

# SITE INFORMATION

## Report Type: Closure Report

### General Site Information:

Site:	SRO 102 SWD					
Company:	COG Operating LLC					
Section, Township and Range	Unit G	Sec 16	T26S	R28E		
Lease Number:	API-30-015-21398					
County:	Eddy County					
GPS:	32.04381° N			104.09047° W		
Surface Owner:	State					
Mineral Owner:						
Directions:	South of Malaga at the intersection of Hwy 285 and CR 274 (White City Rd.) travel west on CR 274 for 2.0 miles, turn left and travel 1.6 miles, turn right and travel 0.1 miles to site.					

### Release Data:

<b>Date Released:</b>	12/31/2013	2/21/2013
<b>Type Release:</b>	Produced Water	Produced Water
<b>Source of Contamination:</b>	Header	Durco Pump Discharge
<b>Fluid Released:</b>	320 bbls	20 bbls
<b>Fluids Recovered:</b>	280 bbls	15 bbls

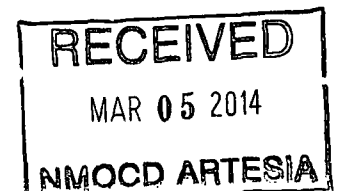
### Official Communication:

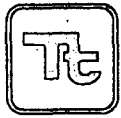
<b>Name:</b>	Robert McNeill	Ike Tavaréz
<b>Company:</b>	COG Operating, LLC	Tetra Tech
<b>Address:</b>	One Concho Center 600 W. Illinois Ave.	4000 N. Big Spring Suite 401
<b>City:</b>	Midland Texas, 79701	Midland, Texas
<b>Phone number:</b>	(432) 686-3023	(432) 682-4559
<b>Fax:</b>	(432) 684-7137	
<b>Email:</b>	rmcneill@conchoresources.com	ike.tavaréz@tetrattech.com

### Ranking Criteria

<b>Depth to Groundwater:</b>	<b>Ranking Score</b>	<b>Site Data</b>
<50 ft	20	
50-99 ft	10	10
>100 ft.	0	
<b>Wellhead Protection:</b>	<b>Ranking Score</b>	<b>Site Data</b>
Water Source <1,000 ft., Private <200 ft.	20	
Water Source >1,000 ft., Private >200 ft.	0	0
<b>Surface Body of Water:</b>	<b>Ranking Score</b>	<b>Site Data</b>
<200 ft.	20	
200 ft - 1,000 ft.	10	
>1,000 ft.	0	0
<b>Total Ranking Score:</b>		<b>10</b>

Acceptable Soil RRAL (mg/kg)		
Benzene	Total BTEX	TPH
10	50	1,000





TETRA TECH

November 20, 2013

Mr. Mike Bratcher  
Environmental Engineer Specialist  
Oil Conservation Division, District 2  
811 S. First Street  
Artesia, New Mexico 88210

**Re: Work Plan for the COG Operating LLC., SRO 102 SWD, Unit G,  
Section 16, Township 26 South, Range 28 East, Eddy County,  
New Mexico.**

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC. (COG) to assess two (2) spills from the SRO 102 SWD located in Unit G, Section 16, Township 26 South, Range 28 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.04381°, W 104.09047°. The site location is shown on Figures 1 and 2.

## **Background**

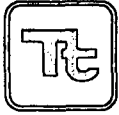
### **Spill #1**

According to the State of New Mexico C-141 Initial Report, the leak was discovered on December 31, 2012, and released approximately three hundred and twenty (320) barrels of produced water from a the header. To alleviate the problem, COG personnel repaired the header. Two hundred and eighty (280) barrels of standing fluids were recovered. The spill initiated on the backside of the SWD in the secondary containment firewall, affecting an area approximately 10' X 340' around the SWD. The release then migrated south out into the pasture affecting an area approximately 35' x 100' and 5' x 180'.

**Tetra Tech**

4000 North Big Spring, Suite 401, Midland, TX 79705

Tel 432.682.4559 Fax 432.682.3946 [www.tetratech.com](http://www.tetratech.com)



## **Spill #2**

According to the State of New Mexico C-141 Initial Report, on February 21, 2013, a leak was discovered from a Durco pump discharge 3X2 swage that released twenty (20) barrels of produced water. Fifteen (15) barrels of fluid were recovered with a vacuum truck. The majority of the release remained inside the lined facility. However, the release breached the fire wall and affected an area measuring approximately 60' X 15' on the pad. The initial C-141 forms are enclosed in Appendix A.

## **Hydrogeology and Groundwater**

According to the Geology and Groundwater Resources of Eddy County, New Mexico (Report 3), the Rustler and Castile formation (Ochoa Series) is present west and east of the Pecos River. The Salado formation overlies the Castile formation east of the Pecos River and was removed by solution west of the river. The Rustler and Castile formations consist of anhydrite, gypsum, inter-bedded sandy clay and beds of dolomite. Groundwater from the Castile and Rustler formations west of the Pecos River is historically high in chloride and sulfate concentrations which increase towards the river.

According to the USGS, no water wells are listed in Section 16. One water well is reported in Section 18, with a depth to groundwater of 25' bgs. According to the NMOCD groundwater map the reported depth to groundwater in this area is approximately 80.0' below surface. The groundwater data is shown in Appendix B

## **Regulatory**

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 1,000 mg/kg.



## **Spill Assessment and Analytical Results**

On January 24, 2013, Tetra Tech personnel inspected and sampled the spill area. Due to a previous excavation and liners being installed, only three (3) trenches (T-1, T-2, and T-3) were installed behind the SWD battery using a backhoe to assess the impacted soils at depths from 3.0' to 6.0' below surface. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0.

Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The results of the sampling are summarized in Table 1. The trench locations are shown on Figure 3.

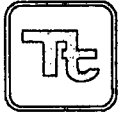
Referring to Table 1, none of the samples exceeded the TPH or Total BTEX RRAL. Elevated chloride concentrations were detected in T-1 and T-2, with chloride highs of 5,690 mg/kg at 1.0', and 1,170 mg/kg at 1.0', respectively. The chloride concentrations declined to a depth of 2.0' below surface and were vertically defined. The area of T-3 had elevated chloride concentrations from 0 to 4.0' below surface with a chloride high of 11,400 mg/kg at 1.0'. The impact was vertically defined at a depth of 5.0' below surface.

## **Site Remediation and Conclusion**

On May 28, 2013, Tetra Tech personnel supervised the excavation of the impacted soils. At Spill #1, the areas of T-1 and T-2 were excavated to 1.0' below surface, and T-3 was excavated to a depth of 5.0' below surface. The excavated areas and depths are highlighted in Table 1 and shown on Figure 4.

Using a backhoe, a trench was installed in the Spill #2 area in front of the SWD to vertically define the spill. Elevated chloride concentrations were detected from 1.0' to 8.0' below surface with concentrations ranging from 5,000 mg/kg to 1,140 mg/kg. The chloride concentration declined with depth to 944 mg/kg at 9.0' below surface. Based on the results, the area was excavated to a depth of approximately 8.0' below surface. The excavated depths are highlighted in Table 2 and show on Figure 4.

Once excavated to appropriate depths, all areas were backfilled with clean material and brought to surface grade. 400 yards of excavated soil were transported to the proper disposal.



TETRA TECH

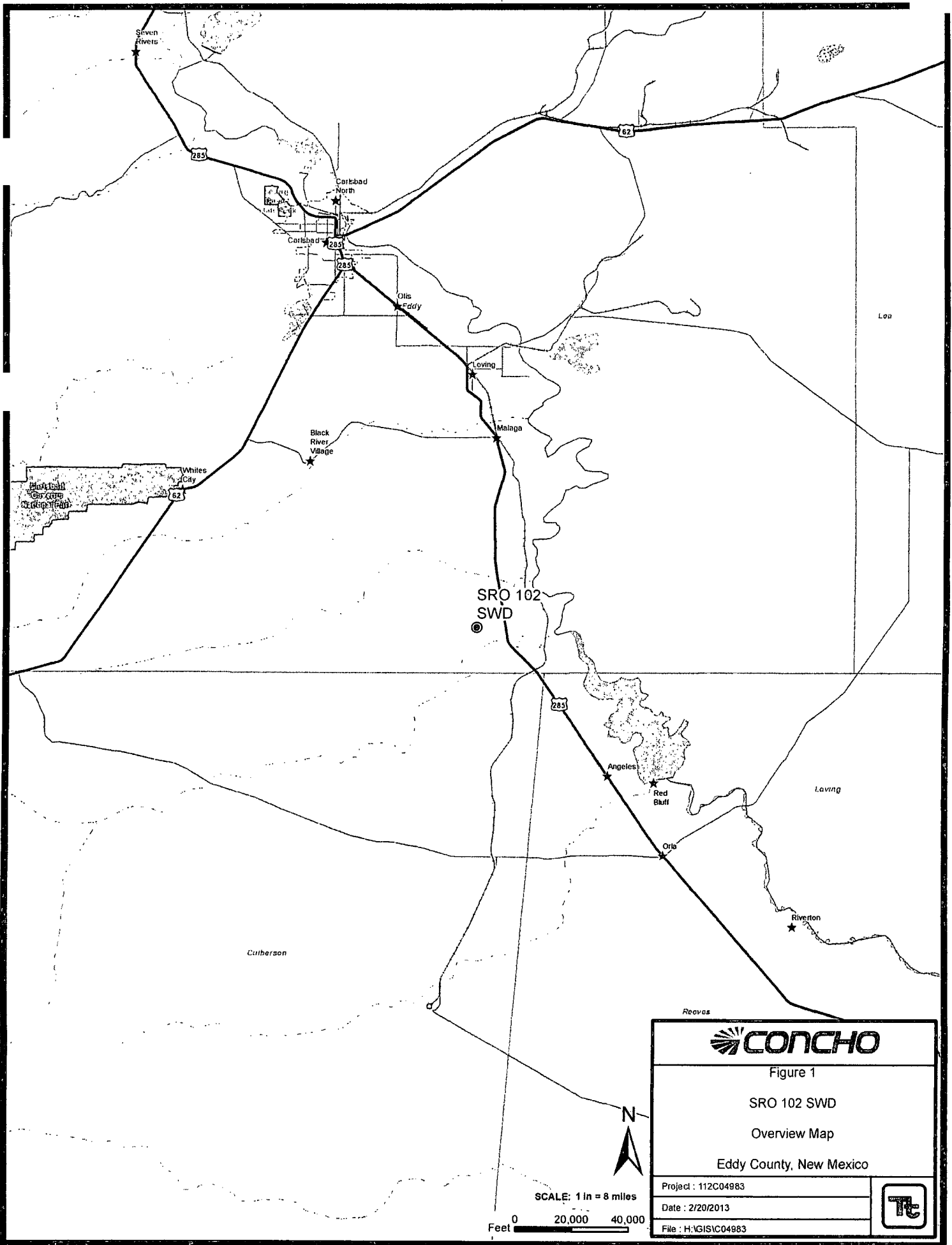
Based on the remedial actions taken, COG requests closure of this site. The Final C-141s are enclosed in Appendix A. If you have any questions or comments concerning the assessment or the remediation activities for this site, please call me at (432) 682-4559.

Respectfully submitted,

Marcus Kujawski  
Staff Scientist

cc: Robert McNeill – COG

## Figures



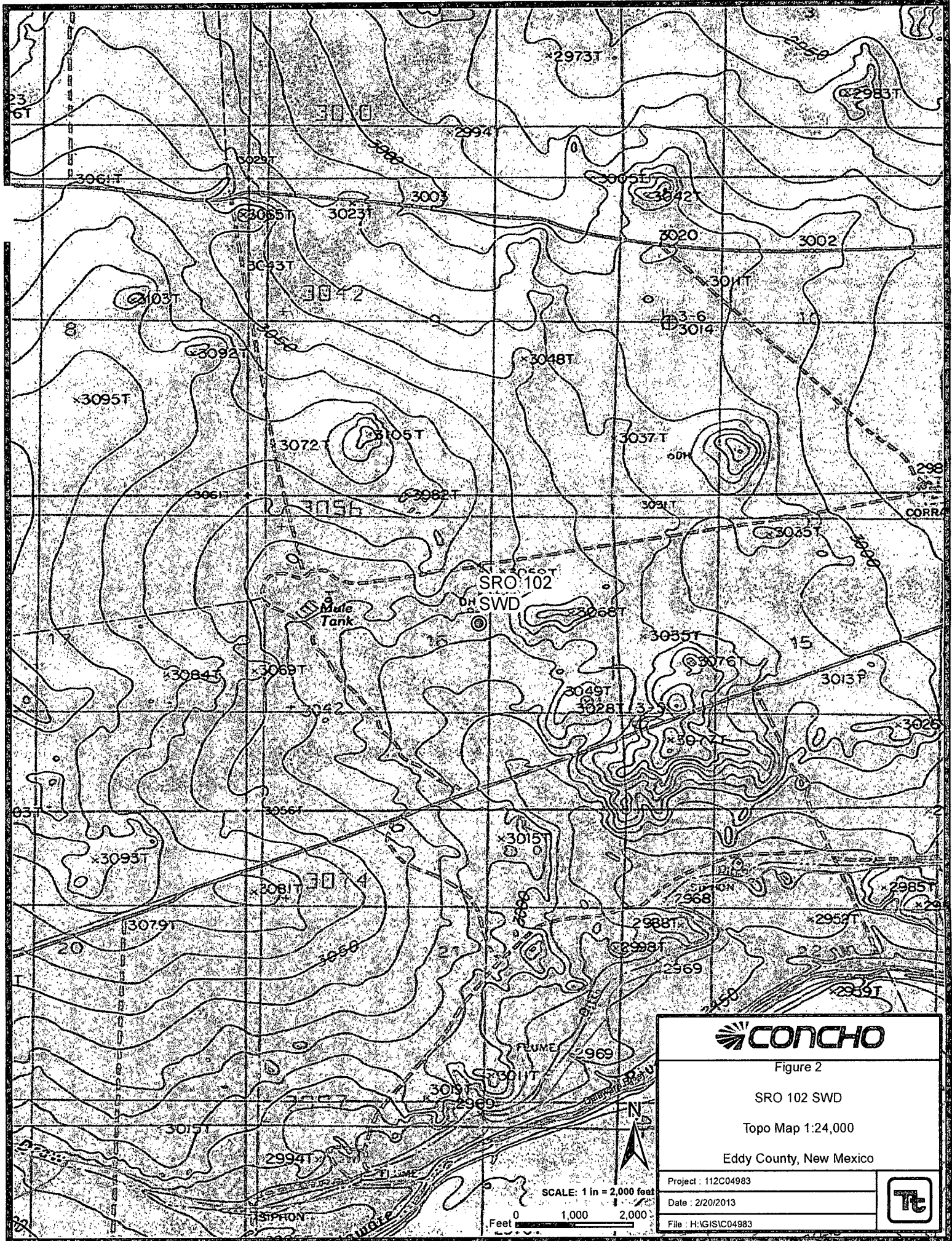


Figure 2

SRO 102 SWD

Topo Map 1:24,000

Eddy County, New Mexico

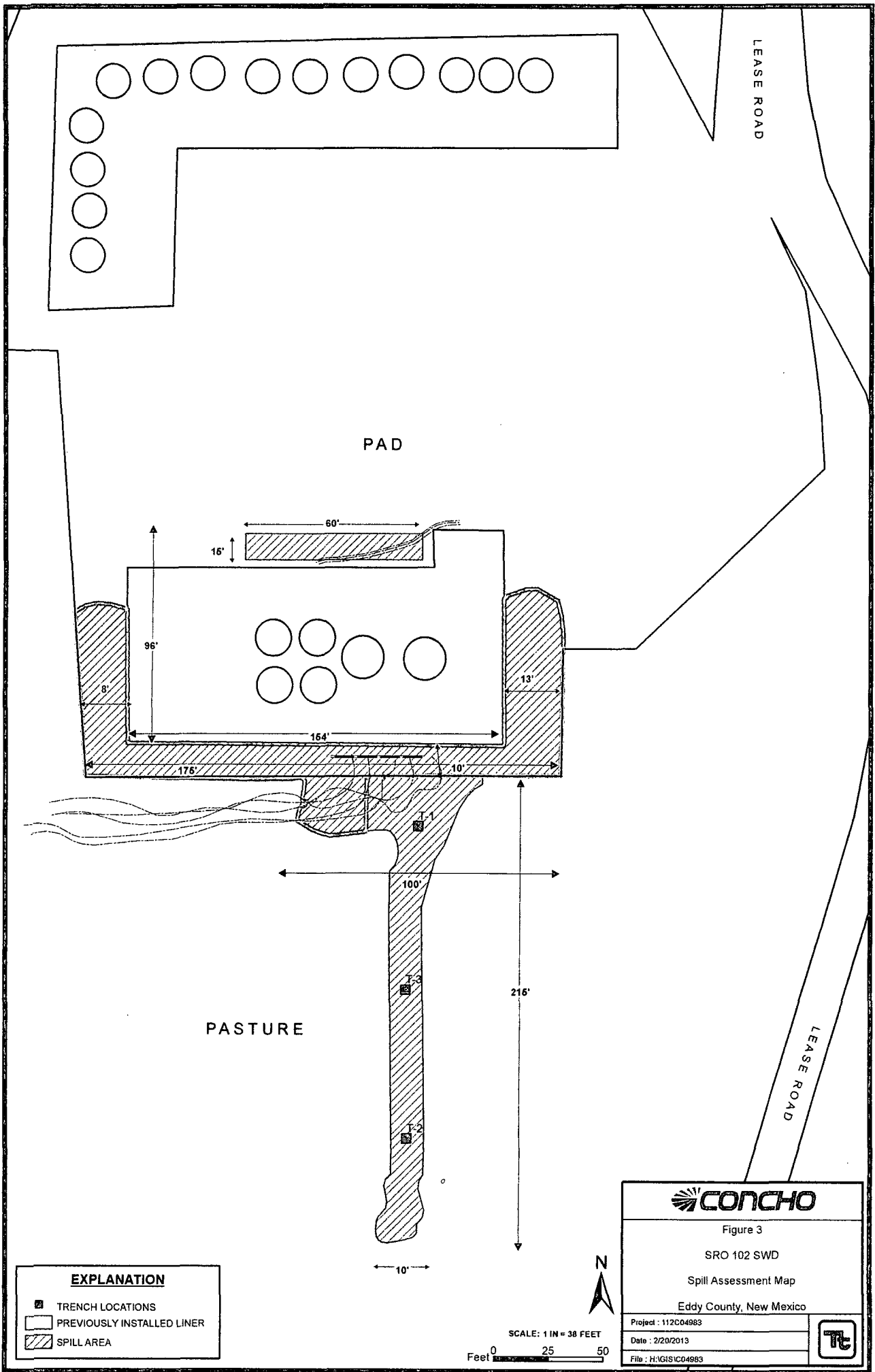
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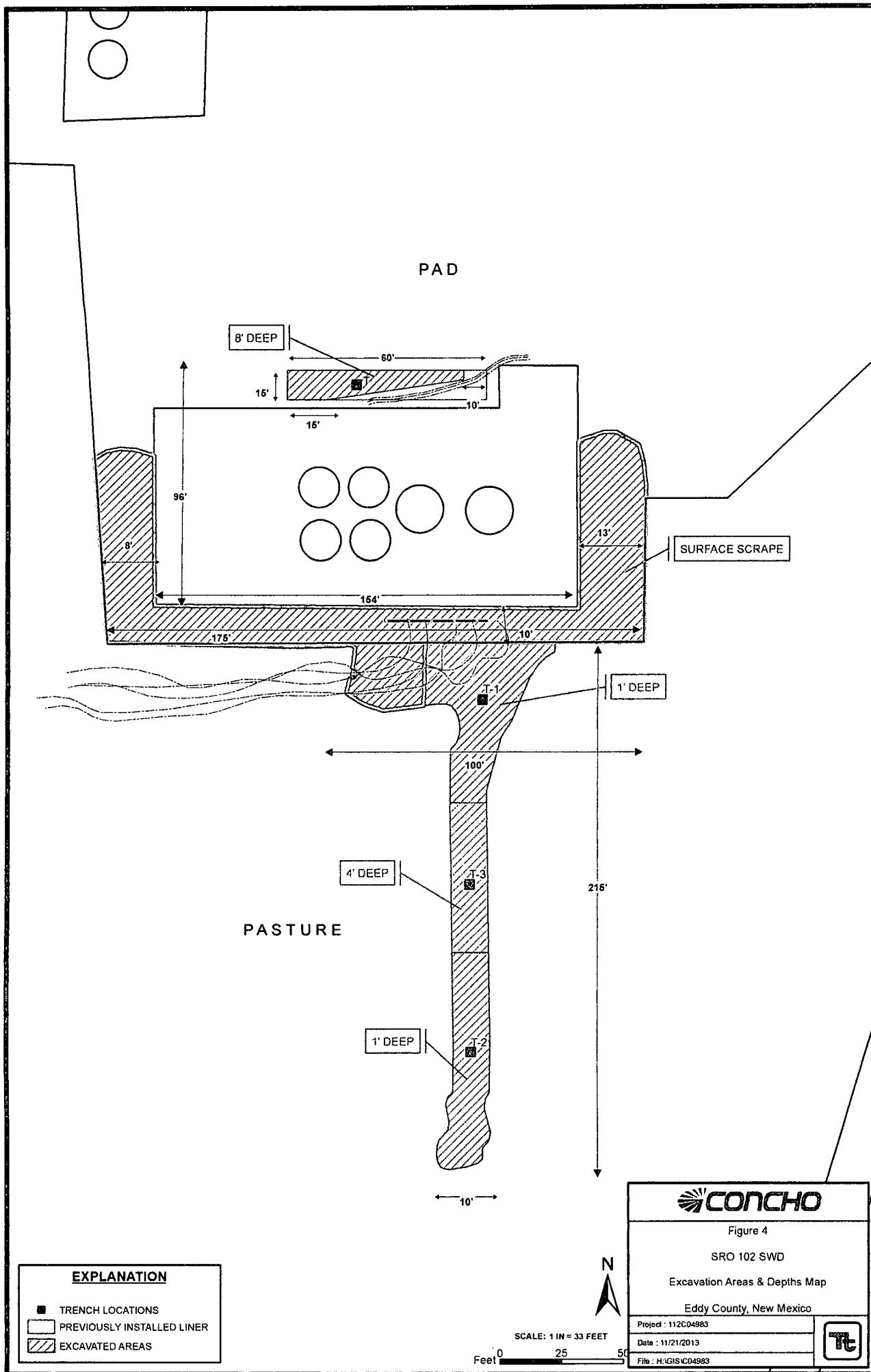
Date: 2/20/2013

File: H:\GIS\CO4983









# Tables

**Table 1**  
**COG Operating LLC.**  
**SRO State Unit Commingle 102 Salt Water Disposal**  
**Spill #1**  
**Eddy County, New Mexico**

Sample ID	Sample Date	Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	Total						
<b>Trench-1</b>	1/21/2013	0-1		X	<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	5,690
	"	2	X		-	-	-	-	-	-	-	-	169
	"	3	X		-	-	-	-	-	-	-	-	284
	"	4	X		-	-	-	-	-	-	-	-	448
<b>Trench-2</b>	1/21/2013	0-0.5		X	<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	3,220
	"	1		X	-	-	-	-	-	-	-	-	11,400
	"	2		X	-	-	-	-	-	-	-	-	8,700
	"	3		X	-	-	-	-	-	-	-	-	7,560
	"	4		X	-	-	-	-	-	-	-	-	3,210
	"	5	X		-	-	-	-	-	-	-	-	688
	"	6	X		-	-	-	-	-	-	-	-	278
<b>Trench-3</b>	1/21/2013	0-1		X	<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	1,170
	"	1	X		-	-	-	-	-	-	-	-	655
	"	2	X		-	-	-	-	-	-	-	-	1,090
	"	3	X		-	-	-	-	-	-	-	-	368

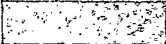
Excavated Depths

( - )

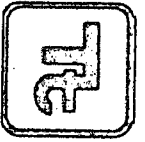
Not Analyzed

**Table 2**  
**COG Operating LLC.**  
**SRO State Unit Commingle 102 Salt Water Disposal**  
**Spill #2**  
**Eddy County, New Mexico**

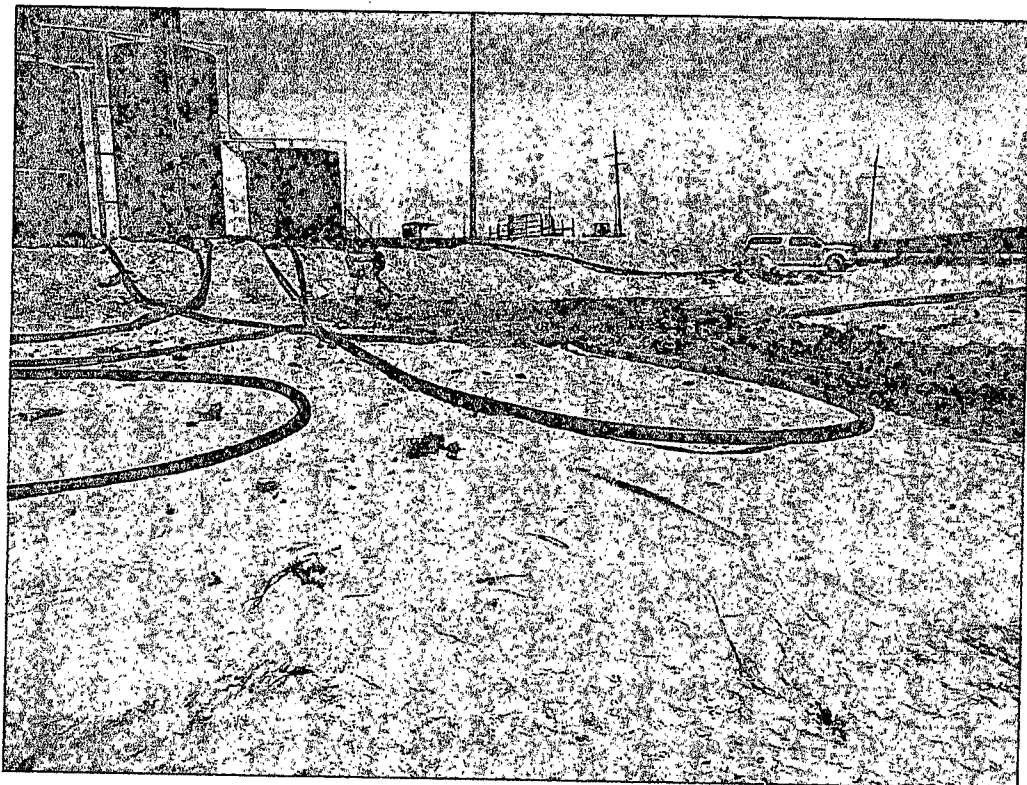
Sample ID	Sample Date	BEB Sample Depth (ft)	Excavation Bottom Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
				In-Situ	Removed	GRO	DRO	Total						
Trench-1	5/29/2013	0-1	0		X	-	-	-	-	-	-	-	-	5,000
	"	2	"		X	-	-	-	-	-	-	-	-	2,630
	"	3	"		X	-	-	-	-	-	-	-	-	2,460
	"	4	"		X	-	-	-	-	-	-	-	-	2,830
	"	5	"		X	-	-	-	-	-	-	-	-	3,070
	"	6	"		X	-	-	-	-	-	-	-	-	2,880
	"	7	"		X	-	-	-	-	-	-	-	-	2,390
	"	8' Bottom Hole	"	X		<4.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	1,140
	"	9	"	X		-	-	-	-	-	-	-	-	944
	"	10	"	X		-	-	-	-	-	-	-	-	261
	"	11	"	X		-	-	-	-	-	-	-	-	35.1
	"	12	"	X		-	-	-	-	-	-	-	-	140

 Excavated depths  
 ( - ) Not Analyzed

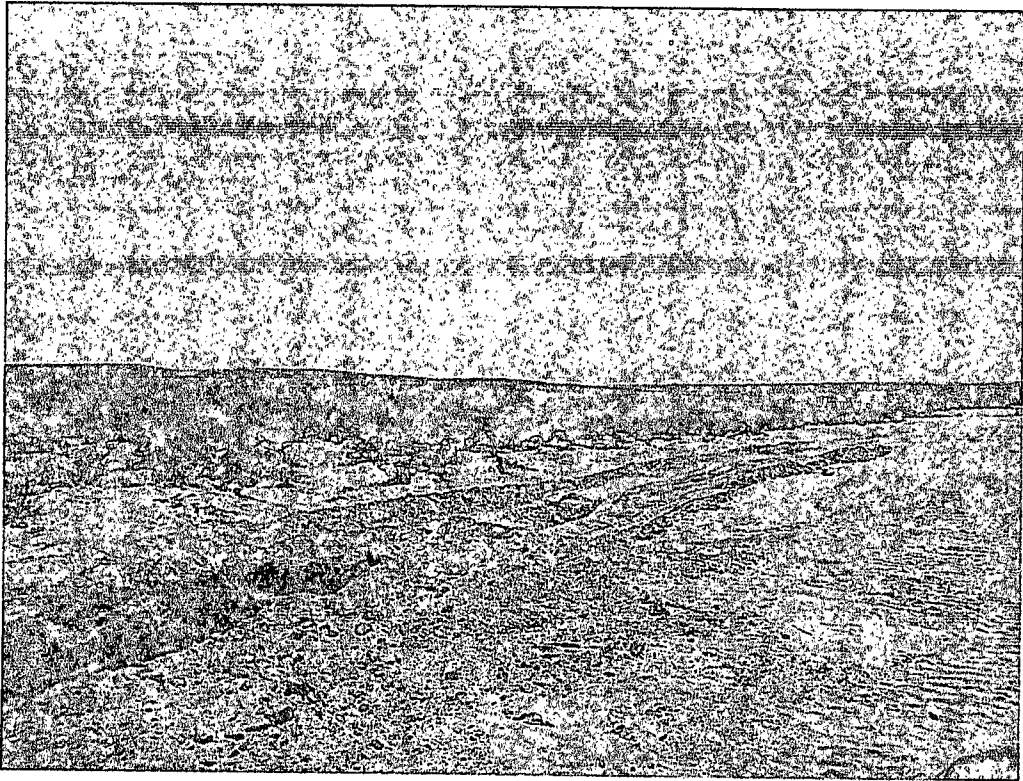
Photos



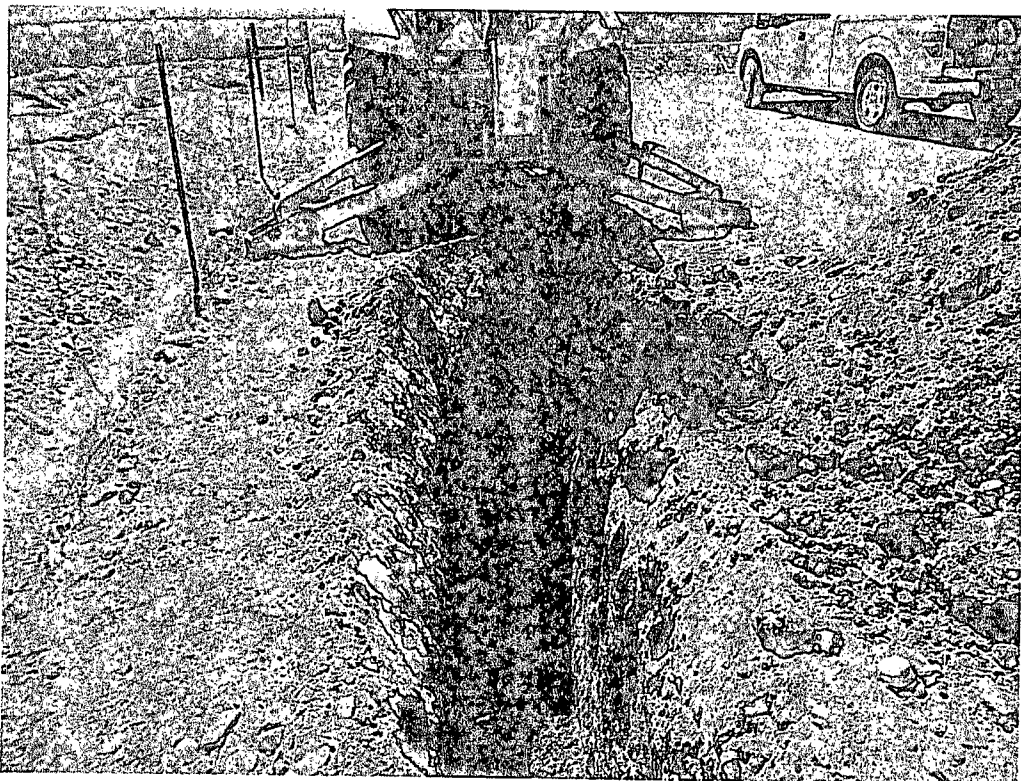
View West – Surface scrape behind battery



View North – T-1 area at 1.0'



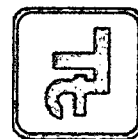
View South – T-2 area at 4.0' and T-3 area at 1.0'



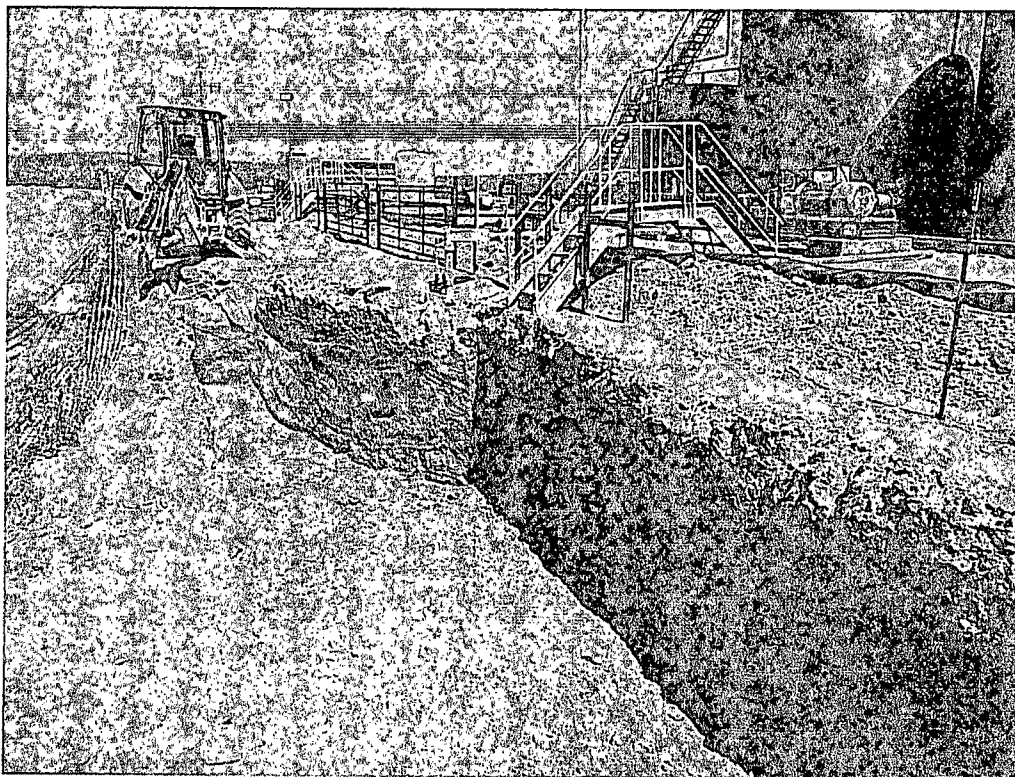
View West – Trench for 2<sup>nd</sup> spill



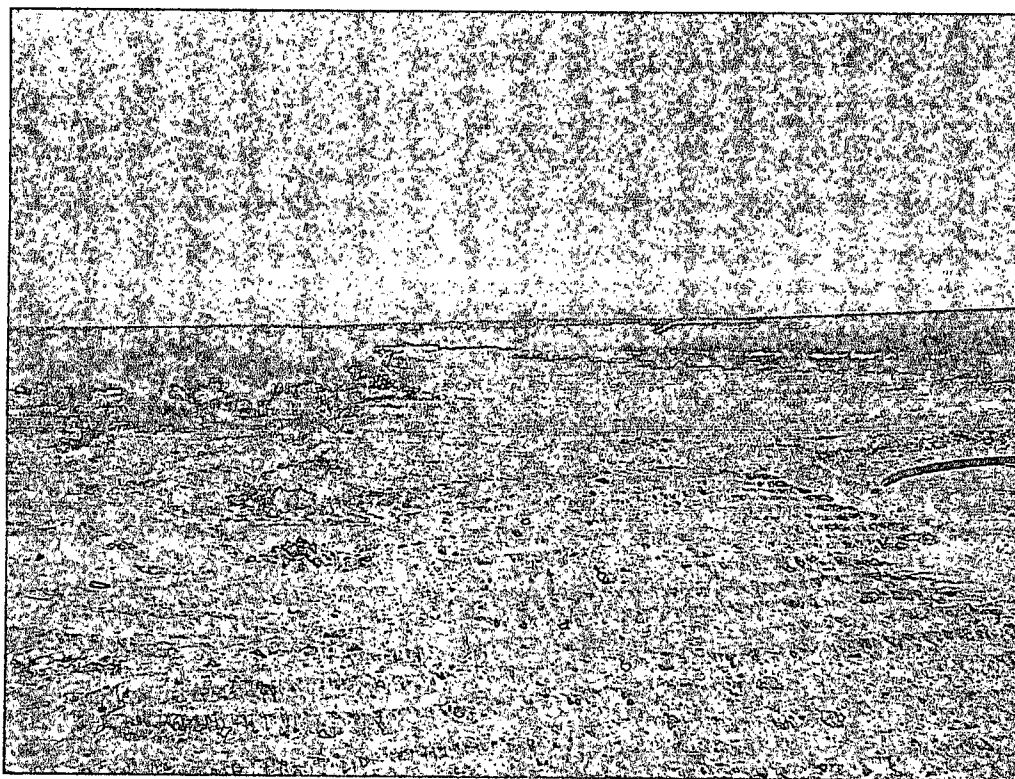
COG Operating LLC  
SRO 102 SWD  
Eddy County, New Mexico



TETRA TECH

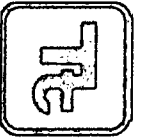


View East – 2<sup>nd</sup> spill area at 8.0'

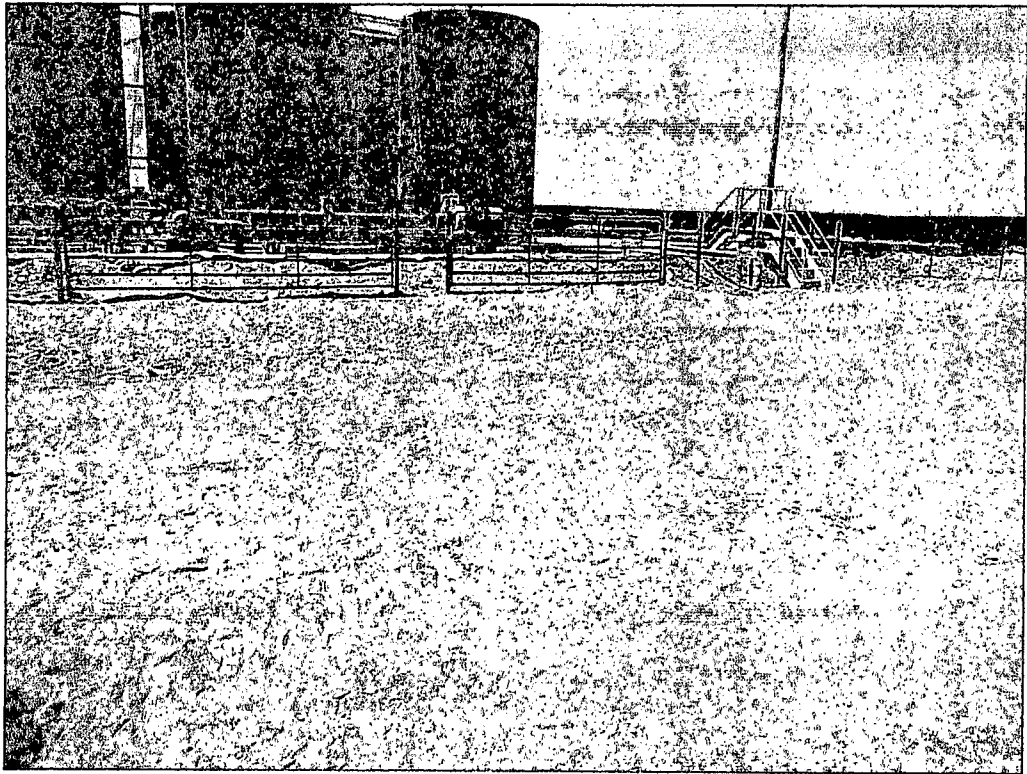


View South – T-1, T-2, and T-3 areas backfilled

COG Operating LLC  
SRO 102 SWD  
Eddy County, New Mexico



TETRA TECH



View Southwest – 2<sup>nd</sup> spill area backfilled

## Appendix A

District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
1301 W. Grand Avenue, 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 October 10, 2003

Submit 2 Copies to appropriate  
District Office in accordance  
with Rule 116 on back  
side of form

**Release Notification and Corrective Action**

**OPERATOR**

☐ Initial Report ☒ Final Report

Name of Company <b>COG Operating LLC</b>	Contact <b>Robert McNeill</b>	
Address <b>600 W. Illinois, Midland, Texas 79701</b>	Telephone No. <b>(432) 685-4332</b>	
Facility Name <b>SRO 102 SWD</b>	Facility Type <b>Tank Battery</b>	
Surface Owner: State	Mineral Owner	Lease No. (API#) 30-015-21398

**LOCATION OF RELEASE**

Unit Letter G	Section 16	Township 26S	Range 28E	Feet from the	North/South Line	Feet from the	East/West Line	County
------------------	---------------	-----------------	--------------	---------------	------------------	---------------	----------------	--------

Latitude N 32.14430° Longitude W 104.09031°

**NATURE OF RELEASE**

Type of Release: Produced Water	Volume of Release 20 bbls	Volume Recovered 15 bbls
Source of Release: Durco pump discharge 3X2 swage	Date and Hour of Occurrence 2/21/2013	Date and Hour of Discovery 2/21/2013 5:30 am
Was Immediate Notice Given? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse. N/A	
If a Watercourse was Impacted, Describe Fully.*  N/A		
Describe Cause of Problem and Remedial Action Taken.*  A Durco pump discharge 3X2 swage cracked when the pump kicked on. Replaced with new plastic coated parts		
Describe Area Affected and Cleanup Action Taken.*  Initially 20 bbls of produced fluid were released into the lined facility. 15 bbls were recovered with a vacuum truck. The majority of the spill remained inside the facility. The contaminated gravel was removed from the facility and replaced with new gravel. Tetra Tech inspected site and collected samples to define spills extent outside of the firewall. Soil that exceeded RRAL was removed and hauled away for proper disposal. Site was then brought up to surface grade with clean backfill material. Tetra Tech prepared closure report and submitted to NMOCD for review.		
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: 		<b>OIL CONSERVATION DIVISION</b>
Printed Name: Ike Tavarez		Approved by District Supervisor:
Title: Project Manager	Approval Date:	Expiration Date:
E-mail Address: Ike.Tavarez@TetraTech.com	Conditions of Approval:	Attached <input type="checkbox"/>
Date: 11-14-13	Phone: (432) 682-4559	

\* Attach Additional Sheets If Necessary

District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
1301 W. Grand Avenue, Artesia, NM 88210  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
District IV  
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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 October 10, 2003

Submit 2 Copies to appropriate  
District Office in accordance  
with Rule 116 on back  
side of form

## Release Notification and Corrective Action

### OPERATOR

☐ Initial Report ☒ Final Report

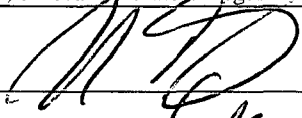
Name of Company <b>COG Operating LLC</b>	Contact <b>Robert McNeill</b>	
Address <b>600 W. Illinois Ave, Midland, Texas 79701</b>	Telephone No. <b>(432) 685-4332</b>	
Facility Name <b>SRO 102 SWD</b>	Facility Type <b>Tank Battery</b>	
Surface Owner: State	Mineral Owner	Lease No. (API#) <b>30-015-21398</b>

### LOCATION OF RELEASE

Unit Letter <b>G</b>	Section <b>16</b>	Township <b>26S</b>	Range <b>28E</b>	Feet from the	North/South Line	Feet from the	East/West Line	County <b>Eddy</b>
-------------------------	----------------------	------------------------	---------------------	---------------	------------------	---------------	----------------	-----------------------

Latitude N 32.14430° Longitude W 104.09031°

### NATURE OF RELEASE

Type of Release: <b>Produced Water</b>	Volume of Release <b>320 bbls</b>	Volume Recovered <b>280 bbls</b>	
Source of Release: <b>Equalizer</b>	Date and Hour of Occurrence <b>12/31/2012</b>	Date and Hour of Discovery <b>12/31/2013 11:00 am</b>	
Was Immediate Notice Given? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?		
By Whom? <b>Josh Russo</b>	Date and Hour <b>3/15/10 4:59 p.m.</b>		
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse. <b>N/A</b>		
If a Watercourse was Impacted, Describe Fully.* <b>N/A</b>			
Describe Cause of Problem and Remedial Action Taken.* <b>The Inlet header at the facility malfunctioned allowing the release of fluid. The header is located on the backside of the facility. The header has been repaired.</b>			
Describe Area Affected and Cleanup Action Taken.* <b>Initially 320 bbls were released from the inlet header, but 280 bbls were recovered with a vacuum truck. The spill area is located on the backside of the facility. Tetra Tech inspected site and collected samples to define spills extent. Soil that exceeded RRAL was removed and hauled away for proper disposal. Site was then brought up to surface grade with clean backfill material. Tetra Tech prepared closure report and submitted to NMOCD for review.</b>			
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: 		<b>OIL CONSERVATION DIVISION</b>	
Printed Name: <b>Ike Tavarez (Agent for COG)</b>		Approved by District Supervisor:	
Title: <b>Project Manager</b>		Approval Date:	Expiration Date:
E-mail Address: <b>Ike.Tavarez@TetraTech.com</b>		Conditions of Approval:	
Date: <b>11/14/2013</b> Phone: <b>(432) 682-4559</b>		Attached <input type="checkbox"/>	

\* Attach Additional Sheets If Necessary

## Appendix B

**Water Well Data**  
**Average Depth to Groundwater (ft)**  
**COG - SRO 102 SWD**  
**Eddy County, New Mexico**

24 South			27 East		
6	5	4	3	2	1
7	8	26	9	10	11
		43			27
18	17		16	15	14
34					31
19	20	21	22	23	24
			70		
30	29	28	27	26	25
31	32	33	34	35	36

24 South			28 East		
6	5	30	4	30	3
70				2	55
7	8	50	9	10	11
				17	20
18	17	16	15	14	13
	42	29	18	52	34
19	20	21	22	23	24
	48				
30	29	28	27	26	25
31	32	33	34	35	36

24 South			29 East		
6	5	4	3	2	1
7	8	9	10	11	12
160					
18	17	16	15	14	13
		18			
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

25 South			27 East		
6	5	4	3	2	1
7	8	9	10	11	12
					92
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36
		19			







25 South			28 East		
6	5	4	35	3	32
	59			2	
7	8	9	10	11	12
18	17	16	15	14	13
67			48	49	
19	20	21	22	23	24
	96				
30	29	28	27	26	25
	15	90		30	
31	32	33	34	35	36
					40

25 South			29 East		
6	5	4	3	2	1
40					
7	8	9	10	11	12
18	17	16	15	14	13
			40		
19	20	21	22	23	24
			60		
30	29	28	27	26	25
30					
31	32	33	34	35	36

26 South			27 East		
6	5	4	3	2	1
	12				
7	8	9	10	11	12
18	17	16	15	14	13
					35
19	20	21	22	23	24
			50		
30	29	28	27	26	25
31	32	33	34	35	36

26 South			28 East		
6	5	4	3	2	1
				120	
7	8	9	10	11	12
					100
18	17	16	15	14	13
25				120	56
19	20	21	22	23	24
			120		
30	29	28	27	26	25
31	32	33	34	35	36

26 South			29 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
			57		
30	29	28	27	26	25
			69		
31	32	33	34	35	36

-  New Mexico State Engineers Well Reports
-  USGS Well Reports
-  Geology and Groundwater Conditions in Southern Eddy, County, NM
-  NMOCD - Groundwater Data
-  Field water level
-  New Mexico Water and Infrastructure Data System

## Appendix C



## Summary Report

Ike Tavarez  
Tetra Tech  
1910 N. Big Spring Street  
Midland, TX 79705

Report Date: January 30, 2013

Work Order: 13012301



Project Location: Eddy Co., NM  
Project Name: COG/SRO State Unit Com. 102 SWD  
Project Number: 112C04983

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
319014	Trench-1 0-1'	soil	2013-01-21	00:00	2013-01-22
319015	Trench-1 2'	soil	2013-01-21	00:00	2013-01-22
319016	Trench-1 3'	soil	2013-01-21	00:00	2013-01-22
319017	Trench-1 4'	soil	2013-01-21	00:00	2013-01-22
319018	Trench-2 0-0.5'	soil	2013-01-21	00:00	2013-01-22
319019	Trench-2 1'	soil	2013-01-21	00:00	2013-01-22
319020	Trench-2 2'	soil	2013-01-21	00:00	2013-01-22
319021	Trench-2 3'	soil	2013-01-21	00:00	2013-01-22
319022	Trench-2 4'	soil	2013-01-21	00:00	2013-01-22
319023	Trench-2 5'	soil	2013-01-21	00:00	2013-01-22
319024	Trench-2 6'	soil	2013-01-21	00:00	2013-01-22
319025	Trench-3 0-0.5'	soil	2013-01-21	00:00	2013-01-22
319026	Trench-3 1'	soil	2013-01-21	00:00	2013-01-22
319027	Trench-3 2'	soil	2013-01-21	00:00	2013-01-22
319028	Trench-3 3'	soil	2013-01-21	00:00	2013-01-22

Sample - Field Code	BTEX				TPH DRO - NEW	TPH GRO
	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylene (mg/Kg)	DRO (mg/Kg)	GRO (mg/Kg)
319014 - Trench-1 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0 Qs	<4.00
319018 - Trench-2 0-0.5'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<4.00
319025 - Trench-3 0-0.5'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<4.00

Sample: 319014 - Trench-1 0-1'

Param	Flag	Result	Units	RL
Chloride		5690	mg/Kg	4

**Sample: 319015 - Trench-1 2'**

Param	Flag	Result	Units	RL
Chloride		169	mg/Kg	4

**Sample: 319016 - Trench-1 3'**

Param	Flag	Result	Units	RL
Chloride		284	mg/Kg	4

**Sample: 319017 - Trench-1 4'**

Param	Flag	Result	Units	RL
Chloride		448	mg/Kg	4

**Sample: 319018 - Trench-2 0-0.5'**

Param	Flag	Result	Units	RL
Chloride		3220	mg/Kg	4

**Sample: 319019 - Trench-2 1'**

Param	Flag	Result	Units	RL
Chloride		11400	mg/Kg	4

**Sample: 319020 - Trench-2 2'**

Param	Flag	Result	Units	RL
Chloride		8700	mg/Kg	4

**Sample: 319021 - Trench-2 3'**

Param	Flag	Result	Units	RL
Chloride		7560	mg/Kg	4

**Sample: 319022 - Trench-2 4'**

Param	Flag	Result	Units	RL
Chloride		3210	mg/Kg	4

**Sample: 319023 - Trench-2 5'**

Param	Flag	Result	Units	RL
Chloride		688	mg/Kg	4

**Sample: 319024 - Trench-2 6'**

Param	Flag	Result	Units	RL
Chloride		278	mg/Kg	4

**Sample: 319025 - Trench-3 0-0.5'**

Param	Flag	Result	Units	RL
Chloride		1170	mg/Kg	4

**Sample: 319026 - Trench-3 1'**

Param	Flag	Result	Units	RL
Chloride		655	mg/Kg	4

**Sample: 319027 - Trench-3 2'**

Param	Flag	Result	Units	RL
Chloride		1090	mg/Kg	4

**Sample: 319028 - Trench-3 3'**

Param	Flag	Result	Units	RL
Chloride		368	mg/Kg	4



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

## Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

# Analytical and Quality Control Report

Ike Tavarez  
Tetra Tech  
1910 N. Big Spring Street  
Midland, TX, 79705

Report Date: January 30, 2013

Work Order: 13012301

Project Location: Eddy Co., NM  
Project Name: COG/SRO State Unit Com. 102 SWD  
Project Number: 112C04983

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
319014	Trench-1 0-1'	soil	2013-01-21	00:00	2013-01-22
319015	Trench-1 2'	soil	2013-01-21	00:00	2013-01-22
319016	Trench-1 3'	soil	2013-01-21	00:00	2013-01-22
319017	Trench-1 4'	soil	2013-01-21	00:00	2013-01-22
319018	Trench-2 0-0.5'	soil	2013-01-21	00:00	2013-01-22
319019	Trench-2 1'	soil	2013-01-21	00:00	2013-01-22
319020	Trench-2 2'	soil	2013-01-21	00:00	2013-01-22
319021	Trench-2 3'	soil	2013-01-21	00:00	2013-01-22
319022	Trench-2 4'	soil	2013-01-21	00:00	2013-01-22
319023	Trench-2 5'	soil	2013-01-21	00:00	2013-01-22
319024	Trench-2 6'	soil	2013-01-21	00:00	2013-01-22
319025	Trench-3 0-0.5'	soil	2013-01-21	00:00	2013-01-22
319026	Trench-3 1'	soil	2013-01-21	00:00	2013-01-22
319027	Trench-3 2'	soil	2013-01-21	00:00	2013-01-22
319028	Trench-3 3'	soil	2013-01-21	00:00	2013-01-22

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 29 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 style with a large, stylized 'M' and 'A'.

---

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

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## Case Narrative

Samples for project COG/SRO State Unit Com. 102 SWD were received by TraceAnalysis, Inc. on 2013-01-22 and assigned to work order 13012301. Samples for work order 13012301 were received intact at a temperature of 1.3 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	83373	2013-01-24 at 12:00	98395	2013-01-24 at 12:00
Chloride (Titration)	SM 4500-Cl B	83354	2013-01-24 at 08:05	98485	2013-01-29 at 14:27
Chloride (Titration)	SM 4500-Cl B	83354	2013-01-24 at 08:05	98486	2013-01-29 at 14:28
TPH DRO - NEW	S 8015 D	83389	2013-01-24 at 13:00	98413	2013-01-25 at 15:45
TPH DRO - NEW	S 8015 D	83395	2013-01-24 at 11:00	98418	2013-01-28 at 08:25
TPH GRO	S 8015 D	83375	2013-01-24 at 12:00	98408	2013-01-24 at 12:00

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

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 13012301 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: January 30, 2013  
112C04983

Work Order: 13012301  
COG/SRO State Unit Com. 102 SWD

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## Analytical Report

Sample: 319014 - Trench-1 0-1'

Laboratory: Midland  
Analysis: BTEX  
QC Batch: 98395  
Prep Batch: 83373

Analytical Method: S 8021B  
Date Analyzed: 2013-01-24  
Sample Preparation: 2013-01-24

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

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)	Qsr	Qsr	2.39	mg/Kg	1	2.00	120	79.5 - 108
4-Bromofluorobenzene (4-BFB)			2.14	mg/Kg	1	2.00	107	71.4 - 108

Sample: 319014 - Trench-1 0-1'

Laboratory: Midland  
Analysis: Chloride (Titration)  
QC Batch: 98485  
Prep Batch: 83354

Analytical Method: SM 4500-Cl B  
Date Analyzed: 2013-01-29  
Sample Preparation: 2013-01-24

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			5690	mg/Kg	10	4.00

Sample: 319014 - Trench-1 0-1'

Laboratory: Midland  
Analysis: TPH DRO - NEW  
QC Batch: 98418  
Prep Batch: 83395

Analytical Method: S 8015 D  
Date Analyzed: 2013-01-28  
Sample Preparation: 2013-01-24

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

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

Report Date: January 30, 2013  
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Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			102	mg/Kg	1	100	102	70 - 130

**Sample: 319014 - Trench-1 0-1'**

Laboratory: Midland  
Analysis: TPH GRO  
QC Batch: 98408  
Prep Batch: 83375

Analytical Method: S 8015 D  
Date Analyzed: 2013-01-24  
Sample Preparation: 2013-01-24

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO			<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)			2.05	mg/Kg	1	2.00	102	70 - 130

**Sample: 319015 - Trench-1 2'**

Laboratory: Midland  
Analysis: Chloride (Titration)  
QC Batch: 98485  
Prep Batch: 83354

Analytical Method: SM 4500-Cl B  
Date Analyzed: 2013-01-29  
Sample Preparation: 2013-01-24

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			169	mg/Kg	5	4.00

**Sample: 319016 - Trench-1 3'**

Laboratory: Midland  
Analysis: Chloride (Titration)  
QC Batch: 98485  
Prep Batch: 83354

Analytical Method: SM 4500-Cl B  
Date Analyzed: 2013-01-29  
Sample Preparation: 2013-01-24

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

*continued ...*

Report Date: January 30, 2013  
112C04983

Work Order: 13012301  
COG/SRO State Unit Com. 102 SWD

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Eddy Co., NM

*sample 319016 continued ...*

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<b>284</b>	mg/Kg	5	4.00

**Sample: 319017 - Trench-1 4'**

Laboratory: Midland  
Analysis: Chloride (Titration)      Analytical Method: SM 4500-Cl B      Prep Method: N/A  
QC Batch: 98485      Date Analyzed: 2013-01-29      Analyzed By: AR  
Prep Batch: 83354      Sample Preparation: 2013-01-24      Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<b>448</b>	mg/Kg	5	4.00

**Sample: 319018 - Trench-2 0-0.5'**

Laboratory: Midland  
Analysis: BTEX      Analytical Method: S 8021B      Prep Method: S 5035  
QC Batch: 98395      Date Analyzed: 2013-01-24      Analyzed By: YG  
Prep Batch: 83373      Sample Preparation: 2013-01-24      Prepared By: YG

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)	QSR	QSR	2.34	mg/Kg	1	2.00	117	79.5 - 108
4-Bromofluorobenzene (4-BFB)			2.03	mg/Kg	1	2.00	102	71.4 - 108

Report Date: January 30, 2013  
112C04983

Work Order: 13012301  
COG/SRO State Unit Com. 102 SWD

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Eddy Co., NM

**Sample: 319018 - Trench-2 0-0.5'**

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-01-29	Analyzed By:	AR
QC Batch:	98485	Sample Preparation:	2013-01-24	Prepared By:	AR
Prep Batch:	83354				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			3220	mg/Kg	10	4.00

**Sample: 319018 - Trench-2 0-0.5'**

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	N/A
Analysis:	TPH DRO - NEW	Date Analyzed:	2013-01-25	Analyzed By:	CW
QC Batch:	98413	Sample Preparation:	2013-01-24	Prepared By:	CW
Prep Batch:	83389				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO		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	70 - 130

**Sample: 319018 - Trench-2 0-0.5'**

Laboratory:	Midland	Analytical Method:	S 8015 D	Prep Method:	S 5035
Analysis:	TPH GRO	Date Analyzed:	2013-01-24	Analyzed By:	YG
QC Batch:	98408	Sample Preparation:	2013-01-24	Prepared By:	YG
Prep Batch:	83375				

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)			2.11	mg/Kg	1	2.00	106	70 - 130
4-Bromofluorobenzene (4-BFB)			1.96	mg/Kg	1	2.00	98	70 - 130

Report Date: January 30, 2013  
112C04983

Work Order: 13012301  
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**Sample: 319019 - Trench-2 1'**

Laboratory:	Midland			
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method: N/A
QC Batch:	98485	Date Analyzed:	2013-01-29	Analyzed By: AR
Prep Batch:	83354	Sample Preparation:	2013-01-24	Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			11400	mg/Kg	10	4.00

**Sample: 319020 - Trench-2 2'**

Laboratory:	Midland			
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method: N/A
QC Batch:	98485	Date Analyzed:	2013-01-29	Analyzed By: AR
Prep Batch:	83354	Sample Preparation:	2013-01-24	Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			8700	mg/Kg	10	4.00

**Sample: 319021 - Trench-2 3'**

Laboratory:	Midland			
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method: N/A
QC Batch:	98485	Date Analyzed:	2013-01-29	Analyzed By: AR
Prep Batch:	83354	Sample Preparation:	2013-01-24	Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			7560	mg/Kg	10	4.00

**Sample: 319022 - Trench-2 4'**

Laboratory:	Midland			
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method: N/A
QC Batch:	98485	Date Analyzed:	2013-01-29	Analyzed By: AR
Prep Batch:	83354	Sample Preparation:	2013-01-24	Prepared By: AR

Report Date: January 30, 2013  
112C04983

Work Order: 13012301  
COG/SRO State Unit Com. 102 SWD

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Eddy Co., NM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<b>3210</b>	mg/Kg	10	4.00

**Sample: 319023 - Trench-2 5'**

Laboratory: Midland  
Analysis: Chloride (Titration)      Analytical Method: SM 4500-Cl B      Prep Method: N/A  
QC Batch: 98485      Date Analyzed: 2013-01-29      Analyzed By: AR  
Prep Batch: 83354      Sample Preparation: 2013-01-24      Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<b>688</b>	mg/Kg	5	4.00

**Sample: 319024 - Trench-2 6'**

Laboratory: Midland  
Analysis: Chloride (Titration)      Analytical Method: SM 4500-Cl B      Prep Method: N/A  
QC Batch: 98486      Date Analyzed: 2013-01-29      Analyzed By: AR  
Prep Batch: 83354      Sample Preparation: 2013-01-24      Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<b>278</b>	mg/Kg	5	4.00

**Sample: 319025 - Trench-3 0-0.5'**

Laboratory: Midland  
Analysis: BTEX      Analytical Method: S 8021B      Prep Method: S 5035  
QC Batch: 98395      Date Analyzed: 2013-01-24      Analyzed By: YG  
Prep Batch: 83373      Sample Preparation: 2013-01-24      Prepared By: YG

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

*continued ...*

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sample 319025 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)	Q <sub>SP</sub>	Q <sub>SP</sub>	2.31	mg/Kg	1	2.00	116	79.5 - 108
4-Bromofluorobenzene (4-BFB)			1.95	mg/Kg	1	2.00	98	71.4 - 108

**Sample: 319025 - Trench-3 0-0.5'**

Laboratory: Midland  
Analysis: Chloride (Titration)      Analytical Method: SM 4500-Cl B      Prep Method: N/A  
QC Batch: 98486      Date Analyzed: 2013-01-29      Analyzed By: AR  
Prep Batch: 83354      Sample Preparation: 2013-01-24      Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1170	mg/Kg	10	4.00

**Sample: 319025 - Trench-3 0-0.5'**

Laboratory: Midland  
Analysis: TPH DRO - NEW      Analytical Method: S 8015 D      Prep Method: N/A  
QC Batch: 98413      Date Analyzed: 2013-01-25      Analyzed By: CW  
Prep Batch: 83389      Sample Preparation: 2013-01-24      Prepared By: CW

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			111	mg/Kg	1	100	111	70 - 130

**Sample: 319025 - Trench-3 0-0.5'**

Laboratory: Midland  
Analysis: TPH GRO      Analytical Method: S 8015 D      Prep Method: S 5035  
QC Batch: 98408      Date Analyzed: 2013-01-24      Analyzed By: YG  
Prep Batch: 83375      Sample Preparation: 2013-01-24      Prepared By: YG

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.10	mg/Kg	1	2.00	105	70 - 130
4-Bromofluorobenzene (4-BFB)			1.90	mg/Kg	1	2.00	95	70 - 130

**Sample: 319026 - Trench-3 1'**

Laboratory: Midland  
Analysis: Chloride (Titration)      Analytical Method: SM 4500-Cl B      Prep Method: N/A  
QC Batch: 98486      Date Analyzed: 2013-01-29      Analyzed By: AR  
Prep Batch: 83354      Sample Preparation: 2013-01-24      Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			655	mg/Kg	5	4.00

**Sample: 319027 - Trench-3 2'**

Laboratory: Midland  
Analysis: Chloride (Titration)      Analytical Method: SM 4500-Cl B      Prep Method: N/A  
QC Batch: 98486      Date Analyzed: 2013-01-29      Analyzed By: AR  
Prep Batch: 83354      Sample Preparation: 2013-01-24      Prepared By: AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1090	mg/Kg	5	4.00

**Sample: 319028 - Trench-3 3'**

Laboratory: Midland  
Analysis: Chloride (Titration)      Analytical Method: SM 4500-Cl B      Prep Method: N/A  
QC Batch: 98486      Date Analyzed: 2013-01-29      Analyzed By: AR  
Prep Batch: 83354      Sample Preparation: 2013-01-24      Prepared By: AR



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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<b>368</b>	mg/Kg	5	4.00

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## Method Blanks

### Method Blank (1) QC Batch: 98395

QC Batch: 98395  
Prep Batch: 83373

Date Analyzed: 2013-01-24  
QC Preparation: 2013-01-24

Analyzed By: YG  
Prepared By: YG

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)	QSR	QSR	2.32	mg/Kg	1	2.00	116	79.5 - 108
4-Bromofluorobenzene (4-BFB)			1.93	mg/Kg	1	2.00	96	71.4 - 108

### Method Blank (1) QC Batch: 98408

QC Batch: 98408  
Prep Batch: 83375

Date Analyzed: 2013-01-24  
QC Preparation: 2013-01-24

Analyzed By: YG  
Prepared By: YG

Parameter	Flag	Cert	MDL Result	Units	RL
GRO		1	<2.32	mg/Kg	4

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.77	mg/Kg	1	2.00	88	70 - 130
4-Bromofluorobenzene (4-BFB)			1.88	mg/Kg	1	2.00	94	70 - 130

### Method Blank (1) QC Batch: 98413

QC Batch: 98413  
Prep Batch: 83389

Date Analyzed: 2013-01-25  
QC Preparation: 2013-01-24

Analyzed By: CW  
Prepared By: CW

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Parameter	Flag	Cert	MDL Result	Units	RL
DRO		,	<6.88	mg/Kg	50

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			96.0	mg/Kg	1	100	96	70 - 130

**Method Blank (1)**      QC Batch: 98418

QC Batch: 98418  
Prep Batch: 83395

Date Analyzed: 2013-01-28  
QC Preparation: 2013-01-24

Analyzed By: CW  
Prepared By: CW

Parameter	Flag	Cert	MDL Result	Units	RL
DRO		,	31.0	mg/Kg	50

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			123	mg/Kg	1	100	123	70 - 130

**Method Blank (1)**      QC Batch: 98485

QC Batch: 98485  
Prep Batch: 83354

Date Analyzed: 2013-01-29  
QC Preparation: 2013-01-24

Analyzed By: AR  
Prepared By: AR

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

**Method Blank (1)**      QC Batch: 98486

QC Batch: 98486  
Prep Batch: 83354

Date Analyzed: 2013-01-29  
QC Preparation: 2013-01-24

Analyzed By: AR  
Prepared By: AR

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

## Laboratory Control Spikes

### Laboratory Control Spike (LCS-1)

QC Batch: 98395  
Prep Batch: 83373

Date Analyzed: 2013-01-24  
QC Preparation: 2013-01-24

Analyzed By: YG  
Prepared By: YG

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.82	mg/Kg	1	2.00	<0.00810	91	72.4 - 120
Toluene		1	1.87	mg/Kg	1	2.00	<0.00750	94	77 - 120
Ethylbenzene		1	2.01	mg/Kg	1	2.00	<0.00730	100	71.8 - 120
Xylene		1	6.21	mg/Kg	1	6.00	<0.00700	104	78.3 - 120

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1	1.76	mg/Kg	1	2.00	<0.00810	88	72.4 - 120	3	20
Toluene		1	1.82	mg/Kg	1	2.00	<0.00750	91	77 - 120	3	20
Ethylbenzene		1	1.95	mg/Kg	1	2.00	<0.00730	98	71.8 - 120	3	20
Xylene		1	6.08	mg/Kg	1	6.00	<0.00700	101	78.3 - 120	2	20

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

Surrogate			LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	Q <sub>sr</sub>	Q <sub>sr</sub>	2.36	2.38	mg/Kg	1	2.00	118	119	79.5 - 108
4-Bromofluorobenzene (4-BFB)	Q <sub>sr</sub>	Q <sub>sr</sub>	2.16	2.10	mg/Kg	1	2.00	108	105	71.4 - 108

### Laboratory Control Spike (LCS-1)

QC Batch: 98408  
Prep Batch: 83375

Date Analyzed: 2013-01-24  
QC Preparation: 2013-01-24

Analyzed By: YG  
Prepared By: YG

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	17.5	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.

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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
GRO			14.6	mg/Kg	1	20.0	<2.32	73	70 - 130	18	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
Trifluorotoluene (TFT)	1.69	1.90	mg/Kg	1	2.00	84	95	70 - 130
4-Bromofluorobenzene (4-BFB)	1.76	2.02	mg/Kg	1	2.00	88	101	70 - 130

#### Laboratory Control Spike (LCS-1)

QC Batch: 98413  
Prep Batch: 83389

Date Analyzed: 2013-01-25  
QC Preparation: 2013-01-24

Analyzed By: CW  
Prepared By: CW

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO			240	mg/Kg	1	250	<6.88	96	70 - 130

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

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO			238	mg/Kg	1	250	<6.88	95	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	LCS Result	Units	Dil.	Spike Amount	LCS Rec.	LCS Rec.	Rec. Limit
n-Tricosane	122	119	mg/Kg	1	100	122	119	70 - 130

#### Laboratory Control Spike (LCS-1)

QC Batch: 98418  
Prep Batch: 83395

Date Analyzed: 2013-01-28  
QC Preparation: 2013-01-24

Analyzed By: CW  
Prepared By: CW

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO			232	mg/Kg	1	250	31	80	70 - 130

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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
DRO			250	mg/Kg	1	250	31	88	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	LCS Result	Units	Dil.	Spike Amount	LCS Rec.	LCS Rec.	Rec. Limit
n-Tricosane	108	106	mg/Kg	1	100	108	106	70 - 130

#### Laboratory Control Spike (LCS-1)

QC Batch: 98485  
Prep Batch: 83354

Date Analyzed: 2013-01-29  
QC Preparation: 2013-01-24

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	85 - 115

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

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2640	mg/Kg	1	2500	<3.85	106	85 - 115	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: 98486  
Prep Batch: 83354

Date Analyzed: 2013-01-29  
QC Preparation: 2013-01-24

Analyzed By: AR  
Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2700	mg/Kg	1	2500	<3.85	108	85 - 115

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

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2590	mg/Kg	1	2500	<3.85	104	85 - 115	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: 319018

QC Batch: 98395  
Prep Batch: 83373

Date Analyzed: 2013-01-24  
QC Preparation: 2013-01-24

Analyzed By: YG  
Prepared By: YG

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	2.28	mg/Kg	1	2.00	<0.00810	114	66.3 - 138
Toluene		1	2.30	mg/Kg	1	2.00	<0.00750	115	64.8 - 142
Ethylbenzene		1	2.50	mg/Kg	1	2.00	<0.00730	125	72 - 132
Xylene		1	7.67	mg/Kg	1	6.00	<0.00700	128	60.8 - 148

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1	2.26	mg/Kg	1	2.00	<0.00810	113	66.3 - 138	1	20
Toluene		1	2.32	mg/Kg	1	2.00	<0.00750	116	64.8 - 142	1	20
Ethylbenzene		1	2.46	mg/Kg	1	2.00	<0.00730	123	72 - 132	2	20
Xylene		1	7.72	mg/Kg	1	6.00	<0.00700	129	60.8 - 148	1	20

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

Surrogate			MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	Q <sub>sr</sub>	Q <sub>sr</sub>	2.35	2.32	mg/Kg	1	2	118	116	79.5 - 108
4-Bromofluorobenzene (4-BFB)			2.04	2.01	mg/Kg	1	2	102	100	71.4 - 108

**Matrix Spike (MS-1)** Spiked Sample: 319018

QC Batch: 98408  
Prep Batch: 83375

Date Analyzed: 2013-01-24  
QC Preparation: 2013-01-24

Analyzed By: YG  
Prepared By: YG

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	22.0	mg/Kg	1	20.0	<2.32	110	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	21.3	mg/Kg	1	20.0	<2.32	106	70 - 130	3	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
Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.07	2.42	mg/Kg	1	2	104	121	70 - 130
4-Bromofluorobenzene (4-BFB)	1.98	2.00	mg/Kg	1	2	99	100	70 - 130

**Matrix Spike (MS-1)** Spiked Sample: 319018

QC Batch: 98413  
Prep Batch: 83389

Date Analyzed: 2013-01-25  
QC Preparation: 2013-01-24

Analyzed By: CW  
Prepared By: CW

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	249	mg/Kg	1	250	11.4	95	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
DRO		1	273	mg/Kg	1	250	11.4	105	70 - 130	9	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	100	110	mg/Kg	1	100	100	110	70 - 130

**Matrix Spike (MS-1)** Spiked Sample: 319164

QC Batch: 98418  
Prep Batch: 83395

Date Analyzed: 2013-01-28  
QC Preparation: 2013-01-24

Analyzed By: CW  
Prepared By: CW

Param			F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO	Qs	Qs		1	389	mg/Kg	1	250	223	66	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
DRO		1	438	mg/Kg	1	250	223	86	70 - 130	12	20



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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	Q <sub>SR</sub>	C <sub>SR</sub>	139	151	mg/Kg	5	100	139	151	70 - 130

**Matrix Spike (MS-1)** Spiked Sample: 319023

QC Batch: 98485  
Prep Batch: 83354

Date Analyzed: 2013-01-29  
QC Preparation: 2013-01-24

Analyzed By: AR  
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			3280	mg/Kg	5	2500	688	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			3080	mg/Kg	5	2500	688	96	78.9 - 121	6	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: 319039

QC Batch: 98486  
Prep Batch: 83354

Date Analyzed: 2013-01-29  
QC Preparation: 2013-01-24

Analyzed By: AR  
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2430	mg/Kg	5	2500	<19.2	97	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			2570	mg/Kg	5	2500	<19.2	103	78.9 - 121	6	20

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

## Calibration Standards

### Standard (CCV-1)

QC Batch: 98395

Date Analyzed: 2013-01-24

Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.107	107	80 - 120	2013-01-24
Toluene		1	mg/kg	0.100	0.108	108	80 - 120	2013-01-24
Ethylbenzene		1	mg/kg	0.100	0.112	112	80 - 120	2013-01-24
Xylene		1	mg/kg	0.300	0.355	118	80 - 120	2013-01-24

### Standard (CCV-2)

QC Batch: 98395

Date Analyzed: 2013-01-24

Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.106	106	80 - 120	2013-01-24
Toluene		1	mg/kg	0.100	0.106	106	80 - 120	2013-01-24
Ethylbenzene		1	mg/kg	0.100	0.108	108	80 - 120	2013-01-24
Xylene		1	mg/kg	0.300	0.331	110	80 - 120	2013-01-24

### Standard (CCV-3)

QC Batch: 98395

Date Analyzed: 2013-01-24

Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/kg	0.100	0.100	100	80 - 120	2013-01-24
Toluene		1	mg/kg	0.100	0.101	101	80 - 120	2013-01-24
Ethylbenzene		1	mg/kg	0.100	0.100	100	80 - 120	2013-01-24
Xylene		1	mg/kg	0.300	0.311	104	80 - 120	2013-01-24

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**Standard (CCV-1)**

QC Batch: 98408

Date Analyzed: 2013-01-24

Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	1.17	117	80 - 120	2013-01-24

**Standard (CCV-2)**

QC Batch: 98408

Date Analyzed: 2013-01-24

Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	1.02	102	80 - 120	2013-01-24

**Standard (CCV-3)**

QC Batch: 98408

Date Analyzed: 2013-01-24

Analyzed By: YG

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	1.15	115	80 - 120	2013-01-24

**Standard (CCV-1)**

QC Batch: 98413

Date Analyzed: 2013-01-25

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	240	96	80 - 120	2013-01-25

**Standard (CCV-2)**

QC Batch: 98413

Date Analyzed: 2013-01-25

Analyzed By: CW

Report Date: January 30, 2013  
112C04983

Work Order: 13012301  
COG/SRO State Unit Com. 102 SWD

Page Number: 25 of 29  
Eddy Co., NM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	294	118	80 - 120	2013-01-25

**Standard (CCV-3)**

QC Batch: 98413

Date Analyzed: 2013-01-25

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	266	106	80 - 120	2013-01-25

**Standard (CCV-4)**

QC Batch: 98413

Date Analyzed: 2013-01-25

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	264	106	80 - 120	2013-01-25

**Standard (CCV-1)**

QC Batch: 98418

Date Analyzed: 2013-01-28

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	244	98	80 - 120	2013-01-28

**Standard (CCV-2)**

QC Batch: 98418

Date Analyzed: 2013-01-28

Analyzed By: CW

Report Date: January 30, 2013  
112C04983

Work Order: 13012301  
COG/SRO State Unit Com. 102 SWD

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Eddy Co., NM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO			mg/Kg	250	291	116	80 - 120	2013-01-28

**Standard (CCV-3)**

QC Batch: 98418

Date Analyzed: 2013-01-28

Analyzed By: CW

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO			mg/Kg	250	239	96	80 - 120	2013-01-28

**Standard (CCV-1)**

QC Batch: 98485

Date Analyzed: 2013-01-29

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	98.2	98	85 - 115	2013-01-29

**Standard (CCV-2)**

QC Batch: 98485

Date Analyzed: 2013-01-29

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	102	102	85 - 115	2013-01-29

**Standard (CCV-1)**

QC Batch: 98486

Date Analyzed: 2013-01-29

Analyzed By: AR

Report Date: January 30, 2013  
112C04983

Work Order: 13012301  
COG/SRO State Unit Com. 102 SWD

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Eddy Co., NM

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.7	100	85 - 115	2013-01-29

**Standard (CCV-2)**

QC Batch: 98486

Date Analyzed: 2013-01-29

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	2013-01-29

## 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 than ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
Je	Estimated concentration exceeding calibration range.
MI1	Split peak or shoulder peak
MI2	Instrument software did not integrate
MI3	Instrument software misidentified the peak
MI4	Instrument software integrated improperly
MI5	Baseline correction
Qc	Calibration check outside of laboratory limits.
Qr	RPD outside of laboratory limits
Qs	Spike recovery outside of laboratory limits.
Qsr	Surrogate recovery outside of laboratory limits.
U	The analyte is not detected above the SDL

### Attachments

Report Date: January 30, 2013  
112C04983

Work Order: 13012301  
COG/SRO State Unit Com. 102 SWD

Page Number: 29 of 29  
Eddy Co., NM

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



13012301

## Analysis Request of Chain of Custody Record

PAGE: 1

OF: 2

**TETRA TECH**

1910 N. Big Spring St.

Midland, Texas 79705

(432) 682-4559 • Fax (432) 682-3946

ANALYSIS REQUEST  
(Circle or Specify Method No.)

CLIENT NAME:

CDG

SITE MANAGER:

Ike Tamarez

PROJECT NO.:

114-6401478

PROJECT NAME:

SRO State Unit Com 102 SWD

LAB I.D.  
NUMBERDATE  
2013

TIME

MATRIX  
COMP  
GRABEddy Co NM  
SAMPLE IDENTIFICATION

NUMBER OF CONTAINERS

FILTERED (Y/N)

HCL

HNO3

ICE

NONE

PRESERVATIVE  
METHOD

BTEX 8021R

TPH 8015 MOD TX1005 (Ext. to C35)

PAH 8270

RCRA Metals Ag As Ba Cd Cr Pb Hg Se

TCLP Metals Ag As Ba Cd Cr Pb Hg Se

TCLP Volatiles

TCLP Semi Volatiles

RCI

GC/MS Vol. 8240/8260/624

GC/MS Semi. Vol. 8270/625

PCB's 8080/608

Pest. 808/608

Chloride

Gamma Spec.

Alpha Beta (Air)

PLM (Asbestos)

Major Anions/Cations, pH, TDS

319014

1/21

S X

Trench - 1

0-1'

1

K

K

K

015

2'

1

016

3'

017

4'

018

Trench - 2

0-0.5'

019

1'

020

2'

021

3'

022

4'

023

5'

RELINQUISHED BY: (Signature)

Date: 1-22-13

Time: 16:45

RELINQUISHED BY: (Signature)

Date: 1-22-13

Time: 16:45

RECEIVED BY: (Signature)

Date: 1-22-13

Time: 16:45

RECEIVED BY: (Signature)

13012301

# Analysis Request of Chain of Custody Record



**TETRA TECH**

1910 N. Big Spring St.  
Midland, Texas 79705  
(432) 682-4559 • Fax (432) 682-3946

PAGE: 2 OF: 2

ANALYSIS REQUEST  
(Circle or Specify Method No.)

CLIENT NAME:

C04

SITE MANAGER:

Ike Tovar

PROJECT NO.:

PROJECT NAME:

SRO State Unit Com 102 SWD

Eddy Co NM  
SAMPLE IDENTIFICATION

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	Eddy Co NM SAMPLE IDENTIFICATION		NUMBER OF	FILTERED (Y/N)	HCL	HNO3	ICE	NONE	BTX 80211	TPH 8015	PAH 8270	RCRA Metals	TCLP Metals	TCLP Volatiles	TCLP Semi	RCI	GC/MS Vol.	GC/MS Semi	PCB's 8080	Pest. 808/608	Chloride	Gamma Sp.	Alpha Beta	PLM (Asbestos)	Major Anions
024	1/21		S	K		Trench - 2	6'	1				X														X				
025	↓		↓		↓	Trench - 3	0-0.5'	↓				↓		X	X											X				
026	↓		↓		↓		1'	↓				↓														X				
027	↓		↓		↓		2'	↓				↓														X				
028	↓		↓		↓		3'	↓				↓														X				
029	↓		↓		↓		4'	↓				↓														Hold				
030	↓		↓		↓		5'	↓				↓														Hold				
031	↓		↓		↓		6'	↓				↓														Hold				

RELINQUISHED BY: (Signature)

[Signature]

Date: 1-22-13  
Time: 16:45

RECEIVED BY: (Signature)

[Signature]

Date: 1-22-13  
Time: 16:45

SAMPLED BY: (Print & Initial)

TE

Date: 1-21-13  
Time:

RELINQUISHED BY: (Signature)

Date:   
Time:

RECEIVED BY: (Signature)

Date:   
Time:

SAMPLE SHIPPED BY: (Circle)

FEDEX BUS  
HAND DELIVERED UPS

AIRBILL #:

OTHER:

RELINQUISHED BY: (Signature)

Date:   
Time:

RECEIVED BY: (Signature)

Date:   
Time:

TETRA TECH CONTACT PERSON:

Ike

Results by:

RUSH Charges  
Authorized:

Yes No

RECEIVING LABORATORY: Trace

ADDRESS:

CITY: Midland STATE: TX ZIP:

CONTACT:

PHONE:

DATE:

TIME:

SAMPLE CONDITION WHEN RECEIVED:

1.30

REMARKS:

Please fill out all copies - Laboratory retains Yellow copy - Return Original copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.

## Summary Report

Ike Tavaréz  
Tetra Tech  
1910 N. Big Spring Street  
Midland, TX 79705

Report Date: June 11, 2013

Work Order: 13060337



Project Location: Eddy Co., NM  
Project Name: COG/SRO State Unit Com. 102 SWD  
Project Number: 112C04983

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
330876	T-1 1'	soil	2013-05-29	00:00	2013-06-03
330877	T-1 2'	soil	2013-05-29	00:00	2013-06-03
330878	T-1 3'	soil	2013-05-29	00:00	2013-06-03
330879	T-1 4'	soil	2013-05-29	00:00	2013-06-03
330880	T-1 5'	soil	2013-05-29	00:00	2013-06-03
330881	T-1 6'	soil	2013-05-29	00:00	2013-06-03
330882	T-1 7'	soil	2013-05-29	00:00	2013-06-03
330883	T-1 8' Bottom Hole	soil	2013-05-29	00:00	2013-06-03
330884	T-1 9'	soil	2013-05-29	00:00	2013-06-03
330885	T-1 10'	soil	2013-05-29	00:00	2013-06-03
330886	T-1 11'	soil	2013-05-29	00:00	2013-06-03
330887	T-1 12'	soil	2013-05-29	00:00	2013-06-03

Sample - Field Code	BTEX				TPH DRO - NEW	TPH GRO
	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylene (mg/Kg)	DRO (mg/Kg)	GRO (mg/Kg)
330883 - T-1 8' Bottom Hole	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<4.00

Sample: 330876 - T-1 1'

Param	Flag	Result	Units	RL
Chloride		5000	mg/Kg	4

Sample: 330877 - T-1 2'

Param	Flag	Result	Units	RL
Chloride		<b>2630</b>	mg/Kg	4

**Sample: 330878 - T-1 3'**

Param	Flag	Result	Units	RL
Chloride		<b>2460</b>	mg/Kg	4

**Sample: 330879 - T-1 4'**

Param	Flag	Result	Units	RL
Chloride		<b>2830</b>	mg/Kg	4

**Sample: 330880 - T-1 5'**

Param	Flag	Result	Units	RL
Chloride		<b>3070</b>	mg/Kg	4

**Sample: 330881 - T-1 6'**

Param	Flag	Result	Units	RL
Chloride		<b>2880</b>	mg/Kg	4

**Sample: 330882 - T-1 7'**

Param	Flag	Result	Units	RL
Chloride		<b>2390</b>	mg/Kg	4

**Sample: 330883 - T-1 8' Bottom Hole**

Param	Flag	Result	Units	RL
Chloride		<b>1140</b>	mg/Kg	4

**Sample: 330884 - T-1 9'**

Param	Flag	Result	Units	RL
Chloride		<b>944</b>	mg/Kg	4

**Sample: 330885 - T-1 10'**

Param	Flag	Result	Units	RL
Chloride		<b>261</b>	mg/Kg	4

**Sample: 330886 - T-1 11'**

Param	Flag	Result	Units	RL
Chloride		<b>35.1</b>	mg/Kg	4

**Sample: 330887 - T-1 12'**

Param	Flag	Result	Units	RL
Chloride		<b>140</b>	mg/Kg	4



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

## Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

# Analytical and Quality Control Report

Ike Tavaréz  
Tetra Tech  
1910 N. Big Spring Street  
Midland, TX, 79705

Report Date: June 11, 2013

Work Order: 13060337

Project Location: Eddy Co., NM  
Project Name: COG/SRO State Unit Com. 102 SWD  
Project Number: 112C04983

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
330876	T-1 1'	soil	2013-05-29	00:00	2013-06-03
330877	T-1 2'	soil	2013-05-29	00:00	2013-06-03
330878	T-1 3'	soil	2013-05-29	00:00	2013-06-03
330879	T-1 4'	soil	2013-05-29	00:00	2013-06-03
330880	T-1 5'	soil	2013-05-29	00:00	2013-06-03
330881	T-1 6'	soil	2013-05-29	00:00	2013-06-03
330882	T-1 7'	soil	2013-05-29	00:00	2013-06-03
330883	T-1 8' Bottom Hole	soil	2013-05-29	00:00	2013-06-03
330884	T-1 9'	soil	2013-05-29	00:00	2013-06-03
330885	T-1 10'	soil	2013-05-29	00:00	2013-06-03
330886	T-1 11'	soil	2013-05-29	00:00	2013-06-03
330887	T-1 12'	soil	2013-05-29	00:00	2013-06-03

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 22 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 style with a large, stylized 'M' and 'A'.

---

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

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Sample 330881 (T-1 6')	7
Sample 330882 (T-1 7')	7
Sample 330883 (T-1 8' Bottom Hole)	8
Sample 330884 (T-1 9')	9
Sample 330885 (T-1 10')	9
Sample 330886 (T-1 11')	10
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## Case Narrative

Samples for project COG/SRO State Unit Com. 102 SWD were received by TraceAnalysis, Inc. on 2013-06-03 and assigned to work order 13060337. Samples for work order 13060337 were received intact at a temperature of 2.4 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	86555	2013-06-09 at 21:00	102164	2013-06-11 at 10:59
Chloride (Titration)	SM 4500-Cl B	86493	2013-06-07 at 09:02	102130	2013-06-10 at 11:24
Chloride (Titration)	SM 4500-Cl B	86493	2013-06-07 at 09:02	102135	2013-06-10 at 12:52
TPH DRO - NEW	S 8015 D	86484	2013-06-06 at 08:00	102081	2013-06-07 at 09:16
TPH GRO	S 8015 D	86503	2013-06-06 at 10:30	102101	2013-06-07 at 14:40

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 13060337 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: June 11, 2013  
112C04983

Work Order: 13060337  
COG/SRO State Unit Com. 102 SWD

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Eddy Co., NM

## Analytical Report

### Sample: 330876 - T-1 1'

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-06-10	Analyzed By:	AR
QC Batch:	102130	Sample Preparation:	2013-06-07	Prepared By:	AR
Prep Batch:	86493				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			5000	mg/Kg	10	4.00

### Sample: 330877 - T-1 2'

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-06-10	Analyzed By:	AR
QC Batch:	102130	Sample Preparation:	2013-06-07	Prepared By:	AR
Prep Batch:	86493				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			2630	mg/Kg	10	4.00

### Sample: 330878 - T-1 3'

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-06-10	Analyzed By:	AR
QC Batch:	102130	Sample Preparation:	2013-06-07	Prepared By:	AR
Prep Batch:	86493				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			2460	mg/Kg	10	4.00

Report Date: June 11, 2013  
112C04983

Work Order: 13060337  
COG/SRO State Unit Com. 102 SWD

Page Number: 7 of 22  
Eddy Co., NM

**Sample: 330879 - T-1 4'**

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-06-10	Analyzed By:	AR
QC Batch:	102130	Sample Preparation:	2013-06-07	Prepared By:	AR
Prep Batch:	86493				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			2830	mg/Kg	10	4.00

**Sample: 330880 - T-1 5'**

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-06-10	Analyzed By:	AR
QC Batch:	102130	Sample Preparation:	2013-06-07	Prepared By:	AR
Prep Batch:	86493				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			3070	mg/Kg	10	4.00

**Sample: 330881 - T-1 6'**

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-06-10	Analyzed By:	AR
QC Batch:	102130	Sample Preparation:	2013-06-07	Prepared By:	AR
Prep Batch:	86493				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			2880	mg/Kg	10	4.00

**Sample: 330882 - T-1 7'**

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-06-10	Analyzed By:	AR
QC Batch:	102130	Sample Preparation:	2013-06-07	Prepared By:	AR
Prep Batch:	86493				

Report Date: June 11, 2013  
112C04983

Work Order: 13060337  
COG/SRO State Unit Com. 102 SWD

Page Number: 8 of 22  
Eddy Co., NM

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			2390	mg/Kg	10	4.00

**Sample: 330883 - T-1 8' Bottom Hole**

Laboratory: Midland  
Analysis: BTEX  
QC Batch: 102164  
Prep Batch: 86555

Analytical Method: S 8021B  
Date Analyzed: 2013-06-11  
Sample Preparation: 2013-06-09

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)			1.72	mg/Kg	1	2.00	86	70 - 130
4-Bromofluorobenzene (4-BFB)			1.76	mg/Kg	1	2.00	88	70 - 130

**Sample: 330883 - T-1 8' Bottom Hole**

Laboratory: Midland  
Analysis: Chloride (Titration)  
QC Batch: 102130  
Prep Batch: 86493

Analytical Method: SM 4500-Cl B  
Date Analyzed: 2013-06-10  
Sample Preparation: 2013-06-07

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			1140	mg/Kg	10	4.00

**Sample: 330883 - T-1 8' Bottom Hole**

Laboratory: Midland  
Analysis: TPH DRO - NEW  
QC Batch: 102081  
Prep Batch: 86484

Analytical Method: S 8015 D  
Date Analyzed: 2013-06-07  
Sample Preparation: 2013-06-06

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

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			90.7	mg/Kg	1	100	91	55.1 - 135.7

**Sample: 330883 - T-1 8' Bottom Hole**

Laboratory: Midland  
Analysis: TPH GRO  
QC Batch: 102101  
Prep Batch: 86503

Analytical Method: S 8015 D  
Date Analyzed: 2013-06-07  
Sample Preparation: 2013-06-06

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO		i	<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)			1.89	mg/Kg	1	2.00	94	70 - 130

**Sample: 330884 - T-1 9'**

Laboratory: Midland  
Analysis: Chloride (Titration)  
QC Batch: 102130  
Prep Batch: 86493

Analytical Method: SM 4500-Cl B  
Date Analyzed: 2013-06-10  
Sample Preparation: 2013-06-07

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			944	mg/Kg	5	4.00

**Sample: 330885 - T-1 10'**

Laboratory: Midland  
Analysis: Chloride (Titration)  
QC Batch: 102130  
Prep Batch: 86493

Analytical Method: SM 4500-Cl B  
Date Analyzed: 2013-06-10  
Sample Preparation: 2013-06-07

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

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Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<b>261</b>	mg/Kg	5	4.00

**Sample: 330886 - T-1 11'**

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-06-10	Analyzed By:	AR
QC Batch:	102135	Sample Preparation:	2013-06-07	Prepared By:	AR
Prep Batch:	86493				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<b>35.1</b>	mg/Kg	5	4.00

**Sample: 330887 - T-1 12'**

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2013-06-10	Analyzed By:	AR
QC Batch:	102135	Sample Preparation:	2013-06-07	Prepared By:	AR
Prep Batch:	86493				

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<b>140</b>	mg/Kg	5	4.00

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## Method Blanks

Method Blank (1) QC Batch: 102081

QC Batch: 102081  
Prep Batch: 86484

Date Analyzed: 2013-06-07  
QC Preparation: 2013-06-06

Analyzed By: CW  
Prepared By: CW

Parameter	Flag	Cert	MDL Result	Units	RL
DRO			<10.2	mg/Kg	50

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			85.0	mg/Kg	1	100	85	55.1 - 135.7

Method Blank (1) QC Batch: 102101

QC Batch: 102101  
Prep Batch: 86503

Date Analyzed: 2013-06-07  
QC Preparation: 2013-06-06

Analyzed By: KC  
Prepared By: KC

Parameter	Flag	Cert	MDL Result	Units	RL
GRO			6.99	mg/Kg	4

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.80	mg/Kg	1	2.00	90	70 - 130
4-Bromofluorobenzene (4-BFB)			1.73	mg/Kg	1	2.00	86	70 - 130

Method Blank (1) QC Batch: 102130

QC Batch: 102130  
Prep Batch: 86493

Date Analyzed: 2013-06-10  
QC Preparation: 2013-06-07

Analyzed By: AR  
Prepared By: AR

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



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**Method Blank (1)**      QC Batch: 102135

QC Batch: 102135  
Prep Batch: 86493

Date Analyzed: 2013-06-10  
QC Preparation: 2013-06-07

Analyzed By: AR  
Prepared By: AR

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

**Method Blank (1)**      QC Batch: 102164

QC Batch: 102164  
Prep Batch: 86555

Date Analyzed: 2013-06-11  
QC Preparation: 2013-06-09

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)			1.72	mg/Kg	1	2.00	86	70 - 130
4-Bromofluorobenzene (4-BFB)			1.72	mg/Kg	1	2.00	86	70 - 130

## Laboratory Control Spikes

### Laboratory Control Spike (LCS-1)

QC Batch: 102081  
Prep Batch: 86484

Date Analyzed: 2013-06-07  
QC Preparation: 2013-06-06

Analyzed By: CW  
Prepared By: CW

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	247	mg/Kg	1	250	<10.2	99	66.9 - 119.9

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
DRO		1	258	mg/Kg	1	250	<10.2	103	66.9 - 119.9	4	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	99.9	104	mg/Kg	1	100	100	104	76.8 - 140.2

### Laboratory Control Spike (LCS-1)

QC Batch: 102101  
Prep Batch: 86503

Date Analyzed: 2013-06-07  
QC Preparation: 2013-06-06

Analyzed By: KC  
Prepared By: KC

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	20.3	mg/Kg	1	20.0	<2.32	102	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	20.3	mg/Kg	1	20.0	<2.32	102	70 - 130	0	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)	1.83	1.83	mg/Kg	1	2.00	92	92	70 - 130
4-Bromofluorobenzene (4-BFB)	1.94	1.89	mg/Kg	1	2.00	97	94	70 - 130

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#### Laboratory Control Spike (LCS-1)

QC Batch: 102130  
Prep Batch: 86493

Date Analyzed: 2013-06-10  
QC Preparation: 2013-06-07

Analyzed By: AR  
Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2630	mg/Kg	1	2500	<3.85	105	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2510	mg/Kg	1	2500	<3.85	100	85 - 115	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: 102135  
Prep Batch: 86493

Date Analyzed: 2013-06-10  
QC Preparation: 2013-06-07

Analyzed By: AR  
Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2460	mg/Kg	1	2500	<3.85	98	85 - 115

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			2550	mg/Kg	1	2500	<3.85	102	85 - 115	4	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: 102164  
Prep Batch: 86555

Date Analyzed: 2013-06-11  
QC Preparation: 2013-06-09

Analyzed By: KC  
Prepared By: KC

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.72	mg/Kg	1	2.00	<0.00810	86	70 - 130
Toluene		1	1.84	mg/Kg	1	2.00	<0.00750	92	70 - 130
Ethylbenzene		1	1.88	mg/Kg	1	2.00	<0.00730	94	70 - 130

*continued ...*

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control spikes continued ...

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Xylene			5.47	mg/Kg	1	6.00	<0.00700	91	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			1.76	mg/Kg	1	2.00	<0.00810	88	70 - 130	2	20
Toluene			1.86	mg/Kg	1	2.00	<0.00750	93	70 - 130	1	20
Ethylbenzene			1.90	mg/Kg	1	2.00	<0.00730	95	70 - 130	1	20
Xylene			5.56	mg/Kg	1	6.00	<0.00700	93	70 - 130	2	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.77	1.69	mg/Kg	1	2.00	88	84	70 - 130
4-Bromofluorobenzene (4-BFB)	1.83	1.72	mg/Kg	1	2.00	92	86	70 - 130

**Matrix Spike (xMS-1)** Spiked Sample: 330714

QC Batch: 102081  
Prep Batch: 86484

Date Analyzed: 2013-06-07  
QC Preparation: 2013-06-06

Analyzed By: CW  
Prepared By: CW

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO			222	mg/Kg	1	250	88.8	53	36.1 - 147.2

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			249	mg/Kg	1	250	88.8	64	36.1 - 147.2	12	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	91.3	104	mg/Kg	1	100	91	104	78.3 - 131.6

**Matrix Spike (MS-1)** Spiked Sample: 330830

QC Batch: 102101  
Prep Batch: 86503

Date Analyzed: 2013-06-07  
QC Preparation: 2013-06-06

Analyzed By: KC  
Prepared By: KC

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Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO			18.2	mg/Kg	1	20.0	<2.32	91	70 - 130

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO			17.4	mg/Kg	1	20.0	<2.32	87	70 - 130	4	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)	1.80	1.83	mg/Kg	1	2	90	92	70 - 130
4-Bromofluorobenzene (4-BFB)	1.92	1.95	mg/Kg	1	2	96	98	70 - 130

**Matrix Spike (MS-1)** Spiked Sample: 330885

QC Batch: 102130  
Prep Batch: 86493

Date Analyzed: 2013-06-10  
QC Preparation: 2013-06-07

Analyzed By: AR  
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			2620	mg/Kg	5	2500	261	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			2720	mg/Kg	5	2500	261	98	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: 331257

QC Batch: 102135  
Prep Batch: 86493

Date Analyzed: 2013-06-10  
QC Preparation: 2013-06-07

Analyzed By: AR  
Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			4230	mg/Kg	10	2500	1780	98	78.9 - 121

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
Chloride			4470	mg/Kg	10	2500	1780	108	78.9 - 121	6	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: 330883

QC Batch: 102164  
Prep Batch: 86555

Date Analyzed: 2013-06-11  
QC Preparation: 2013-06-09

Analyzed By: KC  
Prepared By: KC

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	1.85	mg/Kg	1	2.00	<0.00810	92	70 - 130
Toluene		1	1.97	mg/Kg	1	2.00	<0.00750	98	70 - 130
Ethylbenzene		1	2.00	mg/Kg	1	2.00	<0.00730	100	70 - 130
Xylene		1	5.84	mg/Kg	1	6.00	<0.00700	97	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	1.70	mg/Kg	1	2.00	<0.00810	85	70 - 130	8	20
Toluene		1	1.80	mg/Kg	1	2.00	<0.00750	90	70 - 130	9	20
Ethylbenzene		1	1.84	mg/Kg	1	2.00	<0.00730	92	70 - 130	8	20
Xylene		1	5.37	mg/Kg	1	6.00	<0.00700	90	70 - 130	8	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)	1.65	1.75	mg/Kg	1	2	82	88	70 - 130
4-Bromofluorobenzene (4-BFB)	1.91	1.80	mg/Kg	1	2	96	90	70 - 130

## Calibration Standards

### Standard (CCV-1)

QC Batch: 102081

Date Analyzed: 2013-06-07

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	256	102	80 - 120	2013-06-07

### Standard (CCV-2)

QC Batch: 102081

Date Analyzed: 2013-06-07

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	229	92	80 - 120	2013-06-07

### Standard (CCV-3)

QC Batch: 102081

Date Analyzed: 2013-06-07

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	284	114	80 - 120	2013-06-07

### Standard (CCV-1)

QC Batch: 102101

Date Analyzed: 2013-06-07

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	1.15	115	80 - 120	2013-06-07

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**Standard (CCV-2)**

QC Batch: 102101

Date Analyzed: 2013-06-07

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	1.04	104	80 - 120	2013-06-07

**Standard (CCV-3)**

QC Batch: 102101

Date Analyzed: 2013-06-07

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	1.11	111	80 - 120	2013-06-07

**Standard (CCV-1)**

QC Batch: 102130

Date Analyzed: 2013-06-10

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	2013-06-10

**Standard (CCV-2)**

QC Batch: 102130

Date Analyzed: 2013-06-10

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	98.6	99	85 - 115	2013-06-10

**Standard (CCV-1)**

QC Batch: 102135

Date Analyzed: 2013-06-10

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	101	101	85 - 115	2013-06-10

**Standard (CCV-2)**

QC Batch: 102135

Date Analyzed: 2013-06-10

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	2013-06-10

**Standard (CCV-1)**

QC Batch: 102164

Date Analyzed: 2013-06-11

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	0.0858	86	80 - 120	2013-06-11
Toluene		1	mg/kg	0.100	0.0890	89	80 - 120	2013-06-11
Ethylbenzene		1	mg/kg	0.100	0.0879	88	80 - 120	2013-06-11
Xylene		1	mg/kg	0.300	0.256	85	80 - 120	2013-06-11

**Standard (CCV-2)**

QC Batch: 102164

Date Analyzed: 2013-06-11

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	0.0930	93	80 - 120	2013-06-11
Toluene		1	mg/kg	0.100	0.0960	96	80 - 120	2013-06-11
Ethylbenzene		1	mg/kg	0.100	0.0930	93	80 - 120	2013-06-11
Xylene		1	mg/kg	0.300	0.269	90	80 - 120	2013-06-11

## 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: June 11, 2013  
112C04983

Work Order: 13060337  
COG/SRO State Unit Com. 102 SWD

Page Number: 22 of 22  
Eddy Co., NM

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



13060337

## Analysis Request of Chain of Custody Record

PAGE: 2 OF: 2

**TETRA TECH**

1910 N. Big Spring St.

Midland, Texas 79705

(432) 682-4559 • Fax (432) 682-3946

ANALYSIS REQUEST  
(Circle or Specify Method No.)

CLIENT NAME:

COG

SITE MANAGER:

Ike TAVAREZ

PROJECT NO.:

112C04983

PROJECT NAME:

COG-SRD 102 JWD

LAB I.D.  
NUMBER

DATE

TIME

MATRIX

COMP

GRAB

NUMBER OF CONTAINERS

FILTERED (Y/N)

HCL

HNO3

ICE

NONE

PRESERVATIVE  
METHOD

BTEX 802/B

TPH 8015 MOD. TX1005 (Ext. to C35)

PAH 8270

RCRA Metals Ag As Ba Cd Cr Pb Hg Se

TCLP Metals Ag As Ba Cd Cr Pb Hg Se

TCLP Volatiles

TCLP Semi Volatiles

RCI

GC/MS Vol. 8240/8260/624

GC/MS Semi. Vol. 8270/625

PCB's 8080/608

Pest. 808/608

Chloride

Gamma Spec.

Alpha Beta (Air)

PLM (Asbestos)

Major Anions/Cations, pH, TDS

RELINQUISHED BY: (Signature)

Maren Thiel

Date:

Time:

RECEIVED BY: (Signature)

Kenne Fitch

Date:

Time:

RELINQUISHED BY: (Signature)

Kenne Fitch

Date:

Time:

RECEIVED BY: (Signature)

Kenne Fitch

Date:

Time:

RELINQUISHED BY: (Signature)

Kenne Fitch

Date:

Time:

RECEIVED BY: (Signature)

Kenne Fitch

Date:

Time:

RECEIVING LABORATORY:

TRAC

ADDRESS:

CITY: MIDLAND

STATE: TX

ZIP:

CONTACT:

PHONE:

RECEIVED BY: (Signature)

Kenne Fitch

DATE:

TIME:

SAMPLED BY: (Print &amp; Initial)

MARCUS KUTAWSKI/MK

Date:

Time:

SAMPLE SHIPPED BY: (Circle)

FEDEX

BUS

HAND DELIVERED

UPS

AIRBILL #:

OTHER:

TETRA TECH CONTACT PERSON:

Ike TAVAREZ

Results by:

RUSH Charges

Authorized:

Yes No

SAMPLE CONDITION WHEN RECEIVED:

2.40

REMARKS:

Please fill out all copies - Laboratory retains Yellow copy - Return Original copy to Tetra Tech - Project Manager retains Pink copy - Accounting receives Gold copy.