

## SITE INFORMATION

**Report Type: Work Plan      2RP-4024**

### General Site Information:

Site:	Firefox 4 Fed Com 5H Battery					
Company:	COG Operating LLC					
Section, Township and Range	Unit M	Sec. 04	T 19S	R 31E		
Lease Number:	API No. 30-015-41423					
County:	Eddy County					
GPS:	32.683605° N			103.882709° W		
Surface Owner:	Federal					
Mineral Owner:						
Directions:	From the intersection of 126A (Maljamar Rd) and Lusk Plant Rd. in rural Eddy County, turn west on Lusk Rd for approximately 6.20 mi, turn west onto lease road for 0.4 miles, turn south for 0.6 mi , turn west onto lease road for 0.15 mi to location on north side of lease road.					

### Release Data:

<b>Date Released:</b>	11/25/2016	
<b>Type Release:</b>	Produced Water	
<b>Source of Contamination:</b>	Water Line	
<b>Fluid Released:</b>	8 bbls	
<b>Fluids Recovered:</b>	7 bbls	

### Official Communication:

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

### Ranking Criteria

<b>Depth to Groundwater:</b>	<b>Ranking Score</b>	<b>Site Data</b>
<50 ft	20	
50-99 ft	10	
>100 ft.	0	175'-200'
<b>WellHead Protection:</b>	<b>Ranking Score</b>	<b>Site Data</b>
Water Source <1,000 ft., Private <200 ft.	20	
Water Source >1,000 ft., Private >200 ft.	0	0
<b>Surface Body of Water:</b>	<b>Ranking Score</b>	<b>Site Data</b>
<200 ft.	20	
200 ft - 1,000 ft.	10	
>1,000 ft.	0	0
<b>Total Ranking Score:</b>		0

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



April 28, 2017

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

**Re: Work Plan for the COG Operating LLC., Firefox 4 Fed Com 5H Battery, Unit M, Section 04, Township 19 South, Range 31 East, Eddy County, New Mexico. 2RP-4024**

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating LLC., (COG) to prepare a work plan for the release assessed by COG at the Firefox 4 Fed Com 5H Battery, Unit M, Section 04, Township 19 South, Range 31 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.683605°, W 103.882709°. 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 November 25, 2016, and released approximately eight (8) barrels of produced water due to leak in a water line. Approximately seven (7) barrels of produced water was recovered using a vacuum truck. The spill is located outside the bermed facility and migrated into the pasture and measures approximately 25' x 75' and 25' x 75'. The initial C-141 form is included in Appendix A.

## **Groundwater**

No water wells were listed within Section 04 on the New Mexico Office of the State Engineer's (NMOSE) database. The nearest well listed in the NMOSE database is located in Section 19 with a reported depth of approximately 180' below surface. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in this area is shown to be 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](http://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 December 19, 2016, COG personnel was onsite to evaluate and sample the release area. Using a backhoe, two (2) sample trenches (T-1 and T-2) were installed to total depths of 8.0' and 10.0' below surface to evaluate the impact to the soils. 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 location is shown in Figure 3.

Referring to Table 1, none of the samples collected at trenches (T-1 and T-2) showed total TPH, benzene, or total BTEX concentrations above the RRAL's. However, the area of trench (T-1) showed elevated chloride concentrations in the shallow soils with a chloride high of 8,000 mg/kg at 1.0' below surface, which then declined with depth and showed a bottom hole concentration of 208 mg/kg at 10.0' below surface. Additionally, the area of trench (T-2) showed a chloride high of 12,800 mg/kg at surface, which inconsistently declined with depth to 228 mg/kg at 6.0' below surface. A chloride spike of 3,480 mg/kg was detected at 7.0', before declining to 720 mg/kg at 8.0' below surface and the area was not vertically defined.

Based on the laboratory results, COG personnel returned to the site on March 16, 2017, to resample and assess the area of trench (T-2). One (1) backhoe trench (T-1) was installed in the area of trench (T-2) in order to vertically define the chloride impact. Selected samples were analyzed 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.

Referring to Table 1, the area of T-1 (T-2) showed a chloride concentration of 7,970 mg/kg at surface. The chloride concentrations then steadily declined with depth to 307 mg/kg at 8.0' and showed a bottom hole concentration of <10.0 mg/kg at 14.0' below surface.



**TETRA TECH**

## **Work Plan**

Based on the laboratory results, COG proposes to remove the impacted material as highlighted (green) in Table 1 and shown on Figure 4. The area of trench (T-1) will be excavated to a depth of approximately 2.0' and the area of trench (T-2) will be excavated to a depth of approximately 5.0'-6.0' below surface in order to remove the elevated chloride concentrations in the shallow soils. Once excavated to the appropriate depth, the excavated areas will be backfilled with clean material to surface grade. All of the excavated material will be transported offsite for proper disposal.

The proposed excavation depths may not be reached due to wall cave ins and safety concerns for onsite personnel. In addition, impacted soil around oil and gas equipment, structures or lines may not be feasible or practicable to be removed due to safety concerns for onsite personnel. As such, COG will excavate the impacted soils to the maximum extent practicable.

Upon completion, a final report detailing the remediation activities will be submitted to the NMOCD. 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.

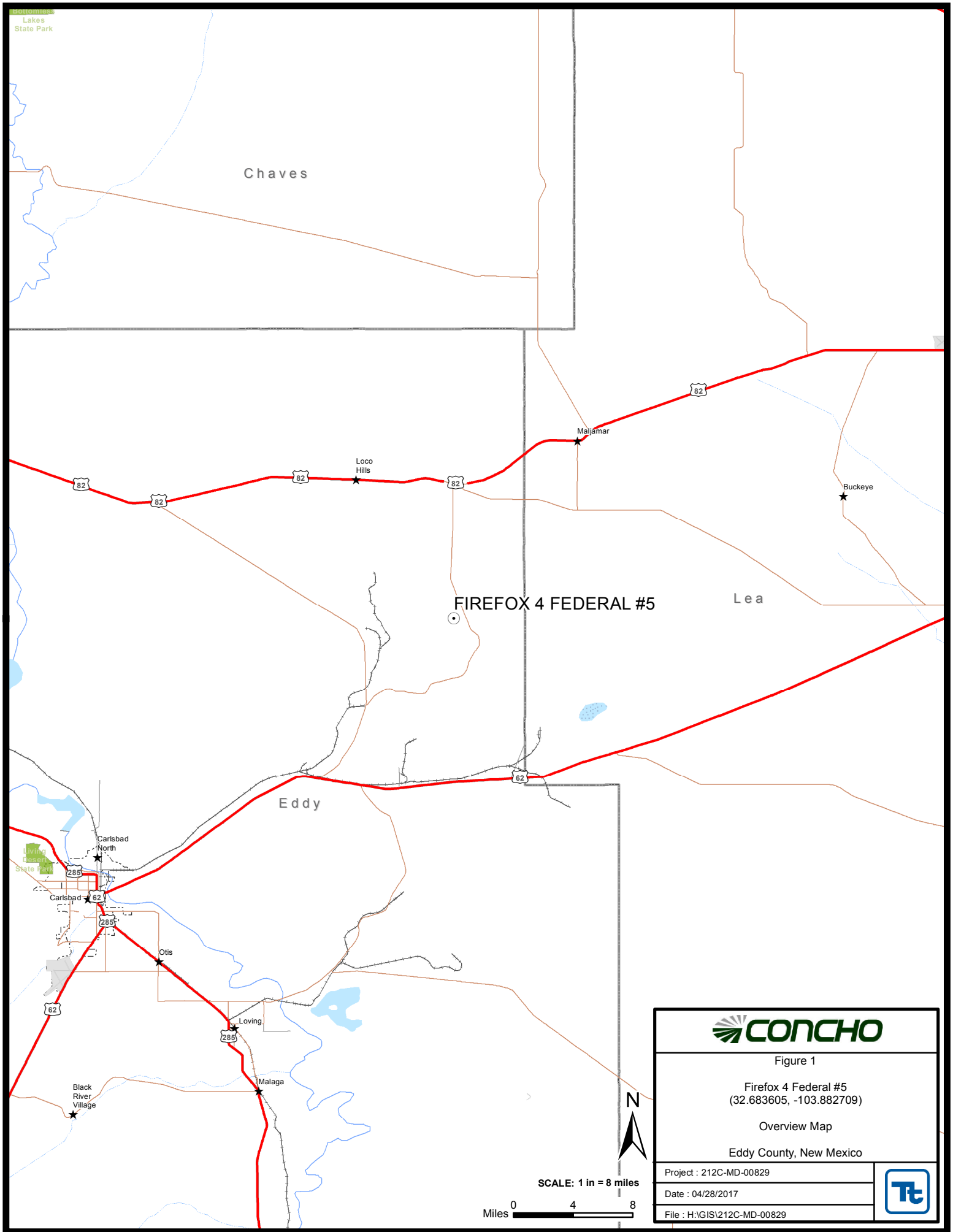
Respectfully submitted,  
TETRA TECH

Clair Gonzales,  
Geologist I

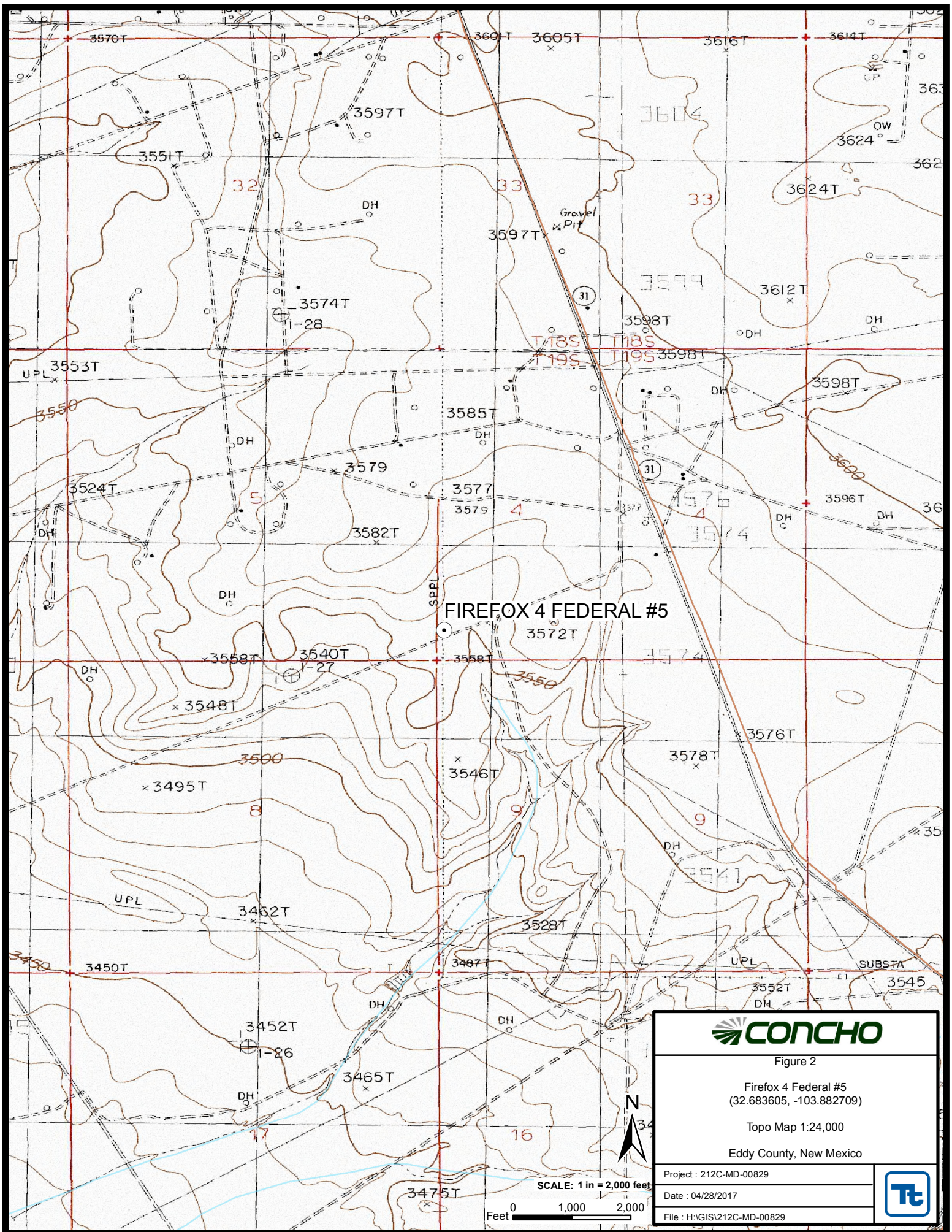
Ike Tavaréz,  
Senior Project Manager, P.G.

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

## Figures











### EXPLANATION



-  TRENCH SAMPLE LOCATIONS
-  SPILL AREA



Figure 3

Firefox 4 Federal #5  
(32.683605, -103.882709)

Spill Assessment Map

Eddy County, New Mexico

Project : 212C-MD-00829

Date : 04/28/2017

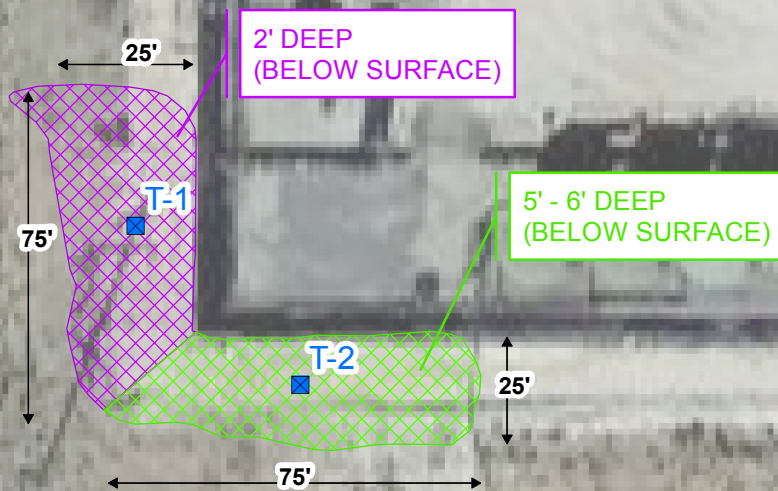
File : H:\GIS\212C-MD-00829





SCALE: 1 IN = 50 FEET

Feet 0 25 50





# EXPLANATION

-  TRENCH SAMPLE LOCATIONS
-  PROPOSED EXCAVATION AREA

SCALE: 1 IN = 50 FEET

Feet 0 25 50



Figure 4

Firefox 4 Federal #5  
(32.683605, -103.882709)

Proposed Excavation Area & Depths Map

Eddy County, New Mexico

Project : 212C-MD-00829

Date : 04/28/2017

File : H:\GIS\212C-MD-00829



## Tables

**Table 1**  
**COG Operating LLC.**  
**Firefox 4 Fed Com #5H**  
**Eddy County, New Mexico**

Sample ID	Sample Date	Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	Total						
T-1	12/19/2016	Surface	X		<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	6,800
	"	1	X		-	-	-	-	-	-	-	-	8,000
	"	2	X		-	-	-	-	-	-	-	-	1,120
	"	3	X		-	-	-	-	-	-	-	-	48.0
	"	4	X		-	-	-	-	-	-	-	-	128
	"	5	X		-	-	-	-	-	-	-	-	112
	"	6	X		-	-	-	-	-	-	-	-	128
	"	8	X		-	-	-	-	-	-	-	-	256
	"	10	X		-	-	-	-	-	-	-	-	208
T-2	12/19/2016	Surface	X		107	1,750	1,857	<0.050	0.113	1.24	3.35	4.7	12,800
	"	1	X		-	-	-	-	-	-	-	-	1,490
	"	2	X		-	-	-	-	-	-	-	-	4,800
	"	3	X		-	-	-	-	-	-	-	-	336
	"	4	X		-	-	-	-	-	-	-	-	1,720
	"	5	X		-	-	-	-	-	-	-	-	9,200
	"	6	X		-	-	-	-	-	-	-	-	228
	"	7	X		-	-	-	-	-	-	-	-	3,480
	"	8	X		-	-	-	-	-	-	-	-	720
T-1 (T-2)	3/16/2017	Surface	X		-	-	-	-	-	-	-	-	7,970
	"	1	X		-	-	-	-	-	-	-	-	6,440
	"	3	X		-	-	-	-	-	-	-	-	1,800
	"	6	X		-	-	-	-	-	-	-	-	941
	"	8	X		-	-	-	-	-	-	-	-	307
	"	10	X		-	-	-	-	-	-	-	-	341
	"	12	X		-	-	-	-	-	-	-	-	31.3
	"	14	X		-	-	-	-	-	-	-	-	<10.0

(-) Not Analyzed

 Proposed Excavation Depths

## 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

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

Form C-141  
Revised August 8, 2011

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

### Release Notification and Corrective Action

#### OPERATOR

☒ Initial Report ☐ Final Report

Name of Company:	COG Operating LLC	Contact:	Robert McNeill
Address:	600 West Illinois Avenue, Midland TX 79701	Telephone No.	432-683-7443
Facility Name:	Firefox 4 Fed Com 5H Battery	Facility Type:	Tank Battery
Surface Owner:	Federal	Mineral Owner:	API No. 30-015-41423

#### LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
M	04	19S	31E	670	South	250	West	Eddy

Latitude 32.684082 Longitude 103.8822098

#### NATURE OF RELEASE

Type of Release:	Produced Water	Volume of Release:	8bbls	Volume Recovered:	7bbls
Source of Release:	Water Line	Date and Hour of Occurrence:	November 25, 2016 10:00 am	Date and Hour of Discovery:	November 25, 2016 10:00 am
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.*					
A four (4) inch 45 degree fitting on a water line developed a hole. The 45 degree fitting was replaced.					
Describe Area Affected and Cleanup Action Taken.*					
The release occurred on location but outside the battery berm. 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:	<u>OIL CONSERVATION DIVISION</u>				
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:	11/30/16	Phone:	432-683-7443		

\* Attach Additional Sheets If Necessary

## Appendix B

**Water Well Data**  
**Average Depth to Groundwater (ft)**  
**COG - Firefox 4 Fed Com #5H**  
**Eddy County, New Mexico**

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 44	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 98	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 65	3	2	1
7 460	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

19 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

19 South			31 East		
6	5	4 SITE	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19 180	20	21	22	23	24
30	29	28	27	26	25
31	32	33 101	34	35	36

19 South			32 East		
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13 135
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

20 South			30 East		
6	5 3.5	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

20 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

20 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)  
 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 Sub-Code	basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
<a href="#">CP 00641 POD1</a>	CP	ED		4	1	36	19S	31E		610247	3609634*	300	130	170
<a href="#">CP 00642 POD1</a>	CP	ED		2	2	25	19S	31E		611025	3611657*	250		
<a href="#">CP 00722 POD1</a>	CP	LE		4	3	3	28	19S	31E	605106	3610273*	200		
<a href="#">CP 00722 POD3</a>	CP	LE		2	4	1	33	19S	31E	605519	3609673*	220	140	80
<a href="#">CP 00723 POD1</a>	CP	ED		2	1	1	33	19S	31E	605111	3610071*	139		
<a href="#">CP 00725 POD1</a>	CP	ED		1	3	3	28	19S	31E	604906	3610473*	231		
<a href="#">CP 00829 POD1</a>	CP	LE		2	4	16	19S	31E		606165	3614009*	120		
<a href="#">CP 00873 POD1</a>	CP	LE		1	1	19	19S	31E		601772	3613147*	340	180	160
<a href="#">CP 01554 POD1</a>	CP	LE		2	2	1	22	19S	31E	607166	3613354	400		
<a href="#">CP 01554 POD2</a>	CP	LE		2	2	1	22	19S	31E	607165	3613322	400		

Average Depth to Water: **150 feet**

Minimum Depth: **130 feet**

Maximum Depth: **180 feet**

Record Count: 10

PLSS Search:

Township: 19S

Range: 31E

\*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.



## Appendix C



# Certificate of Analysis Summary 549473

COG Operating LLC, Artesia, NM

Project Name: Firefox 4 Fed Com #5H



Project Id:

Contact: Dakota Neel

Project Location: Edy County, NM

Date Received in Lab: Sat Mar-25-17 10:27 am

Report Date: 06-APR-17

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	549473-001	549473-002	549473-003	549473-004	549473-005	549473-006
	<i>Field Id:</i>	T1 - Surface	T1 - 1'	T1 - 3'	T1 - 6'	T1 - 8'	T1 - 10'
	<i>Depth:</i>		1 ft	3 ft	6 ft	8 ft	10 ft
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Mar-16-17 09:30	Mar-16-17 09:35	Mar-16-17 09:40	Mar-16-17 09:45	Mar-16-17 09:50	Mar-16-17 09:52
<b>Inorganic Anions by EPA 300/300.1 SUB: TX104704215</b>	<i>Extracted:</i>	Apr-04-17 17:00	Apr-04-17 17:00	Apr-04-17 17:00	Apr-04-17 17:00	Apr-04-17 09:32	Apr-04-17 09:32
	<i>Analyzed:</i>	Apr-05-17 05:23	Apr-05-17 05:45	Apr-05-17 05:52	Apr-05-17 06:00	Apr-05-17 00:36	Apr-05-17 00:43
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		7970 D 100	6440 D 100	1800 10.0	941 10.0	307 10.0	341 10.0

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



# Certificate of Analysis Summary 549473

COG Operating LLC, Artesia, NM

Project Name: Firefox 4 Fed Com #5H



Project Id:

Contact: Dakota Neel

Project Location: Edy County, NM

Date Received in Lab: Sat Mar-25-17 10:27 am

Report Date: 06-APR-17

Project Manager: Kelsey Brooks

<b>Analysis Requested</b>	<b>Lab Id:</b>	549473-007	549473-008				
	<b>Field Id:</b>	T1 - 12'	T1 - 14'				
	<b>Depth:</b>	12 ft	14 ft				
	<b>Matrix:</b>	SOIL	SOIL				
	<b>Sampled:</b>	Mar-16-17 09:58	Mar-16-17 10:00				
<b>Inorganic Anions by EPA 300/300.1 SUB: TX104704215</b>	<b>Extracted:</b>	Apr-04-17 16:00	Apr-04-17 16:00				
	<b>Analyzed:</b>	Apr-05-17 01:05	Apr-05-17 01:12				
	<b>Units/RL:</b>	mg/kg RL	mg/kg RL				
Chloride		31.3 10.0	<10.0 10.0				

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

# **Analytical Report 549473**

**for  
COG Operating LLC**

**Project Manager: Dakota Neel**

**Firefox 4 Fed Com #5H**

**06-APR-17**

Collected By: Dakota Neel



**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)





06-APR-17

Project Manager: **Dakota Neel**

**COG Operating LLC**

2407 Pecos Avenue

Artesia, NM 88210

Reference: XENCO Report No(s): **549473**

**Firefox 4 Fed Com #5H**

Project Address: Edy County, NM

**Dakota Neel:**

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) 549473. 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. 549473 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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## Sample Cross Reference 549473



### COG Operating LLC, Artesia, NM

Firefox 4 Fed Com #5H

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
T1 - Surface	S	03-16-17 09:30	N/A	549473-001
T1 - 1'	S	03-16-17 09:35	- 1 ft	549473-002
T1 - 3'	S	03-16-17 09:40	- 3 ft	549473-003
T1 - 6'	S	03-16-17 09:45	- 6 ft	549473-004
T1 - 8'	S	03-16-17 09:50	- 8 ft	549473-005
T1 - 10'	S	03-16-17 09:52	- 10 ft	549473-006
T1 - 12'	S	03-16-17 09:58	- 12 ft	549473-007
T1 - 14'	S	03-16-17 10:00	- 14 ft	549473-008



## CASE NARRATIVE

*Client Name: COG Operating LLC*

*Project Name: Firefox 4 Fed Com #5H*

Project ID:

Work Order Number(s): 549473

Report Date: 06-APR-17

Date Received: 03/25/2017

---

**Sample receipt non conformances and comments:**

please email results to:

rgrubbs@concho.com rhaskell@concho.com alieb@concho.com

---

**Sample receipt non conformances and comments per sample:**

None



# Certificate of Analytical Results 549473



## COG Operating LLC, Artesia, NM

Firefox 4 Fed Com #5H

Sample Id: **T1 - Surface**

Matrix: Soil

Date Received: 03.25.17 10.27

Lab Sample Id: 549473-001

Date Collected: 03.16.17 09.30

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: ALA

% Moisture:

Analyst: ALA

Date Prep: 04.04.17 17.00

Basis: Wet Weight

Seq Number: 3014107

SUB: TX104704215

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	7970	100	mg/kg	04.05.17 16.56	D	10





## Certificate of Analytical Results 549473



### COG Operating LLC, Artesia, NM

Firefox 4 Fed Com #5H

Sample Id: T1 - 1'  
Lab Sample Id: 549473-002

Matrix: Soil  
Date Collected: 03.16.17 09.35

Date Received: 03.25.17 10.27  
Sample Depth: 1 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Tech: ALA

Analyst: ALA

Seq Number: 3014107

Date Prep: 04.04.17 17.00

Prep Method: E300P

% Moisture:

Basis: Wet Weight

SUB: TX104704215

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	6440	100	mg/kg	04.05.17 17.04	D	10



# Certificate of Analytical Results 549473



## COG Operating LLC, Artesia, NM

Firefox 4 Fed Com #5H

Sample Id: T1 - 3'  
Lab Sample Id: 549473-003

Matrix: Soil  
Date Collected: 03.16.17 09.40

Date Received: 03.25.17 10.27  
Sample Depth: 3 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: ALA

% Moisture:

Analyst: ALA

Date Prep: 04.04.17 17.00

Basis: Wet Weight

Seq Number: 3014107

SUB: TX104704215

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1800	10.0	mg/kg	04.05.17 05.52		1



# Certificate of Analytical Results 549473



## COG Operating LLC, Artesia, NM

Firefox 4 Fed Com #5H

Sample Id: **T1 - 6'**  
Lab Sample Id: 549473-004

Matrix: Soil  
Date Collected: 03.16.17 09.45

Date Received: 03.25.17 10.27  
Sample Depth: 6 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: ALA

% Moisture:

Analyst: ALA

Date Prep: 04.04.17 17.00

Basis: Wet Weight

Seq Number: 3014107

SUB: TX104704215

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	941	10.0	mg/kg	04.05.17 06.00		1



# Certificate of Analytical Results 549473



## COG Operating LLC, Artesia, NM

Firefox 4 Fed Com #5H

Sample Id: **T1 - 8'**  
Lab Sample Id: 549473-005

Matrix: Soil  
Date Collected: 03.16.17 09.50

Date Received: 03.25.17 10.27  
Sample Depth: 8 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Tech: ALA

Analyst: ALA

Seq Number: 3014103

Date Prep: 04.04.17 09.32

Prep Method: E300P

% Moisture:

Basis: Wet Weight

SUB: TX104704215

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	307	10.0	mg/kg	04.05.17 00.36		1



# Certificate of Analytical Results 549473



## COG Operating LLC, Artesia, NM

Firefox 4 Fed Com #5H

Sample Id: **T1 - 10'**  
Lab Sample Id: 549473-006

Matrix: Soil  
Date Collected: 03.16.17 09.52

Date Received: 03.25.17 10.27  
Sample Depth: 10 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: ALA

% Moisture:

Analyst: ALA

Date Prep: 04.04.17 09.32

Basis: Wet Weight

Seq Number: 3014103

SUB: TX104704215

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	341	10.0	mg/kg	04.05.17 00.43		1



# Certificate of Analytical Results 549473



## COG Operating LLC, Artesia, NM

Firefox 4 Fed Com #5H

Sample Id: **T1 - 12'**  
Lab Sample Id: 549473-007

Matrix: Soil  
Date Collected: 03.16.17 09:58

Date Received: 03.25.17 10:27  
Sample Depth: 12 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: ALA

% Moisture:

Analyst: ALA

Date Prep: 04.04.17 16:00

Basis: Wet Weight

Seq Number: 3014103

SUB: TX104704215

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	31.3	10.0	mg/kg	04.05.17 01:05		1



# Certificate of Analytical Results 549473



## COG Operating LLC, Artesia, NM

Firefox 4 Fed Com #5H

Sample Id: **T1 - 14'**  
Lab Sample Id: 549473-008

Matrix: Soil  
Date Collected: 03.16.17 10.00

Date Received: 03.25.17 10.27  
Sample Depth: 14 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: ALA

% Moisture:

Analyst: ALA

Date Prep: 04.04.17 16.00

Basis: Wet Weight

Seq Number: 3014103

SUB: TX104704215

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<10.0	10.0	mg/kg	04.05.17 01.12	U	1



- 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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 2525 W. Huntington Dr. - Suite 102, Tempe AZ 85282

Phone	Fax
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(214) 902 0300	(214) 351-9139
(210) 509-3334	(210) 509-3335
(432) 563-1800	(432) 563-1713
(602) 437-0330	

COG Operating LLC  
Firefox 4 Fed Com #5H

## Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3014002

Matrix: Solid

Prep Method: E300P

MB Sample Id: 722515-1-BLK

LCS Sample Id: 722515-1-BKS

Date Prep: 04.03.17

LCSD Sample Id: 722515-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<2.00	20.0	20.2	101	19.8	99	80-120	2	20	mg/kg	04.03.17 21:23	

## Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3014103

Matrix: Solid

Prep Method: E300P

MB Sample Id: 722589-1-BLK

LCS Sample Id: 722589-1-BKS

Date Prep: 04.04.17

LCSD Sample Id: 722589-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<10.0	100	97.1	97	96.9	97	80-120	0	20	mg/kg	04.05.17 00:21	

## Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3014107

Matrix: Solid

Prep Method: E300P

MB Sample Id: 722590-1-BLK

LCS Sample Id: 722590-1-BKS

Date Prep: 04.04.17

LCSD Sample Id: 722590-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<10.0	100	99.2	99	99.1	99	80-120	0	20	mg/kg	04.05.17 04:24	

## Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3014002

Matrix: Solid

Prep Method: E300P

Parent Sample Id: 549470-012

MS Sample Id: 549470-012 S

Date Prep: 04.03.17

MSD Sample Id: 549470-012 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	8090	100	7970	0	7980	0	80-120	0	20	mg/kg	04.03.17 22:09	X

## Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3014002

Matrix: Solid

Prep Method: E300P

Parent Sample Id: 549470-020

MS Sample Id: 549470-020 S

Date Prep: 04.03.17

MSD Sample Id: 549470-020 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	43.6	100	148	104	147	103	80-120	1	20	mg/kg	04.04.17 00:20	

## Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 3014103

Matrix: Soil

Prep Method: E300P

Parent Sample Id: 549474-008

MS Sample Id: 549474-008 S

Date Prep: 04.04.17

MSD Sample Id: 549474-008 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	168	100	270	102	268	100	80-120	1	20	mg/kg	04.05.17 02:33	



## QC Summary 549473

### COG Operating LLC

Firefox 4 Fed Com #5H

**Analytical Method:** Inorganic Anions by EPA 300/300.1

Seq Number: 3014107

Matrix: Soil

Prep Method: E300P

Date Prep: 04.04.17

Parent Sample Id: 549472-005

MS Sample Id: 549472-005 S

MSD Sample Id: 549472-005 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	925	100	1000	75	1000	75	80-120	0	20	mg/kg	04.05.17 05:01	X

**Analytical Method:** Inorganic Anions by EPA 300/300.1

Seq Number: 3014107

Matrix: Soil

Prep Method: E300P

Date Prep: 04.04.17

Parent Sample Id: 549475-003

MS Sample Id: 549475-003 S

MSD Sample Id: 549475-003 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	3260	100	3280	20	3270	10	80-120	0	20	mg/kg	04.05.17 06:29	X

**Analytical Method:** Inorganic Anions by EPA 300/300.1

Seq Number: 3014103

Matrix: Soil

Prep Method: E300P

Date Prep: 04.04.17

Parent Sample Id: 549473-006

MS Sample Id: 549473-006 S

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	Limits	Units	Analysis Date	Flag
Chloride	341	100	437	96	80-120	mg/kg	04.05.17 00:50	



# CHAIN OF CUSTODY

Page 1 Of 1

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Dallas Texas (214-902-0300)

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Midland, Texas (432-704-5251)

Phoenix, Arizona (480-355-0900)

[www.xenco.com](http://www.xenco.com)

Xenco Quote #

Xenco Job #

549473

Client / Reporting Information		Project Information		Analytical Information		Matrix Codes	
--------------------------------	--	---------------------	--	------------------------	--	--------------	--

Company Name / Branch: COG Operating LLC		Project Name/Number: Firefox 4 Fed Com #5H					
---	--	---	--	--	--	--	--

Company Address: 2407 PECOS Avenue Artesia NM 88210		Project Location: Eddy County, NM					
--	--	--------------------------------------	--	--	--	--	--

Email: dnee2@concho.com alleb@concho.com thaskell@concho.com		Invoice To: COG Operating LLC Attn: Robert McNeill 600 W. Illinois Midland TX 79701					
---	--	---	--	--	--	--	--

Project Contact: Dakota Neel		PO Number:					
------------------------------	--	------------	--	--	--	--	--

Sampler's Name: Dakota Neel							
-----------------------------	--	--	--	--	--	--	--

No.	Field ID / Point of Collection	Collection			Matrix	# of bottles	Number of preserved bottles							Notes:	Field Comments	
		Sample Depth	Date	Time			HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH			NONE
1	TI - Surface	—	3/16/17	9:30 AM	5	1										
2	TI - 1'	1		9:35 AM		1										
3	TI - 3'	3		9:40 AM		1										
4	TI - 6'	6		9:45 AM		1										
5	TI - 8'	8		9:50 AM		1										
6	TI - 10'	10		9:52 AM		1										
7	TI - 12'	12		9:58 AM		1										
8	TI - 14'	14		10:00 AM		1										
9																
10																
Turnaround Time (Business days)																

Turnaround Time (Business days)		Data Deliverable Information					
---------------------------------	--	------------------------------	--	--	--	--	--

<input type="checkbox"/> Same Day TAT	<input type="checkbox"/> 5 Day TAT	<input type="checkbox"/> Level II Std QC	<input type="checkbox"/> Level IV (Full Data Pkg /raw data)				
---------------------------------------	------------------------------------	--	---	--	--	--	--

<input type="checkbox"/> Next Day EMERGENCY	<input type="checkbox"/> 7 Day TAT	<input type="checkbox"/> Level III Std QC+ Forms	<input type="checkbox"/> TRRP Level IV				
---	------------------------------------	--	--	--	--	--	--

<input type="checkbox"/> 2 Day EMERGENCY	<input type="checkbox"/> Contract TAT	<input type="checkbox"/> Level 3 (CLP Forms)	<input type="checkbox"/> UST / RG -411				
--	---------------------------------------	--	--	--	--	--	--

<input type="checkbox"/> 3 Day EMERGENCY	<input type="checkbox"/> TRRP Checklist						
--	---	--	--	--	--	--	--

TAT Starts Day received by Lab, if received by 5:00 pm		FED-EX / UPS: Tracking #					
--	--	--------------------------	--	--	--	--	--

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY							
---	--	--	--	--	--	--	--

Relinquished by Sampler: DANOTAN 3/17	Date Time: 3-24-17 11:00	Received By: Dad Bullen 3/24/17	Relinquished By: 2 5 13	Date Time: 3-25-17	Received By: 2	Temp: 0.0	IR ID: R-8
--	-----------------------------	------------------------------------	----------------------------	-----------------------	-------------------	--------------	------------

Relinquished by:	Date Time:	Received By:	Custody Seal #	Preserved where applicable	On Ice	Corrected Temp:	
------------------	------------	--------------	----------------	----------------------------	--------	-----------------	--



# XENCO Laboratories

## Prelogin/Nonconformance Report- Sample Log-In



Client: COG Operating LLC

Date/ Time Received: 03/25/2017 10:27:00 AM

Work Order #: 549473

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)?	.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
#22 <2 for all samples preserved with HNO3,HCL, H2SO4? Except for samples for the analysis of HEM or HEM-SGT which are verified by the analysts.	N/A
#23 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	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*

Jessica Kramer

Date: 03/27/2017

Checklist reviewed by:

*Kelsey Brooks*

Kelsey Brooks

Date: 03/27/2017



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

---

January 05, 2017

DAKOTA NEEL

COG OPERATING

P. O. BOX 1630

ARTESIA, NM 88210

RE: FIREFOX 4 FED COM #5H

Enclosed are the results of analyses for samples received by the laboratory on 12/29/16 12:05.

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](http://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,

Celey D. Keene

Lab Director/Quality Manager



**Analytical Results For:**

COG OPERATING  
DAKOTA NEEL  
P. O. BOX 1630  
ARTESIA NM, 88210  
Fax To: NONE

Received: 12/29/2016  
Reported: 01/05/2017  
Project Name: FIREFOX 4 FED COM #5H  
Project Number: NONE GIVEN  
Project Location: EDDY COUNTY

Sampling Date: 12/19/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Angela Cabrera

**Sample ID: T1 - SURFACE (H602890-01)**

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	12/30/2016	ND	1.82	91.1	2.00	2.19		
Toluene*	<0.050	0.050	12/30/2016	ND	1.85	92.3	2.00	2.27		
Ethylbenzene*	<0.050	0.050	12/30/2016	ND	1.90	95.0	2.00	2.67		
Total Xylenes*	<0.150	0.150	12/30/2016	ND	5.54	92.3	6.00	2.61		
Total BTEX	<0.300	0.300	12/30/2016	ND						

Surrogate: 4-Bromofluorobenzene (PID) 99.3 % 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	6800	16.0	12/31/2016	ND	416	104	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	12/30/2016	ND	184	92.0	200	3.90	
DRO >C10-C28	<10.0	10.0	12/30/2016	ND	190	95.0	200	1.29	

Surrogate: 1-Chlorooctane 99.9 % 35-147

Surrogate: 1-Chlorooctadecane 112 % 28-171

**Sample ID: T1 - 1' (H602890-02)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	8000	16.0	12/31/2016	ND	416	104	400	0.00	

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



**Analytical Results For:**

COG OPERATING  
DAKOTA NEEL  
P. O. BOX 1630  
ARTESIA NM, 88210  
Fax To: NONE

Received: 12/29/2016  
Reported: 01/05/2017  
Project Name: FIREFOX 4 FED COM #5H  
Project Number: NONE GIVEN  
Project Location: EDDY COUNTY

Sampling Date: 12/19/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Angela Cabrera

**Sample ID: T1 - 2' (H602890-03)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1120	16.0	12/31/2016	ND	416	104	400	0.00	

**Sample ID: T1 - 3' (H602890-04)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	48.0	16.0	12/31/2016	ND	416	104	400	0.00	

**Sample ID: T1 - 4' (H602890-05)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	128	16.0	12/31/2016	ND	416	104	400	0.00	

**Sample ID: T1 - 5' (H602890-06)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	112	16.0	12/31/2016	ND	416	104	400	0.00	

**Sample ID: T1 - 6' (H602890-07)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	128	16.0	12/31/2016	ND	416	104	400	0.00	

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**COG OPERATING  
DAKOTA NEEL  
P. O. BOX 1630  
ARTESIA NM, 88210  
Fax To: NONEReceived: 12/29/2016  
Reported: 01/05/2017  
Project Name: FIREFOX 4 FED COM #5H  
Project Number: NONE GIVEN  
Project Location: EDDY COUNTYSampling Date: 12/19/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Angela Cabrera**Sample ID: T1 - 8' (H602890-08)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	256	16.0	12/31/2016	ND	416	104	400	0.00	

**Sample ID: T1 - 10' (H602890-09)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	208	16.0	12/31/2016	ND	416	104	400	0.00	

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

COG OPERATING  
DAKOTA NEEL  
P. O. BOX 1630  
ARTESIA NM, 88210  
Fax To: NONE

Received: 12/29/2016  
Reported: 01/05/2017  
Project Name: FIREFOX 4 FED COM #5H  
Project Number: NONE GIVEN  
Project Location: EDDY COUNTY

Sampling Date: 12/19/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Angela Cabrera

**Sample ID: T2 - SURFACE (H602890-10)**

BTX 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	12/30/2016	ND	1.82	91.1	2.00	2.19	
Toluene*	0.113	0.050	12/30/2016	ND	1.85	92.3	2.00	2.27	
Ethylbenzene*	1.24	0.050	12/30/2016	ND	1.90	95.0	2.00	2.67	
Total Xylenes*	3.35	0.150	12/30/2016	ND	5.54	92.3	6.00	2.61	
Total BTX	4.70	0.300	12/30/2016	ND					

Surrogate: 4-Bromofluorobenzene (PID) 120 % 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	12800	16.0	12/31/2016	ND	416	104	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	107	10.0	12/30/2016	ND	184	92.0	200	3.90	
DRO >C10-C28	1750	10.0	12/30/2016	ND	190	95.0	200	1.29	

Surrogate: 1-Chlorooctane 116 % 35-147

Surrogate: 1-Chlorooctadecane 125 % 28-171

**Sample ID: T2 - 1' (H602890-11)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1490	16.0	12/31/2016	ND	416	104	400	0.00	QM-07

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

COG OPERATING  
DAKOTA NEEL  
P. O. BOX 1630  
ARTESIA NM, 88210  
Fax To: NONE

Received: 12/29/2016  
Reported: 01/05/2017  
Project Name: FIREFOX 4 FED COM #5H  
Project Number: NONE GIVEN  
Project Location: EDDY COUNTY

Sampling Date: 12/19/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Angela Cabrera

**Sample ID: T2 - 2' (H602890-12)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	4800	16.0	12/31/2016	ND	416	104	400	0.00		

**Sample ID: T2 - 3' (H602890-13)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	336	16.0	12/31/2016	ND	416	104	400	0.00	

**Sample ID: T2 - 4' (H602890-14)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1720	16.0	12/31/2016	ND	416	104	400	0.00	

**Sample ID: T2 - 5' (H602890-15)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	9200	16.0	12/31/2016	ND	416	104	400	0.00	

**Sample ID: T2 - 6' (H602890-16)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	288	16.0	12/31/2016	ND	416	104	400	0.00	

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Celey D. Keene, Lab Director/Quality Manager

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DAKOTA NEEL  
P. O. BOX 1630  
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Fax To: NONEReceived: 12/29/2016  
Reported: 01/05/2017  
Project Name: FIREFOX 4 FED COM #5H  
Project Number: NONE GIVEN  
Project Location: EDDY COUNTYSampling Date: 12/19/2016  
Sampling Type: Soil  
Sampling Condition: Cool & Intact  
Sample Received By: Angela Cabrera**Sample ID: T2 - 7' (H602890-17)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	3480	16.0	12/31/2016	ND	416	104	400	0.00		

**Sample ID: T2 - 8' (H602890-18)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	720	16.0	12/31/2016	ND	416	104	400	0.00	

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

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

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Celey D. Keene, Lab Director/Quality Manager

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**COG Operating LLC**

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