SITE INFORMATION 2RP-761

Report Type: Closure Request

General Site Information:		
Site:	Antelope State Tank Battery	
Company:	COG Operating LLC	
Section, Township and Range	Unit K - Section 36 - T-17S - R-31E	
Lease Number:	30-015-32040	
County:	Eddy County	
GPS:	32.78809° N	103.82599° W
Surface Owner:	State	
Mineral Owner:		
Directions:	From CR 126 and Hwy 529 travel west on Hwy 529 for 3.1 miles, turn left onto lease road and travel 0.8 miles, turn right and travel 0.6 miles to site.	

Release Data:	
Date Released:	4/16/2011
Type Release:	Produced Fluid
Source of Contamination:	Water Tank
Fluid Released:	23 bbls
Fluids Recovered:	21 bbls

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Official Communication:			
Name:	Pat Ellis		Kim Dorey
Company:	COG Operating, LLC		Tetra Tech
Address:	550 W. Texas Ave. Ste. 1300		1910 N. Big Spring
P.O. Box			
City:	Midland Texas, 79701		Midland, Texas
Phone number:	(432) 686-3023		(432) 682-4559
Fax:	(432) 684-7137		
Email:	pellis@conchoresources.com		kim.dorey@tetratech.com

Ranking Criteria		
Depth to Groundwater:	***Ranking Score***	***Site Data***
<50 ft	20	
50-99 ft	10	
>100 ft.	**0**	**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:	**0**	

Acceptable Soil RRAL (mg/kg)		
Benzene	***Total BTEX***	***TPH***
10	50	5,000

TETRA TECH

August 31, 2011

Mr. Mike Bratcher
Environmental Engineer Specialist
Oil Conservation Division, District 2
1301 West Grand Avenue
Artesia, New Mexico 88210

Re: Assessment and Closure Request for the COG Operating LLC., Antelope State Tank Battery, Unit K, Section 36, Township 17 South, Range 31 East, Eddy County, New Mexico.

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC. (COG) to assess a spill from the Antelope State Tank Battery located in Unit K, Section 36, Township 17 South, Range 31 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.78809°, W 103.82599°. The site location is shown on Figures 1 and 2.

Background

According to the State of New Mexico C-141 Initial Report, the leak was discovered on April 16, 2011, and released approximately twenty three (23) barrels of produced fluids due a water transfer pump failure. To alleviate the problem, COG personnel repaired the water transfer pump. Twenty one (21) barrels of standing fluids were recovered. The spill initiated from the pump and impacted an area approximately 8' x 160'. The entire spill was contained within the facility's berm. The initial C-141 form is enclosed in Appendix A.

Tetra Tech
1910 North Big Spring, Midland,TX 79705
Tel 432.682.4559 Fax 432.682.3946 www.tetratech.com

Groundwater

No water wells were listed within Section 36. One well was listed in section 34 with a recorded depth of 271' bgs by the *Geology and Groundwater Resources of Eddy County, New Mexico (Report 3)*. According to the NMOCD groundwater map, the average depth to groundwater in this area is greater than 300' below surface. The groundwater well report 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 5,000 mg/kg.

Soil Assessment and Analytical Results

On May 9, 2011, Tetra Tech personnel inspected and sampled the spill area. Two (2) auger holes (AH-1 and AH-2) were installed using a stainless steel hand auger to assess the impacted soils. Select 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 auger hole locations are shown on Figure 3.

Referring to Table 1, all submitted samples were below the RRAL for TPH and BTEX. Chloride concentrations detected in AH-1 showed a concentration of 636 mg/kg at 0-1' and declined to 285 mg/kg at 1-1.5'. Auger hole (AH-2) did show an elevated chloride of 7,740 mg/kg at 0-1', but declined to <200 mg/kg at 1-1.5' below surface.

Closure Request

Based on the limited extent of chloride impact (0-1') and depth to groundwater (>300'), COG request closure of the site. COG proposes to

perform some general house keeping in the area of AH-2 to remove the surface chloride impact. The final C-141 is enclosed in Appendix A. If you have any questions or require any additional information regarding this assessment, please call me at (432) 682-4559.

Respectfully submitted,
TETRA TECH

Ike Tavarez
Senior Project Manager

cc: Pat Ellis – COG

FIGURES

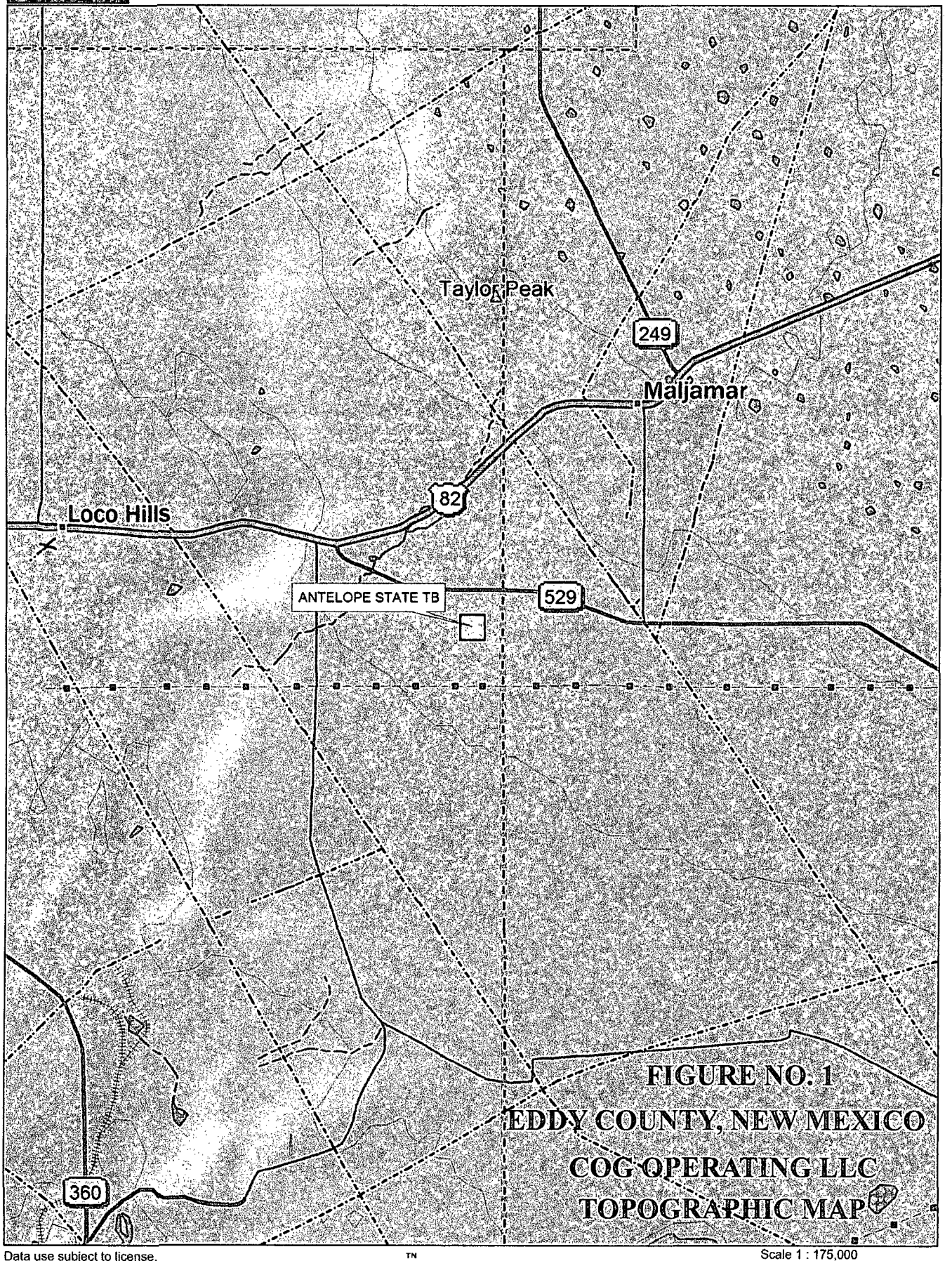


FIGURE NO. 1

EDDY COUNTY, NEW MEXICO

COG OPERATING LLC

TOPOGRAPHIC MAP

TN
MN (7.7°E)

Scale 1 : 175,000
1" = 2.76 mi
Data Zoom 9-2

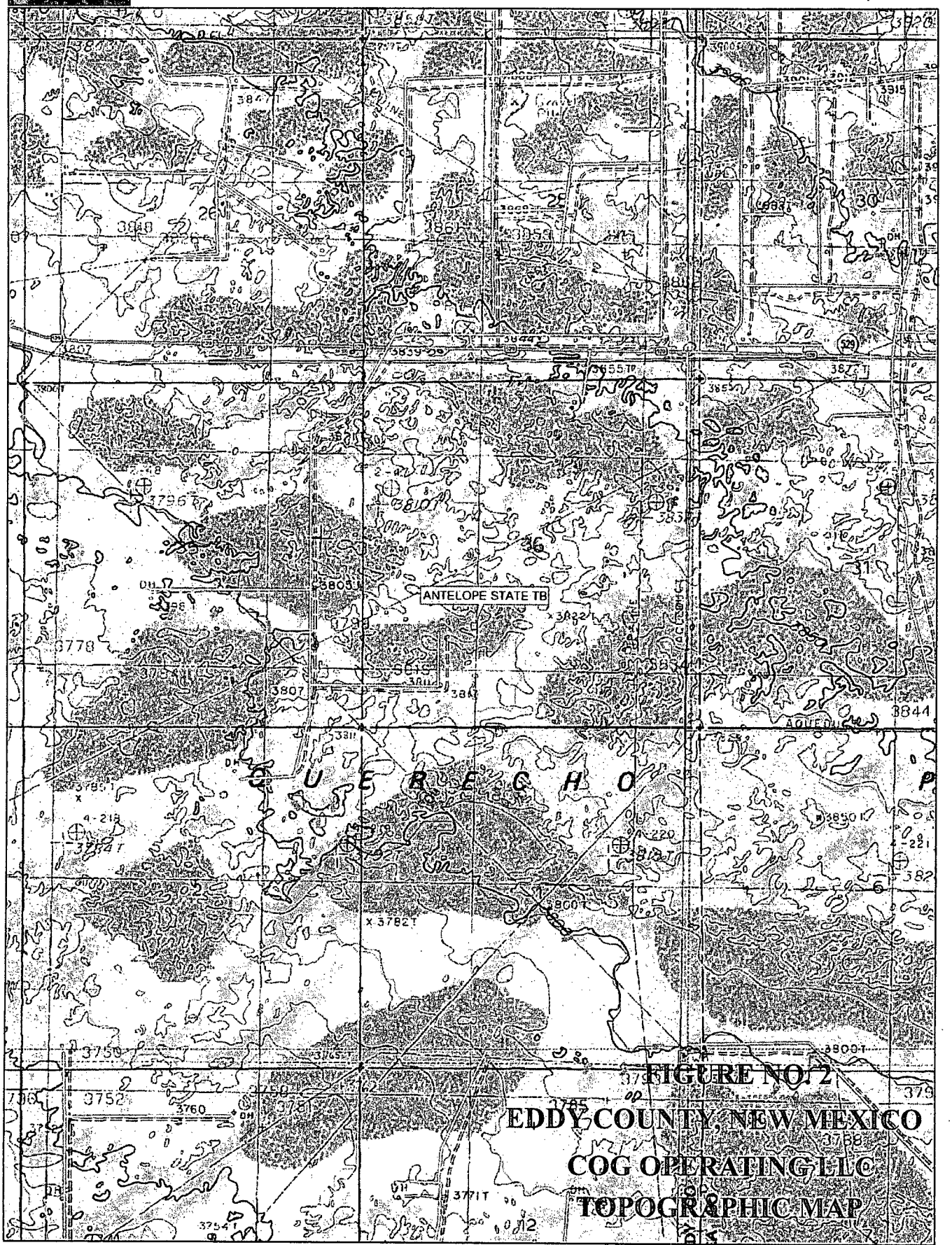


FIGURE NO. 2

EDDY COUNTY, NEW MEXICO

COG OPERATING LLC

TOPOGRAPHIC MAP

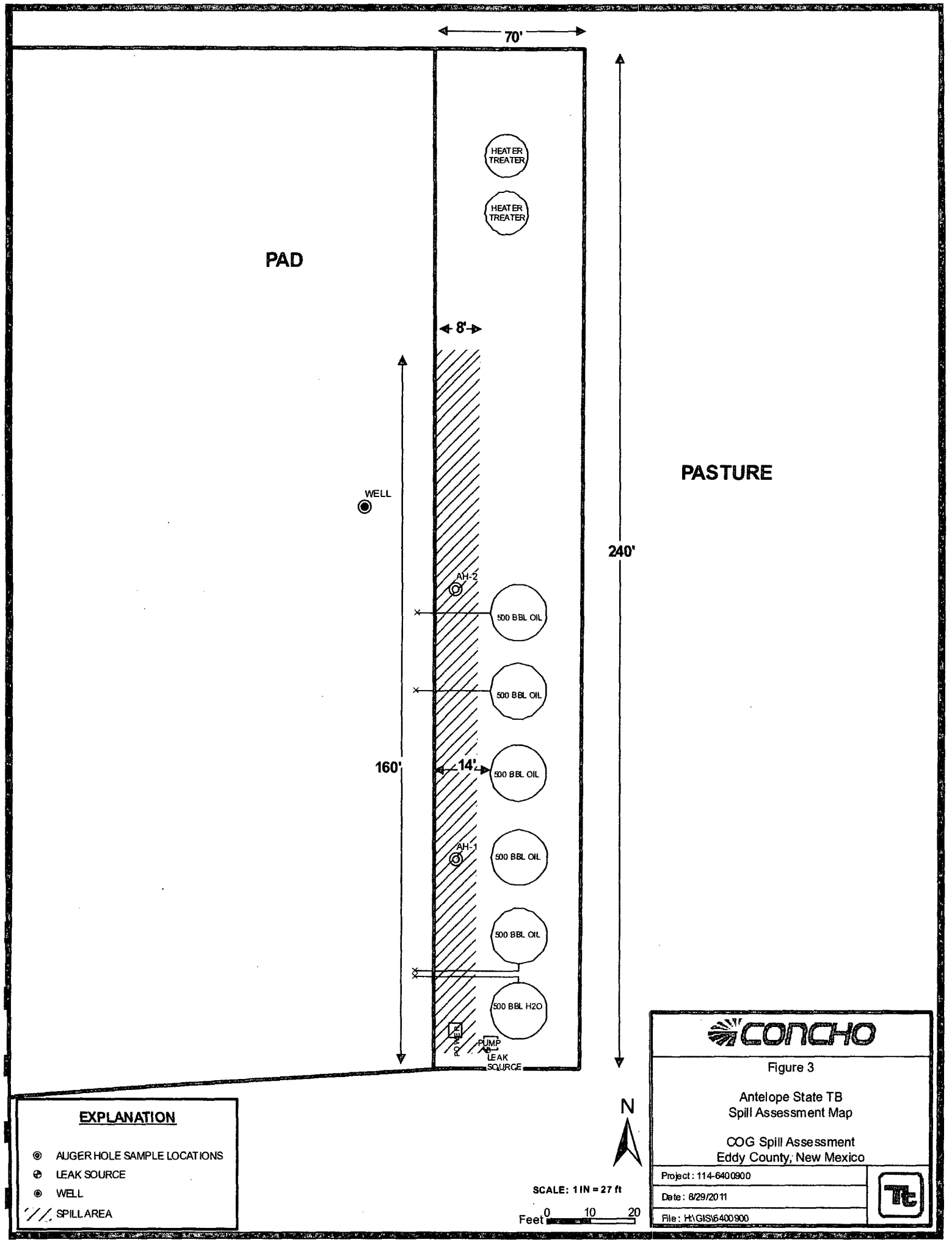
TN

MN (7.7°E)

Scale 1 : 24,000

1" = 2,000.0 ft

Data Zoom 14-0

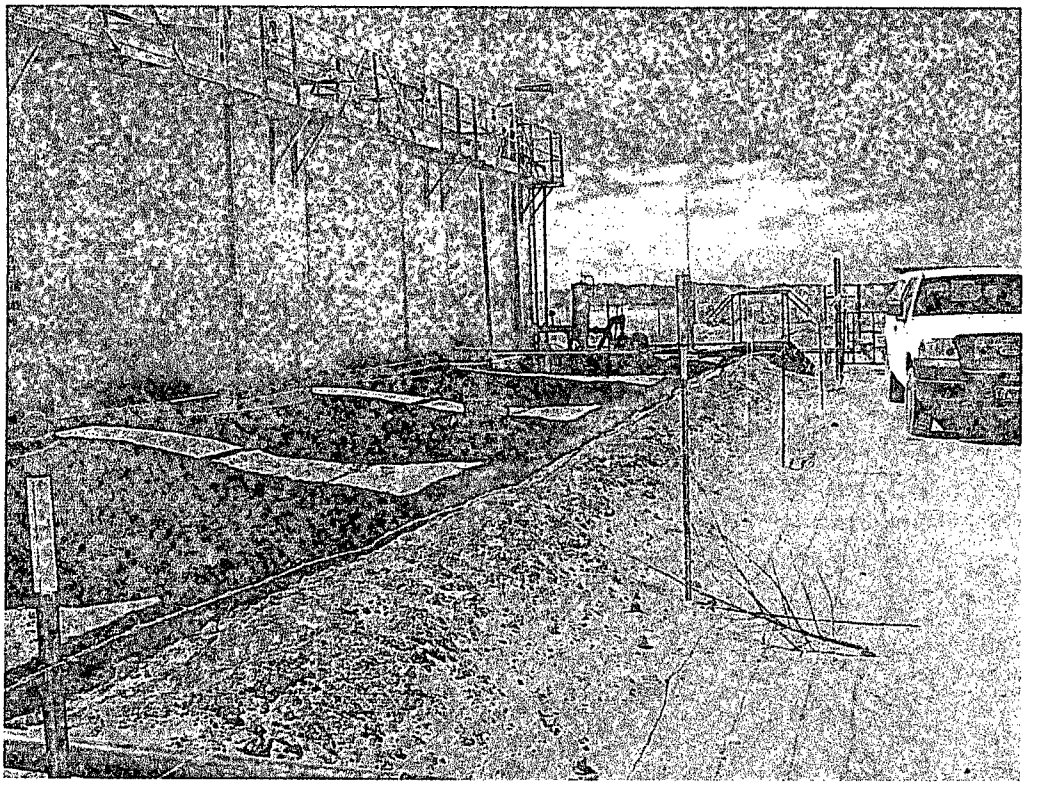


Drawn By: Isabel Marmolejo

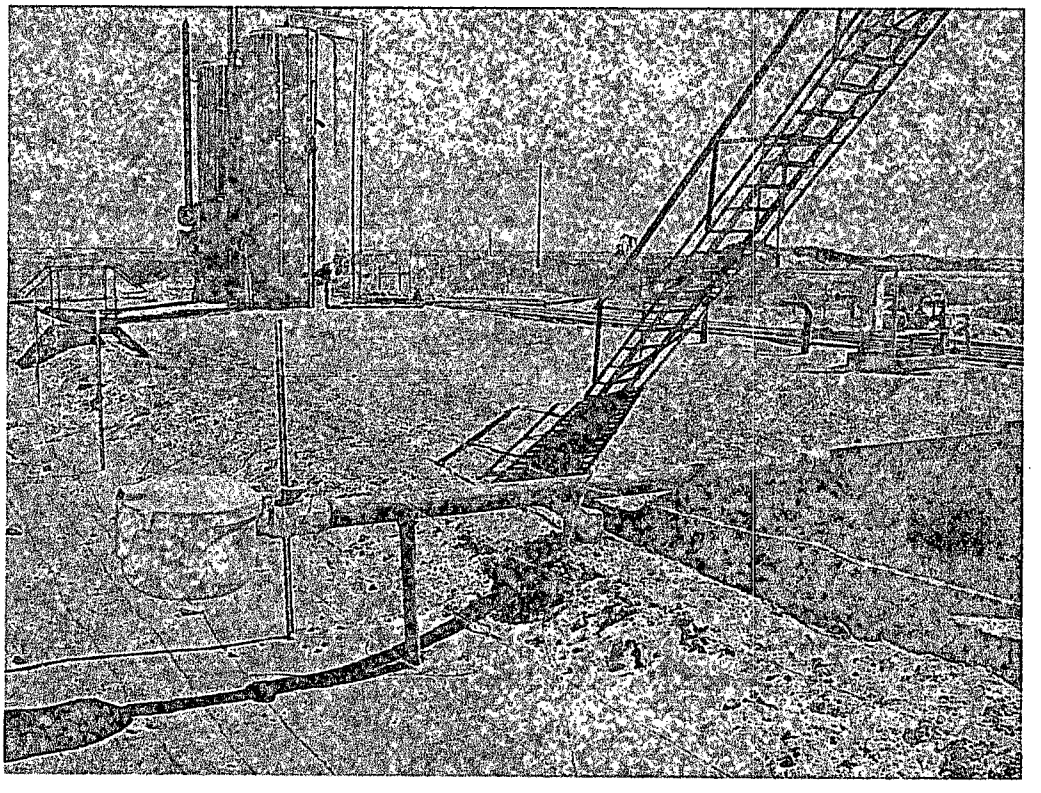
PHOTOGRAPHS

COG Operating LLC
Antelope State Tank Battery
Eddy County, New Mexico

TETRA TECH



View South East – AH-1



View North East – AH-2

TABLES

Table 1
COG Operating LLC.
ANTELOPE STATE TANK BATTERY
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)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	Total					
AH-1	5/9/2011	0-1'	X		<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	636
	"	1-1.5'	X		-	-	-	-	-	-	-	285
	"	2-2.5'	X		-	-	-	-	-	-	-	<200
	"	3-3.5'	X		-	-	-	-	-	-	-	<200
	"	4-4.5'	X		-	-	-	-	-	-	-	215
	"	5-5.5'	X		-	-	-	-	-	-	-	<200
	"	6-6.5'	X		-	-	-	-	-	-	-	424
AH-2	5/9/2011	0-1'	X		<2.00	<50.0	<50.0	<0.0200	<0.0200	<0.0200	<0.0200	7,740
	"	1-1.5'	X		-	-	-	-	-	-	-	<200
	"	2-2.5'	X		-	-	-	-	-	-	-	<200
	"	3-3.5'	X		-	-	-	-	-	-	-	<200
	"	4-4.5'	X		-	-	-	-	-	-	-	<200
	"	5-5.5'	X		-	-	-	-	-	-	-	<200
	"	6-6.5'	X		-	-	-	-	-	-	-	<200
	"	7-7.5'	X		-	-	-	-	-	-	-	<200

(--) Not Analyzed

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	Pat Ellis
Address	550 W. Texas, Suite 100, Midland, TX 79701	Telephone No.	432-230-0077
Facility Name	Antelope State Tank Battery	Facility Type	Tank Battery

Surface Owner State	Mineral Owner	Lease No. (API#) 30-015-32040

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
K	36	17S	31E					Eddy

Latitude 32.78841 **Longitude** 103.82626

NATURE OF RELEASE

Type of Release Produced fluid	Volume of Release 23bbls	Volume Recovered 21bbls
Source of Release Water tank	Date and Hour of Occurrence 04/16/2011	Date and Hour of Discovery 04/16/2011 8:00 a.m.
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.	

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If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

The water transfer pump malfunctioned; it has since been repaired and put back into service.

Describe Area Affected and Cleanup Action Taken.*

Initially 23bbls of produced fluid was released and we were able to recover 21bbls with a vacuum truck. All fluid was completely contained inside the facility walls. The spill area measured 5' x 50' inside the bermed area by the tanks. The spill area has been scraped and the contaminated material has been disposed of appropriately. Tetra Tech will sample the spill site area to delineate any possible contamination from the release and we will present a remediation work plan to the NMOCD for approval prior to any significant remediation work.

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: Josh Russo	Approved by District Supervisor:
Title: HSE Coordinator	Approval Date: / Expiration Date:
E-mail Address: jrusso@conchoresources.com	Conditions of Approval: / Attached ☐
Date: 04/21/2011 Phone: 432-212-2399	

* Attach Additional Sheets If Necessary

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
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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 **COG Operating LLC**	Contact **Pat Ellis**
Address **550 W. Texas, Suite 1300 Midland, Texas 79701**	Telephone No. **(432) 685-4332**
Facility Name **Antelope State Tank Battery**	Facility Type **Tank Battery**

Surface Owner: State	Mineral Owner	Lease No. (API#) 30-015-32040

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
K	36	17S	31E					

Latitude N 32.78841° **Longitude** W 103.82626°

NATURE OF RELEASE

Type of Release: Produced Fluid	Volume of Release 23 bbls	Volume Recovered 21 bbls
Source of Release: Equalizer	Date and Hour of Occurrence 4/16/2011	Date and Hour of Discovery 4/16/2011 8:00 a.m.
Was Immediate Notice Given? ☐ Yes ☒ No ☒ Not Required	If YES, To Whom?	
By Whom? Josh Russo	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

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Describe Cause of Problem and Remedial Action Taken.*

The water transfer pump malfunctioned; it has since been repaired and put back into service.

Describe Area Affected and Cleanup Action Taken.*

Tetra Tech inspected site and collected samples to define the spills extent. Based on the assessment, COG will perform some general house keeping in the area of AH-2 to remove the surface chloride impacted soil. Tetra Tech prepared closure report and submitted to NMOCD for review and approval.

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

Signature:	OIL CONSERVATION DIVISION	
Printed Name: Ike Tavarez	Approved by District Supervisor:	
Title: Project Manager	Approval Date:	Expiration Date:
E-mail Address: Ike.Tavarez@TetraTech.com	Conditions of Approval:	Attached ☐
Date: 8-31-11 Phone: (432) 682-4559		

* Attach Additional Sheets If Necessary

APPENDIX B

Water Well Data
Average Depth to Groundwater (ft)
COG - Antelope State Tank Battery
Eddy County, New Mexico

16 South 30 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
30	29	28	27	26	25
31	32	33	34	35	36

16 South 31 East

6	5	4	3	2	1
7	8	9	10	11	12 **288**
18	17	16	15	14	13 **113**
19	20	21	22	23	24
30	29	28	27	26	25
31 **290**	32	33	34	35	36

16 South 32 East

6	5	4	3 **65**	2 **265**	1 **265**
7	8	9	10	11	12 **215**
18	17	16 **221**	15	14	13 **215**
19 **220**	20	21 **210**	22	23 **210**	24
30	29	28	27	26 **243**	25
31	32	33	34	35	36 **260**

17 South 30 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
30	29	28	27	26	25
31	32	33	34	35	36

17 South 31 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
30	29	28	27	26	25
31	32	33	34 **271**	35	36 Site

17 South 32 East

6	5	4 **82** Maljamar	3 **75**	2 **60**	1 **225**
7	8	9	10	11 **70** **88**	12
18	17	16	15	14	13
19	20	21	22	23	24
30 180 dry	29	28	27	26	25
31 Brown	32	33	34	35	36

18 South 30 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
30	29	28	27	26	25
31	32	33	34	35	36

18 South 31 East

6	5	4	3	2	1
7	8	9	10	11	12 **400**
18	17	16	15	14 **317**	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35 **261**	36

18 South 32 East

6	5	4 **65**	3 Prong #2	2	1
7 **460** **82**	8	9	10	11	12
18	17	16 **84**	15	14	13
19	20 **164**	21	22 **429**	23	24
30	29	28	27	26	25
31	32	33	34 **117**	35	36

- New Mexico State Engineers Well Reports
- USGS Well Reports
- Geology and Groundwater Conditions in Southern Eddy, County, NM
- NMOCD - Groundwater Data

TABLE 1. RECORDS OF WELLS IN EDDY COUNTY, NEW MEXICO. (Continued)

LOCATION NUMBER	OWNER OR NAME	DATE COMPLETED	TOPOGRAPHIC SITUATION	ALTITUDE ABOVE SEA LEVEL (feet)	DEPTH OF WELL (feet)	DIAMETER OF WELL (inches)	PRINCIPAL WATER-BEARING BED	
							CHARACTER OF MATERIAL	GEOLOGIC UNIT
17.28.2.240	Hal Bogle	–	Flat between mesas	–	–	6 (?)	Redbeds (?)	Dockum (?)
14.220	do.	–	Rolling	–	–	7	do.	do.
19.200	do.	–	do.	–	–	8	Redbeds, gypsum (?)	Chalk Bluff or Rustler
22.230	–	–	Flat between mesas	–	–	6	Redbeds (?)	Rustler or Dockum (?)
17.29.22.110	–	–	Bear Grass draw	3,550	–	6	do.	Dockum (?)
29.400	Bishop (?)	–	Flat	–	–	7	do.	do.
17.31.34.000	–	–	Rolling	–	–	6 (?)	Redbeds	Dockum
18.21.13.310	Andy Teel	1915	–	4,100	520	8	Limestone	San Andres
27.440	do.	1947	Broad valley	4,200	667	10	do.	do.
32.430	George Teel	1946	Rolling	4,300	815	6	do.	do.
18.23.6.140	Couhape Bros.	1941	S. of Rio Penasco	4,060	500	10	do.	do.
18.25.23.111	G. M. Phelps	–	Blackdom Terrace	–	–	–	Alluvium (?)	Quaternary (?)

See explanation at beginning of table.

LOCATION NUMBER	WATER LEVEL		YIELD (g.p.m.)	METHOD OF LIFT	USE OF WATER	REMARKS
	BELOW LAND SURFACE (feet)	DATE OF MEASUREMENT				
17.28.2.240	27.6	Dec. 1, 1948	3	W	S	Depth to water measured while pumping.
14.220	80	–	61	W	S & D	Driller: Cy Hinshaw. See analysis, Table 3.
19.200	224.3	Dec. 2, 1948	1.2	W	S	Depth to water measured while pumping.
22.230	45.5	Dec. 1, 1948	–	N	N	Abandoned stock well.
17.29.22.110	79.7	Nov. 29, 1948	3 E.	W	S	Depth to water measured while pumping.
29.400	210	Dec. 3, 1948	1.1	W	S	do.
17.31.34.000	271+	Dec. 6, 1948	3.5	W	S	do. See analysis, Table 3.
18.21.13.310	505	–	10 R.	W	S & D	Formerly C.C.C. well. Cased to 30 ft.
27.440	530	–	–	W	S	Cased to 120 ft.
32.430	800 (?)	–	12 R.	W	S & D	Lowered cylinder 5 ft. in 1948 because water level declined. Cased to 380 ft.
18.23.6.140	440	Jan. 12, 1950	–	W	S & D	
18.25.23.111	117.8	Jan. 1950	–	W	S	

See explanation at beginning of table.
1 Measured Dec. 3, 1948.

APPENDIX C

Summary Report

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

Report Date: June 1, 2011

Work Order: 11051103

Project Location: Eddy Co., NM
Project Name: Antelope State Tank Battery
Project Number: 114-6400900

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
266085	AH-1 0-1'	soil	2011-05-09	00:00	2011-05-10
266086	AH-1 1-1.5'	soil	2011-05-09	00:00	2011-05-10
266087	AH-1 2-2.5'	soil	2011-05-09	00:00	2011-05-10
266088	AH-1 3-3.5'	soil	2011-05-09	00:00	2011-05-10
266089	AH-1 4-4.5'	soil	2011-05-09	00:00	2011-05-10
266090	AH-1 5-5.5'	soil	2011-05-09	00:00	2011-05-10
266091	AH-1 6-6.5'	soil	2011-05-09	00:00	2011-05-10
266092	AH-2 0-1'	soil	2011-05-09	00:00	2011-05-10
266093	AH-2 1-1.5'	soil	2011-05-09	00:00	2011-05-10
266094	AH-2 2-2.5'	soil	2011-05-09	00:00	2011-05-10
266095	AH-2 3-3.5'	soil	2011-05-09	00:00	2011-05-10
266096	AH-2 4-4.5'	soil	2011-05-09	00:00	2011-05-10
266097	AH-2 5-5.5'	soil	2011-05-09	00:00	2011-05-10
266098	AH-2 6-6.5'	soil	2011-05-09	00:00	2011-05-10
266099	AH-2 7-7.5'	soil	2011-05-09	00:00	2011-05-10

	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)
266085 - AH-1 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00
266092 - AH-2 0-1'	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00

Sample: 266085 - AH-1 0-1'

Param	Flag	Result	Units	RL
Chloride		**636**	mg/Kg	4

Sample: 266086 - AH-1 1-1.5'

Param	Flag	Result	Units	RL
Chloride		**285**	mg/Kg	4

Sample: 266087 - AH-1 2-2.5'

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 266088 - AH-1 3-3.5'

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 266089 - AH-1 4-4.5'

Param	Flag	Result	Units	RL
Chloride		**215**	mg/Kg	4

Sample: 266090 - AH-1 5-5.5'

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 266091 - AH-1 6-6.5'

Param	Flag	Result	Units	RL
Chloride		**424**	mg/Kg	4

Sample: 266092 - AH-2 0-1'

Param	Flag	Result	Units	RL
Chloride		**7740**	mg/Kg	4

Sample: 266093 - AH-2 1-1.5'

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 266094 - AH-2 2-2.5'

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 266095 - AH-2 3-3.5'

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 266096 - AH-2 4-4.5'

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 266097 - AH-2 5-5.5'

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 266098 - AH-2 6-6.5'

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

Sample: 266099 - AH-2 7-7.5'

Param	Flag	Result	Units	RL
Chloride		<200	mg/Kg	4

TRACEANALYSIS, INC.

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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 1, 2011

Work Order: 11051103

Project Location: Eddy Co., NM
Project Name: Antelope State Tank Battery
Project Number: 114-6400900

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
266085	AH-1 0-1'	soil	2011-05-09	00:00	2011-05-10
266086	AH-1 1-1.5'	soil	2011-05-09	00:00	2011-05-10
266087	AH-1 2-2.5'	soil	2011-05-09	00:00	2011-05-10
266088	AH-1 3-3.5'	soil	2011-05-09	00:00	2011-05-10
266089	AH-1 4-4.5'	soil	2011-05-09	00:00	2011-05-10
266090	AH-1 5-5.5'	soil	2011-05-09	00:00	2011-05-10
266091	AH-1 6-6.5'	soil	2011-05-09	00:00	2011-05-10
266092	AH-2 0-1'	soil	2011-05-09	00:00	2011-05-10
266093	AH-2 1-1.5'	soil	2011-05-09	00:00	2011-05-10
266094	AH-2 2-2.5'	soil	2011-05-09	00:00	2011-05-10
266095	AH-2 3-3.5'	soil	2011-05-09	00:00	2011-05-10
266096	AH-2 4-4.5'	soil	2011-05-09	00:00	2011-05-10
266097	AH-2 5-5.5'	soil	2011-05-09	00:00	2011-05-10
266098	AH-2 6-6.5'	soil	2011-05-09	00:00	2011-05-10
266099	AH-2 7-7.5'	soil	2011-05-09	00:00	2011-05-10

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 25 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 Antelope State Tank Battery were received by TraceAnalysis, Inc. on 2011-05-10 and assigned to work order 11051103. Samples for work order 11051103 were received intact at a temperature of 8.4 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	68938	2011-05-12 at 08:58	81213	2011-05-12 at 21:06
Chloride (Titration)	SM 4500-Cl B	69151	2011-05-20 at 10:57	81559	2011-05-24 at 12:44
Chloride (Titration)	SM 4500-Cl B	69151	2011-05-20 at 10:57	81650	2011-05-26 at 14:22
Chloride (Titration)	SM 4500-Cl B	69151	2011-05-20 at 10:57	81651	2011-05-26 at 14:22
TPH DRO - NEW	S 8015 D	68968	2011-05-13 at 10:42	81246	2011-05-13 at 10:42
TPH GRO	S 8015 D	68938	2011-05-12 at 08:58	81214	2011-05-12 at 21:06

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 11051103 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: 266085 - AH-1 0-1'

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	81213	Date Analyzed:	2011-05-12	Analyzed By:	ME
Prep Batch:	68938	Sample Preparation:	2011-05-12	Prepared By:	ME

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.08	mg/Kg	1	2.00	104	52.8 - 137
4-Bromofluorobenzene (4-BFB)			1.93	mg/Kg	1	2.00	96	38.4 - 157

Sample: 266085 - AH-1 0-1'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	81559	Date Analyzed:	2011-05-24	Analyzed By:	AR
Prep Batch:	69151	Sample Preparation:	2011-05-20	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**636**	mg/Kg	50	4.00

Sample: 266085 - AH-1 0-1'

Laboratory:	Midland				
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	81246	Date Analyzed:	2011-05-13	Analyzed By:	kg
Prep Batch:	68968	Sample Preparation:	2011-05-13	Prepared By:	kg

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			83.3	mg/Kg	1	100	83	70 - 130

Sample: 266085 - AH-1 0-1'

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	81214	Date Analyzed:	2011-05-12	Analyzed By:	ME
Prep Batch:	68938	Sample Preparation:	2011-05-12	Prepared By:	ME

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO		1	<2.00	mg/Kg	1	2.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.37	mg/Kg	1	2.00	118	48.5 - 152
4-Bromofluorobenzene (4-BFB)			1.99	mg/Kg	1	2.00	100	42 - 159

Sample: 266086 - AH-1 1-1.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	81559	Date Analyzed:	2011-05-24	Analyzed By:	AR
Prep Batch:	69151	Sample Preparation:	2011-05-20	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**285**	mg/Kg	50	4.00

Sample: 266087 - AH-1 2-2.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	81559	Date Analyzed:	2011-05-24	Analyzed By:	AR
Prep Batch:	69151	Sample Preparation:	2011-05-20	Prepared By:	AR

continued ...

sample 266087 continued ...

Parameter	Flag	Cert	RL Result	Units	Dilution	RL

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

Sample: 266088 - AH-1 3-3.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	81650	Date Analyzed:	2011-05-26	Analyzed By:	AR
Prep Batch:	69151	Sample Preparation:	2011-05-20	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

Sample: 266089 - AH-1 4-4.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	81650	Date Analyzed:	2011-05-26	Analyzed By:	AR
Prep Batch:	69151	Sample Preparation:	2011-05-20	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**215**	mg/Kg	50	4.00

Sample: 266090 - AH-1 5-5.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	81650	Date Analyzed:	2011-05-26	Analyzed By:	AR
Prep Batch:	69151	Sample Preparation:	2011-05-20	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

Sample: 266091 - AH-1 6-6.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	81650	Date Analyzed:	2011-05-26	Analyzed By:	AR
Prep Batch:	69151	Sample Preparation:	2011-05-20	Prepared By:	AR

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Chloride			**424**	mg/Kg	50	4.00

Sample: 266092 - AH-2 0-1'

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	81213	Date Analyzed:	2011-05-12	Analyzed By:	ME
Prep Batch:	68938	Sample Preparation:	2011-05-12	Prepared By:	ME

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

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.80	mg/Kg	1	2.00	90	52.8 - 137
4-Bromofluorobenzene (4-BFB)			1.65	mg/Kg	1	2.00	82	38.4 - 157

Sample: 266092 - AH-2 0-1'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	81650	Date Analyzed:	2011-05-26	Analyzed By:	AR
Prep Batch:	69151	Sample Preparation:	2011-05-20	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			**7740**	mg/Kg	100	4.00

Sample: 266092 - AH-2 0-1'

Laboratory:	Midland				
Analysis:	TPH DRO - NEW	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	81246	Date Analyzed:	2011-05-13	Analyzed By:	kg
Prep Batch:	68968	Sample Preparation:	2011-05-13	Prepared By:	kg

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			96.9	mg/Kg	1	100	97	70 - 130

Sample: 266092 - AH-2 0-1'

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	81214	Date Analyzed:	2011-05-12	Analyzed By:	ME
Prep Batch:	68938	Sample Preparation:	2011-05-12	Prepared By:	ME

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO		1	<2.00	mg/Kg	1	2.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.00	mg/Kg	1	2.00	100	48.5 - 152
4-Bromofluorobenzene (4-BFB)			1.71	mg/Kg	1	2.00	86	42 - 159

Sample: 266093 - AH-2 1-1.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	81650	Date Analyzed:	2011-05-26	Analyzed By:	AR
Prep Batch:	69151	Sample Preparation:	2011-05-20	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

Sample: 266094 - AH-2 2-2.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	81650	Date Analyzed:	2011-05-26	Analyzed By:	AR
Prep Batch:	69151	Sample Preparation:	2011-05-20	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

Sample: 266095 - AH-2 3-3.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	81650	Date Analyzed:	2011-05-26	Analyzed By:	AR
Prep Batch:	69151	Sample Preparation:	2011-05-20	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

Sample: 266096 - AH-2 4-4.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	81650	Date Analyzed:	2011-05-26	Analyzed By:	AR
Prep Batch:	69151	Sample Preparation:	2011-05-20	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

Sample: 266097 - AH-2 5-5.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	81650	Date Analyzed:	2011-05-26	Analyzed By:	AR
Prep Batch:	69151	Sample Preparation:	2011-05-20	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

Sample: 266098 - AH-2 6-6.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	81651	Date Analyzed:	2011-05-26	Analyzed By:	AR
Prep Batch:	69151	Sample Preparation:	2011-05-20	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

Sample: 266099 - AH-2 7-7.5'

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	81651	Date Analyzed:	2011-05-26	Analyzed By:	AR
Prep Batch:	69151	Sample Preparation:	2011-05-20	Prepared By:	AR

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride			<200	mg/Kg	50	4.00

Method Blanks

Method Blank (1) QC Batch: 81213

QC Batch:	81213	Date Analyzed:	2011-05-12	Analyzed By:	ME
Prep Batch:	68938	QC Preparation:	2011-05-12	Prepared By:	ME

Parameter	Flag	Cert	MDL Result	Units	RL
Benzene		1	<0.0118	mg/Kg	0.02
Toluene		1	<0.00600	mg/Kg	0.02
Ethylbenzene		1	<0.00850	mg/Kg	0.02
Xylene		1	<0.00613	mg/Kg	0.02

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.71	mg/Kg	1	2.00	86	66.6 - 122
4-Bromofluorobenzene (4-BFB)			1.46	mg/Kg	1	2.00	73	55.4 - 124

Method Blank (1) QC Batch: 81214

QC Batch:	81214	Date Analyzed:	2011-05-12	Analyzed By:	ME
Prep Batch:	68938	QC Preparation:	2011-05-12	Prepared By:	ME

Parameter	Flag	Cert	MDL Result	Units	RL
GRO		1	<0.753	mg/Kg	2

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			1.82	mg/Kg	1	2.00	91	67.6 - 150
4-Bromofluorobenzene (4-BFB)			1.51	mg/Kg	1	2.00	76	52.4 - 130

Method Blank (1) QC Batch: 81246

QC Batch:	81246	Date Analyzed:	2011-05-13	Analyzed By:	kg
Prep Batch:	68968	QC Preparation:	2011-05-13	Prepared By:	kg

Parameter	Flag	Cert	MDL Result	Units	RL
DRO		1	<15.7	mg/Kg	50

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

Method Blank (1) QC Batch: 81559

QC Batch:	81559	Date Analyzed:	2011-05-24	Analyzed By:	AR
Prep Batch:	69151	QC Preparation:	2011-05-20	Prepared By:	AR

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

Method Blank (1) QC Batch: 81650

QC Batch:	81650	Date Analyzed:	2011-05-26	Analyzed By:	AR
Prep Batch:	69151	QC Preparation:	2011-05-20	Prepared By:	AR

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

Method Blank (1) QC Batch: 81651

QC Batch:	81651	Date Analyzed:	2011-05-26	Analyzed By:	AR
Prep Batch:	69151	QC Preparation:	2011-05-20	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: 81213 | Date Analyzed: 2011-05-12 | Analyzed By: ME
Prep Batch: 68938 | QC Preparation: 2011-05-12 | Prepared By: ME

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	2.04	mg/Kg	1	2.00	<0.0118	102	81.9 - 108
Toluene		1	2.18	mg/Kg	1	2.00	<0.00600	109	81.9 - 118
Ethylbenzene		1	1.88	mg/Kg	1	2.00	<0.00850	94	78.4 - 115
Xylene		1	5.62	mg/Kg	1	6.00	<0.00613	94	79.1 - 116

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		1	2.00	mg/Kg	1	2.00	<0.0118	100	81.9 - 108	2	20
Toluene		1	2.13	mg/Kg	1	2.00	<0.00600	106	81.9 - 118	2	20
Ethylbenzene		1	1.87	mg/Kg	1	2.00	<0.00850	94	78.4 - 115	0	20
Xylene		1	5.56	mg/Kg	1	6.00	<0.00613	93	79.1 - 116	1	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.60	1.57	mg/Kg	1	2.00	80	78	70.2 - 114
4-Bromofluorobenzene (4-BFB)	1.59	1.56	mg/Kg	1	2.00	80	78	69.8 - 121

Laboratory Control Spike (LCS-1)

QC Batch: 81214 | Date Analyzed: 2011-05-12 | Analyzed By: ME
Prep Batch: 68938 | QC Preparation: 2011-05-12 | Prepared By: ME

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	12.7	mg/Kg	1	20.0	<0.753	64	60.9 - 95.4

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	12.3	mg/Kg	1	20.0	<0.753	62	60.9 - 95.4	3	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.99	1.95	mg/Kg	1	2.00	100	98	61.9 - 142
4-Bromofluorobenzene (4-BFB)	1.78	1.79	mg/Kg	1	2.00	89	90	68.2 - 132

Laboratory Control Spike (LCS-1)

QC Batch: 81246 | Date Analyzed: 2011-05-13 | Analyzed By: kg
Prep Batch: 68968 | QC Preparation: 2011-05-13 | Prepared By: kg

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	206	mg/Kg	1	250	<15.7	82	47.5 - 144.1

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	200	mg/Kg	1	250	<15.7	80	47.5 - 144.1	3	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Tricosane	114	110	mg/Kg	1	100	114	110	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 81559 | Date Analyzed: 2011-05-24 | Analyzed By: AR
Prep Batch: 69151 | QC Preparation: 2011-05-20 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			96.8	mg/Kg	1	100	<3.85	97	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			103	mg/Kg	1	100	<3.85	103	85 - 115	6	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 81650 | Date Analyzed: 2011-05-26 | Analyzed By: AR
Prep Batch: 69151 | QC Preparation: 2011-05-20 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			97.6	mg/Kg	1	100	<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			104	mg/Kg	1	100	<3.85	104	85 - 115	6	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 81651 | Date Analyzed: 2011-05-26 | Analyzed By: AR
Prep Batch: 69151 | QC Preparation: 2011-05-20 | Prepared By: AR

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			98.0	mg/Kg	1	100	<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			104	mg/Kg	1	100	<3.85	104	85 - 115	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: 266100

QC Batch: 81213 | Date Analyzed: 2011-05-12 | Analyzed By: ME
Prep Batch: 68938 | QC Preparation: 2011-05-12 | Prepared By: ME

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		1	10.3	mg/Kg	10	10.0	<0.118	103	80.5 - 112
Toluene		1	11.4	mg/Kg	10	10.0	0.8359	106	82.4 - 113
Ethylbenzene		1	9.94	mg/Kg	10	10.0	0.7886	92	83.9 - 114
Xylene		1	30.5	mg/Kg	10	30.0	2.7118	93	84 - 114

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	10.1	mg/Kg	10	10.0	<0.118	101	80.5 - 112	2	20
Toluene		1	11.0	mg/Kg	10	10.0	0.8359	102	82.4 - 113	4	20
Ethylbenzene		1	9.63	mg/Kg	10	10.0	0.7886	88	83.9 - 114	3	20
Xylene		1	29.9	mg/Kg	10	30.0	2.7118	91	84 - 114	2	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	11.2	10.2	mg/Kg	10	10	112	102	41.3 - 117
4-Bromofluorobenzene (4-BFB)	12.4	11.2	mg/Kg	10	10	124	112	35.5 - 129

Matrix Spike (MS-1) Spiked Sample: 266092

QC Batch: 81214 | Date Analyzed: 2011-05-12 | Analyzed By: ME
Prep Batch: 68938 | QC Preparation: 2011-05-12 | Prepared By: ME

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		1	12.8	mg/Kg	1	20.0	<0.753	64	61.8 - 114

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	12.4	mg/Kg	1	20.0	<0.753	62	61.8 - 114	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
Trifluorotoluene (TFT)	2.22	2.20	mg/Kg	1	2	111	110	50 - 162
4-Bromofluorobenzene (4-BFB)	2.06	2.01	mg/Kg	1	2	103	100	50 - 162

Matrix Spike (MS-1) Spiked Sample: 266092

QC Batch: 81246 | Date Analyzed: 2011-05-13 | Analyzed By: kg
Prep Batch: 68968 | QC Preparation: 2011-05-13 | Prepared By: kg

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		1	184	mg/Kg	1	250	<15.7	74	11.7 - 152.3

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	181	mg/Kg	1	250	<15.7	72	11.7 - 152.3	2	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Tricosane	106	112	mg/Kg	1	100	106	112	70 - 130

Matrix Spike (MS-1) Spiked Sample: 266087

QC Batch: 81559 | Date Analyzed: 2011-05-24 | Analyzed By: AR
Prep Batch: 69151 | QC Preparation: 2011-05-20 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			10400	mg/Kg	100	10000	<385	104	80 - 120

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			10800	mg/Kg	100	10000	<385	108	80 - 120	4	20

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

Matrix Spike (MS-1) Spiked Sample: 266097

QC Batch: 81650 | Date Analyzed: 2011-05-26 | Analyzed By: AR
Prep Batch: 69151 | QC Preparation: 2011-05-20 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			10200	mg/Kg	100	10000	<385	102	80 - 120

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			10600	mg/Kg	100	10000	<385	106	80 - 120	4	20

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

Matrix Spike (MS-1) Spiked Sample: 266107

QC Batch: 81651 | Date Analyzed: 2011-05-26 | Analyzed By: AR
Prep Batch: 69151 | QC Preparation: 2011-05-20 | Prepared By: AR

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride			10400	mg/Kg	100	10000	397	100	80 - 120

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride			10800	mg/Kg	100	10000	397	104	80 - 120	4	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: 81213 | Date Analyzed: 2011-05-12 | Analyzed By: ME

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/Kg	0.100	0.0983	98	80 - 120	2011-05-12
Toluene		1	mg/Kg	0.100	0.102	102	80 - 120	2011-05-12
Ethylbenzene		1	mg/Kg	0.100	0.0900	90	80 - 120	2011-05-12
Xylene		1	mg/Kg	0.300	0.268	89	80 - 120	2011-05-12

Standard (CCV-2)

QC Batch: 81213 | Date Analyzed: 2011-05-12 | Analyzed By: ME

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		1	mg/Kg	0.100	0.0982	98	80 - 120	2011-05-12
Toluene		1	mg/Kg	0.100	0.106	106	80 - 120	2011-05-12
Ethylbenzene		1	mg/Kg	0.100	0.0912	91	80 - 120	2011-05-12
Xylene		1	mg/Kg	0.300	0.273	91	80 - 120	2011-05-12

Standard (CCV-1)

QC Batch: 81214 | Date Analyzed: 2011-05-12 | Analyzed By: ME

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	0.845	84	80 - 120	2011-05-12

Standard (CCV-2)

QC Batch: 81214 | Date Analyzed: 2011-05-12 | Analyzed By: ME

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	1.00	0.857	86	80 - 120	2011-05-12

Standard (CCV-2)

QC Batch: 81246 Date Analyzed: 2011-05-13 Analyzed By: kg

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	203	81	80 - 120	2011-05-13

Standard (CCV-3)

QC Batch: 81246 Date Analyzed: 2011-05-13 Analyzed By: kg

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	208	83	80 - 120	2011-05-13

Standard (CCV-4)

QC Batch: 81246 Date Analyzed: 2011-05-13 Analyzed By: kg

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1	mg/Kg	250	203	81	80 - 120	2011-05-13

Standard (ICV-1)

QC Batch: 81559 Date Analyzed: 2011-05-24 Analyzed By: AR

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.7	100	85 - 115	2011-05-24

Standard (CCV-1)

QC Batch: 81559 Date Analyzed: 2011-05-24 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	2011-05-24

Standard (ICV-1)

QC Batch: 81650 Date Analyzed: 2011-05-26 Analyzed By: AR

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	101	101	85 - 115	2011-05-26

Standard (CCV-1)

QC Batch: 81650 Date Analyzed: 2011-05-26 Analyzed By: AR

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.2	99	85 - 115	2011-05-26

Standard (ICV-1)

QC Batch: 81651 Date Analyzed: 2011-05-26 Analyzed By: AR

Param	Flag	Cert	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride			mg/Kg	100	99.3	99	85 - 115	2011-05-26

Standard (CCV-1)

QC Batch: 81651 Date Analyzed: 2011-05-26 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	2011-05-26

Appendix

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	T104704392-10-TX	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.
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.

11051103

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

CLIENT NAME: COG

SITE MANAGER: Ike Tavarez

PROJECT NO.: 114-6400900

PROJECT NAME: Antelope State Tank Battery
Eddy Co NM

LAB I.D. NUMBER	DATE 2011	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD (Ext. to C35) TX1005	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
266085	5/9		S		X	AH-1 0-1'	1				X		X	X											X				
086						AH-1 1-1.5'																							
087						AH-1 2-2.5'																							
088						AH-1 3-3.5'																							
089						AH-1 4-4.5'																							
090						AH-1 5-5.5'																							
091						AH-1 6-6.5'																							
092						AH-2 0-1'							X	X															
093						AH-2 1-1.5'																							
094						AH-2 2-2.5'																							

ANALYSIS REQUEST (Circle or Specify Method No.)

RELINQUISHED BY: (Signature)	Date: 5-10-11 Time: 1635	RECEIVED BY: (Signature)	Date: 5/10/11 Time: 16:35
RELINQUISHED BY: (Signature)	Date: Time:	RECEIVED BY: (Signature)	Date: Time:
RELINQUISHED BY: (Signature)	Date: Time:	RECEIVED BY: (Signature)	Date: Time:

SAMPLED BY: (Print & Initial) TF Date: 5-9-11 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:
RECEIVED BY: (Signature)
DATE: TIME:

SAMPLE CONDITION WHEN RECEIVED: 8.4° c intact

REMARKS: If total TPH exceeds 5,000 mg/kg run deeper sample

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

11051103

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

CLIENT NAME: COG

SITE MANAGER: Ike Tavarez

PROJECT NO.: 114-6400900

PROJECT NAME: Antelope State Tank Battery
Eddy Co NM

LAB I.D. NUMBER	DATE 2011	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD (Ext. to C35) TX1005	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
766095	5/9	09	S		X	AH-2 3-3.5'	1				X													X				
096						AH-2 4-4.5'																						
097						AH-2 5-5.5'																						
098						AH-2 6-6.5'																						
099						AH-2 7-7.5'																						

RELINQUISHED BY: (Signature) Date: 5-10-11 Time: 16:35
RECEIVED BY: (Signature) Date: 5/10/11 Time: 16:35
SAMPLED BY: (Print & Initial) TF Date: 5-9-11 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 Tavarez
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: 8.4°C intact
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.