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Report Description

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App Number: pKJ1603939648

1RP - 4162

CIMAREX ENERGY CO. OF COLORADO

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

HOBBS OCD

JAN 29 2014

RECEIVED

State of New Mexico
Energy Minerals and Natural Resources
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 8, 2011

Submit 1 Copy to appropriate District Office in
accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

Initial Report ☐ Final Report ☒

Name of Company: Cimarex Energy Company	Contact: Johnny Titsworth
Address: 600 N. Marienfield, Suite 600, Midland, TX 79701	Telephone No. (432)250-2059
Facility Name: Red Hills 28 SWD	Facility Type: Battery
Surface Owner: Federal	Mineral Owner: API No. 30-025-35598

LOCATION OF RELEASE

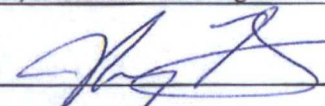
Unit Letter M	Section 32	Township 25	Range 33	Feet from the 660	North/South Line RSL	Feet from the 660	East/West Line FWL	County Lea
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Latitude: 32.09631 Longitude: -103.58338

NATURE OF RELEASE

Type of Release: produced water	Volume of Release: 35	Volume Recovered: 0
Source of Release:	Date & Hour of Occurrence: 7/14/13 1700	Date & Hour of Discovery: 7/15/13 1000
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? John Osborne	
By Whom?	Date and Hour:	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	
If a Watercourse was Impacted, Describe Fully.*		
Describe Cause of Problem and Remedial Action Taken.* Injection line spurn a leak between injection pump and the well.		
Describe Area Affected and Cleanup Action Taken.* 40' x 50' area on pad with no standing fluid, and approximately 10' x 15' area off location on Northeast side of pad. Location will be assessed and a work plan will be submitted for approval.		

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: 	Approval Date: <u>2/21/14</u>	EXPIRATION DATE:
Printed Name: Johnny Titsworth		
Title: Environmental Compliance Coordinator	Conditions of Approval:	Attached ☐
E-mail Address: jtitsworth@cimarex.com		
Date: 1/22/14 Phone: (432)-250-2059		

APPROVED

* Attach Additional Sheets If Necessary

IRP-4162



**CONESTOGA-ROVERS
& ASSOCIATES**

2135 S. Loop 250 West
Midland, Texas 79703
Telephone: (432) 686-0086
www.CRAworld.com

Fax: (432) 686-0186

TRANSMITTAL

DATE: January 27, 2014

REFERENCE NO.: 084703

PROJECT NAME: Red Hills 28 SWD

TO: Geoffrey R. Leking
New Mexico Oil Conservation District
1625 N. French Dr.
Hobbs, NM 88240

HOBBS OCD

JAN 29 2014

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Please find enclosed:

☐ Draft
☒ Originals
☐ Prints
☒ Final
☐ Other

Sent via:

☐ Mail
☒ Overnight Courier
☐ Same Day Courier
☐ Other

QUANTITY	DESCRIPTION
	Site Closure Report

☐ As Requested
☒ For Your Use
☐ For Review and Comment
☐
☐

COMMENTS:

Please contact John Ferguson should you have any questions. Thank you.

Copy to:

Completed by: Polly Dougless
[Please Print]

Signed:

Filing: Correspondence File

HOBBS OCD

JAN 29 2014

Original

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**CONESTOGA-ROVERS
& ASSOCIATES**

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Final Report

SITE CLOSURE REPORT RED HILLS 28 SWD

Section 28 (Unit M), Township 25 South, Range 33 East
Lea County, New Mexico

Prepared for: CIMAREX ENERGY COMPANY

Conestoga-Rovers & Associates

2135 South Loop, 250 West
Midland, Texas 79703

January 2014 • 084703 • Report No. 1



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Sustainability**

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Section 1.0 Introduction

This Site Closure Report provides documentation associated with corrective actions at the Red Hills 28 SWD injection line leak in Lea County, New Mexico. Corrective actions were managed and documented via written field notes and photographs by Conestoga-Rovers & Associates (CRA) under the direction of Cimarex Energy Company (Cimarex). A remediation permit number, 1RP-01-14-3005 was assigned to this project by the New Mexico Oil Conservation Division (NMOCD) District 1, Hobbs, New Mexico office. This report is an attachment to the C-141 Form Final Report submitted for 1RP-01-14-3005.

Section 2.0 Background

The Red Hills 28 SWD (hereafter referred to as the "Site"), is located in Section 28 (Unit M), Township 25 South, Range 33 East, Lea County, New Mexico. Figure 1 (Topographic Map) and Figure 2 (Aerial Image) depict the Site's location. The Site's topography is flat to gently rolling, covered with windblown sand, sparse vegetation and mesquite trees.

On July 15, 2013, Cimarex submitted a Release Notification and Corrective Action C-141 Initial Report to the NMOCD that approximately 35 barrels (bbls) of produced water were released from a leak in an injection line between the injection pump and the well. The C-141 Form Initial Report is attached as Appendix A.

Section 3.0 Scope of Work

The scope of work for the Site's corrective actions and corresponding activities were developed between Cimarex, NMOCD, Bureau of Land Management (BLM) and CRA personnel. CRA was responsible for project management, general management of the remediation and reclamation activities and documentation of the field work. The agreed upon scope of services included:

- Conduct initial site assessment to map, photo document and collect delineation soil samples within identified fluid release area;
- Obtaining appropriate stakeholders involvement needed to conclude scope of work;
- Monitor removal of impacted soils from release area using a backhoe;
- Collect confirmation soil samples from excavation bottom and walls;

- Request and obtain approval to backfill excavation from regulatory agencies based on Site remedial activities and analytical results;
- Monitor backfilling, grading, contouring and seeding of remediated area of the Site; and
- Prepare Site Closure Letter Summary for submittal to the BLM-Carlsbad, New Mexico office and Site Closure Report with the Final C-141 Release Notification and Corrective Action Form to the NMOCD-Hobbs, New Mexico office requesting closure of the site.

Section 4.0 Site Assessment and Remediation Activities

Initial site assessment and soil sampling activities were completed in accordance to the New Mexico Oil Conservation Division's (NMOCD's) guidance document *Guidelines for Remediation of Leaks, Spills and Releases*, dated August 13, 1993. Section III of the guidance document provides three general characteristics (Depth to groundwater, Wellhead Protection Area, Distance to Nearest Surface Water Body) to "evaluate a Site's potential risk, the need for remedial action, and the level of cleanup, if necessary, required at the Site." Section IV provides ranking criteria for each Site-specific characteristic to determine their relative threat to the public, fresh waters, and the environment. The sum of each individual characteristic equals the total ranking score. The total ranking score determines the recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (BTEX) and total petroleum hydrocarbons (TPH) in soil. In addition, NMOCD's draft guidance document *OCD's Guidance for Release Reporting and Corrective Actions*, dated September 30, 2011 was used to determine the RRAL for chlorides.

According to the Petroleum Recovery Research Center (PRRC) database and the New Mexico Office of the State Engineer (NMOSE), the average depth to groundwater in the immediate area of the Site is approximately 190 feet below ground surface (bgs). Attached is Figure 3, a topographic map, depicting the average depths to groundwater, distance to surface water bodies, and any wellheads within a 1.25 mile radius of the Site. Based on average depth to groundwater (>100 feet below ground surface), Wellhead Protection (water source <1,000 feet & <200 feet private) and surface body of water (>1000 feet) for the Site, the RRALs were determined to be 10 ppm for benzene, 50 ppm for BTEX, 5000 ppm for TPH. The NMOCD's September 30, 2011 draft guidance document recommends a RRAL of 1,000 mg/kg for chlorides based on the vertical separation from groundwater of more than 100 feet. The risk ranking for the site is as follows:

New Mexico Oil Conservation Division Spill Guidelines	
Ranking Criteria	Score
Depth to Ground Water (> 100 ft.)	0
Wellhead Protection Area (<1000 ft. (water source) or <200 ft. (private domestic water source))	0
Distance to Surface Body Water (>1000 ft.)	0
Ranking Criteria Total Score	0*
*Because the ranking criteria total score is 0, NMOCD established limits are 10 ppm for Benzene, 50 ppm for BTEX, 5000 ppm for total TPH, and 1000 mg/kg for (2011 Guidance Document) for chlorides.	

On August 7, 2013, CRA mobilized to the Site to perform site assessment activities. Site assessment activities included: mapping, photo documenting and collecting delineation soil samples within the release area. Photographic documentation of the release area is attached as Appendix B. Based on reported release information and site observations, CRA field personnel collected soil samples for benzene, toluene, ethylbenzene, and xylene (BTEX), total petroleum hydrocarbons (TPH), and chloride analysis. Six (6) hand auger borings were selectively placed within the release area to collect delineation soil samples. One (1) hand auger boring was selectively placed outside the release area to collect as a background sample. Attached is Figure 4, a site map detailing the release area and collected sample locations, depths, and analytical results. Collected samples were placed into laboratory provided sample containers, placed on ice and submitted under chain-of-custody control to Trace Analysis, Inc., in Midland, Texas. Analytical results indicated hydrocarbon concentrations were below the regulatory RRALS established for the Site; however, chloride concentrations exhibited elevated concentrations well above RRALS. The chloride concentrations for delineation samples 1, 2 and 3 at the 0 – 1.0 foot interval were 10,000, 5090, and 4280 mg/kg respectively. The chloride concentrations for delineation samples 1, 2, 3 and 5 at the 1.0 - 2.0 foot interval were 4200, 5220, 4830 and 3730 mg/kg respectively. Sample analytical results are summarized in Table 1.

Site corrective action activities consisted of multiple excavating events accompanied by soil sample analysis. All excavating activities were performed by H&R Enterprises, LLC, (H&R). Soil samples were collected by CRA and analyzed by Trace Analysis, Inc. in Midland, Texas.

On September 9, 2013, excavating activity at the Site commenced and continued through September 11, 2013. Excavating activity began at the eastern boundary of the release area located in the adjacent pasture land to the east of the Site's caliche pad. Field screening of soils for chlorides was performed to guide excavating activities.

On September 12, 2013, chloride field screening indicated concentrations in the remaining soil were either below or at the established RRALs for chlorides. Confirmation grab soil samples were collected from the excavation's bottom and walls for laboratory analysis. Collected samples were placed into laboratory provided sample containers, placed on ice and at the request of Cimarex were placed in a refrigerated freezer and not submitted to the lab pending a meeting with CRA, Cimarex and the NMOCD at the District 1 Hobbs, New Mexico office the following Monday.

On Monday, September 16, 2013, CRA and Cimarex met with Geoffrey Leking, Environmental Engineer Specialist, of the NMOCD District 1 Hobbs, New Mexico office to discuss the protocols and procedures required for Site closure. Meeting discussion included the following:

- Review of analytical data of previously collected delineation soil samples;
- Request by CRA and Cimarex for approval by the NMOCD to limit soil excavated from the identified release area located on the Site's caliche pad and the adjacent pasture land to the east of the caliche pad to approximately 3 feet below ground surface (bgs);
- Request by the NMOCD to collect grab bottom samples from the area excavated on the caliche pad at the west end (BS-2) and near previously collected delineation sample DS-3 (BS-4);
- Request by the NMOCD to vertically excavate soil near previously collected delineation samples DS-2 (BS-3), DS-4 (BS-5), and DS-5 (BS-6), field screen soils for chlorides to show a decreasing trend in concentrations towards the Site's RRAL for chlorides, and collect grab bottoms samples;
- Request by the NMOCD to collect composite samples (ENW, WNW, WWS, WSW, ESW, and EWS) from the walls of the excavation;
- Procedures for backfilling and cover design specifications which included installation of a 20 mil woven liner over the excavated area, backfilling with imported clean materials (caliche and topsoil);
- Procedures for re-vegetation plan which included the excavated affected areas off the Site's caliche pad to be graded to match surface contours and seeded using mixtures requested by the BLM; and

- Submittal of a Site Closure Report to the NMOCD District 1 Hobbs, New Mexico office as attachment to NMOCD C-141 Form Final Report and Site Closure Letter Summary to the BLM Carlsbad, New Mexico office.

On September 17, 2013, excavating activities resumed at the Site. Excavating activities followed the agreed upon requests from the meeting between CRA, Cimarex and the NMOCD. Soil was excavated from the Site's caliche pad and the adjacent pasture land to approximately 3 feet bgs. Chloride field screening was performed to guide excavating activities. Upon completion, confirmation composite wall and grab bottom samples were collected from the excavation. To comply with the NMOCD's corrective action requirement to vertically delineate decreasing chloride concentrations, soil was excavated to 10 feet bgs near former DS-2 location, 20 feet bgs near former DS-4 location and 15 feet bgs near former DS-5 location. Confirmation grab samples were collected from the bottom of each vertical excavation. Attached is Figure 4, a site map detailing the excavated area and collected sample locations, depths and analytical results. Collected samples were placed into laboratory provided sample containers, placed on ice and submitted under chain-of-custody control to Trace Analysis, Inc., in Midland, Texas. Analytical results indicated hydrocarbon concentrations were below the Site's established regulatory RRALs, chloride concentrations in bottom samples collected at 3 feet bgs were above the RRALs, chloride concentrations in wall samples at the eastern end of excavation were slightly above the RRALs and chloride concentrations in samples taken for vertical delineation were below the Site's RRALs. Sample analytical results are summarized in Table 1.

On September 24, 2013, further soil excavating activity occurred along the south wall's eastern half to reduce chloride concentrations. Approximately 1 foot of soil was scraped from the wall down to 3 feet bgs and a composite sample was collected for laboratory analysis. Analytical results indicated the chloride concentrations were below the Site's RRALs. Sample analytical results are summarized in Table 1.

Upon review of analytical data and results indicated that hydrocarbon and chloride impacted soil had been effectively removed and corrective action activities complied with the NMOCD's delineation and remediation requirements, a request for approval to line and backfill the excavated area and reclaim the adjacent pasture land to the east of the Site's caliche pad was submitted to the NMOCD District 1 Hobbs, New Mexico office via electronic mail on October 1, 2013. Approval to line and backfill the excavated area and reclaim the excavated area of pasture land was granted by the NMOCD in a reply email dated October 2, 2013. Verbal approval by the BLM was provided to Cimarex via cellular phone call. Electronic mail documents are attached as Appendix C.

Section 5.0 Site Restoration Activities

On October 3, 2013, Site restoration activities began. A 20 mil woven liner was installed over the Site's excavated area prior to backfilling. Backfilling activity of the excavated caliche pad area began with clean caliche and base course fill imported from Wallach Concrete Inc., in Hobbs, New Mexico. Approximately 730 cubic yards (cy) of clean caliche was used to backfill and 125 cubic yards (cy) of base course was used to cap the excavated area. Backfilling of the excavated area in the adjacent pasture land to the east of the caliche pad began with clean topsoil imported from the nearby Cascade 29 Fed #2 well location operated by Cimarex. Approximately 120 cubic yards (cy) of clean top soil was used to backfill the excavated area. Subsequent to backfilling each area was compacted and graded to match surface contour. In addition, unused caliche and base course fill was used to construct a berm along the eastern edge of the caliche pad to prevent runoff of fluids into the adjacent pasture land. Photographic documentation of the backfilled excavation and constructed berm is attached as Appendix B.

On October 7, 2013, seeding activities of at the Site concluded site restoration activities. BLM #2 native grass seed was administered to the reclaimed area in the adjacent pasture land to help minimize erosion. Photographic documentation of the restored area is attached as Appendix B.

Section 6.0 Waste Management

H&R was responsible for managing waste associated with the project activities. Excavated soil was temporarily stored on a lined area at the Site. Sundance Services, Inc. Landfill was utilized as the disposal facility for impacted soils. Sundance Services, Inc. Landfill is a NMOCD and Cimarex Energy approved facility. A total of 932 cubic yards (cy) of materials were disposed of at the facility. Impacted soil was loaded into trucks provided by H&R. Each truck leaving the Site was provided with a uniquely numbered non-hazardous waste manifest to accompany each load. Copies of the waste manifest documents are available upon request.

Section 7.0 Summary

Site assessment, remediation and restoration activities were performed on behalf of Cimarex and in coordination with the NMOCD and BLM regulatory personnel.

On August 7, 2013, delineation soil samples were collected from the Site's caliche pad and adjacent pasture land to the east of the Site's caliche pad. Analytical results indicated hydrocarbon concentrations were below and chloride concentrations were above the Site's

established regulatory RRALs. The laboratory analytical reports for submitted samples are attached as Appendix D.

On September 8, 2013, excavating the release area on the Site's caliche pad and adjacent pasture land began. On September 12, 2013, chloride field screening indicated the excavated release area was effectively delineated. Confirmation grab soil samples were collected from the bottom and walls of the excavation for laboratory analysis.

On September 13, 2013, Cimarex requested collected confirmation samples be held and stored in refrigerated freezer pending meeting scheduled for the following Monday between CRA, Cimarex, and NMOCD at the Hobbs, New Mexico office.

On Monday, September 16, 2013, CRA and Cimarex met with Geoffrey Leking, Environmental Engineer Specialist, of the NMOCD District 1 Hobbs, New Mexico office to discuss the protocols and procedures required for Site closure.

On September 17, 2013, excavating activities resumed at the site. Excavating activities followed the agreed upon Site closure requests from the meeting between CRA, Cimarex and the NMOCD. Soil was excavated from the Site's caliche pad and the adjacent pasture land to approximately 3 feet bgs. Confirmation composite wall and grab bottom samples were collected. Subsequent vertical delineation followed by excavating soils to 10 feet bgs near former DS-2 location, 20 feet bgs near former DS-4 location and 15 feet bgs near former DS-5 location. Confirmation grab samples were collected from the bottom of each vertical excavation. Analytical results indicated the following: hydrocarbon concentrations remained below the Site's established regulatory RRALs; chloride concentrations in bottom samples collected at 3 feet bgs from the excavation were above the RRALs; chloride concentrations in wall samples at the eastern end of excavation were slightly above the RRALs; and chloride concentrations in samples taken at depth were below the RRALs. The laboratory analytical reports for submitted samples are attached as Appendix D.

On September 24, 2013, further soil excavating activity took place along the eastern half of the south wall. A follow-up confirmation composite sample was collected from the area for laboratory analysis. Analytical results indicated the chloride concentrations were below the RRALs. The laboratory analytical reports for submitted samples are attached as Appendix D.

Upon review of analytical data and results indicated that impacted soil had been effectively removed and corrective action activities complied with the NMOCD's remediation and

delineation requests. A request for approval to line and backfill the excavated caliche pad area and line, backfill and reclaim the excavated area of adjacent pasture land was submitted to the NMOCD District 1 Hobbs, New Mexico office via electronic mail on October 1, 2013. Approval was granted by the NMOCD in a reply email dated October 2, 2013. Verbal approval by the BLM via cellular phone call was provided to Cimarex. Submitted and reply electronic mail documents are attached as Appendix C.

On October 3, 2013, restoration activities at the Site began. A 20 mil woven liner was installed within the Site's excavation prior to backfilling. Approximately 730 cubic yards (cy) of clean caliche was used to backfill and 125 cubic yards (cy) of base course was used to cap the excavated caliche pad area. Backfilling and reclamation of the excavated area in the adjacent pasture land began with approximately 120 cubic yards (cy) of clean top soil used to backfill the area. Each area was compacted and graded to match surface contour. Unused caliche and base course fill was used to construct a berm along the eastern edge of the caliche pad to prevent runoff of fluids into the adjacent pasture land. Photographic documentation of the backfilled excavation and constructed berm is attached as Appendix B.

On October 7, 2013, seeding activities of at the Site concluded site restoration activities. BLM #2 native grass seed was administered to the reclaimed area in the adjacent pasture land to help minimize erosion. Photographic documentation of the restored area is attached as Appendix B.

H&R was responsible for managing waste associated with the project activities. Excavated soil was temporarily stored on a lined area at the Site. Sundance Services, Inc. Landfill was utilized as the disposal facility for impacted soils. A total of 932 cubic yards (cy) of materials were disposed of at the landfill facility. Impacted soil was loaded into trucks provided by H&R. Each truck leaving the Site was provided with a uniquely numbered non-hazardous waste manifest to accompany each load.

Section 8.0 Site Closure Request

This Site Closure Report provides documentation of the Red Hills 28 SWD site assessment, remedial corrective actions and restoration activities performed in accordance to 1RP-01-14-3005. This report is an attachment to the C-141 Form Final Report submitted for

1RP-01-14-3005. Based on NMOCD and BLM communications and corrective actions performed, CRA, on behalf of Cimarex, respectfully requests the NMOCD to rule that no further action of the Site's remediated and restored areas is required and closure is granted. Please feel free to contact the CRA Midland office if there are any questions or additional information is required.

All of which is Respectfully Submitted,

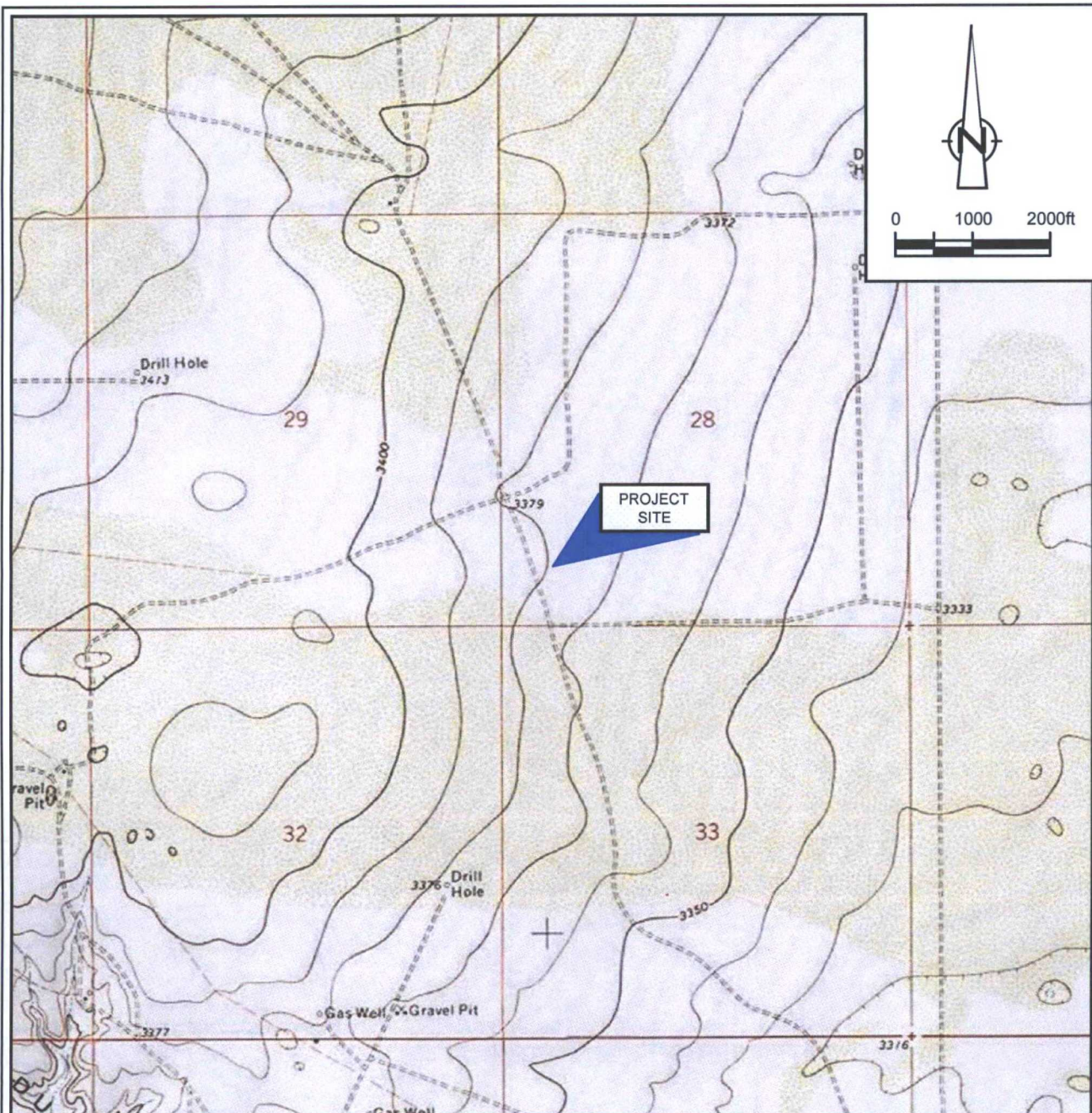
CONESTOGA-ROVERS & ASSOCIATES



John Ferguson
Senior Project Manager



Thomas C. Larson
Principal, Midland Operations Manager

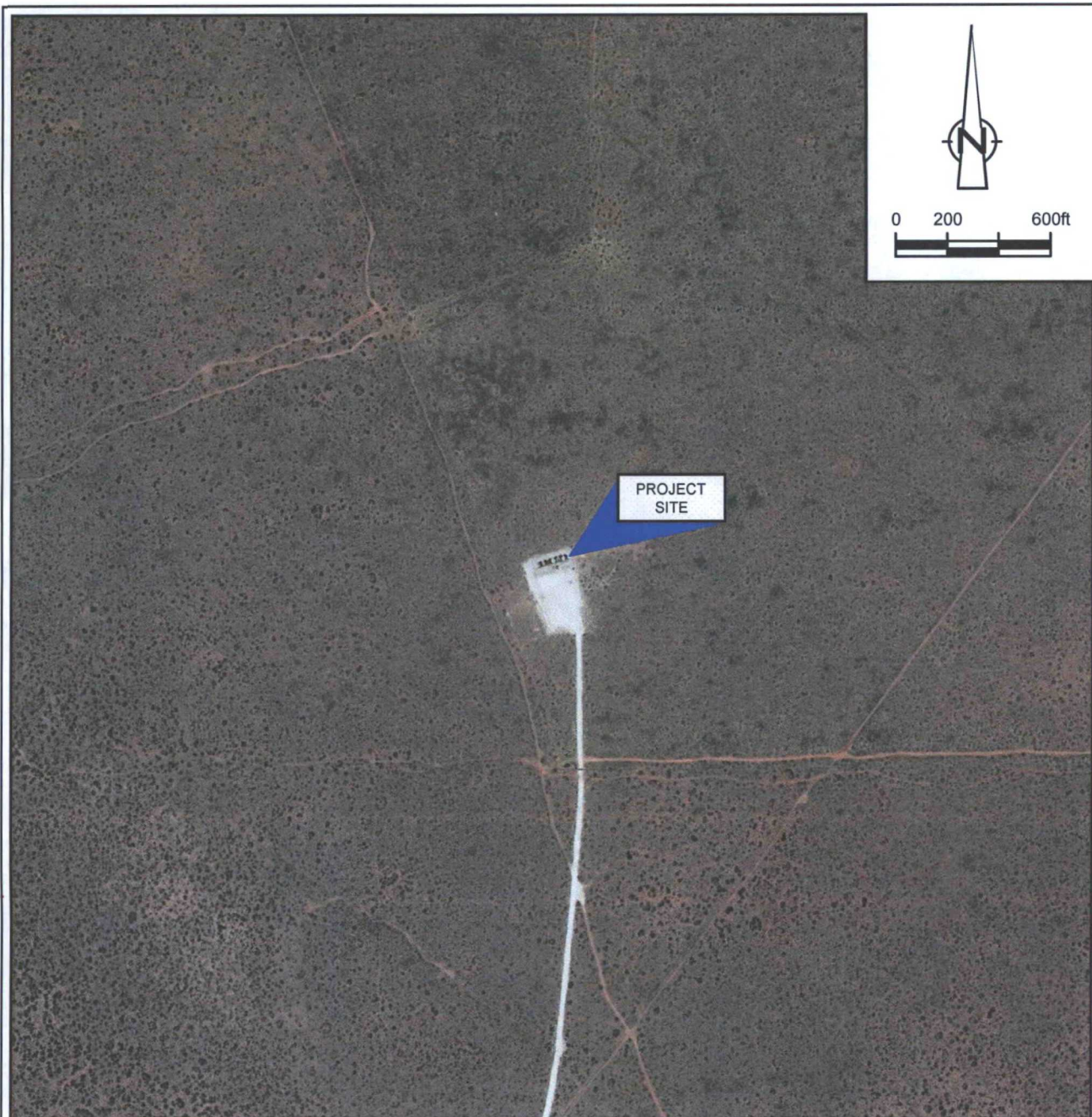


SOURCE: USGS 7.5 MINUTE QUAD
"PADUCA BREAKS EAST, NEW MEXICO"

LAT/LONG: 32.0964° NORTH, 103.5835° WEST
COORDINATE: NAD83 DATUM, U.S. FOOT
STATE PLANE ZONE - NEW MEXICO EAST

Figure 1
SITE LOCATION MAP
RED HILLS 28 SWD
LEA COUNTY, NEW MEXICO
Cimarex





LAT/LONG: 32.0964° NORTH, 103.5835° WEST
COORDINATE: NAD83 DATUM, U.S. FOOT
STATE PLANE ZONE - NEW MEXICO EAST

Figure 2
AERIAL PHOTOGRAPH
RED HILLS 28 SWD
LEA COUNTY, NEW MEXICO
Cimarex



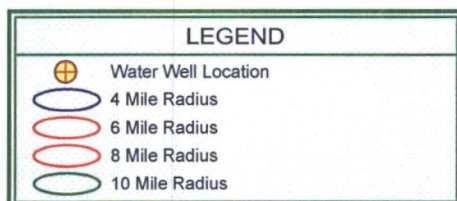
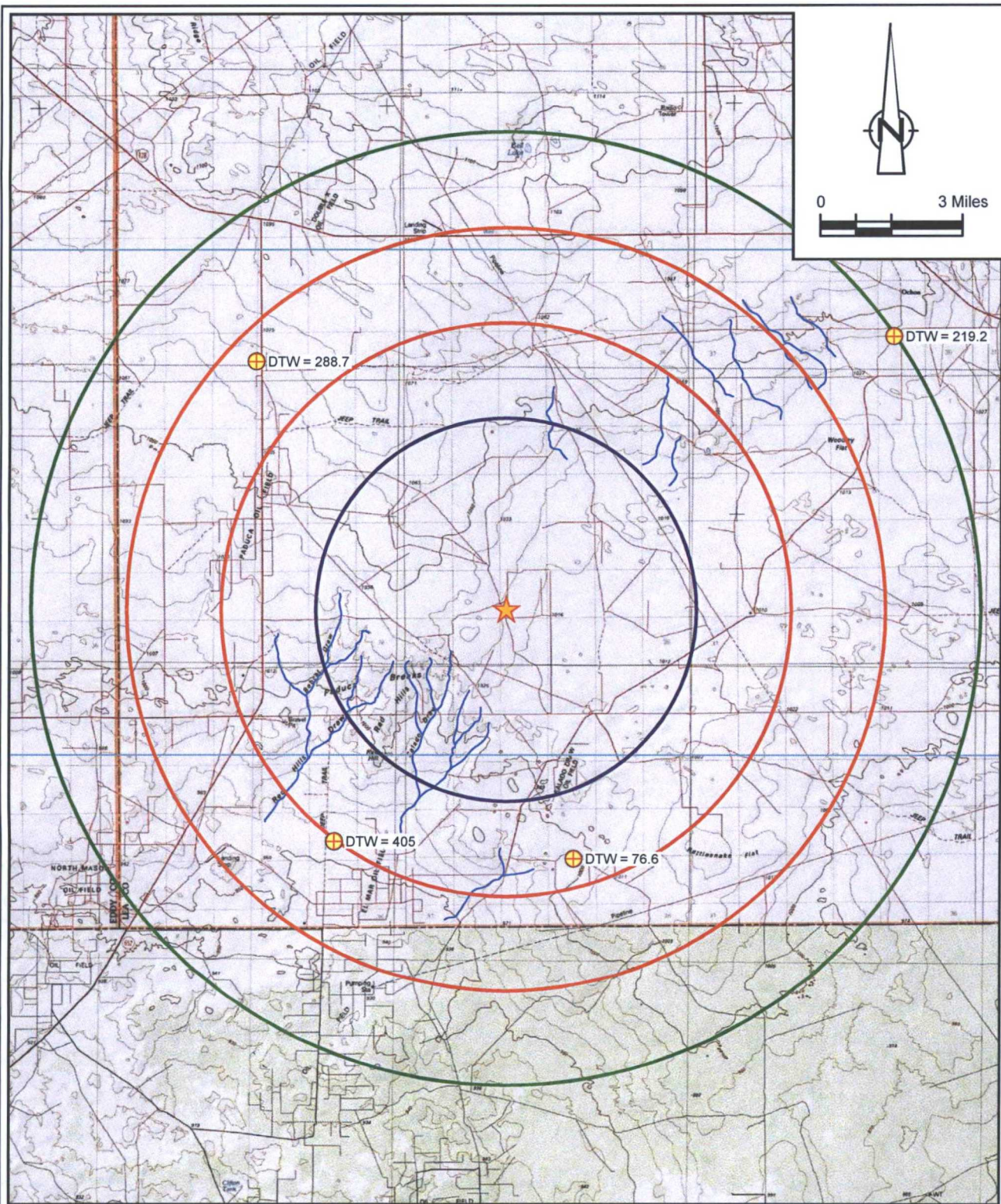


Figure 3
 WATER SOURCE WITHIN 10 MILES
 RED HILLS 28 SWD
 LEA COUNTY, NEW MEXICO
Cimarex



NOTES:

1. Yellow shaded cells indicate RRAL (Ranking Score= 0) exceedance.
2. Delineation samples were taken August 07, 2013.
3. Confirmation samples were taken September 17 & 24, 2013.
4. All wall samples are composite samples except WWS.

Property Boundary

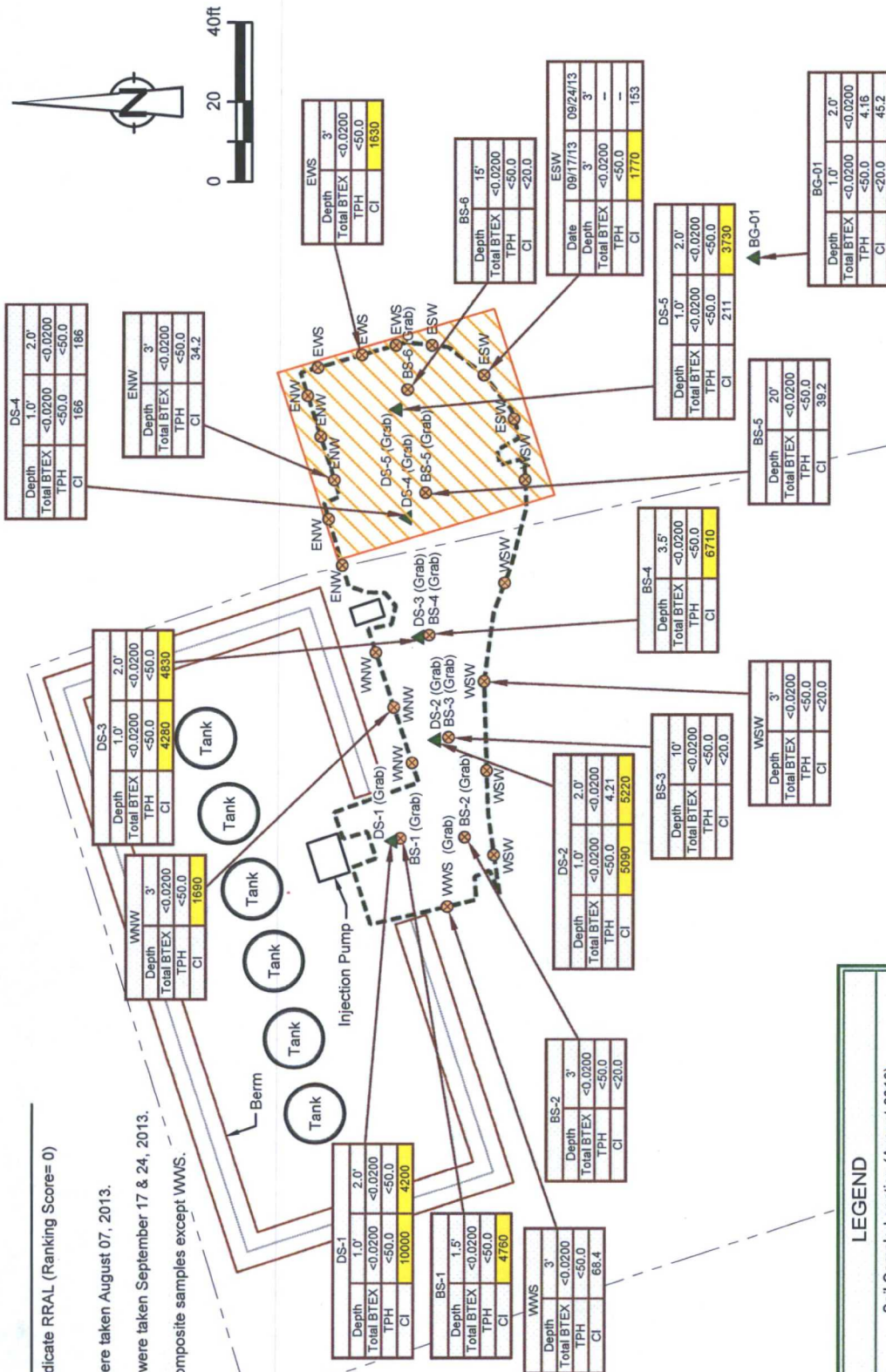


Figure 4
DETAILED SITE MAP WITH ANALYTICAL DATA
RED HILLS 28 SWD
LEA COUNTY, NEW MEXICO
Cimarex



TABLE I
CIMAREX ENERGY
RED HILLS 28 SWD
SOIL ANALYTICAL SUMMARY
LEA COUNTY, NEW MEXICO

Sample ID	Sample Date	Depth (feet bgs)	Benzene	Toluene	Ethyl-Benzene	Xylenes	BTEX	TPH				Chloride
			(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	GRO(C6-C10)	DRO(C10-C28)	ORO (C28-C35)	Total (GRO/DRO/ORO)	
			NMOCD Soil Delineation & Remediation Action Levels (Ranking Score < 10)									
			10 mg/Kg	---	---	---	50 mg/Kg	---	---	---	5000 mg/Kg	1000 mg/Kg
DELINEATION SOIL SAMPLE RESULTS												
S-084703-080713-JF-DS-1	08/07/13	1.0'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	10000
S-084703-080713-JF-DS-1	08/07/13	2.0'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	4200
S-084703-080713-JF-DS-2	08/07/13	1.0'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	5090
S-084703-080713-JF-DS-2	08/07/13	2.0'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	4.21	<50.0	---	4.21	5220
S-084703-080713-JF-DS-3	08/07/13	1.0'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	4280
S-084703-080713-JF-DS-3	08/07/13	2.0'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	4830
S-084703-080713-JF-DS-4	08/07/13	1.0'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	166
S-084703-080713-JF-DS-4	08/07/13	2.0'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	186
S-084703-080713-JF-DS-5	08/07/13	1.0'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	211
S-084703-080713-JF-DS-5	08/07/13	2.0'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	3730
BACKGROUND SAMPLE RESULTS												
S-084703-080713-JF-BG-1	08/07/13	1.0'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	<20.0
S-084703-080713-JF-BG-1	08/07/13	2.0'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	4.16	<50.0	---	4.16	45.2
CONFIRMATION SAMPLE RESULTS												
S-084703-091713-JF-ENW	9/17/13	3'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	34.2
S-084703-091713-JF-WNW	9/17/13	3'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	1690
S-084703-091713-JF-BS-1	9/17/13	1.5'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	4760
S-084703-091713-JF-WWS	9/17/13	3'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	68.4
S-084703-091713-JF-BS-2	9/17/13	3'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	<20.0
S-084703-091713-JF-WSW	9/17/13	3'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	<20.0
S-084703-091713-JF-BS-3	9/17/13	10'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	<20.0
S-084703-091713-JF-BS-4	9/17/13	3.5'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	6710
S-084703-091713-JF-ESW	9/17/13	3'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	1770
	9/24/13	3'	---	---	---	---	---	---	---	---	---	153
S-084703-091713-JF-EWS	9/17/13	3'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	1630
S-084703-091713-JF-BS-5	9/17/13	20'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	39.2
S-084703-091713-JF-BS-6	9/17/13	15'	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<4.00	<50.0	---	<50.0	<20.0

1. Values reported in mg/Kg.
2. < = Value Less than Reporting Limit (RL).
3. Bold Indicates Analyte Detected.
4. Bold & Highlighted Exceeds NMOCD Remediation Action Levels.
5. BTEX analyses by EPA Method SW 8021B.
6. TPH analyses by EPA Method SW 8015B Mod.
7. Chloride analyses by EPA Method E300.0/300.1.
8. GRO/DRO/ORO = Gasoline/ Diesel/ Oil.

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 8, 2011

Submit 1 Copy to appropriate District Office in
accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

x Initial Report ☐ Final Report

Name of Company: Cimarex Energy Company	Contact: Johnny Titsworth
Address: 600 N. Marienfield, Suite 600, Midland, TX 79701	Telephone No. (432)250-2059
Facility Name: Red Hills 28 SWD	Facility Type: Battery
Surface Owner: Federal	Mineral Owner: API No. 30-025-35598

LOCATION OF RELEASE

Unit Letter M	Section 32	Township 25	Range 33	Feet from the 660	North/South Line RSL	Feet from the 660	East/West Line FWL	County Lea
------------------	---------------	----------------	-------------	----------------------	-------------------------	----------------------	-----------------------	---------------

Latitude: 32.09631 Longitude: -103.58338

NATURE OF RELEASE

Type of Release: produced water	Volume of Release: 35	Volume Recovered: 0
Source of Release:	Date & Hour of Occurrence: 7/14/13 1700	Date & Hour of Discovery: 7/15/13 1000
Was Immediate Notice Given? x Yes ☐ No ☐ Not Required	If YES, To Whom? John Osborne	
By Whom?	Date and Hour:	
Was a Watercourse Reached? ☐ Yes x No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

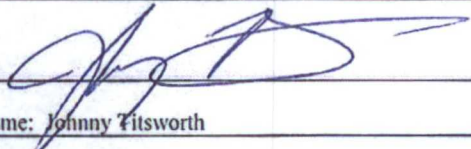
Describe Cause of Problem and Remedial Action Taken.*

Injection line spurn a leak between injection pump and the well.

Describe Area Affected and Cleanup Action Taken.*

40' x 50' area on pad with no standing fluid, and approximately 10' x 15' area off location on Northeast side of pad. Location will be assessed and a work plan will be submitted for approval.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: 	OIL CONSERVATION DIVISION	
Printed Name: Johnny Titsworth	Approved by Environmental Specialist:	
Title: Environmental Compliance Coordinator	Approval Date:	Expiration Date:
E-mail Address: jtitsworth@cimarex.com	Conditions of Approval:	Attached ☐
Date: 7/18/13	Phone: (432)-250-2059	

* Attach Additional Sheets If Necessary

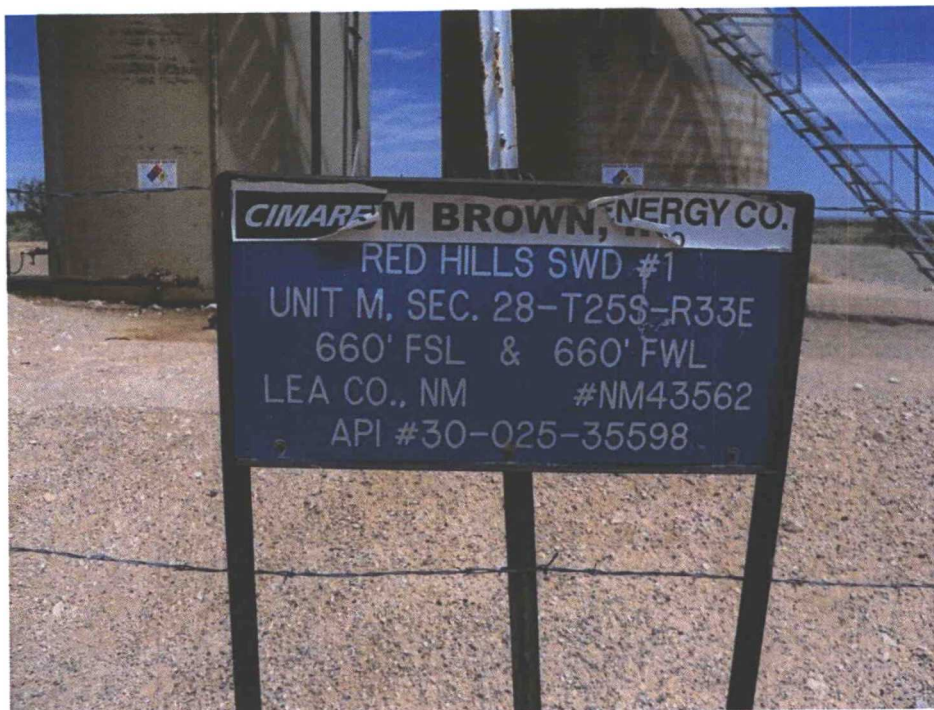


Photo 1: View of Facility Sign



Photo 2: View of SWD Well and Tank Battery

SITE PHOTOGRAPHS





Photo 5: View of Release Area on Facility Pad



Photo 6: View of Release Area in Pastureland east of Facility Pad

SITE PHOTOGRAPHS



Photo 7: Another view of Release Area in Pasture east of Facility Pad



Photo 8: View of Excavated Release Area

SITE PHOTOGRAPHS

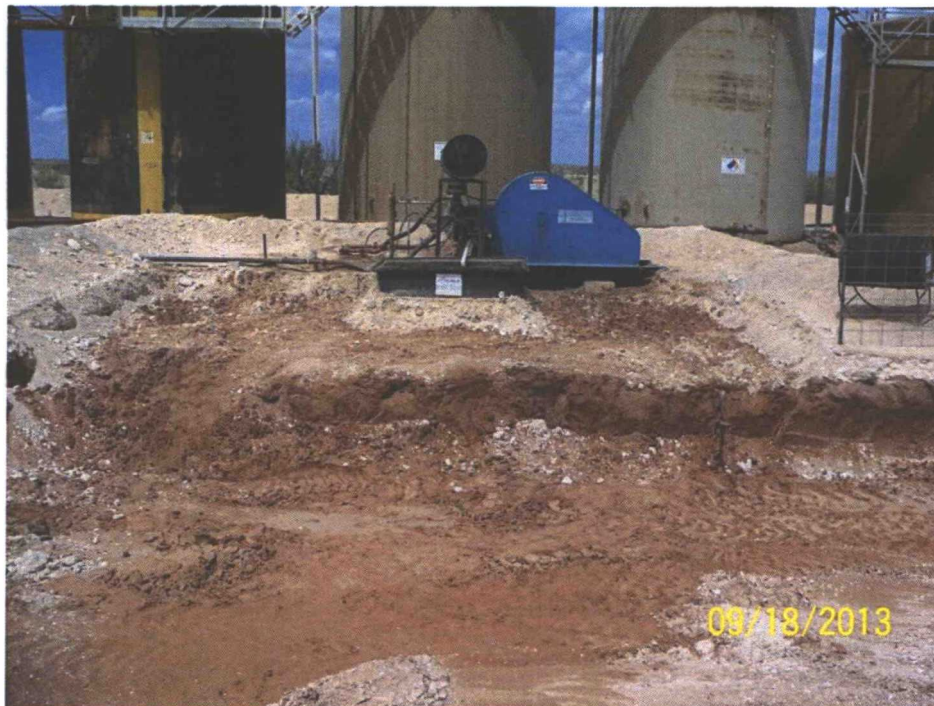


Photo 9: View of Excavation near Release Source



Photo 10: View of Excavation's North Wall along Facility's Firewall

SITE PHOTOGRAPHS





Photo 11: View of Excavation's South Wall near Southwest Corner



Photo 12: View of Excavation's North Wall of Excavation along Facility's Firewall

SITE PHOTOGRAPHS





Photo 13: View of Excavation's South Wall Mid-Point



Photo 14: View of Excavation's South Wall near Southeast Corner

SITE PHOTOGRAPHS



Photo 16: View of Excavation's North Wall near Northeast Corner



Photo 17: View of Excavation's East Wall

SITE PHOTOGRAPHS



Photo 17: View of Excavation's Northeast Corner



Photo 18: View of Excavation's Southeast Corner

SITE PHOTOGRAPHS





Photo 19: View of Excavated Release Area



Photo 20: View of 20 mil Liner installed in Excavation

SITE PHOTOGRAPHS



Photo 21: View of Liner installed in West Side of Excavation



Photo 22: View of Liner in Center of Excavation

SITE PHOTOGRAPHS



Photo 23: View of Liner installed in East Side of Excavation

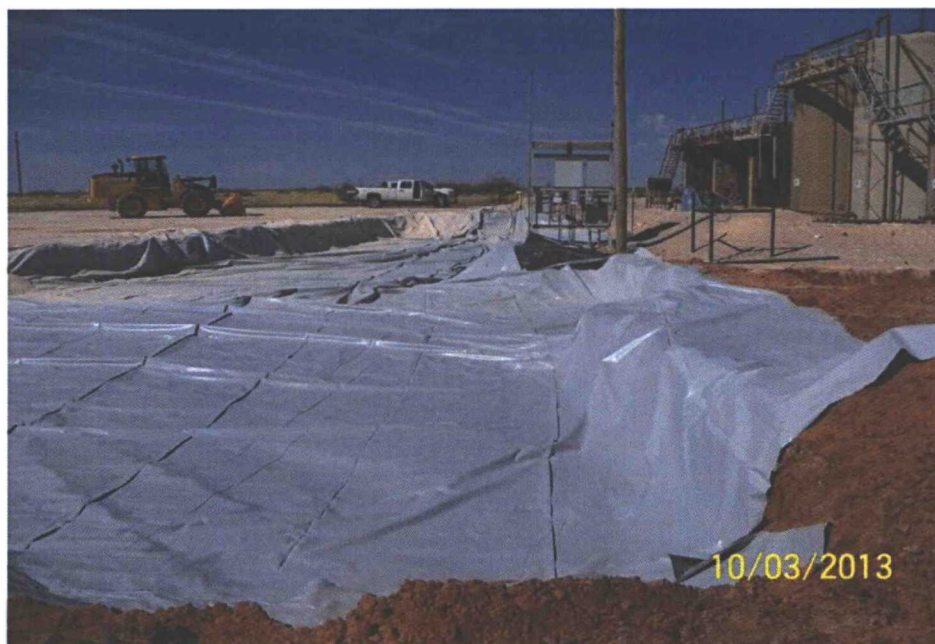


Photo 24: Another view of 20 mil Liner installed in Excavation

SITE PHOTOGRAPHS



Photo 25: View of Backfilled and Compacted former Excavated Area on Facility Pad



Photo 26: Another View of Backfilled and Compacted former Excavated Area on Facility's Pad

SITE PHOTOGRAPHS



Photo 27: View of Diversion Berm constructed along eastern Edge of Facility's Pad



Photo 28: View of Contoured and Seeded Area on Backfilled and Compacted Former Excavated Area in Pastureland east of Facility's Pad

SITE PHOTOGRAPHS





Photo 29: Another view of Contoured and Seeded Backfilled and Compacted former Excavated Area in Pastureland east of Facility's Pad

SITE PHOTOGRAPHS

Ferguson, John (Midland)

From: Ferguson, John (Midland)
Sent: Tuesday, October 01, 2013 10:32 AM
To: Geoffrey Leking
Cc: John Osborne; Johnny Titsworth; Christine Alderman; Larson, Thomas; Project Email Filing
Subject: FW: 084703 Cimarex Red Hills 28 SWD Request to Line & Backfill Excavation ~COR-084703~
Attachments: 084703-00(000)GN-DL001-Aer.pdf; 084703-00(000)GN-DL001-SD (2).pdf; 084703-00(000)GN-DL001-Topo.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Email with attachments.

John F.

From: Ferguson, John (Midland)
Sent: Tuesday, October 01, 2013 10:30 AM
To: Geoffrey Leking
Cc: John Osborne; Johnny Titsworth; Christine Alderman; Larson, Thomas; Project Email Filing
Subject: 084703 Cimarex Red Hills 28 SWD Request to Line & Backfill Excavation ~COR-084703~

Mr. Geoff Leking,

Via this email and on behalf of Cimarex Energy, CRA is requesting permission to line and backfill the excavated area located at the Cimarex-Red Hills 28 SWD (Site) located in Lea County, NM. The Site's lat/long is 32.0964° N, 103.5835° W. Attached is a Topographic Map & an Aerial Image depicting the location of the Site and a Detailed Site Map with sample locations (grab and composite), depths, and soil analytical data results.

The reason for the request is that remedial efforts and confirmation wall & bottom samples have met the requirements set by the NMOCD in the September 16, 2013 meeting with CRA and Cimarex (Christine Alderman) at the District 1 Hobbs office. OCD requirements included the following:

- Delineate horizontally & vertically and excavate hydrocarbon and chloride contaminants from a reported recent release of produced water;
- Delineate vertically and excavate hydrocarbon and chloride contaminants released from an unreported historic release of produced water. Delineation samples DS-4 (collected near the furthest extent of the recent release) and DS-5 (collected outside the extent of the recent release) indicate a historic release with limited remedial efforts. In addition, the area east of the tank battery had reduced/cleared and stressed vegetation prior to the recent release;
- Provide field screening and/or analytical results from confirmation bottom samples collected from OCD specified locations within the excavation (BS-3, BS-5, & BS-6) that shows a decrease in chloride concentrations at depth.

Chloride contamination in wall samples EWS (near edge of 50' BLM buffer zone), WNW (against tank battery firewall), and bottom sample BS-1 (near injection pump) will be addressed during Site abandonment and reclamation.

A 20 millimeter woven liner will be installed in the bottom of the excavation and at the request of the OCD up and along the wall adjacent to the tank battery. Backfill material will consist of caliche and top soil stockpiled at various locations within the lease.

A reply email with your approval to line and backfill is requested for closure report and project file.

Your timely response is appreciated and please contact me if you have questions or comments.

Thanks,

John Ferguson, P.G.
Conestoga-Rovers & Associates (CRA)
2135 S Loop 250 West
Midland, TX 79703

Phone: (432) 686-0086

Fax: (432) 686-0186

Mobile: (432) 488-7907

Email: jfergerson@CRAworld.com

Web: www.CRAworld.com

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Ferguson, John (Midland)

From: Leking, Geoffrey R, EMNRD <GeoffreyR.Leking@state.nm.us>
Sent: Wednesday, October 02, 2013 3:57 PM
To: Ferguson, John (Midland)
Cc: John Osborne; Johnny Titsworth; Christine Alderman; Larson, Thomas; Project Email Filing
Subject: RE: 084703 Cimarex Red Hills 28 SWD Request to Line & Backfill Excavation ~COR-084703~ ~COR-084703~

Follow Up Flag: Follow up
Flag Status: Completed

John

RE: 084703 Cimarex Red Hills 28 SWD Request to Line & Backfill Excavation

As per our telephone conversation of today and as discussed at the meeting of September 16, 2003, Cimarex is approved to line the excavation at a depth of 3' and backfill. Please include any lab data sheets with your closure report. Thank you.

Geoffrey Leking
Environmental Specialist
NMOCD-Hobbs
1625 N. French Drive
Hobbs, NM 88240
Office: (575) 393-6161 Ext. 113
Cell: (575) 399-2990
email: geoffreyr.leking@state.nm.us

From: Ferguson, John (Midland) [<mailto:jfergerson@croworld.com>]
Sent: Tuesday, October 01, 2013 9:32 AM
To: Leking, Geoffrey R, EMNRD
Cc: John Osborne; Johnny Titsworth; Christine Alderman; Larson, Thomas; Project Email Filing
Subject: FW: 084703 Cimarex Red Hills 28 SWD Request to Line & Backfill Excavation ~COR-084703~ ~COR-084703~

Email with attachments.

John F.

From: Ferguson, John (Midland)
Sent: Tuesday, October 01, 2013 10:30 AM
To: Geoffrey Leking
Cc: John Osborne; Johnny Titsworth; Christine Alderman; Larson, Thomas; Project Email Filing
Subject: 084703 Cimarex Red Hills 28 SWD Request to Line & Backfill Excavation ~COR-084703~

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Your timely response is appreciated and please contact me if you have questions or comments.

Thanks,

John Fergerson, P.G.
Conestoga-Rovers & Associates (CRA)
2135 S Loop 250 West
Midland, TX 79703

Phone: (432) 686-0086

Fax: (432) 686-0186

Mobile: (432) 488-7907

Email: jfergerson@CRAworld.com

Web: www.CRAworld.com

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(BioAquatic) 2501 Mayes Rd., Suite 100

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El Paso, Texas 79922
Midland, Texas 79703
Carrollton, Texas 75006

800-378-1296

806-794-1296

FAX 806-794-1298

915-585-3443

FAX 915-585-4944

432-689-6301

FAX 432-689-6313

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

John Ferguson
CRA-Midland
2135 South Loop 250 West
Midland, TX, 79703

Report Date: August 16, 2013

Work Order: 13080816



Project Location: Lea Co, NM
Project Name: Cimarex/Red Hills 28 SWD
Project Number: 084703

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
337972	S-084703-080713-JF-DS-1 (0-1')	soil	2013-08-07	11:00	2013-08-08
337973	S-084703-080713-JF-DS-1 (1-2')	soil	2013-08-07	11:10	2013-08-08
337974	S-084703-080713-JF-DS-2 (0-1')	soil	2013-08-07	10:55	2013-08-08
337975	S-084703-080713-JF-DS-2 (1-2')	soil	2013-08-07	11:12	2013-08-08
337976	S-084703-080713-JF-DS-3 (0-1')	soil	2013-08-07	11:02	2013-08-08
337977	S-084703-080713-JF-DS-3 (1-2')	soil	2013-08-07	11:14	2013-08-08
337978	S-084703-080713-JF-DS-4 (0-1')	soil	2013-08-07	11:04	2013-08-08
337979	S-084703-080713-JF-DS-4 (1-2')	soil	2013-08-07	11:16	2013-08-08
337980	S-084703-080713-JF-DS-5 (0-1')	soil	2013-08-07	11:06	2013-08-08
337981	S-084703-080713-JF-DS-5 (1-2')	soil	2013-08-07	11:18	2013-08-08
337982	S-084703-080713-JF-BG-1 (0-1')	soil	2013-08-07	11:08	2013-08-08
337983	S-084703-080713-JF-BG-1 (1-2')	soil	2013-08-07	11:20	2013-08-08

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.

Michael Abel

Dr. Blair Leftwich, Director
Dr. Michael Abel, Project Manager

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Case Narrative

Samples for project Cimarex/Red Hills 28 SWD were received by TraceAnalysis, Inc. on 2013-08-08 and assigned to work order 13080816. Samples for work order 13080816 were received intact at a temperature of 6.0 C.

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

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
BTEX	S 8021B	88164	2013-08-14 at 07:30	104064	2013-08-14 at 08:45
Chloride (Titration)	SM 4500-Cl B	88009	2013-08-09 at 11:00	103874	2013-08-09 at 14:37
Chloride (Titration)	SM 4500-Cl B	88009	2013-08-09 at 11:00	103875	2013-08-09 at 14:41
TPH DRO - NEW	S 8015 D	88173	2013-08-14 at 14:00	104059	2013-08-15 at 10:50
TPH GRO	S 8015 D	88187	2013-08-14 at 07:30	104077	2013-08-14 at 14:29

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 13080816 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.

Report Date: August 16, 2013
084703

Work Order: 13080816
Cimarex/Red Hills 28 SWD

Page Number: 6 of 36
Lea Co, NM

Analytical Report

Sample: 337972 - S-084703-080713-JF-DS-1 (0-1')

Laboratory: Midland
Analysis: BTEX
QC Batch: 104064
Prep Batch: 88164

Analytical Method: S 8021B
Date Analyzed: 2013-08-14
Sample Preparation: 2013-08-14

Prep Method: S 5035
Analyzed By: KC
Prepared By: KC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.0200	mg/Kg	1	0.0200
Toluene	U	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	<0.0200	mg/Kg	1	0.0200
Xylene	U	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.00	mg/Kg	1	2.00	100	70 - 130
4-Bromofluorobenzene (4-BFB)			1.89	mg/Kg	1	2.00	94	70 - 130

Sample: 337972 - S-084703-080713-JF-DS-1 (0-1')

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 103874
Prep Batch: 88009

Analytical Method: SM 4500-Cl B
Date Analyzed: 2013-08-09
Sample Preparation: 2013-08-09

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			10000	mg/Kg	10	4.00

Sample: 337972 - S-084703-080713-JF-DS-1 (0-1')

Laboratory: Midland
Analysis: TPH DRO - NEW
QC Batch: 104059
Prep Batch: 88173

Analytical Method: S 8015 D
Date Analyzed: 2013-08-15
Sample Preparation: 2013-08-14

Prep Method: N/A
Analyzed By: CW
Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	Jb	1	<50.0	mg/Kg	1	50.0

Report Date: August 16, 2013
084703

Work Order: 13080816
Cimarex/Red Hills 28 SWD

Page Number: 7 of 36
Lea Co, NM

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			106	mg/Kg	1	100	106	76.3 - 192.6

Sample: 337972 - S-084703-080713-JF-DS-1 (0-1')

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 104077
Prep Batch: 88187

Analytical Method: S 8015 D
Date Analyzed: 2013-08-14
Sample Preparation: 2013-08-14

Prep Method: S 5035
Analyzed By: KC
Prepared By: KC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	Jb	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.95	mg/Kg	1	2.00	98	70 - 130
4-Bromofluorobenzene (4-BFB)			2.01	mg/Kg	1	2.00	100	70 - 130

Sample: 337973 - S-084703-080713-JF-DS-1 (1-2')

Laboratory: Midland
Analysis: BTEX
QC Batch: 104064
Prep Batch: 88164

Analytical Method: S 8021B
Date Analyzed: 2013-08-14
Sample Preparation: 2013-08-14

Prep Method: S 5035
Analyzed By: KC
Prepared By: KC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	u	1	<0.0200	mg/Kg	1	0.0200
Toluene	u	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	u	1	<0.0200	mg/Kg	1	0.0200
Xylene	u	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.88	mg/Kg	1	2.00	94	70 - 130
4-Bromofluorobenzene (4-BFB)			1.80	mg/Kg	1	2.00	90	70 - 130

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Sample: 337973 - S-084703-080713-JF-DS-1 (1-2')

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 103874 Date Analyzed: 2013-08-09 Analyzed By: AR
Prep Batch: 88009 Sample Preparation: 2013-08-09 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			4200	mg/Kg	10	4.00

Sample: 337973 - S-084703-080713-JF-DS-1 (1-2')

Laboratory: Midland
Analysis: TPH DRO - NEW Analytical Method: S 8015 D Prep Method: N/A
QC Batch: 104059 Date Analyzed: 2013-08-15 Analyzed By: CW
Prep Batch: 88173 Sample Preparation: 2013-08-14 Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	Jb	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			110	mg/Kg	1	100	110	76.3 - 192.6

Sample: 337973 - S-084703-080713-JF-DS-1 (1-2')

Laboratory: Midland
Analysis: TPH GRO Analytical Method: S 8015 D Prep Method: S 5035
QC Batch: 104077 Date Analyzed: 2013-08-14 Analyzed By: KC
Prep Batch: 88187 Sample Preparation: 2013-08-14 Prepared By: KC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	Jb	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.86	mg/Kg	1	2.00	93	70 - 130
4-Bromofluorobenzene (4-BFB)			2.02	mg/Kg	1	2.00	101	70 - 130

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Sample: 337974 - S-084703-080713-JF-DS-2 (0-1')

Laboratory: Midland
Analysis: BTEX
QC Batch: 104064
Prep Batch: 88164

Analytical Method: S 8021B
Date Analyzed: 2013-08-14
Sample Preparation: 2013-08-14

Prep Method: S 5035
Analyzed By: KC
Prepared By: KC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.0200	mg/Kg	1	0.0200
Toluene	U	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	<0.0200	mg/Kg	1	0.0200
Xylene	U	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.88	mg/Kg	1	2.00	94	70 - 130
4-Bromofluorobenzene (4-BFB)			1.86	mg/Kg	1	2.00	93	70 - 130

Sample: 337974 - S-084703-080713-JF-DS-2 (0-1')

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 103874
Prep Batch: 88009

Analytical Method: SM 4500-Cl B
Date Analyzed: 2013-08-09
Sample Preparation: 2013-08-09

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			5090	mg/Kg	10	4.00

Sample: 337974 - S-084703-080713-JF-DS-2 (0-1')

Laboratory: Midland
Analysis: TPH DRO - NEW
QC Batch: 104059
Prep Batch: 88173

Analytical Method: S 8015 D
Date Analyzed: 2013-08-15
Sample Preparation: 2013-08-14

Prep Method: N/A
Analyzed By: CW
Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	Jb	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			108	mg/Kg	1	100	108	76.3 - 192.6

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Sample: 337974 - S-084703-080713-JF-DS-2 (0-1')

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 104077
Prep Batch: 88187

Analytical Method: S 8015 D
Date Analyzed: 2013-08-14
Sample Preparation: 2013-08-14

Prep Method: S 5035
Analyzed By: KC
Prepared By: KC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	Jb	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.86	mg/Kg	1	2.00	93	70 - 130
4-Bromofluorobenzene (4-BFB)			2.07	mg/Kg	1	2.00	104	70 - 130

Sample: 337975 - S-084703-080713-JF-DS-2 (1-2')

Laboratory: Midland
Analysis: BTEX
QC Batch: 104064
Prep Batch: 88164

Analytical Method: S 8021B
Date Analyzed: 2013-08-14
Sample Preparation: 2013-08-14

Prep Method: S 5035
Analyzed By: KC
Prepared By: KC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.0200	mg/Kg	1	0.0200
Toluene	U	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	<0.0200	mg/Kg	1	0.0200
Xylene	U	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.91	mg/Kg	1	2.00	96	70 - 130
4-Bromofluorobenzene (4-BFB)			1.95	mg/Kg	1	2.00	98	70 - 130

Sample: 337975 - S-084703-080713-JF-DS-2 (1-2')

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 103874
Prep Batch: 88009

Analytical Method: SM 4500-Cl B
Date Analyzed: 2013-08-09
Sample Preparation: 2013-08-09

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			5220	mg/Kg	10	4.00

Sample: 337975 - S-084703-080713-JF-DS-2 (1-2')

Laboratory: Midland
Analysis: TPH DRO - NEW Analytical Method: S 8015 D Prep Method: N/A
QC Batch: 104059 Date Analyzed: 2013-08-15 Analyzed By: CW
Prep Batch: 88173 Sample Preparation: 2013-08-14 Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	Jb	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			108	mg/Kg	1	100	108	76.3 - 192.6

Sample: 337975 - S-084703-080713-JF-DS-2 (1-2')

Laboratory: Midland
Analysis: TPH GRO Analytical Method: S 8015 D Prep Method: S 5035
QC Batch: 104077 Date Analyzed: 2013-08-14 Analyzed By: KC
Prep Batch: 88187 Sample Preparation: 2013-08-14 Prepared By: KC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	B	1	4.21	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.87	mg/Kg	1	2.00	94	70 - 130
4-Bromofluorobenzene (4-BFB)			2.16	mg/Kg	1	2.00	108	70 - 130

Sample: 337976 - S-084703-080713-JF-DS-3 (0-1')

Laboratory: Midland
Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5035
QC Batch: 104064 Date Analyzed: 2013-08-14 Analyzed By: KC
Prep Batch: 88164 Sample Preparation: 2013-08-14 Prepared By: KC

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.0200	mg/Kg	1	0.0200
Toluene	U	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	<0.0200	mg/Kg	1	0.0200
Xylene	U	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.94	mg/Kg	1	2.00	97	70 - 130
4-Bromofluorobenzene (4-BFB)			1.80	mg/Kg	1	2.00	90	70 - 130

Sample: 337976 - S-084703-080713-JF-DS-3 (0-1')

Laboratory:	Midland			
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method: N/A
QC Batch:	103875	Date Analyzed:	2013-08-09	Analyzed By: AR
Prep Batch:	88009	Sample Preparation:	2013-08-09	Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			4280	mg/Kg	10	4.00

Sample: 337976 - S-084703-080713-JF-DS-3 (0-1')

Laboratory:	Midland			
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method: N/A
QC Batch:	104059	Date Analyzed:	2013-08-15	Analyzed By: CW
Prep Batch:	88173	Sample Preparation:	2013-08-14	Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	Jb	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			110	mg/Kg	1	100	110	76.3 - 192.6

Sample: 337976 - S-084703-080713-JF-DS-3 (0-1')

Laboratory:	Midland			
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method: S 5035
QC Batch:	104077	Date Analyzed:	2013-08-14	Analyzed By: KC
Prep Batch:	88187	Sample Preparation:	2013-08-14	Prepared By: KC

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	Jb	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.91	mg/Kg	1	2.00	96	70 - 130
4-Bromofluorobenzene (4-BFB)			2.01	mg/Kg	1	2.00	100	70 - 130

Sample: 337977 - S-084703-080713-JF-DS-3 (1-2')

Laboratory: Midland

Analysis: BTEX

QC Batch: 104064

Prep Batch: 88164

Analytical Method: S 8021B

Date Analyzed: 2013-08-14

Sample Preparation: 2013-08-14

Prep Method: S 5035

Analyzed By: KC

Prepared By: KC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.0200	mg/Kg	1	0.0200
Toluene	U	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	<0.0200	mg/Kg	1	0.0200
Xylene	U	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.89	mg/Kg	1	2.00	94	70 - 130
4-Bromofluorobenzene (4-BFB)			1.81	mg/Kg	1	2.00	90	70 - 130

Sample: 337977 - S-084703-080713-JF-DS-3 (1-2')

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 103875

Prep Batch: 88009

Analytical Method: SM 4500-Cl B

Date Analyzed: 2013-08-09

Sample Preparation: 2013-08-09

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			4830	mg/Kg	10	4.00

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Sample: 337977 - S-084703-080713-JF-DS-3 (1-2')

Laboratory:	Midland		
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D
QC Batch:	104059	Date Analyzed:	2013-08-15
Prep Batch:	88173	Sample Preparation:	2013-08-14
		Prep Method:	N/A
		Analyzed By:	CW
		Prepared By:	CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	U	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			108	mg/Kg	1	100	108	76.3 - 192.6

Sample: 337977 - S-084703-080713-JF-DS-3 (1-2')

Laboratory:	Midland		
Analysis:	TPH GRO	Analytical Method:	S 8015 D
QC Batch:	104077	Date Analyzed:	2013-08-14
Prep Batch:	88187	Sample Preparation:	2013-08-14
		Prep Method:	S 5035
		Analyzed By:	KC
		Prepared By:	KC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	Jb	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.86	mg/Kg	1	2.00	93	70 - 130
4-Bromofluorobenzene (4-BFB)			2.01	mg/Kg	1	2.00	100	70 - 130

Sample: 337978 - S-084703-080713-JF-DS-4 (0-1')

Laboratory:	Midland		
Analysis:	BTEX	Analytical Method:	S 8021B
QC Batch:	104064	Date Analyzed:	2013-08-14
Prep Batch:	88164	Sample Preparation:	2013-08-14
		Prep Method:	S 5035
		Analyzed By:	KC
		Prepared By:	KC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.0200	mg/Kg	1	0.0200
Toluene	U	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	<0.0200	mg/Kg	1	0.0200

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Xylene	U	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.86	mg/Kg	1	2.00	93	70 - 130
4-Bromofluorobenzene (4-BFB)			1.76	mg/Kg	1	2.00	88	70 - 130

Sample: 337978 - S-084703-080713-JF-DS-4 (0-1')

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	103875	Date Analyzed:	2013-08-09	Analyzed By:	AR
Prep Batch:	88009	Sample Preparation:	2013-08-09	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			166	mg/Kg	5	4.00

Sample: 337978 - S-084703-080713-JF-DS-4 (0-1')

Laboratory:	Midland				
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	104059	Date Analyzed:	2013-08-15	Analyzed By:	CW
Prep Batch:	88173	Sample Preparation:	2013-08-14	Prepared By:	CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	Jb	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			110	mg/Kg	1	100	110	76.3 - 192.6

Sample: 337978 - S-084703-080713-JF-DS-4 (0-1')

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	104077	Date Analyzed:	2013-08-14	Analyzed By:	KC
Prep Batch:	88187	Sample Preparation:	2013-08-14	Prepared By:	KC

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	Jb	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.85	mg/Kg	1	2.00	92	70 - 130
4-Bromofluorobenzene (4-BFB)			1.97	mg/Kg	1	2.00	98	70 - 130

Sample: 337979 - S-084703-080713-JF-DS-4 (1-2')

Laboratory: Midland

Analysis: BTEX

QC Batch: 104064

Prep Batch: 88164

Analytical Method: S 8021B

Date Analyzed: 2013-08-14

Sample Preparation: 2013-08-14

Prep Method: S 5035

Analyzed By: KC

Prepared By: KC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	u	1	<0.0200	mg/Kg	1	0.0200
Toluene	u	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	u	1	<0.0200	mg/Kg	1	0.0200
Xylene	u	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.89	mg/Kg	1	2.00	94	70 - 130
4-Bromofluorobenzene (4-BFB)			1.81	mg/Kg	1	2.00	90	70 - 130

Sample: 337979 - S-084703-080713-JF-DS-4 (1-2')

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 103875

Prep Batch: 88009

Analytical Method: SM 4500-Cl B

Date Analyzed: 2013-08-09

Sample Preparation: 2013-08-09

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			186	mg/Kg	5	4.00

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Sample: 337979 - S-084703-080713-JF-DS-4 (1-2')

Laboratory: Midland

Analysis: TPH DRO - NEW

QC Batch: 104059

Prep Batch: 88173

Analytical Method: S 8015 D

Date Analyzed: 2013-08-15

Sample Preparation: 2013-08-14

Prep Method: N/A

Analyzed By: CW

Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	U	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			113	mg/Kg	1	100	113	76.3 - 192.6

Sample: 337979 - S-084703-080713-JF-DS-4 (1-2')

Laboratory: Midland

Analysis: TPH GRO

QC Batch: 104077

Prep Batch: 88187

Analytical Method: S 8015 D

Date Analyzed: 2013-08-14

Sample Preparation: 2013-08-14

Prep Method: S 5035

Analyzed By: KC

Prepared By: KC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	JB	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.91	mg/Kg	1	2.00	96	70 - 130
4-Bromofluorobenzene (4-BFB)			2.04	mg/Kg	1	2.00	102	70 - 130

Sample: 337980 - S-084703-080713-JF-DS-5 (0-1')

Laboratory: Midland

Analysis: BTEX

QC Batch: 104064

Prep Batch: 88164

Analytical Method: S 8021B

Date Analyzed: 2013-08-14

Sample Preparation: 2013-08-14

Prep Method: S 5035

Analyzed By: KC

Prepared By: KC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.0200	mg/Kg	1	0.0200
Toluene	U	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	<0.0200	mg/Kg	1	0.0200

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Xylene	U	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.92	mg/Kg	1	2.00	96	70 - 130
4-Bromofluorobenzene (4-BFB)			1.79	mg/Kg	1	2.00	90	70 - 130

Sample: 337980 - S-084703-080713-JF-DS-5 (0-1')

Laboratory:	Midland			
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method: N/A
QC Batch:	103875	Date Analyzed:	2013-08-09	Analyzed By: AR
Prep Batch:	88009	Sample Preparation:	2013-08-09	Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			211	mg/Kg	5	4.00

Sample: 337980 - S-084703-080713-JF-DS-5 (0-1')

Laboratory:	Midland			
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method: N/A
QC Batch:	104059	Date Analyzed:	2013-08-15	Analyzed By: CW
Prep Batch:	88173	Sample Preparation:	2013-08-14	Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	Jb	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			114	mg/Kg	1	100	114	76.3 - 192.6

Sample: 337980 - S-084703-080713-JF-DS-5 (0-1')

Laboratory:	Midland			
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method: S 5035
QC Batch:	104077	Date Analyzed:	2013-08-14	Analyzed By: KC
Prep Batch:	88187	Sample Preparation:	2013-08-14	Prepared By: KC

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	Jb	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.92	mg/Kg	1	2.00	96	70 - 130
4-Bromofluorobenzene (4-BFB)			2.00	mg/Kg	1	2.00	100	70 - 130

Sample: 337981 - S-084703-080713-JF-DS-5 (1-2')

Laboratory: Midland

Analysis: BTEX

QC Batch: 104064

Prep Batch: 88164

Analytical Method: S 8021B

Date Analyzed: 2013-08-14

Sample Preparation: 2013-08-14

Prep Method: S 5035

Analyzed By: KC

Prepared By: KC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	u	1	<0.0200	mg/Kg	1	0.0200
Toluene	u	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	u	1	<0.0200	mg/Kg	1	0.0200
Xylene	u	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.81	mg/Kg	1	2.00	90	70 - 130
4-Bromofluorobenzene (4-BFB)			1.70	mg/Kg	1	2.00	85	70 - 130

Sample: 337981 - S-084703-080713-JF-DS-5 (1-2')

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 103875

Prep Batch: 88009

Analytical Method: SM 4500-Cl B

Date Analyzed: 2013-08-09

Sample Preparation: 2013-08-09

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			3730	mg/Kg	5	4.00

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Sample: 337981 - S-084703-080713-JF-DS-5 (1-2')

Laboratory:	Midland		
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D
QC Batch:	104059	Date Analyzed:	2013-08-15
Prep Batch:	88173	Sample Preparation:	2013-08-14
		Prep Method:	N/A
		Analyzed By:	CW
		Prepared By:	CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	U	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			109	mg/Kg	1	100	109	76.3 - 192.6

Sample: 337981 - S-084703-080713-JF-DS-5 (1-2')

Laboratory:	Midland		
Analysis:	TPH GRO	Analytical Method:	S 8015 D
QC Batch:	104077	Date Analyzed:	2013-08-14
Prep Batch:	88187	Sample Preparation:	2013-08-14
		Prep Method:	S 5035
		Analyzed By:	KC
		Prepared By:	KC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	Jb	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.82	mg/Kg	1	2.00	91	70 - 130
4-Bromofluorobenzene (4-BFB)			1.98	mg/Kg	1	2.00	99	70 - 130

Sample: 337982 - S-084703-080713-JF-BG-1 (0-1')

Laboratory:	Midland		
Analysis:	BTEX	Analytical Method:	S 8021B
QC Batch:	104064	Date Analyzed:	2013-08-14
Prep Batch:	88164	Sample Preparation:	2013-08-14
		Prep Method:	S 5035
		Analyzed By:	KC
		Prepared By:	KC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.0200	mg/Kg	1	0.0200
Toluene	U	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	<0.0200	mg/Kg	1	0.0200

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sample 337982 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Xylene	U	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.91	mg/Kg	1	2.00	96	70 - 130
4-Bromofluorobenzene (4-BFB)			1.84	mg/Kg	1	2.00	92	70 - 130

Sample: 337982 - S-084703-080713-JF-BG-1 (0-1')

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 103875 Date Analyzed: 2013-08-09 Analyzed By: AR
Prep Batch: 88009 Sample Preparation: 2013-08-09 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	U		<20.0	mg/Kg	5	4.00

Sample: 337982 - S-084703-080713-JF-BG-1 (0-1')

Laboratory: Midland
Analysis: TPH DRO - NEW Analytical Method: S 8015 D Prep Method: N/A
QC Batch: 104059 Date Analyzed: 2013-08-15 Analyzed By: CW
Prep Batch: 88173 Sample Preparation: 2013-08-14 Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	U	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			105	mg/Kg	1	100	105	76.3 - 192.6

Sample: 337982 - S-084703-080713-JF-BG-1 (0-1')

Laboratory: Midland
Analysis: TPH GRO Analytical Method: S 8015 D Prep Method: S 5035
QC Batch: 104077 Date Analyzed: 2013-08-14 Analyzed By: KC
Prep Batch: 88187 Sample Preparation: 2013-08-14 Prepared By: KC

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO		1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.92	mg/Kg	1	2.00	96	70 - 130
4-Bromofluorobenzene (4-BFB)			2.11	mg/Kg	1	2.00	106	70 - 130

Sample: 337983 - S-084703-080713-JF-BG-1 (1-2')

Laboratory: Midland

Analysis: BTEX

QC Batch: 104064

Prep Batch: 88164

Analytical Method: S 8021B

Date Analyzed: 2013-08-14

Sample Preparation: 2013-08-14

Prep Method: S 5035

Analyzed By: KC

Prepared By: KC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	u	1	<0.0200	mg/Kg	1	0.0200
Toluene	u	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	u	1	<0.0200	mg/Kg	1	0.0200
Xylene	u	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.97	mg/Kg	1	2.00	98	70 - 130
4-Bromofluorobenzene (4-BFB)			1.88	mg/Kg	1	2.00	94	70 - 130

Sample: 337983 - S-084703-080713-JF-BG-1 (1-2')

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 103875

Prep Batch: 88009

Analytical Method: SM 4500-Cl B

Date Analyzed: 2013-08-09

Sample Preparation: 2013-08-09

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			45.2	mg/Kg	5	4.00

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Sample: 337983 - S-084703-080713-JF-BG-1 (1-2')

Laboratory:	Midland		
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D
QC Batch:	104059	Date Analyzed:	2013-08-15
Prep Batch:	88173	Sample Preparation:	2013-08-14
		Prep Method:	N/A
		Analyzed By:	CW
		Prepared By:	CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	U	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			103	mg/Kg	1	100	103	76.3 - 192.6

Sample: 337983 - S-084703-080713-JF-BG-1 (1-2')

Laboratory:	Midland		
Analysis:	TPH GRO	Analytical Method:	S 8015 D
QC Batch:	104077	Date Analyzed:	2013-08-14
Prep Batch:	88187	Sample Preparation:	2013-08-14
		Prep Method:	S 5035
		Analyzed By:	KC
		Prepared By:	KC

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	B	1	4.16	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.94	mg/Kg	1	2.00	97	70 - 130
4-Bromofluorobenzene (4-BFB)			2.13	mg/Kg	1	2.00	106	70 - 130

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Method Blanks

Method Blank (1) QC Batch: 103874

QC Batch: 103874
Prep Batch: 88009

Date Analyzed: 2013-08-09
QC Preparation: 2013-08-09

Analyzed By: AR
Prepared By: AR

Parameter	Flag	Cert	MDL Result	Units	RL
Chloride			<3.85	mg/Kg	4

Method Blank (1) QC Batch: 103875

QC Batch: 103875
Prep Batch: 88009

Date Analyzed: 2013-08-09
QC Preparation: 2013-08-09

Analyzed By: AR
Prepared By: AR

Parameter	Flag	Cert	MDL Result	Units	RL
Chloride			<3.85	mg/Kg	4

Method Blank (1) QC Batch: 104059

QC Batch: 104059
Prep Batch: 88173

Date Analyzed: 2013-08-15
QC Preparation: 2013-08-14

Analyzed By: CW
Prepared By: CW

Parameter	Flag	Cert	MDL Result	Units	RL
DRO		1	12.8	mg/Kg	50

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			103	mg/Kg	1	100	103	64.1 - 164.4

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Method Blank (1) QC Batch: 104064

QC Batch: 104064
Prep Batch: 88164

Date Analyzed: 2013-08-14
QC Preparation: 2013-08-14

Analyzed By: KC
Prepared By: KC

Parameter	Flag	Cert	MDL Result	Units	RL
Benzene		1	<0.00810	mg/Kg	0.02
Toluene		1	<0.00750	mg/Kg	0.02
Ethylbenzene		1	<0.00730	mg/Kg	0.02
Xylene		1	<0.00700	mg/Kg	0.02

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.95	mg/Kg	1	2.00	98	70 - 130
4-Bromofluorobenzene (4-BFB)			1.83	mg/Kg	1	2.00	92	70 - 130

Method Blank (1) QC Batch: 104077

QC Batch: 104077
Prep Batch: 88187

Date Analyzed: 2013-08-14
QC Preparation: 2013-08-14

Analyzed By: KC
Prepared By: KC

Parameter	Flag	Cert	MDL Result	Units	RL
GRO		1	3.95	mg/Kg	4

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.94	mg/Kg	1	2.00	97	70 - 130
4-Bromofluorobenzene (4-BFB)			2.04	mg/Kg	1	2.00	102	70 - 130

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Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 103874
Prep Batch: 88009

Date Analyzed: 2013-08-09
QC Preparation: 2013-08-09

Analyzed By: AR
Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2520	mg/Kg	1	2500	<3.85	101	89.7 - 115.9

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
Chloride			2690	mg/Kg	1	2500	<3.85	108	89.7 - 115.9	6	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: 103875
Prep Batch: 88009

Date Analyzed: 2013-08-09
QC Preparation: 2013-08-09

Analyzed By: AR
Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2650	mg/Kg	1	2500	<3.85	106	89.7 - 115.9

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
Chloride			2510	mg/Kg	1	2500	<3.85	100	89.7 - 115.9	5	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: 104059
Prep Batch: 88173

Date Analyzed: 2013-08-15
QC Preparation: 2013-08-14

Analyzed By: CW
Prepared By: CW

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Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	268	mg/Kg	1	250	12.8	102	53.8 - 129

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
DRO		1	260	mg/Kg	1	250	12.8	99	53.8 - 129	3	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-Tricosane	103	99.7	mg/Kg	1	100	103	100	61.3 - 170.4

Laboratory Control Spike (LCS-1)

QC Batch: 104064
Prep Batch: 88164

Date Analyzed: 2013-08-14
QC Preparation: 2013-08-14

Analyzed By: KC
Prepared By: KC

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	2.18	mg/Kg	1	2.00	<0.00810	109	70 - 130
Toluene		1	2.27	mg/Kg	1	2.00	<0.00750	114	70 - 130.
Ethylbenzene		1	2.32	mg/Kg	1	2.00	<0.00730	116	70 - 130
Xylene		1	6.96	mg/Kg	1	6.00	<0.00700	116	70 - 130

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
Benzene		1	2.00	mg/Kg	1	2.00	<0.00810	100	70 - 130	9	20
Toluene		1	2.09	mg/Kg	1	2.00	<0.00750	104	70 - 130	8	20
Ethylbenzene		1	2.14	mg/Kg	1	2.00	<0.00730	107	70 - 130	8	20
Xylene		1	6.41	mg/Kg	1	6.00	<0.00700	107	70 - 130	8	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
Trifluorotoluene (TFT)	1.82	1.91	mg/Kg	1	2.00	91	96	70 - 130
4-Bromofluorobenzene (4-BFB)	1.87	1.80	mg/Kg	1	2.00	94	90	70 - 130

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Laboratory Control Spike (LCS-1)

QC Batch: 104077
Prep Batch: 88187

Date Analyzed: 2013-08-14
QC Preparation: 2013-08-14

Analyzed By: KC
Prepared By: KC

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	20.1	mg/Kg	1	20.0	3.95	100	70 - 130

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
GRO		1	22.2	mg/Kg	1	20.0	3.95	111	70 - 130	10	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
Trifluorotoluene (TFT)	1.71	1.73	mg/Kg	1	2.00	86	86	70 - 130
4-Bromofluorobenzene (4-BFB)	1.65	1.43	mg/Kg	1	2.00	82	72	70 - 130

Matrix Spike (MS-1) Spiked Sample: 337975

QC Batch: 103874
Prep Batch: 88009

Date Analyzed: 2013-08-09
QC Preparation: 2013-08-09

Analyzed By: AR
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			7560	mg/Kg	10	2500	5220	94	78.9 - 121

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
Chloride			7890	mg/Kg	10	2500	5220	107	78.9 - 121	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: 337983

QC Batch: 103875
Prep Batch: 88009

Date Analyzed: 2013-08-09
QC Preparation: 2013-08-09

Analyzed By: AR
Prepared By: AR

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Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2510	mg/Kg	5	2500	45.2	98	78.9 - 121

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
Chloride			2620	mg/Kg	5	2500	45.2	103	78.9 - 121	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: 337966

QC Batch: 104059
Prep Batch: 88173

Date Analyzed: 2013-08-15
QC Preparation: 2013-08-14

Analyzed By: CW
Prepared By: CW

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	280	mg/Kg	1	250	<10.2	112	29 - 168.5

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
DRO		1	289	mg/Kg	1	250	<10.2	116	29 - 168.5	3	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-Tricosane	110	108	mg/Kg	1	100	110	108	59.5 - 168.9

Matrix Spike (MS-1) Spiked Sample: 337982

QC Batch: 104064
Prep Batch: 88164

Date Analyzed: 2013-08-14
QC Preparation: 2013-08-14

Analyzed By: KC
Prepared By: KC

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	2.08	mg/Kg	1	2.00	<0.00810	104	70 - 130
Toluene		1	2.16	mg/Kg	1	2.00	<0.00750	108	70 - 130
Ethylbenzene		1	2.20	mg/Kg	1	2.00	<0.00730	110	70 - 130
Xylene		1	6.54	mg/Kg	1	6.00	<0.00700	109	70 - 130

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

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Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1	2.03	mg/Kg	1	2.00	<0.00810	102	70 - 130	2	20
Toluene		1	2.12	mg/Kg	1	2.00	<0.00750	106	70 - 130	2	20
Ethylbenzene		1	2.16	mg/Kg	1	2.00	<0.00730	108	70 - 130	2	20
Xylene		1	6.43	mg/Kg	1	6.00	<0.00700	107	70 - 130	2	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
Trifluorotoluene (TFT)	1.94	1.89	mg/Kg	1	2	97	94	70 - 130
4-Bromofluorobenzene (4-BFB)	1.78	1.73	mg/Kg	1	2	89	86	70 - 130

Matrix Spike (MS-1) Spiked Sample: 337972

QC Batch: 104077
Prep Batch: 88187

Date Analyzed: 2013-08-14
QC Preparation: 2013-08-14

Analyzed By: KC
Prepared By: KC

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	17.7	mg/Kg	1	20.0	<2.32	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
GRO		1	17.2	mg/Kg	1	20.0	<2.32	86	70 - 130	3	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
Trifluorotoluene (TFT)	1.78	1.76	mg/Kg	1	2	89	88	70 - 130
4-Bromofluorobenzene (4-BFB)	2.06	2.01	mg/Kg	1	2	103	100	70 - 130

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Calibration Standards

Standard (CCV-1)

QC Batch: 103874

Date Analyzed: 2013-08-09

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2013-08-09

Standard (CCV-2)

QC Batch: 103874

Date Analyzed: 2013-08-09

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.1	99	85 - 115	2013-08-09

Standard (CCV-1)

QC Batch: 103875

Date Analyzed: 2013-08-09

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2013-08-09

Standard (CCV-2)

QC Batch: 103875

Date Analyzed: 2013-08-09

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.5	100	85 - 115	2013-08-09

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Standard (CCV-1)

QC Batch: 104059

Date Analyzed: 2013-08-15

Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	258	103	80 - 120	2013-08-15

Standard (CCV-2)

QC Batch: 104059

Date Analyzed: 2013-08-15

Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	273	109	80 - 120	2013-08-15

Standard (CCV-3)

QC Batch: 104059

Date Analyzed: 2013-08-15

Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	270	108	80 - 120	2013-08-15

Standard (CCV-1)

QC Batch: 104064

Date Analyzed: 2013-08-14

Analyzed By: KC

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.109	109	80 - 120	2013-08-14
Toluene		1	mg/kg	0.100	0.111	111	80 - 120	2013-08-14
Ethylbenzene		1	mg/kg	0.100	0.109	109	80 - 120	2013-08-14
Xylene		1	mg/kg	0.300	0.326	109	80 - 120	2013-08-14

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Lea Co, NM

Standard (CCV-2)

QC Batch: 104064

Date Analyzed: 2013-08-14

Analyzed By: KC

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.111	111	80 - 120	2013-08-14
Toluene		1	mg/kg	0.100	0.111	111	80 - 120	2013-08-14
Ethylbenzene		1	mg/kg	0.100	0.108	108	80 - 120	2013-08-14
Xylene		1	mg/kg	0.300	0.323	108	80 - 120	2013-08-14

Standard (CCV-3)

QC Batch: 104064

Date Analyzed: 2013-08-14

Analyzed By: KC

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.109	109	80 - 120	2013-08-14
Toluene		1	mg/kg	0.100	0.109	109	80 - 120	2013-08-14
Ethylbenzene		1	mg/kg	0.100	0.105	105	80 - 120	2013-08-14
Xylene		1	mg/kg	0.300	0.315	105	80 - 120	2013-08-14

Standard (CCV-1)

QC Batch: 104077

Date Analyzed: 2013-08-14

Analyzed By: KC

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	1.19	119	80 - 120	2013-08-14

Standard (CCV-2)

QC Batch: 104077

Date Analyzed: 2013-08-14

Analyzed By: KC

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	1.14	114	80 - 120	2013-08-14

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084703

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Lea Co, NM

Standard (CCV-3)

QC Batch: 104077

Date Analyzed: 2013-08-14

Analyzed By: KC

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	1.08	108	80 - 120	2013-08-14

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	NELAP	T104704392-12-4	Midland

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 then 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.
U	The analyte is not detected above the SDL

Attachments

Report Date: August 16, 2013
084703

Work Order: 13080816
Cimarex/Red Hills 28 SWD

Page Number: 36 of 36
Lea Co, NM

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

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1 (888) 588-3443BioAqualic Testing
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Carrollton, Texas 75006
Tel (972) 242-7750

Company Name:

CRA

Phone #:

432-686-0086

Address: (Street, City, Zip)

2135 S. Loop 250 West, Midland, TX 79703

Fax #:

E-mail:

jfergerson@craworld.com

Contact Person:

John Ferguson

Invoice to:

(If different from above)

Project #:

084703

Project Name:

Cimarex Energy - Red Hills 28 SWD

Project Location (including state):

Lea County, NM

Sampler Signature:

John Ferguson

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume / Amount	MATRIX			PRESERVATIVE METHOD						SAMPLING		Turn Around Time if	Hold
				WATER	SOIL	AIR	SLUDGE	HCl	HNO ₃	H ₂ SO ₄	NaOH	ICE	NONE	DATE		
972	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
973	JF-DS-1 (0-1)	1	0.5												✓	
974	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
975	JF-DS-1 (1-2)	1	0.5												✓	
976	S-084703-080713-	1	0.5		✓						✓		8/7/13	1055		
977	JF-DS-2 (0-1)	1	0.5												✓	
978	S-084703-080713-	1	0.5		✓						✓		8/7/13	1102		
979	JF-DS-2 (1-2)	1	0.5												✓	
980	S-084703-080713-	1	0.5		✓						✓		8/7/13	1102		
981	JF-DS-3 (0-1)	1	0.5												✓	
982	S-084703-080713-	1	0.5		✓						✓		8/7/13	1055		
983	JF-DS-2 (0-1)	1	0.5												✓	
984	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
985	JF-DS-1 (1-2)	1	0.5												✓	
986	S-084703-080713-	1	0.5		✓						✓		8/7/13	1102		
987	JF-DS-2 (0-1)	1	0.5												✓	
988	S-084703-080713-	1	0.5		✓						✓		8/7/13	1055		
989	JF-DS-1 (1-2)	1	0.5												✓	
990	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
991	JF-DS-2 (0-1)	1	0.5												✓	
992	S-084703-080713-	1	0.5		✓						✓		8/7/13	1102		
993	JF-DS-2 (1-2)	1	0.5												✓	
994	S-084703-080713-	1	0.5		✓						✓		8/7/13	1055		
995	JF-DS-1 (0-1)	1	0.5												✓	
996	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
997	JF-DS-1 (1-2)	1	0.5												✓	
998	S-084703-080713-	1	0.5		✓						✓		8/7/13	1102		
999	JF-DS-2 (0-1)	1	0.5												✓	
1000	S-084703-080713-	1	0.5		✓						✓		8/7/13	1055		
1001	JF-DS-1 (1-2)	1	0.5												✓	
1002	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
1003	JF-DS-2 (0-1)	1	0.5												✓	
1004	S-084703-080713-	1	0.5		✓						✓		8/7/13	1102		
1005	JF-DS-2 (1-2)	1	0.5												✓	
1006	S-084703-080713-	1	0.5		✓						✓		8/7/13	1055		
1007	JF-DS-1 (0-1)	1	0.5												✓	
1008	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
1009	JF-DS-1 (1-2)	1	0.5												✓	
1010	S-084703-080713-	1	0.5		✓						✓		8/7/13	1102		
1011	JF-DS-2 (0-1)	1	0.5												✓	
1012	S-084703-080713-	1	0.5		✓						✓		8/7/13	1055		
1013	JF-DS-1 (1-2)	1	0.5												✓	
1014	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
1015	JF-DS-2 (0-1)	1	0.5												✓	
1016	S-084703-080713-	1	0.5		✓						✓		8/7/13	1102		
1017	JF-DS-2 (1-2)	1	0.5												✓	
1018	S-084703-080713-	1	0.5		✓						✓		8/7/13	1055		
1019	JF-DS-1 (0-1)	1	0.5												✓	
1020	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
1021	JF-DS-1 (1-2)	1	0.5												✓	
1022	S-084703-080713-	1	0.5		✓						✓		8/7/13	1102		
1023	JF-DS-2 (0-1)	1	0.5												✓	
1024	S-084703-080713-	1	0.5		✓						✓		8/7/13	1055		
1025	JF-DS-1 (1-2)	1	0.5												✓	
1026	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
1027	JF-DS-2 (0-1)	1	0.5												✓	
1028	S-084703-080713-	1	0.5		✓						✓		8/7/13	1102		
1029	JF-DS-2 (1-2)	1	0.5												✓	
1030	S-084703-080713-	1	0.5		✓						✓		8/7/13	1055		
1031	JF-DS-1 (0-1)	1	0.5												✓	
1032	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
1033	JF-DS-1 (1-2)	1	0.5												✓	
1034	S-084703-080713-	1	0.5		✓						✓		8/7/13	1102		
1035	JF-DS-2 (0-1)	1	0.5												✓	
1036	S-084703-080713-	1	0.5		✓						✓		8/7/13	1055		
1037	JF-DS-1 (1-2)	1	0.5												✓	
1038	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
1039	JF-DS-2 (0-1)	1	0.5												✓	
1040	S-084703-080713-	1	0.5		✓						✓		8/7/13	1102		
1041	JF-DS-2 (1-2)	1	0.5												✓	
1042	S-084703-080713-	1	0.5		✓						✓		8/7/13	1055		
1043	JF-DS-1 (0-1)	1	0.5												✓	
1044	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
1045	JF-DS-1 (1-2)	1	0.5												✓	
1046	S-084703-080713-	1	0.5		✓						✓		8/7/13	1102		
1047	JF-DS-2 (0-1)	1	0.5												✓	
1048	S-084703-080713-	1	0.5		✓						✓		8/7/13	1055		
1049	JF-DS-1 (1-2)	1	0.5												✓	
1050	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
1051	JF-DS-2 (0-1)	1	0.5												✓	
1052	S-084703-080713-	1	0.5		✓						✓		8/7/13	1102		
1053	JF-DS-2 (1-2)	1	0.5												✓	
1054	S-084703-080713-	1	0.5		✓						✓		8/7/13	1055		
1055	JF-DS-1 (0-1)	1	0.5												✓	
1056	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
1057	JF-DS-1 (1-2)	1	0.5												✓	
1058	S-084703-080713-	1	0.5		✓						✓		8/7/13	1102		
1059	JF-DS-2 (0-1)	1	0.5												✓	
1060	S-084703-080713-	1	0.5		✓						✓		8/7/13	1055		
1061	JF-DS-1 (1-2)	1	0.5												✓	
1062	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
1063	JF-DS-2 (0-1)	1	0.5												✓	
1064	S-084703-080713-	1	0.5		✓						✓		8/7/13	1102		
1065	JF-DS-2 (1-2)	1	0.5												✓	
1066	S-084703-080713-	1	0.5		✓						✓		8/7/13	1055		
1067	JF-DS-1 (0-1)	1	0.5												✓	
1068	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
1069	JF-DS-1 (1-2)	1	0.5												✓	
1070	S-084703-080713-	1	0.5		✓						✓		8/7/13	1102		
1071	JF-DS-2 (0-1)	1	0.5												✓	
1072	S-084703-080713-	1	0.5		✓						✓		8/7/13	1055		
1073	JF-DS-1 (1-2)	1	0.5												✓	
1074	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
1075	JF-DS-2 (0-1)	1	0.5												✓	
1076	S-084703-080713-	1	0.5		✓						✓		8/7/13	1102		
1077	JF-DS-2 (1-2)	1	0.5												✓	
1078	S-084703-080713-	1	0.5		✓						✓		8/7/13	1055		
1079	JF-DS-1 (0-1)	1	0.5												✓	
1080	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
1081	JF-DS-1 (1-2)	1	0.5												✓	
1082	S-084703-080713-	1	0.5		✓						✓		8/7/13	1102		
1083	JF-DS-2 (0-1)	1	0.5												✓	
1084	S-084703-080713-	1	0.5		✓						✓		8/7/13	1055		
1085	JF-DS-1 (1-2)	1	0.5												✓	
1086	S-084703-080713-	1	0.5		✓						✓		8/7/13	1100		
1087	JF-DS-2 (0-1)	1	0.5												✓	
1088	S-084703-080713-	1	0.5		✓						✓					

Relinquished by: <i>John Ferguson</i>	Company: CRA	Date: 8/13/13	Time: 10:45	Received by: <i>John Ferguson</i>	Company: CRA	Date: 8/13/13	Time: 10:45	INST: 12-1	LAB USE ONLY	REMARKS: Midland, AR
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	INST: OBS: COR: 6-8	INST: OBS: COR: 6-8	
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	INST: OBS: COR: 6-8	INST: OBS: COR: 6-8	

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

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Carrier #

Carly

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1 (888) 588-3443BioAqualic Testing
2501 Mayes Rd., Ste 100
Carrollton, Texas 75006
Tel (972) 242-7750**Company Name:**

CRA

Phone #:

432-686-0086

Address: (Street, City, Zip)**Fax #:**

432-686-0086

Project #:

084703

Project Location (including state):

Lea County, NR

Contact Person:

John Ferguson

Invoice to:

John Ferguson

E-mail:

jfergerson@craworld.com

Project Name:

Cimarex Energy - Red Hills 28 SWP

Sample Signature:**Matrix**

WATER

AIR

SLUDGE

Preservative Method

NONE

ICE

NaOH

Field Code

S-084703-080713-

JF-06-1 (0-1)

S-084703-080713-

Volume / Amount

1

1

1

Containers

1

1

1

Sampling

DATE

TIME

8/13/08

Analysis Request

(Circle or Specify Method No.)

MTBE 8021 / 602 / 8260 / 624

BTEX 8021 / 602 / 8260 / 624

TPH 418.1 / TX1005 / TX1005 Ext(C35)

TPH 8015 GRO / DRO / TVHC

PAH 8270 / 625

Total Metals Ag As Ba Cd Cr Pb Se Hg 6010/200.7

TCMP Metals Ag As Ba Cd Cr Pb Se Hg

TCMP Volatiles

TCMP Semi Volatiles

TCMP Pesticides

RCI

GC/MS Vol. 8260 / 624

GC/MS Semi. Vol. 8270 / 625

PCB's 8082 / 608

Pesticides 8081 / 608

BOD, TSS, pH

Moisture Content

Na, Ca, Mg, K, TDS, EC

Cl, F, SO4, NO3-N, NO2-N, PO4-P, Alkalinity

Turn Around Time if different from standard

Relinquished by:

Company:

Date:

Time:

Relinquished by:

Company:

Date:

Time:

Relinquished by:

Company:

Date:

Time:

Relinquished by:

Company:

Date:

Time:

Relinquished by:

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Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

(Corrected Report)

John Fergerson
CRA-Midland
2135 South Loop 250 West
Midland, TX, 79703

Report Date: September 24, 2013

Work Order: 13091811



Project Location: Lea Co, NM
Project Name: Cimarex/Red Hills 28 SWD
Project Number: 084703

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
342058	S-084703-091713-JF-ENW (3')	soil	2013-09-17	13:30	2013-09-18
342059	S-084703-091713-JF-WNW (3')	soil	2013-09-17	13:55	2013-09-18
342060	S-084703-091713-JF-BS-1 (1.5')	soil	2013-09-17	14:10	2013-09-18
342061	S-084703-091713-JF-WWS (3')	soil	2013-09-17	14:15	2013-09-18
342062	S-084703-091713-JF-BS-2 (3')	soil	2013-09-17	14:20	2013-09-18
342063	S-084703-091713-JF-WSW (3')	soil	2013-09-17	14:30	2013-09-18
342064	S-084703-091713-JF-BS-3 (10')	soil	2013-09-17	15:10	2013-09-18
342065	S-084703-091713-JF-BS-4 (3.5')	soil	2013-09-17	15:20	2013-09-18
342066	S-084703-091713-JF-ESW (3')	soil	2013-09-17	15:30	2013-09-18
342067	S-084703-091713-JF-EWS (3')	soil	2013-09-17	15:35	2013-09-18
342068	S-084703-091713-JF-BS-5 (20')	soil	2013-09-17	15:40	2013-09-18
342069	S-084703-091713-JF-BS-6 (15')	soil	2013-09-17	15:45	2013-09-18

Report Corrections (Work Order 13091811)

- 9/24/13: Reran Chlorides for sample 342066 and 342067.

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 40 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

A handwritten signature in black ink that reads "Michael Abel". The signature is written in a cursive, flowing style.

Dr. Blair Leftwich, Director
Dr. Michael Abel, Project Manager

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Case Narrative

Samples for project Cimarex/Red Hills 28 SWD were received by TraceAnalysis, Inc. on 2013-09-18 and assigned to work order 13091811. Samples for work order 13091811 were received intact at a temperature of 4.0 C.

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

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
BTEX	S 8021B	89103	2013-09-18 at 14:50	105213	2013-09-19 at 08:46
BTEX	S 8021B	89103	2013-09-18 at 14:50	105258	2013-09-20 at 08:09
Chloride (Titration)	SM 4500-Cl B	89095	2013-09-18 at 12:30	105242	2013-09-19 at 12:45
Chloride (Titration)	SM 4500-Cl B	89095	2013-09-18 at 12:30	105243	2013-09-19 at 12:56
Chloride (Titration)	SM 4500-Cl B	89209	2013-09-23 at 12:07	105355	2013-09-23 at 15:40
TPH DRO - NEW	S 8015 D	89114	2013-09-18 at 13:00	105216	2013-09-19 at 09:08
TPH GRO	S 8015 D	89103	2013-09-18 at 14:50	105257	2013-09-20 at 08:03

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 13091811 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.

Report Date: September 24, 2013
084703

Work Order: 13091811
Cimarex/Red Hills 28 SWD

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Lea Co, NM

Analytical Report

Sample: 342058 - S-084703-091713-JF-ENW (3')

Laboratory: Midland

Analysis: BTEX

QC Batch: 105213

Prep Batch: 89103

Analytical Method: S 8021B

Date Analyzed: 2013-09-19

Sample Preparation: 2013-09-18

Prep Method: S 5035

Analyzed By: AK

Prepared By: AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	u	1	<0.0200	mg/Kg	1	0.0200
Toluene	u	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	u	1	<0.0200	mg/Kg	1	0.0200
Xylene	u	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.12	mg/Kg	1	2.00	106	70 - 130
4-Bromofluorobenzene (4-BFB)			1.95	mg/Kg	1	2.00	98	70 - 130

Sample: 342058 - S-084703-091713-JF-ENW (3')

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 105242

Prep Batch: 89095

Analytical Method: SM 4500-Cl B

Date Analyzed: 2013-09-19

Sample Preparation: 2013-09-18

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			34.2	mg/Kg	5	4.00

Sample: 342058 - S-084703-091713-JF-ENW (3')

Laboratory: Midland

Analysis: TPH DRO - NEW

QC Batch: 105216

Prep Batch: 89114

Analytical Method: S 8015 D

Date Analyzed: 2013-09-19

Sample Preparation: 2013-09-18

Prep Method: N/A

Analyzed By: CW

Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	u	1	<50.0	mg/Kg	1	50.0

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Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			133	mg/Kg	1	100	133	76.3 - 192.6

Sample: 342058 - S-084703-091713-JF-ENW (3')

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 105257
Prep Batch: 89103

Analytical Method: S 8015 D
Date Analyzed: 2013-09-20
Sample Preparation: 2013-09-18

Prep Method: S 5035
Analyzed By: AK
Prepared By: AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	U	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.43	mg/Kg	1	2.00	122	70 - 130
4-Bromofluorobenzene (4-BFB)			2.35	mg/Kg	1	2.00	118	70 - 130

Sample: 342059 - S-084703-091713-JF-WNW (3')

Laboratory: Midland
Analysis: BTEX
QC Batch: 105258
Prep Batch: 89103

Analytical Method: S 8021B
Date Analyzed: 2013-09-20
Sample Preparation: 2013-09-18

Prep Method: S 5035
Analyzed By: AK
Prepared By: AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.0200	mg/Kg	1	0.0200
Toluene	U	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	<0.0200	mg/Kg	1	0.0200
Xylene	U	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.19	mg/Kg	1	2.00	110	70 - 130
4-Bromofluorobenzene (4-BFB)			1.97	mg/Kg	1	2.00	98	70 - 130

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Cimarex/Red Hills 28 SWD

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Sample: 342059 - S-084703-091713-JF-WNW (3')

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 105242 Date Analyzed: 2013-09-19 Analyzed By: AR
Prep Batch: 89095 Sample Preparation: 2013-09-18 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1690	mg/Kg	5	4.00

Sample: 342059 - S-084703-091713-JF-WNW (3')

Laboratory: Midland
Analysis: TPH DRO - NEW Analytical Method: S 8015 D Prep Method: N/A
QC Batch: 105216 Date Analyzed: 2013-09-19 Analyzed By: CW
Prep Batch: 89114 Sample Preparation: 2013-09-18 Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	U	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			117	mg/Kg	1	100	117	76.3 - 192.6

Sample: 342059 - S-084703-091713-JF-WNW (3')

Laboratory: Midland
Analysis: TPH GRO Analytical Method: S 8015 D Prep Method: S 5035
QC Batch: 105257 Date Analyzed: 2013-09-20 Analyzed By: AK
Prep Batch: 89103 Sample Preparation: 2013-09-18 Prepared By: AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	U	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.52	mg/Kg	1	2.00	126	70 - 130
4-Bromofluorobenzene (4-BFB)			2.36	mg/Kg	1	2.00	118	70 - 130

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Sample: 342060 - S-084703-091713-JF-BS-1 (1.5')

Laboratory: Midland
Analysis: BTEX
QC Batch: 105213
Prep Batch: 89103

Analytical Method: S 8021B
Date Analyzed: 2013-09-19
Sample Preparation: 2013-09-18

Prep Method: S 5035
Analyzed By: AK
Prepared By: AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.0200	mg/Kg	1	0.0200
Toluene	U	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	<0.0200	mg/Kg	1	0.0200
Xylene	U	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.12	mg/Kg	1	2.00	106	70 - 130
4-Bromofluorobenzene (4-BFB)			1.92	mg/Kg	1	2.00	96	70 - 130

Sample: 342060 - S-084703-091713-JF-BS-1 (1.5')

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 105242
Prep Batch: 89095

Analytical Method: SM 4500-Cl B
Date Analyzed: 2013-09-19
Sample Preparation: 2013-09-18

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			4760	mg/Kg	10	4.00

Sample: 342060 - S-084703-091713-JF-BS-1 (1.5')

Laboratory: Midland
Analysis: TPH DRO - NEW
QC Batch: 105216
Prep Batch: 89114

Analytical Method: S 8015 D
Date Analyzed: 2013-09-19
Sample Preparation: 2013-09-18

Prep Method: N/A
Analyzed By: CW
Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	Jb	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			117	mg/Kg	1	100	117	76.3 - 192.6

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Sample: 342060 - S-084703-091713-JF-BS-1 (1.5')

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 105257
Prep Batch: 89103

Analytical Method: S 8015 D
Date Analyzed: 2013-09-20
Sample Preparation: 2013-09-18

Prep Method: S 5035
Analyzed By: AK
Prepared By: AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	U	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.43	mg/Kg	1	2.00	122	70 - 130
4-Bromofluorobenzene (4-BFB)			2.33	mg/Kg	1	2.00	116	70 - 130

Sample: 342061 - S-084703-091713-JF-WWS (3')

Laboratory: Midland
Analysis: BTEX
QC Batch: 105213
Prep Batch: 89103

Analytical Method: S 8021B
Date Analyzed: 2013-09-19
Sample Preparation: 2013-09-18

Prep Method: S 5035
Analyzed By: AK
Prepared By: AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.0200	mg/Kg	1	0.0200
Toluene	U	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	<0.0200	mg/Kg	1	0.0200
Xylene	U	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.16	mg/Kg	1	2.00	108	70 - 130
4-Bromofluorobenzene (4-BFB)			1.98	mg/Kg	1	2.00	99	70 - 130

Sample: 342061 - S-084703-091713-JF-WWS (3')

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 105242
Prep Batch: 89095

Analytical Method: SM 4500-Cl B
Date Analyzed: 2013-09-19
Sample Preparation: 2013-09-18

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			68.4	mg/Kg	5	4.00

Sample: 342061 - S-084703-091713-JF-WWS (3')

Laboratory: Midland
Analysis: TPH DRO - NEW
QC Batch: 105216
Prep Batch: 89114

Analytical Method: S 8015 D
Date Analyzed: 2013-09-19
Sample Preparation: 2013-09-18

Prep Method: N/A
Analyzed By: CW
Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	u	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			125	mg/Kg	1	100	125	76.3 - 192.6

Sample: 342061 - S-084703-091713-JF-WWS (3')

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 105257
Prep Batch: 89103

Analytical Method: S 8015 D
Date Analyzed: 2013-09-20
Sample Preparation: 2013-09-18

Prep Method: S 5035
Analyzed By: AK
Prepared By: AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	u	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.44	mg/Kg	1	2.00	122	70 - 130
4-Bromofluorobenzene (4-BFB)			2.30	mg/Kg	1	2.00	115	70 - 130

Sample: 342062 - S-084703-091713-JF-BS-2 (3')

Laboratory: Midland
Analysis: BTEX
QC Batch: 105213
Prep Batch: 89103

Analytical Method: S 8021B
Date Analyzed: 2013-09-19
Sample Preparation: 2013-09-18

Prep Method: S 5035
Analyzed By: AK
Prepared By: AK

Report Date: September 24, 2013
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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	u	1	<0.0200	mg/Kg	1	0.0200
Toluene	u	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	u	1	<0.0200	mg/Kg	1	0.0200
Xylene	u	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.94	mg/Kg	1	2.00	97	70 - 130
4-Bromofluorobenzene (4-BFB)			1.76	mg/Kg	1	2.00	88	70 - 130

Sample: 342062 - S-084703-091713-JF-BS-2 (3')

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 105242 Date Analyzed: 2013-09-19 Analyzed By: AR
Prep Batch: 89095 Sample Preparation: 2013-09-18 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	u		<20.0	mg/Kg	5	4.00

Sample: 342062 - S-084703-091713-JF-BS-2 (3')

Laboratory: Midland
Analysis: TPH DRO - NEW Analytical Method: S 8015 D Prep Method: N/A
QC Batch: 105216 Date Analyzed: 2013-09-19 Analyzed By: CW
Prep Batch: 89114 Sample Preparation: 2013-09-18 Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	u	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			136	mg/Kg	1	100	136	76.3 - 192.6

Sample: 342062 - S-084703-091713-JF-BS-2 (3')

Laboratory: Midland
Analysis: TPH GRO Analytical Method: S 8015 D Prep Method: S 5035
QC Batch: 105257 Date Analyzed: 2013-09-20 Analyzed By: AK
Prep Batch: 89103 Sample Preparation: 2013-09-18 Prepared By: AK

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	U	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.25	mg/Kg	1	2.00	112	70 - 130
4-Bromofluorobenzene (4-BFB)			2.22	mg/Kg	1	2.00	111	70 - 130

Sample: 342063 - S-084703-091713-JF-WSW (3')

Laboratory: Midland

Analysis: BTEX

QC Batch: 105213

Prep Batch: 89103

Analytical Method: S 8021B

Date Analyzed: 2013-09-19

Sample Preparation: 2013-09-18

Prep Method: S 5035

Analyzed By: AK

Prepared By: AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.0200	mg/Kg	1	0.0200
Toluene	U	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	<0.0200	mg/Kg	1	0.0200
Xylene	U	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.05	mg/Kg	1	2.00	102	70 - 130
4-Bromofluorobenzene (4-BFB)			1.87	mg/Kg	1	2.00	94	70 - 130

Sample: 342063 - S-084703-091713-JF-WSW (3')

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 105242

Prep Batch: 89095

Analytical Method: SM 4500-Cl B

Date Analyzed: 2013-09-19

Sample Preparation: 2013-09-18

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	U		<20.0	mg/Kg	5	4.00

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Sample: 342063 - S-084703-091713-JF-WSW (3')

Laboratory: Midland
Analysis: TPH DRO - NEW Analytical Method: S 8015 D Prep Method: N/A
QC Batch: 105216 Date Analyzed: 2013-09-19 Analyzed By: CW
Prep Batch: 89114 Sample Preparation: 2013-09-18 Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	U	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			126	mg/Kg	1	100	126	76.3 - 192.6

Sample: 342063 - S-084703-091713-JF-WSW (3')

Laboratory: Midland
Analysis: TPH GRO Analytical Method: S 8015 D Prep Method: S 5035
QC Batch: 105257 Date Analyzed: 2013-09-20 Analyzed By: AK
Prep Batch: 89103 Sample Preparation: 2013-09-18 Prepared By: AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	U	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.26	mg/Kg	1	2.00	113	70 - 130
4-Bromofluorobenzene (4-BFB)			2.23	mg/Kg	1	2.00	112	70 - 130

Sample: 342064 - S-084703-091713-JF-BS-3 (10')

Laboratory: Midland
Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5035
QC Batch: 105213 Date Analyzed: 2013-09-19 Analyzed By: AK
Prep Batch: 89103 Sample Preparation: 2013-09-18 Prepared By: AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.0200	mg/Kg	1	0.0200
Toluene	U	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	<0.0200	mg/Kg	1	0.0200

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sample 342064 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Xylene	u	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.09	mg/Kg	1	2.00	104	70 - 130
4-Bromofluorobenzene (4-BFB)			1.88	mg/Kg	1	2.00	94	70 - 130

Sample: 342064 - S-084703-091713-JF-BS-3 (10')

Laboratory:	Midland			
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method: N/A
QC Batch:	105242	Date Analyzed:	2013-09-19	Analyzed By: AR
Prep Batch:	89095	Sample Preparation:	2013-09-18	Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<20.0	mg/Kg	5	4.00

Sample: 342064 - S-084703-091713-JF-BS-3 (10')

Laboratory:	Midland			
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method: N/A
QC Batch:	105216	Date Analyzed:	2013-09-19	Analyzed By: CW
Prep Batch:	89114	Sample Preparation:	2013-09-18	Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	u	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			119	mg/Kg	1	100	119	76.3 - 192.6

Sample: 342064 - S-084703-091713-JF-BS-3 (10')

Laboratory:	Midland			
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method: S 5035
QC Batch:	105257	Date Analyzed:	2013-09-20	Analyzed By: AK
Prep Batch:	89103	Sample Preparation:	2013-09-18	Prepared By: AK

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	U	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.22	mg/Kg	1	2.00	111	70 - 130
4-Bromofluorobenzene (4-BFB)			2.17	mg/Kg	1	2.00	108	70 - 130

Sample: 342065 - S-084703-091713-JF-BS-4 (3.5')

Laboratory: Midland

Analysis: BTEX

QC Batch: 105213

Prep Batch: 89103

Analytical Method: S 8021B

Date Analyzed: 2013-09-19

Sample Preparation: 2013-09-18

Prep Method: S 5035

Analyzed By: AK

Prepared By: AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.0200	mg/Kg	1	0.0200
Toluene	U	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	<0.0200	mg/Kg	1	0.0200
Xylene	U	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.07	mg/Kg	1	2.00	104	70 - 130
4-Bromofluorobenzene (4-BFB)			1.92	mg/Kg	1	2.00	96	70 - 130

Sample: 342065 - S-084703-091713-JF-BS-4 (3.5')

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 105242

Prep Batch: 89095

Analytical Method: SM 4500-Cl B

Date Analyzed: 2013-09-19

Sample Preparation: 2013-09-18

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			6710	mg/Kg	10	4.00

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Sample: 342065 - S-084703-091713-JF-BS-4 (3.5')

Laboratory:	Midland		
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D
QC Batch:	105216	Date Analyzed:	2013-09-19
Prep Batch:	89114	Sample Preparation:	2013-09-18
		Prep Method:	N/A
		Analyzed By:	CW
		Prepared By:	CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	U	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			120	mg/Kg	1	100	120	76.3 - 192.6

Sample: 342065 - S-084703-091713-JF-BS-4 (3.5')

Laboratory:	Midland		
Analysis:	TPH GRO	Analytical Method:	S 8015 D
QC Batch:	105257	Date Analyzed:	2013-09-20
Prep Batch:	89103	Sample Preparation:	2013-09-18
		Prep Method:	S 5035
		Analyzed By:	AK
		Prepared By:	AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	U	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.38	mg/Kg	1	2.00	119	70 - 130
4-Bromofluorobenzene (4-BFB)			2.27	mg/Kg	1	2.00	114	70 - 130

Sample: 342066 - S-084703-091713-JF-ESW (3')

Laboratory:	Midland		
Analysis:	BTEX	Analytical Method:	S 8021B
QC Batch:	105258	Date Analyzed:	2013-09-20
Prep Batch:	89103	Sample Preparation:	2013-09-18
		Prep Method:	S 5035
		Analyzed By:	AK
		Prepared By:	AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.0200	mg/Kg	1	0.0200
Toluene	U	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	<0.0200	mg/Kg	1	0.0200

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sample 342066 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Xylene	u	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.04	mg/Kg	1	2.00	102	70 - 130
4-Bromofluorobenzene (4-BFB)			1.88	mg/Kg	1	2.00	94	70 - 130

Sample: 342066 - S-084703-091713-JF-ESW (3')

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 105355 Date Analyzed: 2013-09-23 Analyzed By: AR
Prep Batch: 89209 Sample Preparation: 2013-09-23 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1770	mg/Kg	10	4.00

Sample: 342066 - S-084703-091713-JF-ESW (3')

Laboratory: Midland
Analysis: TPH DRO - NEW Analytical Method: S 8015 D Prep Method: N/A
QC Batch: 105216 Date Analyzed: 2013-09-19 Analyzed By: CW
Prep Batch: 89114 Sample Preparation: 2013-09-18 Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	u	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			126	mg/Kg	1	100	126	76.3 - 192.6

Sample: 342066 - S-084703-091713-JF-ESW (3')

Laboratory: Midland
Analysis: TPH GRO Analytical Method: S 8015 D Prep Method: S 5035
QC Batch: 105257 Date Analyzed: 2013-09-20 Analyzed By: AK
Prep Batch: 89103 Sample Preparation: 2013-09-18 Prepared By: AK

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	U	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.37	mg/Kg	1	2.00	118	70 - 130
4-Bromofluorobenzene (4-BFB)			2.24	mg/Kg	1	2.00	112	70 - 130

Sample: 342067 - S-084703-091713-JF-EWS (3')

Laboratory: Midland

Analysis: BTEX

QC Batch: 105213

Prep Batch: 89103

Analytical Method: S 8021B

Date Analyzed: 2013-09-19

Sample Preparation: 2013-09-18

Prep Method: S 5035

Analyzed By: AK

Prepared By: AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.0200	mg/Kg	1	0.0200
Toluene	U	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	<0.0200	mg/Kg	1	0.0200
Xylene	U	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.14	mg/Kg	1	2.00	107	70 - 130
4-Bromofluorobenzene (4-BFB)			1.94	mg/Kg	1	2.00	97	70 - 130

Sample: 342067 - S-084703-091713-JF-EWS (3')

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 105355

Prep Batch: 89209

Analytical Method: SM 4500-Cl B

Date Analyzed: 2013-09-23

Sample Preparation: 2013-09-23

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1630	mg/Kg	10	4.00

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Sample: 342067 - S-084703-091713-JF-EWS (3')

Laboratory:	Midland		
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D
QC Batch:	105216	Date Analyzed:	2013-09-19
Prep Batch:	89114	Sample Preparation:	2013-09-18
		Prep Method:	N/A
		Analyzed By:	CW
		Prepared By:	CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	U	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			124	mg/Kg	1	100	124	76.3 - 192.6

Sample: 342067 - S-084703-091713-JF-EWS (3')

Laboratory:	Midland		
Analysis:	TPH GRO	Analytical Method:	S 8015 D
QC Batch:	105257	Date Analyzed:	2013-09-20
Prep Batch:	89103	Sample Preparation:	2013-09-18
		Prep Method:	S 5035
		Analyzed By:	AK
		Prepared By:	AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	U	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.47	mg/Kg	1	2.00	124	70 - 130
4-Bromofluorobenzene (4-BFB)			2.38	mg/Kg	1	2.00	119	70 - 130

Sample: 342068 - S-084703-091713-JF-BS-5 (20')

Laboratory:	Midland		
Analysis:	BTEX	Analytical Method:	S 8021B
QC Batch:	105213	Date Analyzed:	2013-09-19
Prep Batch:	89103	Sample Preparation:	2013-09-18
		Prep Method:	S 5035
		Analyzed By:	AK
		Prepared By:	AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.0200	mg/Kg	1	0.0200
Toluene	U	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	<0.0200	mg/Kg	1	0.0200

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sample 342068 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Xylene	U	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.03	mg/Kg	1	2.00	102	70 - 130
4-Bromofluorobenzene (4-BFB)			1.87	mg/Kg	1	2.00	94	70 - 130

Sample: 342068 - S-084703-091713-JF-BS-5 (20')

Laboratory: Midland
Analysis: Chloride (Titration) Analytical Method: SM 4500-Cl B Prep Method: N/A
QC Batch: 105243 Date Analyzed: 2013-09-19 Analyzed By: AR
Prep Batch: 89095 Sample Preparation: 2013-09-18 Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			39.2	mg/Kg	5	4.00

Sample: 342068 - S-084703-091713-JF-BS-5 (20')

Laboratory: Midland
Analysis: TPH DRO - NEW Analytical Method: S 8015 D Prep Method: N/A
QC Batch: 105216 Date Analyzed: 2013-09-19 Analyzed By: CW
Prep Batch: 89114 Sample Preparation: 2013-09-18 Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	U	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			122	mg/Kg	1	100	122	76.3 - 192.6

Sample: 342068 - S-084703-091713-JF-BS-5 (20')

Laboratory: Midland
Analysis: TPH GRO Analytical Method: S 8015 D Prep Method: S 5035
QC Batch: 105257 Date Analyzed: 2013-09-20 Analyzed By: AK
Prep Batch: 89103 Sample Preparation: 2013-09-18 Prepared By: AK

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	U	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.38	mg/Kg	1	2.00	119	70 - 130
4-Bromofluorobenzene (4-BFB)			2.32	mg/Kg	1	2.00	116	70 - 130

Sample: 342069 - S-084703-091713-JF-BS-6 (15')

Laboratory: Midland
Analysis: BTEX
QC Batch: 105213
Prep Batch: 89103

Analytical Method: S 8021B
Date Analyzed: 2013-09-19
Sample Preparation: 2013-09-18

Prep Method: S 5035
Analyzed By: AK
Prepared By: AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene	U	1	<0.0200	mg/Kg	1	0.0200
Toluene	U	1	<0.0200	mg/Kg	1	0.0200
Ethylbenzene	U	1	<0.0200	mg/Kg	1	0.0200
Xylene	U	1	<0.0200	mg/Kg	1	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.04	mg/Kg	1	2.00	102	70 - 130
4-Bromofluorobenzene (4-BFB)			1.89	mg/Kg	1	2.00	94	70 - 130

Sample: 342069 - S-084703-091713-JF-BS-6 (15')

Laboratory: Midland
Analysis: Chloride (Titration)
QC Batch: 105243
Prep Batch: 89095

Analytical Method: SM 4500-Cl B
Date Analyzed: 2013-09-19
Sample Preparation: 2013-09-18

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	U		<20.0	mg/Kg	5	4.00

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Sample: 342069 - S-084703-091713-JF-BS-6 (15')

Laboratory: Midland

Analysis: TPH DRO - NEW

QC Batch: 105216

Prep Batch: 89114

Analytical Method: S 8015 D

Date Analyzed: 2013-09-19

Sample Preparation: 2013-09-18

Prep Method: N/A

Analyzed By: CW

Prepared By: CW

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO	U	1	<50.0	mg/Kg	1	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			131	mg/Kg	1	100	131	76.3 - 192.6

Sample: 342069 - S-084703-091713-JF-BS-6 (15')

Laboratory: Midland

Analysis: TPH GRO

QC Batch: 105257

Prep Batch: 89103

Analytical Method: S 8015 D

Date Analyzed: 2013-09-20

Sample Preparation: 2013-09-18

Prep Method: S 5035

Analyzed By: AK

Prepared By: AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	U	1	<4.00	mg/Kg	1	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.38	mg/Kg	1	2.00	119	70 - 130
4-Bromofluorobenzene (4-BFB)			2.16	mg/Kg	1	2.00	108	70 - 130

Method Blanks

Method Blank (1) QC Batch: 105213

QC Batch: 105213
Prep Batch: 89103

Date Analyzed: 2013-09-19
QC Preparation: 2013-09-18

Analyzed By: AK
Prepared By: AK

Parameter	Flag	Cert	MDL Result	Units	RL
Benzene		1	<0.00810	mg/Kg	0.02
Toluene		1	<0.00750	mg/Kg	0.02
Ethylbenzene		1	<0.00730	mg/Kg	0.02
Xylene		1	<0.00700	mg/Kg	0.02

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.93	mg/Kg	1	2.00	96	70 - 130
4-Bromofluorobenzene (4-BFB)			1.73	mg/Kg	1	2.00	86	70 - 130

Method Blank (1) QC Batch: 105216

QC Batch: 105216
Prep Batch: 89114

Date Analyzed: 2013-09-19
QC Preparation: 2013-09-18

Analyzed By: CW
Prepared By: CW

Parameter	Flag	Cert	MDL Result	Units	RL
DRO		1	12.8	mg/Kg	50

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			108	mg/Kg	1	100	108	64.1 - 164.4

Method Blank (1) QC Batch: 105242

QC Batch: 105242
Prep Batch: 89095

Date Analyzed: 2013-09-19
QC Preparation: 2013-09-18

Analyzed By: AR
Prepared By: AR

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Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 105213
Prep Batch: 89103

Date Analyzed: 2013-09-19
QC Preparation: 2013-09-18

Analyzed By: AK
Prepared By: AK

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.56	mg/Kg	1	2.00	<0.00810	78	70 - 130
Toluene		1	1.59	mg/Kg	1	2.00	<0.00750	80	70 - 130
Ethylbenzene		1	1.56	mg/Kg	1	2.00	<0.00730	78	70 - 130
Xylene		1	4.80	mg/Kg	1	6.00	<0.00700	80	70 - 130

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
Benzene		1	1.62	mg/Kg	1	2.00	<0.00810	81	70 - 130	4	20
Toluene		1	1.63	mg/Kg	1	2.00	<0.00750	82	70 - 130	2	20
Ethylbenzene		1	1.62	mg/Kg	1	2.00	<0.00730	81	70 - 130	4	20
Xylene		1	4.96	mg/Kg	1	6.00	<0.00700	83	70 - 130	3	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
Trifluorotoluene (TFT)	2.01	2.05	mg/Kg	1	2.00	100	102	70 - 130
4-Bromofluorobenzene (4-BFB)	1.76	1.82	mg/Kg	1	2.00	88	91	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 105216
Prep Batch: 89114

Date Analyzed: 2013-09-19
QC Preparation: 2013-09-18

Analyzed By: CW
Prepared By: CW

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	304	mg/Kg	1	250	12.8	116	53.8 - 129

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

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control spikes continued ...

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO		1	287	mg/Kg	1	250	12.8	110	53.8 - 129	6	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-Tricosane	128	122	mg/Kg	1	100	128	122	61.3 - 170.4

Laboratory Control Spike (LCS-1)

QC Batch: 105242
Prep Batch: 89095

Date Analyzed: 2013-09-19
QC Preparation: 2013-09-18

Analyzed By: AR
Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2400	mg/Kg	1	2500	<3.85	96	89.7 - 115.9

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
Chloride			2460	mg/Kg	1	2500	<3.85	98	89.7 - 115.9	2	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: 105243
Prep Batch: 89095

Date Analyzed: 2013-09-19
QC Preparation: 2013-09-18

Analyzed By: AR
Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2510	mg/Kg	1	2500	<3.85	100	89.7 - 115.9

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
Chloride			2380	mg/Kg	1	2500	<3.85	95	89.7 - 115.9	5	20

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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: 105257
Prep Batch: 89103

Date Analyzed: 2013-09-20
QC Preparation: 2013-09-18

Analyzed By: AK
Prepared By: AK

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	18.0	mg/Kg	1	20.0	<2.32	90	70 - 130

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
GRO		1	18.1	mg/Kg	1	20.0	<2.32	90	70 - 130	1	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
Trifluorotoluene (TFT)	2.48	2.51	mg/Kg	1	2.00	124	126	70 - 130
4-Bromofluorobenzene (4-BFB)	2.57	2.61	mg/Kg	1	2.00	128	130	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 105258
Prep Batch: 89103

Date Analyzed: 2013-09-20
QC Preparation: 2013-09-18

Analyzed By: AK
Prepared By: AK

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.58	mg/Kg	1	2.00	<0.00810	79	70 - 130
Toluene		1	1.61	mg/Kg	1	2.00	<0.00750	80	70 - 130
Ethylbenzene		1	1.61	mg/Kg	1	2.00	<0.00730	80	70 - 130
Xylene		1	4.96	mg/Kg	1	6.00	<0.00700	83	70 - 130

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
Benzene		1	1.64	mg/Kg	1	2.00	<0.00810	82	70 - 130	4	20
Toluene		1	1.67	mg/Kg	1	2.00	<0.00750	84	70 - 130	4	20
Ethylbenzene		1	1.67	mg/Kg	1	2.00	<0.00730	84	70 - 130	3	20
Xylene		1	5.13	mg/Kg	1	6.00	<0.00700	86	70 - 130	4	20

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

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Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.07	2.08	mg/Kg	1	2.00	104	104	70 - 130
4-Bromofluorobenzene (4-BFB)	2.03	2.04	mg/Kg	1	2.00	102	102	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 105355
Prep Batch: 89209

Date Analyzed: 2013-09-23
QC Preparation: 2013-09-23

Analyzed By: AR
Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2420	mg/Kg	1	2500	<3.85	97	89.7 - 115.9

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
Chloride			2530	mg/Kg	1	2500	<3.85	101	89.7 - 115.9	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: 342063

QC Batch: 105213
Prep Batch: 89103

Date Analyzed: 2013-09-19
QC Preparation: 2013-09-18

Analyzed By: AK
Prepared By: AK

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.62	mg/Kg	1	2.00	<0.00810	81	70 - 130
Toluene		1	1.65	mg/Kg	1	2.00	<0.00750	82	70 - 130
Ethylbenzene		1	1.63	mg/Kg	1	2.00	<0.00730	82	70 - 130
Xylene		1	5.01	mg/Kg	1	6.00	<0.00700	84	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	1.57	mg/Kg	1	2.00	<0.00810	78	70 - 130	3	20
Toluene		1	1.58	mg/Kg	1	2.00	<0.00750	79	70 - 130	4	20
Ethylbenzene		1	1.58	mg/Kg	1	2.00	<0.00730	79	70 - 130	3	20
Xylene		1	4.82	mg/Kg	1	6.00	<0.00700	80	70 - 130	4	20

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

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Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.00	1.97	mg/Kg	1	2	100	98	70 - 130
4-Bromofluorobenzene (4-BFB)	1.97	1.89	mg/Kg	1	2	98	94	70 - 130

Matrix Spike (MS-1) Spiked Sample: 342058

QC Batch: 105216
Prep Batch: 89114

Date Analyzed: 2013-09-19
QC Preparation: 2013-09-18

Analyzed By: CW
Prepared By: CW

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	314	mg/Kg	1	250	<10.2	126	29 - 168.5

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
DRO		1	315	mg/Kg	1	250	<10.2	126	29 - 168.5	0	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-Tricosane	127	129	mg/Kg	1	100	127	129	59.5 - 168.9

Matrix Spike (MS-1) Spiked Sample: 342067

QC Batch: 105242
Prep Batch: 89095

Date Analyzed: 2013-09-19
QC Preparation: 2013-09-18

Analyzed By: AR
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			3210	mg/Kg	5	2500	601	104	78.9 - 121

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
Chloride			3100	mg/Kg	5	2500	601	100	78.9 - 121	4	20

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

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Matrix Spike (MS-1) Spiked Sample: 342146

QC Batch: 105243
Prep Batch: 89095

Date Analyzed: 2013-09-19
QC Preparation: 2013-09-18

Analyzed By: AR
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			4530	mg/Kg	10	2500	1840	108	78.9 - 121

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 Limit
Chloride			4460	mg/Kg	10	2500	1840	105	78.9 - 121	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:

QC Batch: 105257
Prep Batch: 89103

Date Analyzed: 2013-09-20
QC Preparation: 2013-09-18

Analyzed By: AK
Prepared By: AK

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	15.7	mg/Kg	1	20.0	<2.32	78	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 Limit
GRO		1	16.0	mg/Kg	1	20.0	<2.32	80	70 - 130	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
Trifluorotoluene (TFT)	2.20	2.20	mg/Kg	1	2	110	110	70 - 130
4-Bromofluorobenzene (4-BFB)	2.31	2.37	mg/Kg	1	2	116	118	70 - 130

Matrix Spike (MS-1) Spiked Sample: 342066

QC Batch: 105258
Prep Batch: 89103

Date Analyzed: 2013-09-20
QC Preparation: 2013-09-18

Analyzed By: AK
Prepared By: AK

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Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.63	mg/Kg	1	2.00	<0.00810	82	70 - 130
Toluene		1	1.66	mg/Kg	1	2.00	<0.00750	83	70 - 130
Ethylbenzene		1	1.66	mg/Kg	1	2.00	<0.00730	83	70 - 130
Xylene		1	5.10	mg/Kg	1	6.00	<0.00700	85	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	1.59	mg/Kg	1	2.00	<0.00810	80	70 - 130	2	20
Toluene		1	1.62	mg/Kg	1	2.00	<0.00750	81	70 - 130	2	20
Ethylbenzene		1	1.63	mg/Kg	1	2.00	<0.00730	82	70 - 130	2	20
Xylene		1	4.98	mg/Kg	1	6.00	<0.00700	83	70 - 130	2	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
Trifluorotoluene (TFT)	2.09	2.03	mg/Kg	1	2	104	102	70 - 130
4-Bromofluorobenzene (4-BFB)	1.97	1.93	mg/Kg	1	2	98	96	70 - 130

Matrix Spike (MS-1) Spiked Sample: 342513

QC Batch: 105355
Prep Batch: 89209

Date Analyzed: 2013-09-23
QC Preparation: 2013-09-23

Analyzed By: AR
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2770	mg/Kg	5	2500	100	107	78.9 - 121

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
Chloride			2650	mg/Kg	5	2500	100	102	78.9 - 121	4	20

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

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Calibration Standards

Standard (CCV-1)

QC Batch: 105213

Date Analyzed: 2013-09-19

Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.0965	96	80 - 120	2013-09-19
Toluene		1	mg/kg	0.100	0.0963	96	80 - 120	2013-09-19
Ethylbenzene		1	mg/kg	0.100	0.0912	91	80 - 120	2013-09-19
Xylene		1	mg/kg	0.300	0.278	93	80 - 120	2013-09-19

Standard (CCV-2)

QC Batch: 105213

Date Analyzed: 2013-09-19

Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.0899	90	80 - 120	2013-09-19
Toluene		1	mg/kg	0.100	0.0896	90	80 - 120	2013-09-19
Ethylbenzene		1	mg/kg	0.100	0.0844	84	80 - 120	2013-09-19
Xylene		1	mg/kg	0.300	0.257	86	80 - 120	2013-09-19

Standard (CCV-1)

QC Batch: 105216

Date Analyzed: 2013-09-19

Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	297	119	80 - 120	2013-09-19

Standard (CCV-2)

QC Batch: 105216

Date Analyzed: 2013-09-19

Analyzed By: CW

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Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	291	116	80 - 120	2013-09-19

Standard (CCV-3)

QC Batch: 105216

Date Analyzed: 2013-09-19

Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	288	115	80 - 120	2013-09-19

Standard (CCV-1)

QC Batch: 105242

Date Analyzed: 2013-09-19

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2013-09-19

Standard (CCV-2)

QC Batch: 105242

Date Analyzed: 2013-09-19

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.6	100	85 - 115	2013-09-19

Standard (CCV-1)

QC Batch: 105243

Date Analyzed: 2013-09-19

Analyzed By: AR

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Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2013-09-19

Standard (CCV-2)

QC Batch: 105243

Date Analyzed: 2013-09-19

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	100	100	85 - 115	2013-09-19

Standard (CCV-1)

QC Batch: 105257

Date Analyzed: 2013-09-20

Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	1.06	106	80 - 120	2013-09-20

Standard (CCV-2)

QC Batch: 105257

Date Analyzed: 2013-09-20

Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	0.908	91	80 - 120	2013-09-20

Standard (CCV-3)

QC Batch: 105257

Date Analyzed: 2013-09-20

Analyzed By: AK

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Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	0.929	93	80 - 120	2013-09-20

Standard (CCV-1)

QC Batch: 105258

Date Analyzed: 2013-09-20

Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.0925	92	80 - 120	2013-09-20
Toluene		1	mg/kg	0.100	0.0921	92	80 - 120	2013-09-20
Ethylbenzene		1	mg/kg	0.100	0.0885	88	80 - 120	2013-09-20
Xylene		1	mg/kg	0.300	0.270	90	80 - 120	2013-09-20

Standard (CCV-2)

QC Batch: 105258

Date Analyzed: 2013-09-20

Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.0936	94	80 - 120	2013-09-20
Toluene		1	mg/kg	0.100	0.0935	94	80 - 120	2013-09-20
Ethylbenzene		1	mg/kg	0.100	0.0899	90	80 - 120	2013-09-20
Xylene		1	mg/kg	0.300	0.274	91	80 - 120	2013-09-20

Standard (CCV-1)

QC Batch: 105355

Date Analyzed: 2013-09-23

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.4	99	85 - 115	2013-09-23

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Standard (CCV-2)

QC Batch: 105355

Date Analyzed: 2013-09-23

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2013-09-23

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	NELAP	T104704392-12-4	Midland

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 then 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.
U	The analyte is not detected above the SDL

Attachments

Report Date: September 24, 2013
084703

Work Order: 13091811
Cimarex/Red Hills 28 SWD

Page Number: 40 of 40
Lea Co, NM

The scanned attachments will follow this page.
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BioAqualic Testing
2501 Mayes Rd., Ste 100
Carrollton, Texas 75006
Tel (972) 242-7750

Company Name: **CRA Inc** Phone #: **432-686-0086**

Address: (Street, City, Zip) Fax #:

2135 S. Loop 250 West, Midland, TX 79703

Contact Person: **John Ferguson** E-mail: **ferguson@cravorld.com**

Invoice to: (If different from above)

Project #: **084703** Project Name: **Cimarex Energy Company - Red Hills 28 SWD**

Project Location (including state): **Lea County, NM** Sampler Signature: *John Ferguson*

Field Code: **S-084703-091713 -**

LAB # **063** JF-WSW (3')

LAB # **064** JF-BS-3 (10')

LAB # **065** JF-BS-4 (3.5')

LAB # **066** JF-ESW (3')

LAB # **067** JF-EWS (3')

Volume / Amount

CONTAINERS

MATRIX

WATER

SOIL

AIR

SLUDGE

HCl

HNO₃

H₂SO₄

NaOH

ICE

NONE

PRESERVATIVE METHOD

DATE

TIME

SAMPLING

MTBE 8021 / 602 / 8260 / 624

BTEX 8021 / 602 / 8260 / 624

TPH 418.1 / TX1005 / TX1005 Ext(C35)

TPH 8015 GRO / DRO / TVHC

PAH 8270 / 625

Total Metals Ag As Ba Cd Cr Pb Se Hg 6010/200.7

TCLP Volatiles

TCLP Semi Volatiles

TCLP Pesticides

RCI

GC/MS Vol. 8260 / 624

GC/MS Semi. Vol. 8270 / 625

PCBs 8082 / 608

Pesticides 8081 / 608

BOD, TSS, pH

Moisture Content

Cl⁻, F⁻, SO₄²⁻, NO₃⁻, NO₂⁻, N⁻, PO₄³⁻, P, Alkalinity

Na, Ca, Mg, K, TDS, EC

Turn Around Time if different from standard

ANALYSIS REQUEST

(Circle or Specify Method No.)

REMARKS:

LAB USE

ONLY

INST

OBS

COR

Time:

Date:

Company:

Received by:

Time:

Date:

Company:

Received by:

Time:

Date:

Company:

Received by:

Time:

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Company:

Received by:

Time:

Date:

Company:

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

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

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Carrollton, Texas 75006
Tel (972) 242-7750

ANALYSIS REQUEST
(Circle or Specify Method No.)

if different from

N, NO₂-N, PO₄-P, EC

608

8270 / 625

/ 624

es

a Cd Cr Pb Sb H

s Ba Cd Cr P

DRO TVHC

05 / TX1005

/ 8260 / 624

02 / 8260 / 624

Parameter	2 day	7 day
MTBE 8021 / 60	✓	✓
BTEX 8021 / 602	✓	✓
TPH 418.1 / TX10		
TPH 8015 GRO /	✓	✓
PAH 8270 / 625		
Total Metals Ag As B		
TCLP Metals Ag A		
TCLP Volatiles		
TCLP Semi Volatile		
TCLP Pesticides		
RCI		
GC/MS Vol. 8260		
GC/MS Semi. Vol.		
PCB's 8082 / 608		
Pesticides 8081 /		
BOD, TSS, pH		
Moisture Content		
Cl, F, SO ₄ , NO ₃ -N	✓	✓
Na, Ca, Mg, K, TD		
Turn Around Time	2 day	7 day
Hold		

[illegible]

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Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

John Fergerson
CRA-Midland
2135 South Loop 250 West
Midland, TX, 79703

Report Date: September 27, 2013

Work Order: 13092607



Project Location: Lea Co, NM
Project Name: Cimarex/Red Hills 28 SWD
Project Number: 084703

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
342743	S-084703-092413-JF-ESW (3')	soil	2013-09-24	10:30	2013-09-26

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 9 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director
Dr. Michael Abel, Project Manager

Report Contents

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Case Narrative

Samples for project Cimarex/Red Hills 28 SWD were received by TraceAnalysis, Inc. on 2013-09-26 and assigned to work order 13092607. Samples for work order 13092607 were received intact at a temperature of 4.5 C.

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

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
Chloride (Titration)	SM 4500-Cl B	89318	2013-09-26 at 09:05	105512	2013-09-27 at 10:22

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 13092607 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.

Report Date: September 27, 2013
084703

Work Order: 13092607
Cimarex/Red Hills 28 SWD

Page Number: 4 of 9
Lea Co, NM

Analytical Report

Sample: 342743 - S-084703-092413-JF-ESW (3')

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-09-27	Analyzed By:	AR
QC Batch:	105512	Sample Preparation:	2013-09-26	Prepared By:	AR
Prep Batch:	89318				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			153	mg/Kg	5	4.00

Report Date: September 27, 2013
084703

Work Order: 13092607
Cimarex/Red Hills 28 SWD

Page Number: 5 of 9
Lea Co, NM

Method Blanks

Method Blank (1) QC Batch: 105512

QC Batch: 105512
Prep Batch: 89318

Date Analyzed: 2013-09-27
QC Preparation: 2013-09-26

Analyzed By: AR
Prepared By: AR

Parameter	Flag	Cert	MDL Result	Units	RL
Chloride			<3.85	mg/Kg	4

Report Date: September 27, 2013
084703

Work Order: 13092607
Cimarex/Red Hills 28 SWD

Page Number: 6 of 9
Lea Co, NM

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 105512
Prep Batch: 89318

Date Analyzed: 2013-09-27
QC Preparation: 2013-09-26

Analyzed By: AR
Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2520	mg/Kg	1	2500	<3.85	101	89.7 - 115.9

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
Chloride			2390	mg/Kg	1	2500	<3.85	96	89.7 - 115.9	5	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: 342601

QC Batch: 105512
Prep Batch: 89318

Date Analyzed: 2013-09-27
QC Preparation: 2013-09-26

Analyzed By: AR
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			6750	mg/Kg	10	2500	4130	105	78.9 - 121

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
Chloride			6520	mg/Kg	10	2500	4130	96	78.9 - 121	4	20

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

Report Date: September 27, 2013
084703

Work Order: 13092607
Cimarex/Red Hills 28 SWD

Page Number: 7 of 9
Lea Co, NM

Calibration Standards

Standard (CCV-1)

QC Batch: 105512

Date Analyzed: 2013-09-27

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.2	99	85 - 115	2013-09-27

Standard (CCV-2)

QC Batch: 105512

Date Analyzed: 2013-09-27

Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2013-09-27

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

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 then 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.
U	The analyte is not detected above the SDL

Attachments

Report Date: September 27, 2013
084703

Work Order: 13092607
Cimarex/Red Hills 28 SWD

Page Number: 9 of 9
Lea Co, NM

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email: lab@traceanalysis.com

Company Name: **CRA Inc**
 Address: (Street, City, Zip) **2135 S. Loop West, Midland, TX**
 Phone #: **432-686-6086**
 Fax #: **79763**
 Contact Person: **John Ferguson**
 Invoice to: **John Ferguson**
 E-mail: **(If different from above)**

Project #:	084703	Project Name:	Cinacex Energy Company - Red Hills 28 SWP
Project Location (including state):	Lea County, New Mexico	Sampler Signature:	<i>[Signature]</i>
		PRESERVATIVE	

[illegible][illegible]

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	INST	OBS	COR	LAB USE ONLY	REMARKS:
Whitby	CRA	9/24/13	10:12	[Signature]	TA	9/24/13	10:10	INST	OBS	COR	LAB USE ONLY	Dudlad - all
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	INST	OBS	COR	LAB USE ONLY	
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	INST	OBS	COR	LAB USE ONLY	

INST Y / N / N

Headspace Y / N / NA

Log-in-Review

☐ Dry Weight Basis Required

☐ TRRP Report Required

☐ Check if Special Reporting Limits Are Needed