240 W. 71st Avenue, Suite 1
Westminster CO 80030

Clint Ward
Project Number: 452711.001
Project: Federal 397-3k

Notes and Definitions

- U Result not detected above the detection limit
- J Greater than the detection limit but less than the reporting limit
- H [Undefined]
- h [Undefined]
- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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November 19, 2014

Apex Companies, LLC
Clint Ward
3240 W. 71st Avenue, Suite 1
Westminster CO 80030

Project Name - Federal 397-3k

Project Number - 452711.001

Attached are your analytical results for Federal 397-3k received by Origins Laboratory, Inc. November 18, 2014. This project is associated with Origins project number X411186-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Apex Companies, LLC
3240 W. 71st Avenue, Suite 1
Westminster CO 80030

Clint Ward
Project Number: 452711.001
Project: Federal 397-3k

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Treated Soil	X411186-01	Soil	November 18, 2014 13:05	11/18/2014 17:30

Origins Laboratory, Inc.



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Noelle Doyle Mathis, President

Apex Companies, LLC
 3240 W. 71st Avenue, Suite 1
 Westminster CO 80030

Clint Ward
 Project Number: 452711.001
 Project: Federal 397-3k

Origins Laboratory

F-012207-01-R1
 Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: X411186

Client: Apex

Client Project ID: Federal 397-3k

Checklist Completed by: David Mathis

Shipped Via: (UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 11/18/14 1735

Airbill #: 1324

Matrix(s) Received: (Check all that apply): Soil/Solid Water Other: _____

Cooler Number/Temperature: _____ / 1.34 °C _____ / _____ °C _____ / _____ °C (Describe)

Thermometer ID: T002

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	X			
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact ⁽¹⁾ ?	X			
Was adequate sample volume provided ⁽¹⁾ ?	X			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		X		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	X			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	X			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	X			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			X	
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH < 2 for samples preserved with HNO ₃ , HCl, H ₂ SO ₄) / (pH > 10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)			X	
Additional Comments (if any):				

⁽¹⁾If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

[Signature]
 Reviewed by (Project Manager)

11/18/14
 Date/Time Reviewed

Origins Laboratory, Inc.



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Apex Companies, LLC
 3240 W. 71st Avenue, Suite 1
 Westminster CO 80030

Clint Ward
 Project Number: 452711.001
 Project: Federal 397-3k

Treated Soil

11/18/2014 1:05:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
 X411186-01 (Soil)

BTEX by EPA 8260C

Benzene	ND	0.002	mg/kg	1	4K18013	11/18/2014	11/18/2014	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	
Xylenes, total	0.006	0.002	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	91.8 %	70-130			"	"	"	
Surrogate: Toluene-d8	97.3 %	70-130			"	"	"	
Surrogate: 4-Bromofluorobenzene	98.9 %	70-130			"	"	"	

TPH-Carbon Chain by EPA Method 8015C

Gasoline (C6-C10)	ND	50.0	mg/kg	1	4K18014	11/18/2014	11/18/2014	
Diesel (C10-C28)	313	50.0	"	"	"	"	"	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	
TPH - Carbon Chain Total	313	50.0	"	"	"	"	"	

Surrogate: o-Terphenyl	68.1 %	65-146			"	"	"	
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Origins Laboratory, Inc.



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Apex Companies, LLC
 3240 W. 71st Avenue, Suite 1
 Westminster CO 80030

Clint Ward
 Project Number: 452711.001
 Project: Federal 397-3k

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4K18013 - EPA 5030 (soil)

Blank (4K18013-BLK1)

Prepared: 11/18/2014 Analyzed: 11/18/2014

Benzene	ND	0.002	mg/kg							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>57</i>		<i>ug/kg</i>	<i>62.5</i>		<i>91.7</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>61</i>		<i>"</i>	<i>62.5</i>		<i>96.9</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>62</i>		<i>"</i>	<i>62.5</i>		<i>98.8</i>	<i>70-130</i>			

Origins Laboratory, Inc.



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Noelle Doyle Mathis, President

Apex Companies, LLC
 3240 W. 71st Avenue, Suite 1
 Westminster CO 80030

Clint Ward
 Project Number: 452711.001
 Project: Federal 397-3k

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4K18013 - EPA 5030 (soil)

LCS (4K18013-BS1)

Prepared: 11/18/2014 Analyzed: 11/18/2014

Benzene	0.10	0.002	mg/kg	0.100		104	77.1-124			
Toluene	0.10	0.002	"	0.100		102	74.5-128			
Ethylbenzene	0.10	0.002	"	0.100		99.1	66.4-127			
m,p-Xylene	0.20	0.004	"	0.200		98.0	76.6-124			
o-Xylene	0.09	0.002	"	0.100		89.7	76.6-124			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>54</i>		<i>ug/kg</i>	<i>62.5</i>		<i>86.3</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>62</i>		<i>"</i>	<i>62.5</i>		<i>99.2</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>62</i>		<i>"</i>	<i>62.5</i>		<i>99.6</i>	<i>70-130</i>			

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 Westminster CO 80030

Clint Ward
 Project Number: 452711.001
 Project: Federal 397-3k

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4K18013 - EPA 5030 (soil)

Matrix Spike (4K18013-MS1)	Source: X411176-01			Prepared: 11/18/2014 Analyzed: 11/18/2014						
Benzene	0.11	0.002	mg/kg	0.100	ND	111	71.8-126			
Toluene	0.11	0.002	"	0.100	ND	110	65.1-130			
Ethylbenzene	0.11	0.002	"	0.100	ND	106	62.2-130			
m,p-Xylene	0.21	0.004	"	0.200	ND	105	46.5-137			
o-Xylene	0.10	0.002	"	0.100	ND	102	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	53		ug/kg	62.5		85.4	70-130			
Surrogate: Toluene-d8	61		"	62.5		98.0	70-130			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		97.3	70-130			

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 Project: Federal 397-3k

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4K18013 - EPA 5030 (soil)

Matrix Spike Dup (4K18013-MSD1)	Source: X411176-01			Prepared: 11/18/2014 Analyzed: 11/18/2014						
Benzene	0.09	0.002	mg/kg	0.100	ND	87.9	71.8-126	23.4	11.3	
Toluene	0.09	0.002	"	0.100	ND	85.8	65.1-130	24.6	15.4	
Ethylbenzene	0.08	0.002	"	0.100	ND	84.0	62.2-130	23.3	19.6	
m,p-Xylene	0.17	0.004	"	0.200	ND	82.8	46.5-137	23.6	19.2	
o-Xylene	0.08	0.002	"	0.100	ND	75.4	54.2-134	30.1	17.9	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>57</i>		<i>ug/kg</i>	<i>62.5</i>		<i>90.9</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>62</i>		<i>"</i>	<i>62.5</i>		<i>99.1</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>62</i>		<i>"</i>	<i>62.5</i>		<i>98.4</i>	<i>70-130</i>			

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Clint Ward
 Project Number: 452711.001
 Project: Federal 397-3k

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Extractable Petroleum Hydrocarbons by 8015M - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4K18014 - EPA 3580

Blank (4K18014-BLK1)

Prepared: 11/18/2014 Analyzed: 11/18/2014

Gasoline (C6-C10)	ND	50.0	mg/kg							
Diesel (C10-C28)	ND	50.0	"							
Residual Range Organics (C28-C36)	ND	200	"							
TPH - Carbon Chain Total	ND	50.0	"							

Surrogate: *o*-Terphenyl 42 g 50.0 83.8 65-146

LCS (4K18014-BS1)

Prepared: 11/18/2014 Analyzed: 11/18/2014

Gasoline (C6-C10)	975	50.0	mg/kg	1000		97.5	66.7-119			
Diesel (C10-C28)	1090	50.0	"	1000		109	70.1-127			
Residual Range Organics (C28-C36)	930	200	"	1000		93.0	54.5-139			

Surrogate: *o*-Terphenyl 41 g 50.0 81.5 65-146

Matrix Spike (4K18014-MS1)

Source: X411176-02

Prepared: 11/18/2014 Analyzed: 11/18/2014

Gasoline (C6-C10)	856	50.0	mg/kg	1000	ND	85.6	56.4-132			
Diesel (C10-C28)	967	50.0	"	1000	ND	96.7	57.4-138			
Residual Range Organics (C28-C36)	808	200	"	1000	ND	80.8	47.7-129			

Surrogate: *o*-Terphenyl 34 g 50.0 67.8 65-146

Matrix Spike Dup (4K18014-MSD1)

Source: X411176-02

Prepared: 11/18/2014 Analyzed: 11/18/2014

Gasoline (C6-C10)	978	50.0	mg/kg	1000	ND	97.8	56.4-132	13.3	22	
Diesel (C10-C28)	1120	50.0	"	1000	ND	112	57.4-138	14.3	18.3	
Residual Range Organics (C28-C36)	967	200	"	1000	ND	96.7	47.7-129	17.9	30.1	

Origins Laboratory, Inc.



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Apex Companies, LLC
 3240 W. 71st Avenue, Suite 1
 Westminster CO 80030

Clint Ward
 Project Number: 452711.001
 Project: Federal 397-3k

Extractable Petroleum Hydrocarbons by 8015M - Quality Control
 Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4K18014 - EPA 3580

Matrix Spike Dup (4K18014-MSD1)

Source: X411176-02

Prepared: 11/18/2014 Analyzed: 11/18/2014

Surrogate: o-Terphenyl	39		g	50.0		78.4	65-146			
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Origins Laboratory, Inc.



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Noelle Doyle Mathis, President

Apex Companies, LLC
3240 W. 71st Avenue, Suite 1
Westminster CO 80030

Clint Ward
Project Number: 452711.001
Project: Federal 397-3k

Notes and Definitions

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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Noelle Doyle Mathis, President