

SITE INFORMATION

Report Type: Closure Report 2RP-4073

General Site Information:

Site:	Puckett 13 Federal Tank Battery				
Company:	COG Operating LLC				
Section, Township and Range	Unit P	Sec. 12	T 17S	R 31E	
Lease Number:	API No. 30-015-40737				
County:	Eddy County				
GPS:	32.842045° N			103.816429° W	
Surface Owner:	Federal				
Mineral Owner:					
Directions:	From the intersection of NM 529 & HWY 82 in rural Eddy County, Travel east on HWY 82 for approximatey 3.9 miles, turn north onto a lease road for approximately 0.10 mi, turn northeast onto lease road for 0.20 mi to location on south side of the lease road.				

Release Data:

Date Released:	1/6/2017	
Type Release:	Oil & Produced Water	
Source of Contamination:	Portable Tester	
Fluid Released:	2 bbls oil & 3 bbls water	
Fluids Recovered:	1 bbl oil & 2 bbls water	

Official Communication:

Name:	Robert McNeil		Ike Tavarez
Company:	COG Operating, LLC		Tetra Tech
Address:	One Concho Center		4000 N. Big Spring
	600 W. Illinois Ave.		Ste 401
City:	Midland Texas, 79701		Midland, Texas
Phone number:	(432) 686-3023		(432) 687-8110
Fax:	(432) 684-7137		
Email:	rmcneil@conchoresources.com		Ike.Tavarez@tetrattech.com

Ranking Criteria

Depth to Groundwater:	Ranking Score	Site Data
<50 ft	20	
50-99 ft	10	
>100 ft.	0	175'-200'
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



July 18, 2017

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

Re: Closure Report for the COG Operating LLC., Puckett 13 Federal Tank Battery, Unit P, Section 12, Township 17 South, Range 31 East, Eddy County, New Mexico. 2RP-4073

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC., (COG) to assess and remediate a release that occurred at the COG at the Puckett 13 Federal Tank Battery, Unit P, Section 12, Township 17 South, Range 31 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.842045^o, W 103.816429^o. 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 January 6, 2017, and released approximately two (2) barrels of oil and three (3) barrels of produced water due to a failed pop off valve on a portable tester. Approximately one (1) barrel of oil and two (2) barrels of produced water were recovered using a vacuum truck. The spill is located on the pad area and measured approximately 140' x 140'. The initial C-141 form is included in Appendix A.

Groundwater

No water wells were listed within Section 12 on the New Mexico Office of the State Engineer's (NMOSE) database. The nearest well listed on the NMOSE database is located in Section 10, Township 17 South, Range 32 East, with a reported depth of approximately 132' below surface. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in this area is between 175' and 200' below surface. The groundwater data is shown in Appendix B.

Tetra Tech

4000 North Big Spring, Suite 401, Midland, TX 79705
Tel 432.682.4559 Fax 432.682.3946 www.tetrattech.com



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 February 7, 2017, COG personnel were onsite to evaluate and sample the release area. Using a backhoe, two (2) trenches (T-1 and T-2) were installed to a total depths of 4.0' 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 the 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 in Figure 3.

Referring to Table 1, none of the samples collected in the areas of trenches (T-1 and T-2) showed TPH, benzene, or total BTEX concentrations above the laboratory reporting limits or the RRAL's. However, the area of trench (T-1) showed elevated chloride concentrations in the shallow soils of 6,240 mg/kg (surface) and 1,020 mg/kg (1.0'). The chloride concentrations then declined with depth at 2.0' to 32.0 mg/kg with a bottom trench concentration of <16.0 mg/kg at 4.0' below surface. The area of trench (T-2) did not show a significant chloride impact to the soils with a chloride high of 368 mg/kg at surface, which declined with depth to 16.0 mg/kg at 2.0' below surface.

Remediation Activities

Tetra Tech submitted the work plan, dated April 25, 2017, to the NMOCD and BLM for review and approval. The NMOCD approved the work plan with stipulations. As performed, the NMOCD requested lateral samples/definition of the impacted soils.

After the initial release was assessed, the southern portion of the pad area was reclaimed and approximately 1.0' of the pad material was removed from the area. Additionally, a berm was placed along the south edge of the pad. On June 14-15, 2017, Tetra Tech personnel were onsite to supervise the excavation and remediation activities. The excavated areas and depths are shown on Figure 4 and highlighted (green) in Table 1. The area of trench (T-1) was excavated to 1.0' below surface and expanded horizontally to properly remove the impacted soils.

A total of four (4) sidewall samples, South Sidewall, West Sidewall, East Sidewall, and North Sidewall (East), were collected to ensure proper removal of the impacted material. On the south excavation, the impacted soil were removed up to the berm and collected confirmation samples on the sidewall next to the berm. In addition, a sample (SP-1) was collected immediately south the berm to confirm the removal of the impacted soils during the reclamation activities. Selected samples were analyzed for chloride by EPA method 300.0. Copies of the laboratory analysis and chain-of-custody documentation are included in Appendix C. The results



of the sampling are summarized in Table 1. The sidewall sample locations are shown on Figure 4.

Referring to Table 1, the sidewall samples collected at (West Sidewall and North Sidewall) did not show significant chlorides in the area, with concentrations of 103 mg/kg and 1,100 mg/kg, respectively. However, the North Sidewall (east) field screening showed a chloride concentration of 680 mg/kg, but the lab results showed a chloride of 1,100 mg/kg.

The confirmation samples along the edge of the south berm showed chloride concentrations of 2,480 mg/kg (South Sidewall) and 3,200 mg/kg (East Sidewall). However, due to the berm in the area, a confirmation sample (SP-1) was collected immediately south of the berm and showed a chloride concentration of 15.6 mg/kg. Based on the results, the chloride concentrations detected along the berm is limited to edge of the berm and does not appear to be an environmental concern. Based on the insignificant chloride concentration south of the berm, the areas of South Sidewall and East Sidewall were not expanded further, which would require the removal of the berm.

Once the excavation was completed, the area of trench (T-1) was backfilled with clean material to surface grade. Approximately 140 cubic yards of excavated material was transported offsite for proper disposal.

Based on the soil assessment and remediation work performed at the site, COG requests closure of this spill. The final C-141 is enclosed in Appendix A. If you have any questions or comments concerning the assessment or the proposed remediation activities for this site, please call me at (432) 682-4559.

Respectfully submitted,
TETRA TECH

A handwritten signature in blue ink that reads 'Clair Gonzales'.

Clair Gonzales,
Geologist I

A handwritten signature in blue ink that reads 'Ike Tavaréz'.

Ike Tavaréz,
Senior Project Manager, P.G.

cc: Robert McNeill – COG
Dakota Neel – COG
Rebecca Haskell - COG
Shelly Tucker – BLM

Figures

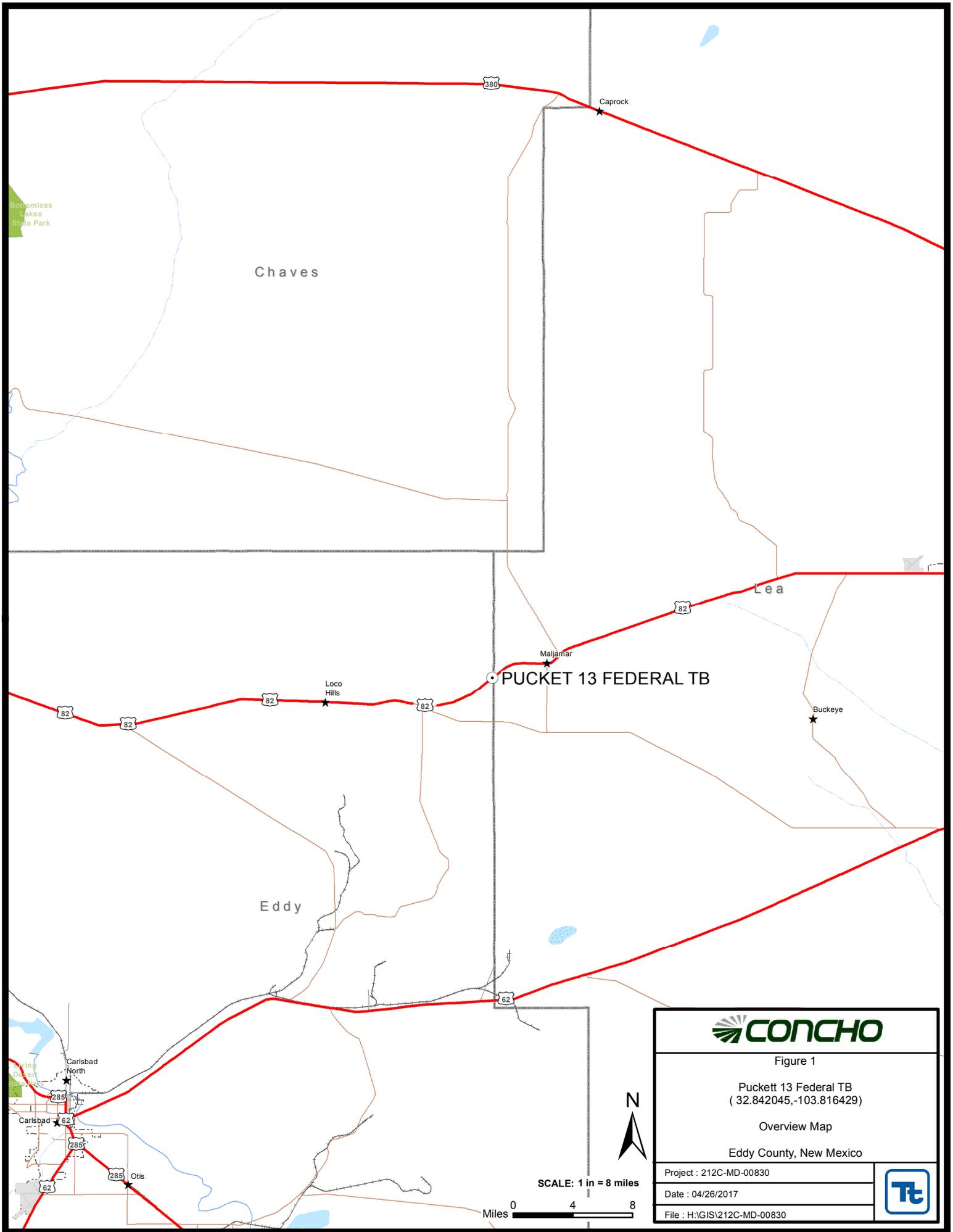


Figure 1

Pucket 13 Federal TB
(32.842045,-103.816429)

Overview Map

Eddy County, New Mexico

Project : 212C-MD-00830

Date : 04/26/2017

File : H:\GIS\212C-MD-00830



SCALE: 1 in = 8 miles





SPILL AREA APPROX.
140'x140'

T-1

T-2

82

EXPLANATION

 TRENCH SAMPLE LOCATIONS
 SPILL AREA

SCALE: 1 IN = 80 FEET



Figure 3

Puckett 13 Federal TB
(32.842045,-103.816429)

Spill Assessment Map

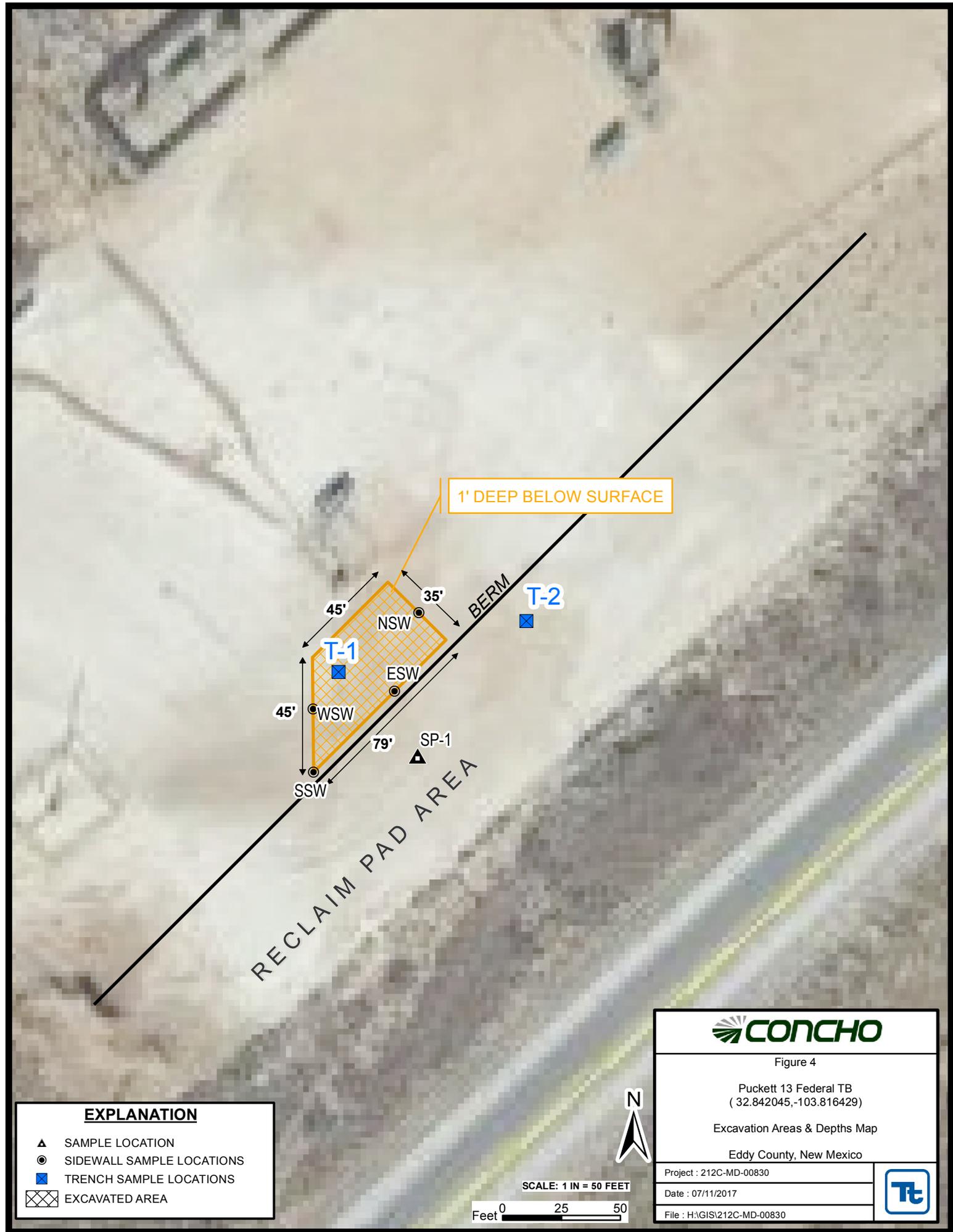
Eddy County, New Mexico

Project : 212C-MD-00830

Date : 04/26/2017

File : H:\GIS\212C-MD-00830





1' DEEP BELOW SURFACE

RECLAIM PAD AREA

BERM

T-1

T-2

SP-1

NSW

ESW

WSW

SSW

45'

45'

79'

35'

EXPLANATION

- ▲ SAMPLE LOCATION
- SIDEWALL SAMPLE LOCATIONS
- TRENCH SAMPLE LOCATIONS
- ▨ EXCAVATED AREA



SCALE: 1 IN = 50 FEET



Figure 4

Puckett 13 Federal TB
(32.842045,-103.816429)

Excavation Areas & Depths Map

Eddy County, New Mexico

Project : 212C-MD-00830
Date : 07/11/2017
File : H:\GIS\212C-MD-00830



Tables

Table 1
COG Operating LLC.
Pucket 13 Federal 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)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	Total						
T-1	2/7/2017	Surface		X	<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	6,240
	"	1		X	<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	1,020
	"	2	X		<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	32.0
	"	3	X		<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	<16.0
	"	4	X		<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	<16.0
South Sidewall (edge of berm)	6/14/2017	-	X		-	-	-	-	-	-	-	-	2,480
West Sidewall	6/14/2017	-	X		-	-	-	-	-	-	-	-	103
East Sidewall (edge of berm)	6/14/2017	-	X		-	-	-	-	-	-	-	-	3,220
North Sidewall (east)	6/15/2017	-	X		-	-	-	-	-	-	-	-	1,100
SP-1 (south of berm)	6/14/2017	0-1	X		-	-	-	-	-	-	-	-	15.6
T-2	2/7/2017	Surface	X		<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	368
	"	1	X		<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	160
	"	2	X		<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	16.0
	"	3	X		<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	32.0
	"	4	X		<10.0	<10.0	<10.0	<0.50	<0.50	<0.50	<0.150	<0.300	32.0

(-) Not Analyzed
 Excavation Depths

Photos

COG Operating LLC
Puckett 13 Federal Tank Battery
Eddy County, New Mexico



TETRA TECH



View West – Excavated Area of T-1



View Southwest – Backfilled Area of T-1

Appendix A

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

State of New Mexico
Energy Minerals and Natural Resources

Form C-141
Revised August 8, 2011

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

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

Release Notification and Corrective Action

OPERATOR

Initial Report Final Report

Name of Company: COG Operating LLC	Contact: Robert McNeill
Address: 600 West Illinois Avenue, Midland TX 79701	Telephone No. 432-683-7443
Facility Name: Puckett 13 Federal Tank Battery	Facility Type: Tank Battery
Surface Owner: Federal	Mineral Owner:
	API No. 30-015-40737

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
P	12	17S	31E	43	South	590	East	Eddy

Latitude 32.8420105 Longitude 103.8164825

NATURE OF RELEASE

Type of Release: Oil and Produced Water	Volume of Release: 2 bbls Oil & 3 bbls PW	Volume Recovered: 1 bbls Oil & 2 bbls PW
Source of Release: Portable Tester	Date and Hour of Occurrence: January 6, 2017 7:00 pm	Date and Hour of Discovery: January 6, 2017 7:00 pm
Was Immediate Notice Given? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?	
By Whom?	Date and Hour:	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

The release was due to a pop off valve on a portable tester. The portable tester was removed from service.

Describe Area Affected and Cleanup Action Taken.*

The release occurred on the pad and into the adjacent pasture. A vacuum truck was dispatched to remove all freestanding fluids. Concho will have the spill area sampled to delineate any possible impact from the release and we will present a remediation work plan to the NMOCD for approval prior to any significant remediation activities.

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: <i>Rebecca Haskell</i>	OIL CONSERVATION DIVISION	
Printed Name: Rebecca Haskell	Approved by Environmental Specialist:	
Title: Senior HSE Coordinator	Approval Date:	Expiration Date:
E-mail Address: rhaskell@concho.com	Conditions of Approval:	Attached <input type="checkbox"/>
Date: January 17, 2017 Phone: 432-683-7443		

* 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 McNeil
Address 600 West Illinois Ave., Midland TX 79701	Telephone No. (432) 683-7443
Facility Name Puckett 13 Federal Tank Battery	Facility Type Tank Battery

Surface Owner: Federal	Mineral Owner	API No. 30-015-40737
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LOCATION OF RELEASE

Unit Letter P	Section 12	Township 17S	Range 31E	Feet from the 43	North/South Line South	Feet from the 590	East/West Line East	County Eddy
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Latitude N 32.8420105° Longitude W 103.81648258°

NATURE OF RELEASE

Type of Release: Oil and Produced Water	Volume of Release 2 bbls oil & 3 bbls water	Volume Recovered 1 bbls oil & 2 bbls water
Source of Release: Portable Tester	Date and Hour of Occurrence 01/06/17 7:00 pm	Date and Hour of Discovery 01/06/17 7:00 pm
Was Immediate Notice Given? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse. N/A	

If a Watercourse was Impacted, Describe Fully.*

N/A

Describe Cause of Problem and Remedial Action Taken.*

The release occurred due to a pop off valve on a portable tester, which has been taken out of service. The release occurred on the pad area. A vacuum truck was dispatched to remove all standing fluids.

Describe Area Affected and Cleanup Action Taken.*

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:		<u>OIL CONSERVATION DIVISION</u>	
Printed Name: Ike Tavaréz		Approved by District Supervisor:	
Title: Project Manager		Approval Date:	Expiration Date:
E-mail Address: Ike.Tavaréz@TetraTech.com		Conditions of Approval:	
Date: 07/17/17	Phone: (432) 682-4559	Attached <input type="checkbox"/>	

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG - Puckett 13 Federal 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
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			32 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			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	35	36

17 South			32 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			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
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			32 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

- 88** New Mexico State Engineers Well Reports
- 105** USGS Well Reports
- 90** Geology and Groundwater Conditions in Southern Lea, County, NM (Report 6)
- 90** Geology and Groundwater Resources of Eddy County, NM (Report 3)
- 34** NMOCD - Groundwater Data
- 123** Tetra Tech installed temporary wells and field water level
- 143** NMOCD Groundwater map well location



New Mexico Office of the State Engineer

Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced,
O=orphaned,
C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest) (NAD83 UTM in meters)

(In feet)

POD Number	POD Code	Sub-basin	County	POD Sub-County			Sec	Tws	Rng	X	Y	DepthWell	DepthWater	Water Column
				64	16	4								
RA 11590 POD1	ED		ED	2	1	3	32	17S	31E	603315	3628545	158		
RA 11590 POD3	ED		ED	3	1	2	32	17S	31E	603932	3629260	60		
RA 11590 POD4	ED		ED	4	1	1	32	17S	31E	603308	3629253	55		

Average Depth to Water: --

Minimum Depth: --

Maximum Depth: --

Record Count: 3

PLSS Search:

Township: 17S **Range:** 31E

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

4/25/17 9:47 AM

WATER COLUMN/ AVERAGE DEPTH
TO WATER



New Mexico Office of the State Engineer

Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced,
O=orphaned,
C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	DepthWell	DepthWater	Water Column
L 04021 POD3		L	LE	3	4	03	17S	32E		616761	3636252*	247		
L 04021 S		L	LE	2	4	4	03	17S	32E	617262	3636354*	260		
L 13050 POD1		L	LE	2	2	1	10	17S	32E	616463	3635945*	156	132	24
RA 08855			LE	4	1	1	10	17S	32E	616061	3635742*	158		
RA 09505			LE	2	2	1	10	17S	32E	616462	3635944	147		
RA 09505 S			LE	2	2	1	10	17S	32E	616463	3635945*	144		
RA 11734 POD1			LE	2	2	1	10	17S	32E	616556	3635929	165		

Average Depth to Water: **132 feet**
 Minimum Depth: **132 feet**
 Maximum Depth: **132 feet**

Record Count: 7

PLSS Search:

Section(s): 3-10

Township: 17S

Range: 32E

*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

4/25/17 9:58 AM

WATER COLUMN/ AVERAGE DEPTH TO WATER

Appendix C



February 22, 2017

AARON LIEB
COG OPERATING
P. O. BOX 1630
ARTESIA, NM 88210

RE: PUCKETT 13 FEDERAL TANK BATTERY

Enclosed are the results of analyses for samples received by the laboratory on 02/15/17 12:00.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-16-8. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Celey D. Keene".

Celey D. Keene
Lab Director/Quality Manager

Analytical Results For:

 COG OPERATING
 AARON LIEB
 P. O. BOX 1630
 ARTESIA NM, 88210
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 1 - SURFACE (H700395-01)

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	02/18/2017	ND	2.18	109	2.00	2.72	
Toluene*	<0.050	0.050	02/18/2017	ND	2.05	103	2.00	2.65	
Ethylbenzene*	<0.050	0.050	02/18/2017	ND	2.07	103	2.00	3.06	
Total Xylenes*	<0.150	0.150	02/18/2017	ND	5.90	98.4	6.00	2.94	
Total BTEX	<0.300	0.300	02/18/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID) 99.1 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	6240	16.0	02/20/2017	ND	432	108	400	3.64	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	02/17/2017	ND	187	93.5	200	0.699	
DRO >C10-C28	<10.0	10.0	02/17/2017	ND	195	97.6	200	1.31	

Surrogate: 1-Chlorooctane 89.3 % 35-147
Surrogate: 1-Chlorooctadecane 88.1 % 28-171

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* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 COG OPERATING
 AARON LIEB
 P. O. BOX 1630
 ARTESIA NM, 88210
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 1 - 1' (H700395-02)

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/18/2017	ND	2.18	109	2.00	2.72		
Toluene*	<0.050	0.050	02/18/2017	ND	2.05	103	2.00	2.65		
Ethylbenzene*	<0.050	0.050	02/18/2017	ND	2.07	103	2.00	3.06		
Total Xylenes*	<0.150	0.150	02/18/2017	ND	5.90	98.4	6.00	2.94		
Total BTEX	<0.300	0.300	02/18/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 99.6 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1020	16.0	02/20/2017	ND	432	108	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	02/17/2017	ND	187	93.5	200	0.699		
DRO >C10-C28	<10.0	10.0	02/17/2017	ND	195	97.6	200	1.31		

Surrogate: 1-Chlorooctane 88.3 % 35-147

Surrogate: 1-Chlorooctadecane 98.7 % 28-171

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Analytical Results For:

 COG OPERATING
 AARON LIEB
 P. O. BOX 1630
 ARTESIA NM, 88210
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 1 - 2' (H700395-03)

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/18/2017	ND	2.18	109	2.00	2.72		
Toluene*	<0.050	0.050	02/18/2017	ND	2.05	103	2.00	2.65		
Ethylbenzene*	<0.050	0.050	02/18/2017	ND	2.07	103	2.00	3.06		
Total Xylenes*	<0.150	0.150	02/18/2017	ND	5.90	98.4	6.00	2.94		
Total BTEX	<0.300	0.300	02/18/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 98.3 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32.0	16.0	02/20/2017	ND	432	108	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	02/17/2017	ND	187	93.5	200	0.699		
DRO >C10-C28	<10.0	10.0	02/17/2017	ND	195	97.6	200	1.31		

Surrogate: 1-Chlorooctane 83.3 % 35-147

Surrogate: 1-Chlorooctadecane 97.8 % 28-171

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Analytical Results For:

 COG OPERATING
 AARON LIEB
 P. O. BOX 1630
 ARTESIA NM, 88210
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 1 - 3' (H700395-04)

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/18/2017	ND	2.18	109	2.00	2.72		
Toluene*	<0.050	0.050	02/18/2017	ND	2.05	103	2.00	2.65		
Ethylbenzene*	<0.050	0.050	02/18/2017	ND	2.07	103	2.00	3.06		
Total Xylenes*	<0.150	0.150	02/18/2017	ND	5.90	98.4	6.00	2.94		
Total BTEX	<0.300	0.300	02/18/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 97.6 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	<16.0	16.0	02/20/2017	ND	432	108	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	02/17/2017	ND	187	93.5	200	0.699		
DRO >C10-C28	<10.0	10.0	02/17/2017	ND	195	97.6	200	1.31		

Surrogate: 1-Chlorooctane 83.6 % 35-147

Surrogate: 1-Chlorooctadecane 102 % 28-171

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Analytical Results For:

 COG OPERATING
 AARON LIEB
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Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 1 - 4' (H700395-05)

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/18/2017	ND	2.18	109	2.00	2.72		
Toluene*	<0.050	0.050	02/18/2017	ND	2.05	103	2.00	2.65		
Ethylbenzene*	<0.050	0.050	02/18/2017	ND	2.07	103	2.00	3.06		
Total Xylenes*	<0.150	0.150	02/18/2017	ND	5.90	98.4	6.00	2.94		
Total BTEX	<0.300	0.300	02/18/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 98.7 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	<16.0	16.0	02/20/2017	ND	432	108	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	02/17/2017	ND	187	93.5	200	0.699		
DRO >C10-C28	<10.0	10.0	02/17/2017	ND	195	97.6	200	1.31		

Surrogate: 1-Chlorooctane 86.6 % 35-147

Surrogate: 1-Chlorooctadecane 101 % 28-171

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Analytical Results For:

 COG OPERATING
 AARON LIEB
 P. O. BOX 1630
 ARTESIA NM, 88210
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 2 - SURFACE (H700395-06)

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/18/2017	ND	2.18	109	2.00	2.72		
Toluene*	<0.050	0.050	02/18/2017	ND	2.05	103	2.00	2.65		
Ethylbenzene*	<0.050	0.050	02/18/2017	ND	2.07	103	2.00	3.06		
Total Xylenes*	<0.150	0.150	02/18/2017	ND	5.90	98.4	6.00	2.94		
Total BTEX	<0.300	0.300	02/18/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 99.0 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	368	16.0	02/20/2017	ND	432	108	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	02/16/2017	ND	187	93.3	200	0.843		
DRO >C10-C28	<10.0	10.0	02/16/2017	ND	201	100	200	0.331		

Surrogate: 1-Chlorooctane 83.8 % 35-147

Surrogate: 1-Chlorooctadecane 88.4 % 28-171

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Analytical Results For:

 COG OPERATING
 AARON LIEB
 P. O. BOX 1630
 ARTESIA NM, 88210
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 2 - 1' (H700395-07)

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/18/2017	ND	2.18	109	2.00	2.72		
Toluene*	<0.050	0.050	02/18/2017	ND	2.05	103	2.00	2.65		
Ethylbenzene*	<0.050	0.050	02/18/2017	ND	2.07	103	2.00	3.06		
Total Xylenes*	<0.150	0.150	02/18/2017	ND	5.90	98.4	6.00	2.94		
Total BTEX	<0.300	0.300	02/18/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 98.8 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	160	16.0	02/20/2017	ND	448	112	400	0.00	QM-07	

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	02/16/2017	ND	187	93.3	200	0.843		
DRO >C10-C28	<10.0	10.0	02/16/2017	ND	201	100	200	0.331		

Surrogate: 1-Chlorooctane 82.5 % 35-147

Surrogate: 1-Chlorooctadecane 91.7 % 28-171

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Analytical Results For:

 COG OPERATING
 AARON LIEB
 P. O. BOX 1630
 ARTESIA NM, 88210
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 2 - 2' (H700395-08)

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/19/2017	ND	2.02	101	2.00	7.72		
Toluene*	<0.050	0.050	02/19/2017	ND	1.88	94.2	2.00	9.17		
Ethylbenzene*	<0.050	0.050	02/19/2017	ND	1.84	92.0	2.00	12.1		
Total Xylenes*	<0.150	0.150	02/19/2017	ND	5.25	87.4	6.00	12.0		
Total BTEX	<0.300	0.300	02/19/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 97.7 % 73.6-140

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	16.0	16.0	02/20/2017	ND	448	112	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	02/16/2017	ND	187	93.3	200	0.843		
DRO >C10-C28	<10.0	10.0	02/16/2017	ND	201	100	200	0.331		

Surrogate: 1-Chlorooctane 85.6 % 35-147

Surrogate: 1-Chlorooctadecane 93.0 % 28-171

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Analytical Results For:

 COG OPERATING
 AARON LIEB
 P. O. BOX 1630
 ARTESIA NM, 88210
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 2 - 3' (H700395-09)

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	02/19/2017	ND	2.02	101	2.00	7.72		
Toluene*	<0.050	0.050	02/19/2017	ND	1.88	94.2	2.00	9.17		
Ethylbenzene*	<0.050	0.050	02/19/2017	ND	1.84	92.0	2.00	12.1		
Total Xylenes*	<0.150	0.150	02/19/2017	ND	5.25	87.4	6.00	12.0		
Total BTEX	<0.300	0.300	02/19/2017	ND						

Surrogate: 4-Bromofluorobenzene (PID) 98.9 % 73.6-140

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32.0	16.0	02/20/2017	ND	448	112	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	02/16/2017	ND	187	93.3	200	0.843		
DRO >C10-C28	<10.0	10.0	02/16/2017	ND	201	100	200	0.331		

Surrogate: 1-Chlorooctane 77.5 % 35-147

Surrogate: 1-Chlorooctadecane 87.8 % 28-171

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Analytical Results For:

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 AARON LIEB
 P. O. BOX 1630
 ARTESIA NM, 88210
 Fax To: NONE

Received:	02/15/2017	Sampling Date:	02/07/2017
Reported:	02/22/2017	Sampling Type:	Soil
Project Name:	PUCKETT 13 FEDERAL TANK BATTERY	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: T 2 - 4' (H700395-10)

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	02/19/2017	ND	2.02	101	2.00	7.72	
Toluene*	<0.050	0.050	02/19/2017	ND	1.88	94.2	2.00	9.17	
Ethylbenzene*	<0.050	0.050	02/19/2017	ND	1.84	92.0	2.00	12.1	
Total Xylenes*	<0.150	0.150	02/19/2017	ND	5.25	87.4	6.00	12.0	
Total BTEX	<0.300	0.300	02/19/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID) 99.7 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	32.0	16.0	02/20/2017	ND	448	112	400	0.00	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	02/16/2017	ND	187	93.3	200	0.843	
DRO >C10-C28	<10.0	10.0	02/16/2017	ND	201	100	200	0.331	

Surrogate: 1-Chlorooctane 83.6 % 35-147

Surrogate: 1-Chlorooctadecane 93.5 % 28-171

Cardinal Laboratories

* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

QR-02	The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report



Analytical Report 556709

for
Tetra Tech- Midland

Project Manager: Ike Tavarez

COG-Puckett 13 Federal

212C-MD-00830

07-JUL-17

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
Oklahoma (9218)

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400)
Xenco-San Antonio: Texas (T104704534)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)



07-JUL-17

Project Manager: **Ike Tavarez**
Tetra Tech- Midland
4000 N. Big Spring Suite 401
Midland, TX 79705

Reference: XENCO Report No(s): **556709**
COG-Puckett 13 Federal
Project Address: Eddy Co NM

Ike Tavarez:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 556709. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 556709 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Kelsey Brooks

Project Manager

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Houston - Dallas - Midland - San Antonio - Phoenix - Oklahoma - Latin America



Sample Cross Reference 556709



Tetra Tech- Midland, Midland, TX

COG-Puckett 13 Federal

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SSW	S	06-14-17 00:00		556709-001
WSW	S	06-14-17 00:00		556709-002
ESW	S	06-14-17 00:00		556709-003
SP-1 (0-1)	S	06-14-17 00:00		556709-004
NSW	S	06-15-17 00:00		556709-005



CASE NARRATIVE

Client Name: Tetra Tech- Midland

Project Name: COG-Puckett 13 Federal

Project ID: 212C-MD-00830
Work Order Number(s): 556709

Report Date: 07-JUL-17
Date Received: 06/30/2017

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None



Certificate of Analysis Summary 556709



Tetra Tech- Midland, Midland, TX

Project Name: COG-Puckett 13 Federal

Project Id: 212C-MD-00830

Contact: Ike Tavarez

Project Location: Eddy Co NM

Date Received in Lab: Fri Jun-30-17 10:41 am

Report Date: 07-JUL-17

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	556709-001	556709-002	556709-003	556709-004	556709-005	
	<i>Field Id:</i>	SSW	WSW	ESW	SP-1 (0-1)	NSW	
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	
	<i>Sampled:</i>	Jun-14-17 00:00	Jun-14-17 00:00	Jun-14-17 00:00	Jun-14-17 00:00	Jun-15-17 00:00	
Inorganic Anions by EPA 300/300.1	<i>Extracted:</i>	Jul-06-17 16:40					
	<i>Analyzed:</i>	Jul-06-17 23:22	Jul-06-17 23:29	Jul-06-17 23:37	Jul-06-17 23:45	Jul-07-17 00:08	
	<i>Units/RL:</i>	mg/kg RL					
Chloride		2480 24.8	103 4.95	3220 24.8	15.6 4.96	1100 24.8	

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

Houston - Dallas - San Antonio - Atlanta - Tampa - Boca Raton - Latin America - Odessa - Corpus Christi

Kelsey Brooks
Project Manager

- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

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(210) 509-3334	(210) 509-3335
(432) 563-1800	(432) 563-1713
(602) 437-0330	



BS / BSD Recoveries



Project Name: COG-Puckett 13 Federal

Work Order #: 556709

Project ID: 212C-MD-00830

Analyst: MGO

Date Prepared: 07/06/2017

Date Analyzed: 07/06/2017

Lab Batch ID: 3021694

Sample: 727283-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	250	258	103	250	246	98	5	90-110	20	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$

Blank Spike Recovery [D] = $100 * (C)/[B]$

Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: COG-Puckett 13 Federal

Work Order # : 556709

Project ID: 212C-MD-00830

Lab Batch ID: 3021694

QC- Sample ID: 556656-001 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 07/06/2017

Date Prepared: 07/06/2017

Analyst: MGO

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	14.7	249	261	99	249	249	94	5	90-110	20	

Lab Batch ID: 3021694

QC- Sample ID: 556709-004 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 07/06/2017

Date Prepared: 07/06/2017

Analyst: MGO

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	15.6	248	260	99	248	240	90	8	90-110	20	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*(C-F)/(C+F)

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Analysis Request of Chain of Custody Record



TETRA TECH

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

556709

CLIENT NAME:

COG

SITE MANAGER:

Ike Tawarez

PROJECT NO.:

ZTC-MD-00830

PROJECT NAME:

Pickett / J Federal Eddy Co WY

LAB I.D. NUMBER

DATE

TIME

MATRIX COMP. GRAB

SAMPLE IDENTIFICATION

NUMBER OF CONTAINERS
FILTERED (Y/N)
HCL
HNO3
ICE
NONE

PRESERVATIVE METHOD

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

PAGE: 1

OF: 1

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	HCL	HNO3	ICE	NONE	PRESERVATIVE METHOD	ANALYSIS REQUEST
	6/14	-	S		X	SSW	1				X			X
	6/14	-	S		X	WSW	1				X			X
	6/14	-	S		X	ESW	1				X			X
	6/14	-	S		X	SP-1 (0-1')	1				X			X
	6/15	-	S		X	NSW	1				X			X

Temp: 4.1
CF: (0.6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 3.9
IR ID: R-8

RELINQUISHED BY: (Signature) *D. L. Pruitt* Date: 6/28/13 Time: 10:11
 RECEIVED BY: (Signature) *[Signature]* Date: _____ Time: _____

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

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

RECEIVING LABORATORY: _____
 ADDRESS: _____ CITY: _____ STATE: _____ ZIP: _____
 CONTACT: _____ PHONE: _____ DATE: _____ TIME: _____

SAMPLE CONDITION WHEN RECEIVED: _____

REMARKS: _____

SAMPLED BY: (Print & Initial) *D. L. Pruitt* Date: 6/15/13 Time: 13:00
 SAMPLE SHIPPED BY: (Circle) FEDEX BUS UPS
 TETRA TECH CONTACT PERSON: *Ike Tawarez*

RESULTS BY: _____
 RUSH CHARGES AUTHORIZED: Yes No

Client: Tetra Tech- Midland

Date/ Time Received: 06/30/2017 10:41:00 AM

Work Order #: 556709

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient
Temperature Measuring device used : R8

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	3.9
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seal present on shipping container/ cooler?	N/A
#5 *Custody Seals intact on shipping container/ cooler?	N/A
#6 Custody Seals intact on sample bottles?	N/A
#7 *Custody Seals Signed and dated?	N/A
#8 *Chain of Custody present?	Yes
#9 Sample instructions complete on Chain of Custody?	Yes
#10 Any missing/extra samples?	No
#11 Chain of Custody signed when relinquished/ received?	Yes
#12 Chain of Custody agrees with sample label(s)?	Yes
#13 Container label(s) legible and intact?	Yes
#14 Sample matrix/ properties agree with Chain of Custody?	Yes
#15 Samples in proper container/ bottle?	Yes
#16 Samples properly preserved?	Yes
#17 Sample container(s) intact?	Yes
#18 Sufficient sample amount for indicated test(s)?	Yes
#19 All samples received within hold time?	Yes
#20 Subcontract of sample(s)?	N/A
#21 VOC samples have zero headspace?	N/A

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst:

PH Device/Lot#:

Checklist completed by: Jessica Kramer Date: 06/30/2017
 Jessica Kramer

Checklist reviewed by: Kelsey Brooks Date: 06/30/2017
 Kelsey Brooks