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

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

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

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
811S. 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

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

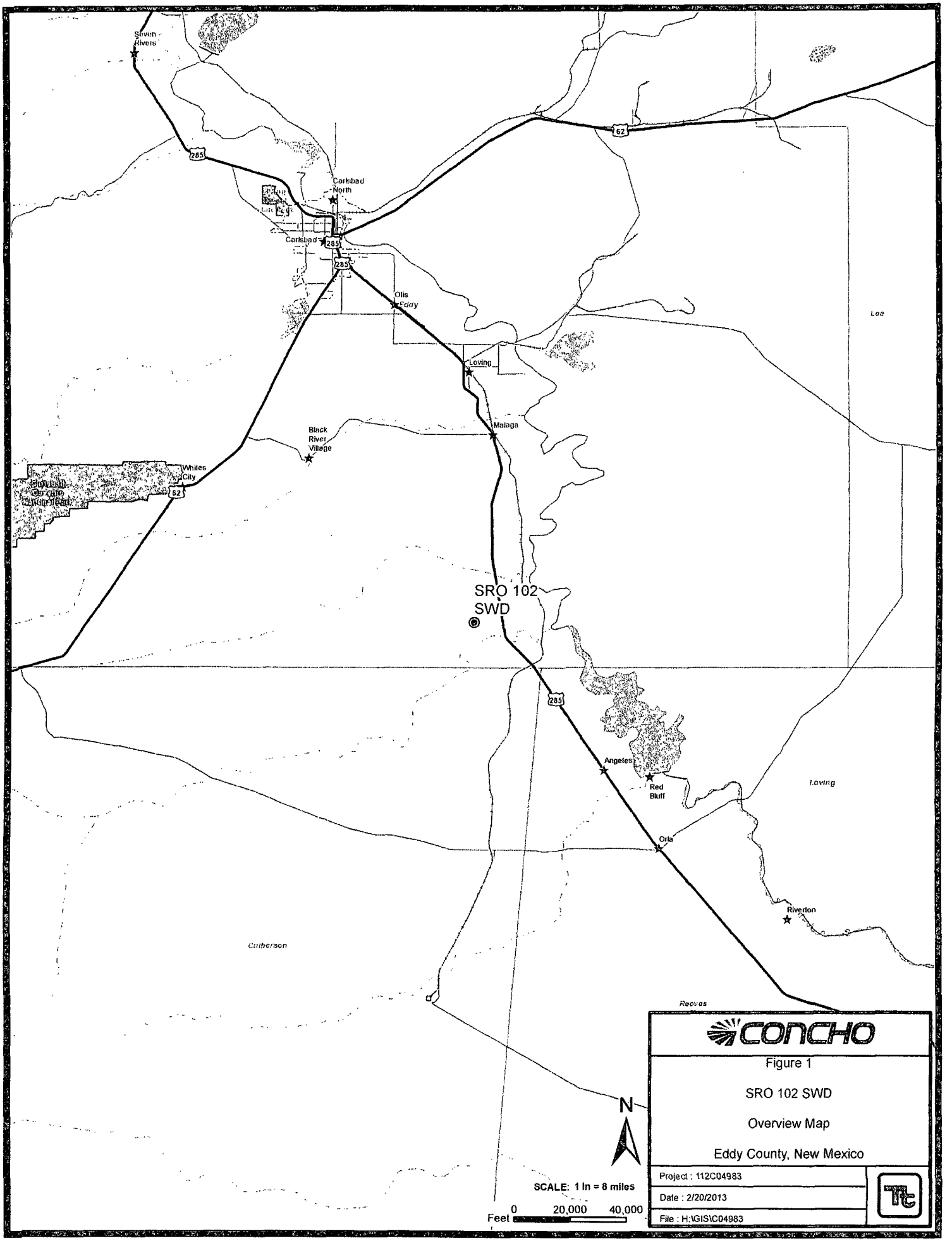
Based on the remedial actions taken, COG requests closure of this site. The Final C-141s are enclosed in Appendix A. If you have any questions or comments concerning the assessment or the remediation activities for this site, please call me at (432) 682-4559.

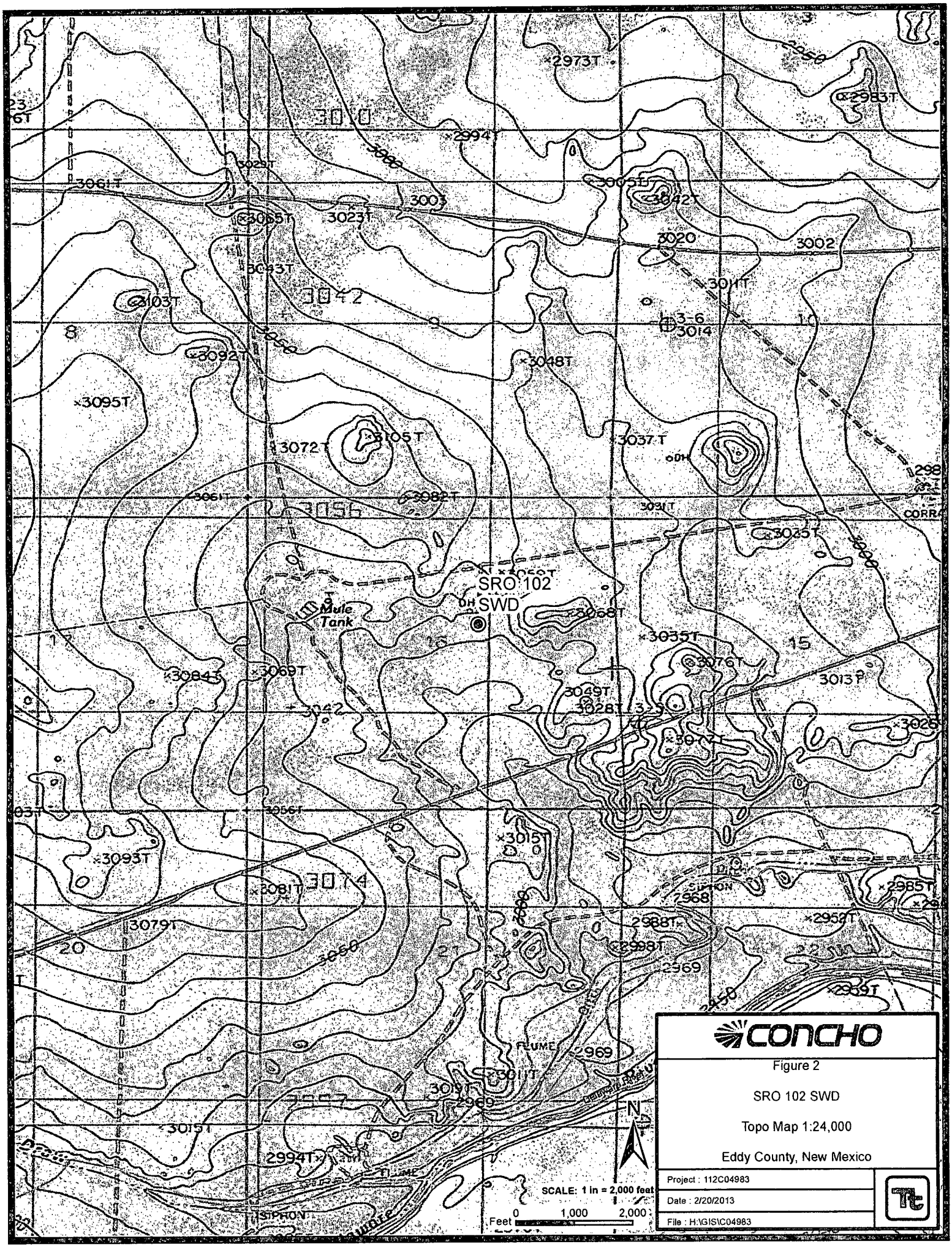
Respectfully submitted,

Marcus Kujawski
Staff Scientist

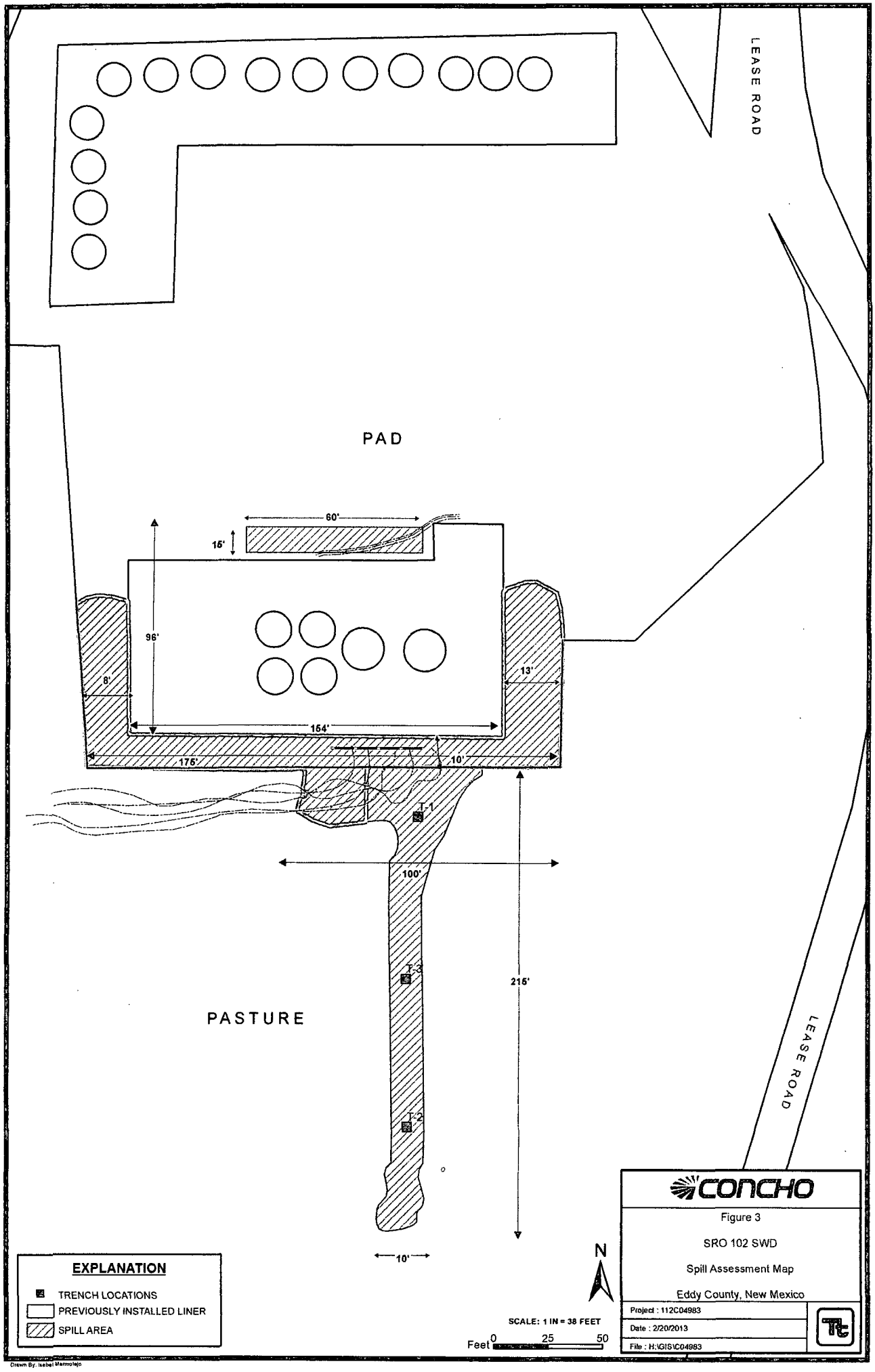
cc: Robert McNeill – COG

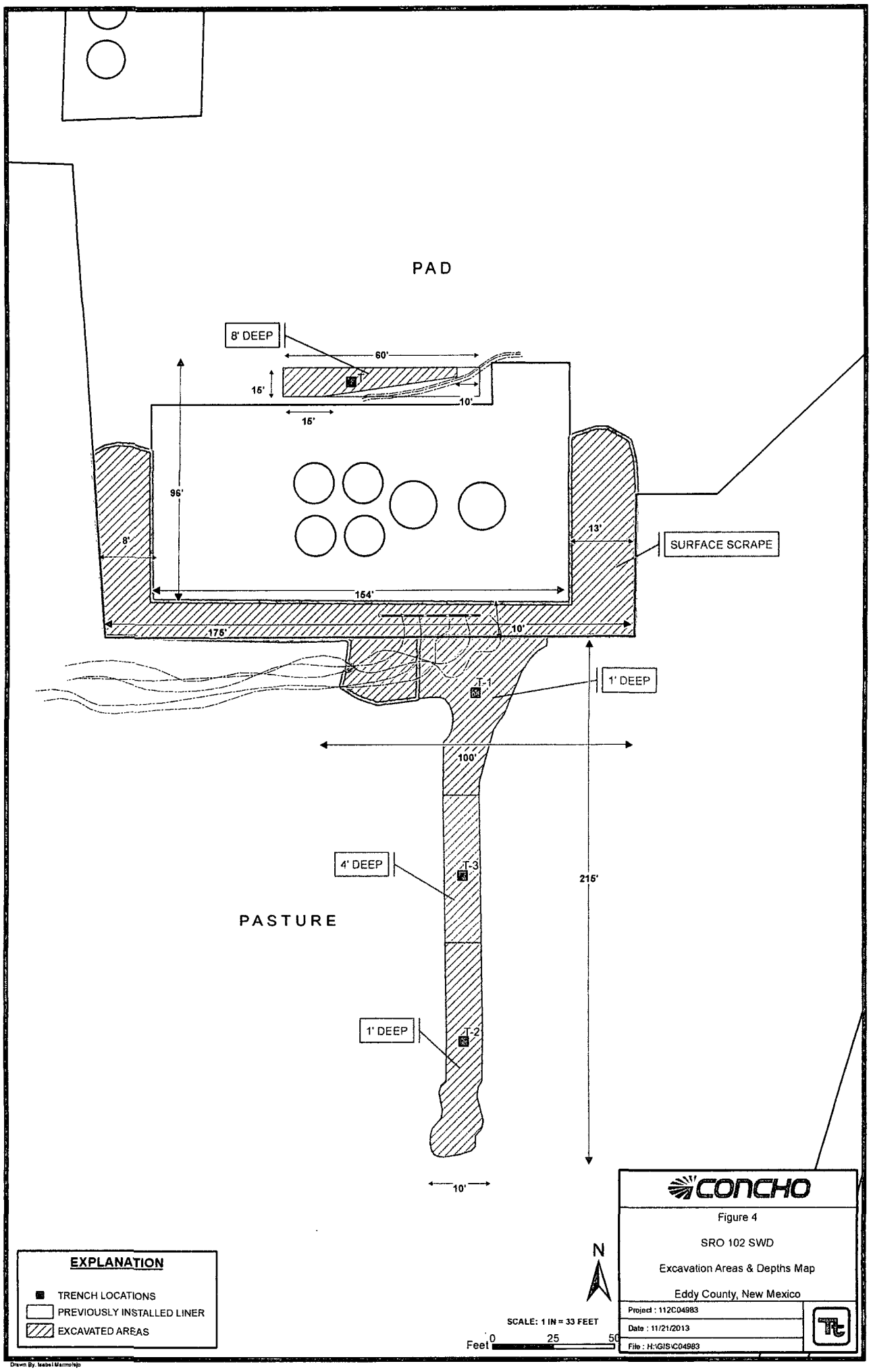
Figures


Seven Rivers
285
Carlsbad North
Carlsbad
285
285
62
Otis
Eddy
Lea
Loving
Malaga
Black River Village
Whites City
62
SRO 102
SWD
283
Angeles
Red Bluff
Loving
Orla
Riverton
Culberson
Reeves
N
SCALE: 1 In = 8 miles
0
20,000
40,000
Feet
CONCHO
Figure 1
SRO 102 SWD
Overview Map
Eddy County, New Mexico
Project : 112C04983
Date : 2/20/2013
File : H:\GIS\C04983
Drawn By: Isabel Marmolejo



Drawn By: Isabel Marmolejo


LEASE ROAD
PAD
60'
15'
96'
8'
13'
154'
175'
10'
T-1
100'
T-3
215'
PASTURE
T-2
10'
LEASE ROAD
EXPLANATION
TRENCH LOCATIONS
PREVIOUSLY INSTALLED LINER
SPILL AREA
N
SCALE: 1 IN = 38 FEET
Feet 0 25 50
CONCHO
Figure 3
SRO 102 SWD
Spill Assessment Map
Eddy County, New Mexico
Project : 112C04983
Date : 2/20/2013
File : H:\GIS\C04983
Drawn By: Isabel Manriquez


PAD
8' DEEP
60'
15'
10'
15'
96'
8'
13'
SURFACE SCRAPE
154'
175'
10'
T-1
1' DEEP
100'
4' DEEP
T-3
215'
PASTURE
1' DEEP
T-2
10'
EXPLANATION
TRENCH LOCATIONS
PREVIOUSLY INSTALLED LINER
EXCAVATED AREAS
N
SCALE: 1 IN = 33 FEET
Feet 0 25 50
CONCHO
Figure 4
SRO 102 SWD
Excavation Areas & Depths Map
Eddy County, New Mexico
Project : 112C04983
Date : 11/21/2013
File : H:\GIS\C04983
Drawn By: Isabel Marmolejo

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						
Trench-1	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
Trench-2	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
Trench-3	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

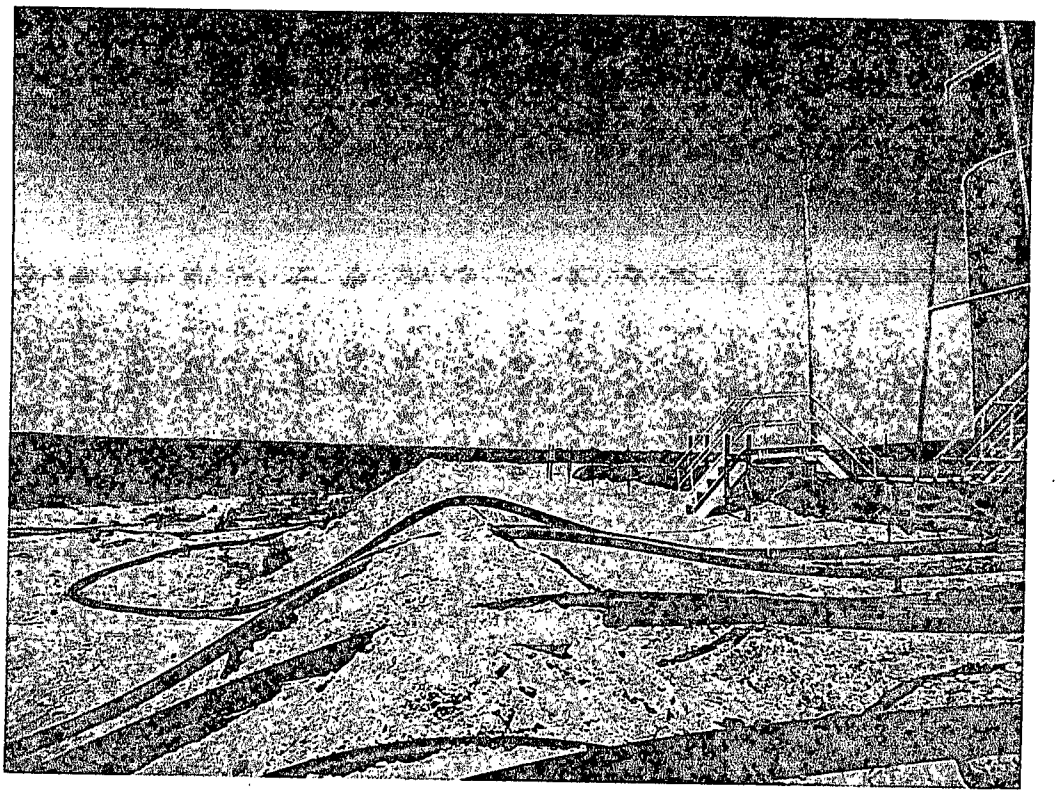
Ecavated depths

(-) Not Analyzed

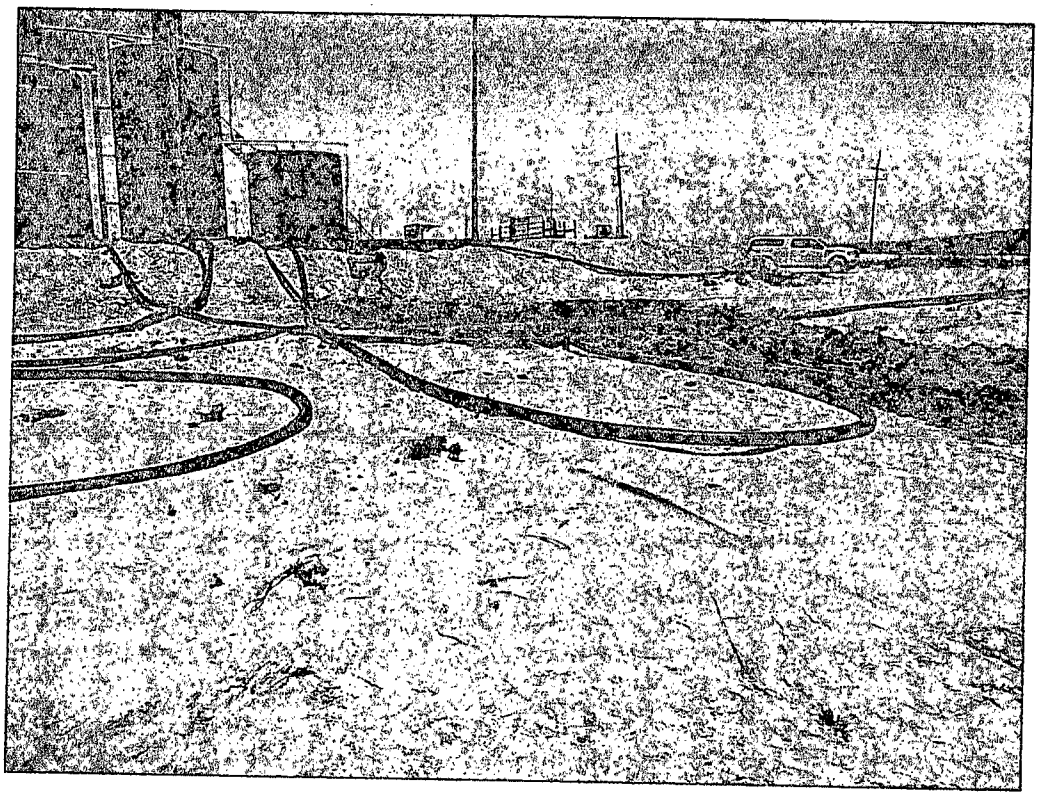
Photos

COG Operating LLC
SRO 102 SWD
Eddy County, New Mexico

TETRA TECH



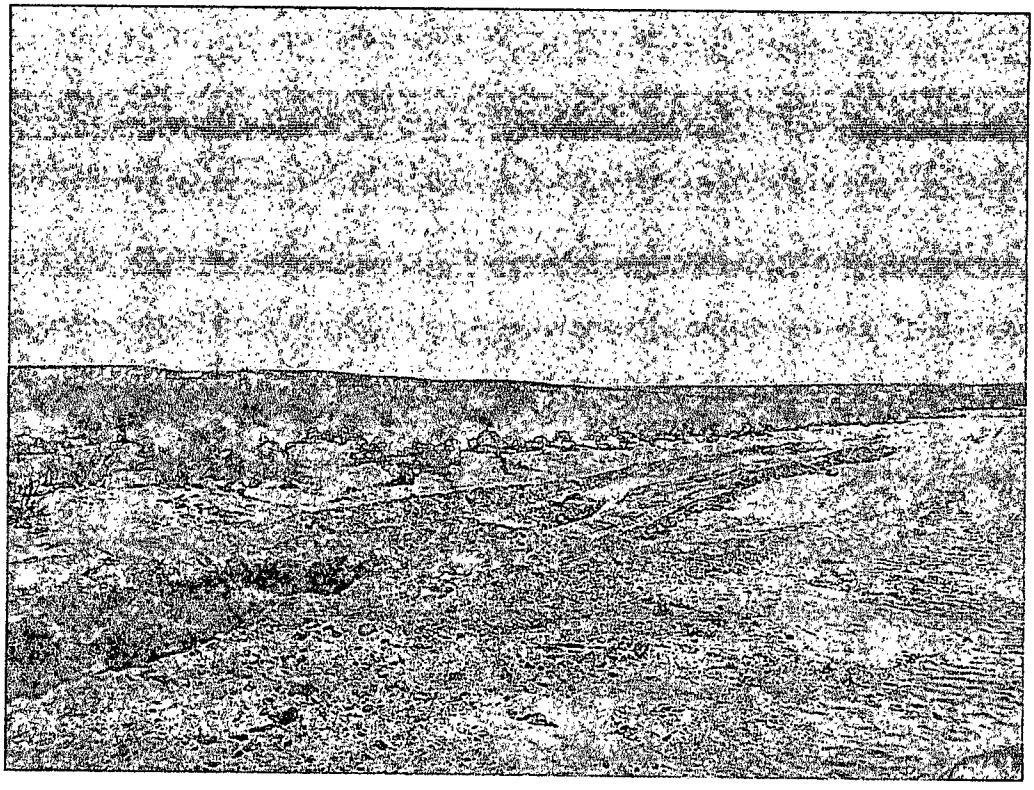
View West – Surface scrape behind battery



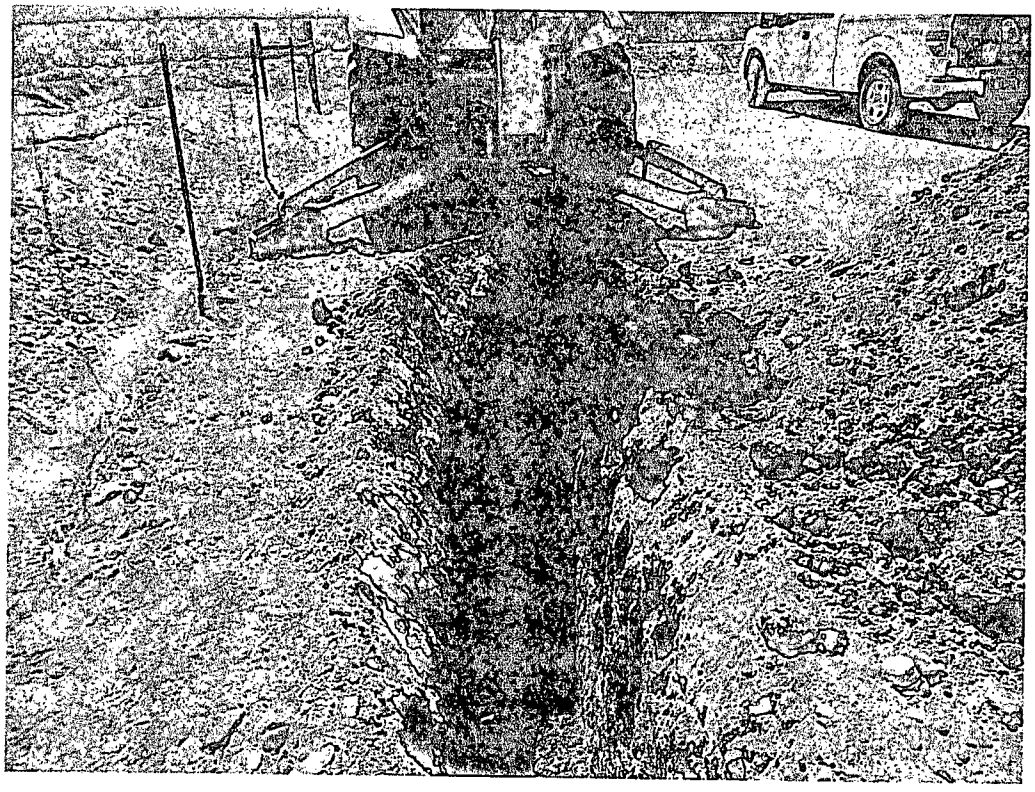
View North – T-1 area at 1.0'

COG Operating LLC
SRO 102 SWD
Eddy County, New Mexico

TETRA TECH



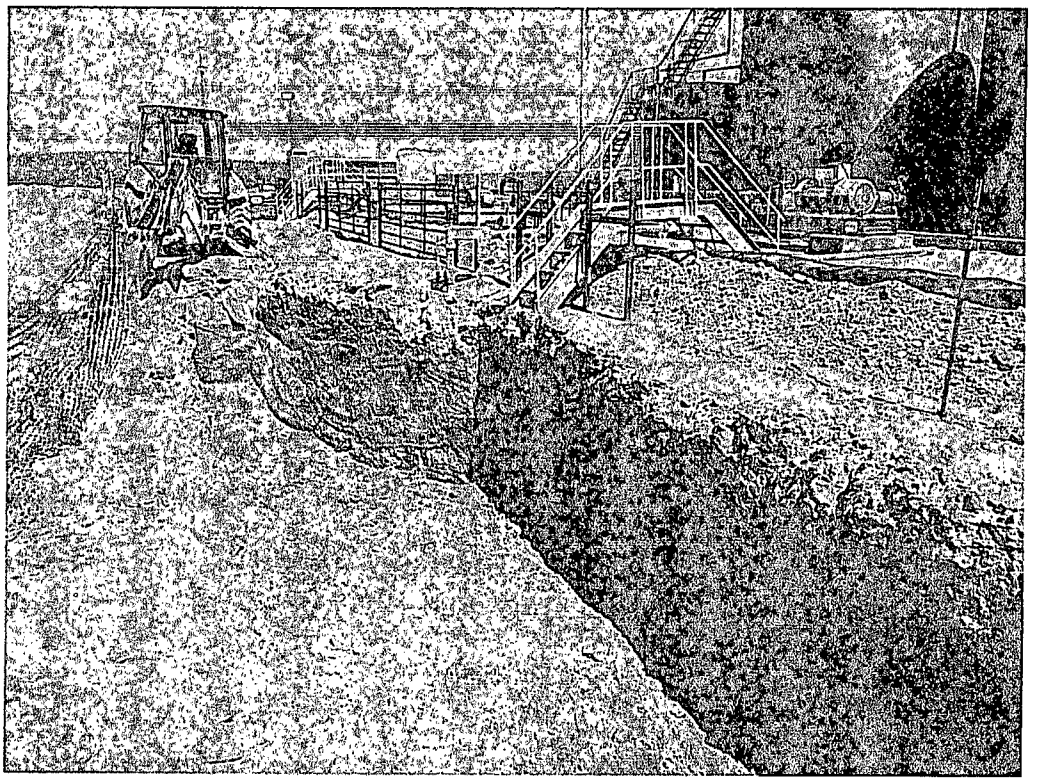
View South – T-2 area at 4.0' and T-3 area at 1.0'



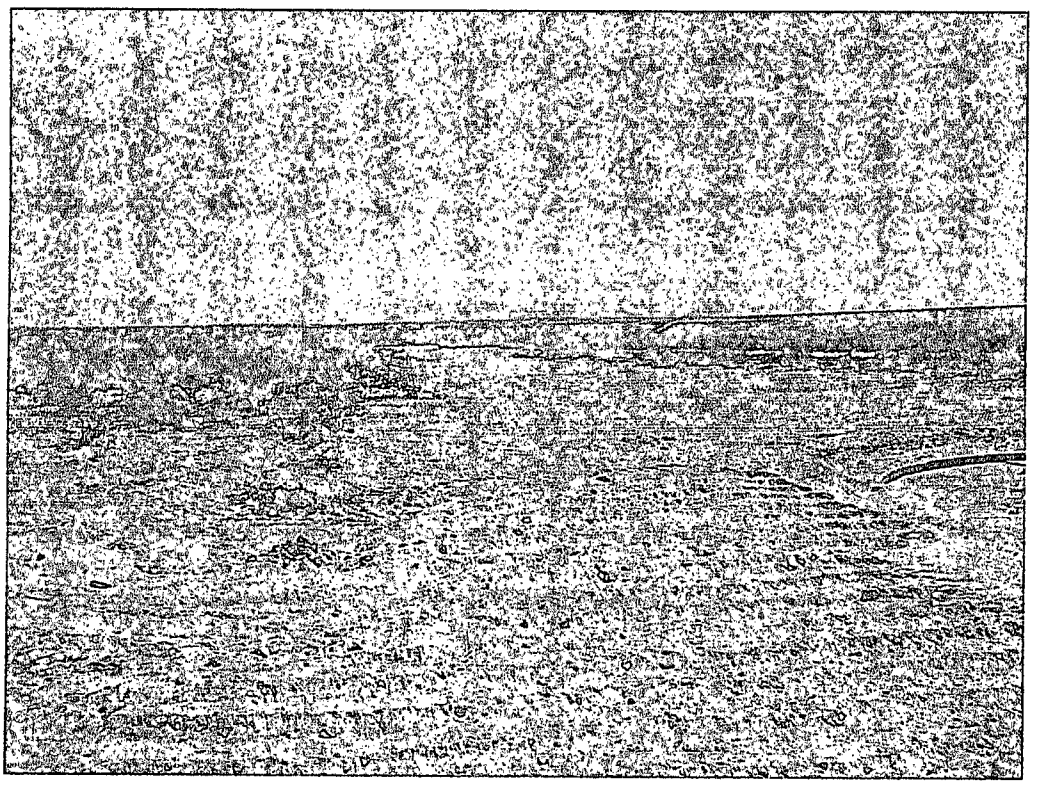
View West – Trench for 2nd spill

COG Operating LLC
SRO 102 SWD
Eddy County, New Mexico

TETRA TECH



View East – 2nd 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

View Southwest – 2nd spill area backfilled

TETRA TECH

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 **COG Operating LLC**	Contact **Robert McNeill**
Address **600 W. Illinois, Midland, Texas 79701**	Telephone No. **(432) 685-4332**
Facility Name **SRO 102 SWD**	Facility Type **Tank Battery**

Surface Owner: State	Mineral Owner	Lease No. (API#) 30-015-21398

LOCATION OF RELEASE

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

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? ☐ Yes ☐ No ☒ Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. N/A	

If a Watercourse was Impacted, Describe Fully.*

N/A

RECEIVED
MAR 05 2014
NMOCD ARTESIA

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:	OIL CONSERVATION DIVISION	
Printed Name: Ike Tavarez (Agent for COG)	Approved by District Supervisor:	
Title: Project Manager	Approval Date:	Expiration Date:
E-mail Address: Ike.Tavarez@TetraTech.com	Conditions of Approval:	Attached ☐
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
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 **COG Operating LLC**	Contact **Robert McNeill**
Address **600 W. Illinois Ave, Midland, Texas 79701**	Telephone No. **(432) 685-4332**
Facility Name SRO 102 SWD	Facility Type **Tank Battery**

Surface Owner: State	Mineral Owner	Lease No. (API#) 30-015-21398

LOCATION OF RELEASE

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

Latitude N 32.14430° **Longitude** W 104.09031°

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release 320 bbls	Volume Recovered 280 bbls
Source of Release: Equalizer	Date and Hour of Occurrence 12/31/212	Date and Hour of Discovery 12/31/2013 11:00 am
Was Immediate Notice Given? ☐ Yes ☐ No ☒ Not Required	If YES, To Whom?	
By Whom? Josh Russo	Date and Hour 3/15/10 4:59 p.m.	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. N/A	

If a Watercourse was Impacted, Describe Fully.*

N/A

RECEIVED
MAR 05 2014
NMOCD ARTESIA

Describe Cause of Problem and Remedial Action Taken.*

The Inlet heade4r at the facility malfunctioned allowing the release of fluid. The header is located on the backside of the facility. The header has been repaired.

Describe Area Affected and Cleanup Action Taken.*

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.

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

Signature:	OIL CONSERVATION DIVISION	
Printed Name: Ike Tavarez (Agent for COG)	Approved by District Supervisor:	
Title: Project Manager	Approval Date:	Expiration Date:
E-mail Address: Ike.Tavarez@TetraTech.com	Conditions of Approval:	Attached ☐
Date: 11/14/2013 Phone: (432) 682-4559		

* 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 **43**	10	11	12 **27**
18 **34**	17	16	15	14	13 **31**
19	20	21	22 **70**	23	24
30	29	28	27	26	25
31	32	33	34	35	36

24 South 28 East

6 **70**	5 **30**	4 **30**	3	2 **55**	1 **60**
7	8 **50**	9	10 **17**	11 **20**	12 **73**
18	17 **42**	16 **29**	15 **18**	14 **62**	13 **34**
19	20 **48**	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

24 South 29 East

6	5	4	3	2	1
7 **160**	8	9	10	11	12
18	17	16 **18**	15	14	13
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 **19**	34	35	36

25 South 28 East

6	5 **69**	4 **35**	3 **32**	2	1
7	8	9	10	11	12
18 **67**	17	16	15 **48** **49**	14	13
19	20 **96**	21	22	23	24
30	29 **15**	28 **90**	27	26 **30**	25
31	32	33	34	35	36 **40**

25 South 29 East

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

26 South 27 East

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

26 South 28 East

6	5	4	3	2 **120**	1
7	8	9	10	11	12 **100**
18 **25**	17	16 SITE	15	14 **120**	13 **56**
19	20	21	22 **120**	23	24
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 **67** **69**	23	24
30	29	28	27	26	25
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

	BTEX				TPH DRO - NEW	TPH GRO
Sample - Field Code	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

TRACEANALYSIS, INC.

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

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

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.

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

Report Contents

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.

Analytical Report

Sample: 319014 - Trench-1 0-1'

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
Trifluorotolnene (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)	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			**5690**	mg/Kg	10	4.00

Sample: 319014 - Trench-1 0-1'

Laboratory:	Midland				
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	98418	Date Analyzed:	2013-01-28	Analyzed By:	CW
Prep Batch:	83395	Sample Preparation:	2013-01-24	Prepared By:	CW

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

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	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

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.37	mg/Kg	1	2.00	118	70 - 130
4-Bromofluorobenzene (4-BFB)			2.05	mg/Kg	1	2.00	102	70 - 130

Sample: 319015 - Trench-1 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			**169**	mg/Kg	5	4.00

Sample: 319016 - Trench-1 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

continued ...

sample 319016 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**284**	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			**448**	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

Sample: 319018 - Trench-2 0-0.5'

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			**3220**	mg/Kg	10	4.00

Sample: 319018 - Trench-2 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			114	mg/Kg	1	100	114	70 - 130

Sample: 319018 - Trench-2 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

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

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**3210**	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			**688**	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			**278**	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 ...

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)	Qsr	Qsr	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

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**368**	mg/Kg	5	4.00

Method Blanks

Method Blank (1) QC Batch: 98395

QC Batch: 98395 | Date Analyzed: 2013-01-24 | Analyzed By: YG
Prep Batch: 83373 | QC Preparation: 2013-01-24 | 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 | Date Analyzed: 2013-01-24 | Analyzed By: YG
Prep Batch: 83375 | QC Preparation: 2013-01-24 | 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 | Date Analyzed: 2013-01-25 | Analyzed By: CW
Prep Batch: 83389 | QC Preparation: 2013-01-24 | Prepared By: CW

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 Date Analyzed: 2013-01-28 Analyzed By: CW
Prep Batch: 83395 QC Preparation: 2013-01-24 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 Date Analyzed: 2013-01-29 Analyzed By: AR
Prep Batch: 83354 QC Preparation: 2013-01-24 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 Date Analyzed: 2013-01-29 Analyzed By: AR
Prep Batch: 83354 QC Preparation: 2013-01-24 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 | Date Analyzed: 2013-01-24 | Analyzed By: YG
Prep Batch: 83373 | QC Preparation: 2013-01-24 | 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)	Qsr	Qsr	2.36	2.38	mg/Kg	1	2.00	118	119	79.5 - 108
4-Bromofluorobenzene (4-BFB)	Qsr	Qsr	2.16	2.10	mg/Kg	1	2.00	108	105	71.4 - 108

Laboratory Control Spike (LCS-1)

QC Batch: 98408 | Date Analyzed: 2013-01-24 | Analyzed By: YG
Prep Batch: 83375 | QC Preparation: 2013-01-24 | 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.

continued ...

control spikes continued ...

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		1	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	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD 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 | Date Analyzed: 2013-01-25 | Analyzed By: CW
Prep Batch: 83389 | QC Preparation: 2013-01-24 | Prepared By: CW

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

Laboratory Control Spike (LCS-1)

QC Batch: 98418 | Date Analyzed: 2013-01-28 | Analyzed By: CW
Prep Batch: 83395 | QC Preparation: 2013-01-24 | Prepared By: CW

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

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
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	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Tricosane	108	106	mg/Kg	1	100	108	106	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 98485 | Date Analyzed: 2013-01-29 | Analyzed By: AR
Prep Batch: 83354 | QC Preparation: 2013-01-24 | 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	LCSD 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 | Date Analyzed: 2013-01-29 | Analyzed By: AR
Prep Batch: 83354 | QC Preparation: 2013-01-24 | 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	LCSD 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.

Matrix Spike (MS-1) Spiked Sample: 319018

QC Batch: 98395 | Date Analyzed: 2013-01-24 | Analyzed By: YG
Prep Batch: 83373 | QC Preparation: 2013-01-24 | 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)	Qsr	Qsr	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 | Date Analyzed: 2013-01-24 | Analyzed By: YG
Prep Batch: 83375 | QC Preparation: 2013-01-24 | 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.

continued ...

matrix spikes continued ...

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 | Date Analyzed: 2013-01-25 | Analyzed By: CW
Prep Batch: 83389 | QC Preparation: 2013-01-24 | 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 | Date Analyzed: 2013-01-28 | Analyzed By: CW
Prep Batch: 83395 | QC Preparation: 2013-01-24 | Prepared By: CW

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO	Q8	Q8 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

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	Qsr	Qsr	139	151	mg/Kg	5	100	139	151	70 - 130

Matrix Spike (MS-1) Spiked Sample: 319023

QC Batch: 98485 | Date Analyzed: 2013-01-29 | Analyzed By: AR
Prep Batch: 83354 | QC Preparation: 2013-01-24 | 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 | Date Analyzed: 2013-01-29 | Analyzed By: AR
Prep Batch: 83354 | QC Preparation: 2013-01-24 | 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

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

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

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

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 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

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

1301230 1

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: COG

SITE MANAGER: Ike Tavarez

PROJECT NO.: 114-6401478

PROJECT NAME: SRO State Unit Com 102 SWD Eddy Co NM

LAB I.D. NUMBER	DATE 2013	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	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 Vr Pd 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	X	Trench - 1 0-1'	1				X		X	X											X				
015						2'																			X				
016						3'																			X				
017						4'																			X				
018						Trench - 2 0-0.5'							X	X											X				
019						1'																			X				
020						2'																			X				
021						3'																			X				
022						4'																			X				
023						5'																			X				

RELINQUISHED BY: (Signature) Date: 1-22-13 Time: 16:45
RECEIVED BY: (Signature) Date: 1/22/13 Time: 16.45
SAMPLED BY: (Print & Initial) TF 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:

RECEIVING LABORATORY: Trace
ADDRESS:
CITY: Midland STATE: TX ZIP:
CONTACT: PHONE:
RECEIVED BY: (Signature)
DATE: TIME:
RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 1.3°

REMARKS: If TPH exceeds 1,000 mg/kg, OR (and per EMNRD) Benzene exceeds 10 mg/kg OR and total BTEX exceeds 50 mg/kg run deeper sample. Midland - all

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

13012301

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

CLIENT NAME: COG

SITE MANAGER: Ike Tavarez

PROJECT NO.:

PROJECT NAME: SRO State Unit Com 102 SWD Eddy Co NM

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB I.D. NUMBER	DATE 2013	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	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 Vr Pd 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
024	1/21		S		X	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'																		X				
030						5'																		X				
031						6'																		X				

RELINQUISHED BY: (Signature) — Date: 1-22-13 Time: 1645 — RECEIVED BY: (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:

RECEIVING LABORATORY: Trace — RECEIVED BY: (Signature)

ADDRESS: CITY: Midland STATE: TX ZIP: CONTACT: PHONE: DATE: TIME:

RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 1.3°

REMARKS:

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

Summary Report

Ike Tavarez
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

	BTEX				TPH DRO - NEW	TPH GRO
	Benzene	Toluene	Ethylbenzene	Xylene	DRO	GRO
Sample - Field Code	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(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		**2630**	mg/Kg	4

Sample: 330878 - T-1 3'

Param	Flag	Result	Units	RL
Chloride		**2460**	mg/Kg	4

Sample: 330879 - T-1 4'

Param	Flag	Result	Units	RL
Chloride		**2830**	mg/Kg	4

Sample: 330880 - T-1 5'

Param	Flag	Result	Units	RL
Chloride		**3070**	mg/Kg	4

Sample: 330881 - T-1 6'

Param	Flag	Result	Units	RL
Chloride		**2880**	mg/Kg	4

Sample: 330882 - T-1 7'

Param	Flag	Result	Units	RL
Chloride		**2390**	mg/Kg	4

Sample: 330883 - T-1 8' Bottom Hole

Param	Flag	Result	Units	RL
Chloride		**1140**	mg/Kg	4

Sample: 330884 - T-1 9'

Param	Flag	Result	Units	RL
Chloride		**944**	mg/Kg	4

Sample: 330885 - T-1 10'

Param	Flag	Result	Units	RL
Chloride		**261**	mg/Kg	4

Sample: 330886 - T-1 11'

Param	Flag	Result	Units	RL
Chloride		**35.1**	mg/Kg	4

Sample: 330887 - T-1 12'

Param	Flag	Result	Units	RL
Chloride		**140**	mg/Kg	4

TRACEANALYSIS, INC.

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

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

Ike Tavarez
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.

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

Report Contents

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.

Analytical Report

Sample: 330876 - T-1 1'

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

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

Sample: 330877 - T-1 2'

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

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

Sample: 330878 - T-1 3'

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

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

Sample: 330879 - T-1 4'

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

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

Sample: 330880 - T-1 5'

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

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

Sample: 330881 - T-1 6'

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

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

Sample: 330882 - T-1 7'

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

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	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	102164	Date Analyzed:	2013-06-11	Analyzed By:	KC
Prep Batch:	86555	Sample Preparation:	2013-06-09	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)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	102130	Date Analyzed:	2013-06-10	Analyzed By:	AR
Prep Batch:	86493	Sample Preparation:	2013-06-07	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	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	102081	Date Analyzed:	2013-06-07	Analyzed By:	CW
Prep Batch:	86484	Sample Preparation:	2013-06-06	Prepared By:	CW

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

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

Sample: 330883 - T-1 8' Bottom Hole

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	102101	Date Analyzed:	2013-06-07	Analyzed By:	KC
Prep Batch:	86503	Sample Preparation:	2013-06-06	Prepared By:	KC

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.82	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)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	102130	Date Analyzed:	2013-06-10	Analyzed By:	AR
Prep Batch:	86493	Sample Preparation:	2013-06-07	Prepared By:	AR

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

Sample: 330885 - T-1 10'

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**261**	mg/Kg	5	4.00

Sample: 330886 - T-1 11'

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**35.1**	mg/Kg	5	4.00

Sample: 330887 - T-1 12'

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

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**140**	mg/Kg	5	4.00

Method Blanks

Method Blank (1) QC Batch: 102081

QC Batch: 102081 | Date Analyzed: 2013-06-07 | Analyzed By: CW
Prep Batch: 86484 | QC Preparation: 2013-06-06 | 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 | Date Analyzed: 2013-06-07 | Analyzed By: KC
Prep Batch: 86503 | QC Preparation: 2013-06-06 | 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 | Date Analyzed: 2013-06-10 | Analyzed By: AR
Prep Batch: 86493 | QC Preparation: 2013-06-07 | Prepared By: AR

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

Method Blank (1) QC Batch: 102135

QC Batch:	102135	Date Analyzed:	2013-06-10	Analyzed By:	AR
Prep Batch:	86493	QC Preparation:	2013-06-07	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	Date Analyzed:	2013-06-11	Analyzed By:	KC
Prep Batch:	86555	QC Preparation:	2013-06-09	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 | Date Analyzed: 2013-06-07 | Analyzed By: CW
Prep Batch: 86484 | QC Preparation: 2013-06-06 | 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 | Date Analyzed: 2013-06-07 | Analyzed By: KC
Prep Batch: 86503 | QC Preparation: 2013-06-06 | 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

Laboratory Control Spike (LCS-1)

QC Batch: 102130 | Date Analyzed: 2013-06-10 | Analyzed By: AR
Prep Batch: 86493 | QC Preparation: 2013-06-07 | 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 | Date Analyzed: 2013-06-10 | Analyzed By: AR
Prep Batch: 86493 | QC Preparation: 2013-06-07 | 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 | Date Analyzed: 2013-06-11 | Analyzed By: KC
Prep Batch: 86555 | QC Preparation: 2013-06-09 | 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 ...

control spikes continued ...

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Xylene		1	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	1.76	mg/Kg	1	2.00	<0.00810	88	70 - 130	2	20
Toluene		1	1.86	mg/Kg	1	2.00	<0.00750	93	70 - 130	1	20
Ethylbenzene		1	1.90	mg/Kg	1	2.00	<0.00730	95	70 - 130	1	20
Xylene		1	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 | Date Analyzed: 2013-06-07 | Analyzed By: CW
Prep Batch: 86484 | QC Preparation: 2013-06-06 | Prepared By: CW

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	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		1	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 | Date Analyzed: 2013-06-07 | Analyzed By: KC
Prep Batch: 86503 | QC Preparation: 2013-06-06 | Prepared By: KC

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 | Date Analyzed: 2013-06-10 | Analyzed By: AR
Prep Batch: 86493 | QC Preparation: 2013-06-07 | 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 | Date Analyzed: 2013-06-10 | Analyzed By: AR
Prep Batch: 86493 | QC Preparation: 2013-06-07 | 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.

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 | Date Analyzed: 2013-06-11 | Analyzed By: KC
Prep Batch: 86555 | QC Preparation: 2013-06-09 | 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

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

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

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

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

PAGE: 1 OF: 2

ANALYSIS REQUEST
(Circle or Specify Method No.)

CLIENT NAME: COG

SITE MANAGER: Ike Tavarez

PROJECT NO.: 112C04983

PROJECT NAME: COG - SRA 102 SWD
Eddy Co, NM

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH TX1005 (Ext. to C35)	TPH 8015 MOD.	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd 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
330876	5/29		S		X	T-1 1'	1				✓															X				
877						T-1 2'	1				✓															X				
878						T-1 3'	1				✓															X				
879						T-1 4'	1				✓															X				
880						T-1 5'	1				✓															X				
881						T-1 6'	1				✓															X				
882						T-1 7'	1				✓															X				
883						T-1 8' Bottom Hole	1				✓			X	X											X				
884						T-1 9'	1				✓															X				
885						T-1 10'	1				✓															X				

RELINQUISHED BY: (Signature) Mark Kunkel — Date: — Time: —
RECEIVED BY: (Signature) Jeanne Fitch — Date: 6-3-13 — Time: 1539

RELINQUISHED BY: (Signature) Jeanne Fitch — Date: 6-3-13 — Time: 1607
RECEIVED BY: (Signature) — Date: 6/3/13 — Time: 16:07

RELINQUISHED BY: (Signature) — Date: — Time:
RECEIVED BY: (Signature) — Date: — Time:

SAMPLED BY: (Print & Initial) MARCUS KUNKOWSKI / MK — Date: — Time:

SAMPLE SHIPPED BY: (Circle)
FEDEX BUS
HAND DELIVERED UPS
AIRBILL #:
OTHER:

RECEIVING LABORATORY: TRACE
ADDRESS:
CITY: MIDLAND STATE: TX ZIP:
CONTACT: PHONE:
RECEIVED BY: (Signature)
DATE: TIME:

TETRA TECH CONTACT PERSON: IKE TAVAREZ

Results by:

RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED: 2.40

REMARKS: Midland - all

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

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

CLIENT NAME: COG

SITE MANAGER: Ike Tavarez

PROJECT NO.: 112C04983

PROJECT NAME: COG-SRO 102 SWD Eddy Co, NM

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	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 Vr Pd 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
886	5/29		S		X	T-1 11'	1				✓														X				
887	5/29		S		X	T-1 12'	1				✓														X				

ANALYSIS REQUEST (Circle or Specify Method No.)

RELINQUISHED BY: (Signature)	Date:	Time:	RECEIVED BY: (Signature)	Date:	Time:
Marcus Kutawski			Jeanne Fitch	6-3-13	1530
Jeanne Fitch	6-3-13	1600		6/3/13	16:07

SAMPLED BY: (Print & 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

RECEIVING LABORATORY: TRACE

ADDRESS:

CITY: Midland STATE: TX ZIP:

CONTACT: PHONE: DATE: TIME:

RECEIVED BY: (Signature)

SAMPLE CONDITION WHEN RECEIVED: 2.4°

REMARKS:

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