SITE INFORMATION

Report Type: Closure Report 2RP-5134

General Site Information:						
Site:	**Crapshoot 13 Federal #1H**					
Company:	**COG Operating LLC**					
Section, Township and Range	**Unit A**	**Sec. 24**	**T 20S**	**R 29E**		
Lease Number:	**API No. 30-015-42323**					
County:	**Eddy County**					
GPS:	**32.56562**			**-104.02292**		
Surface Owner:	**Federal**					
Directions:	From the intersection of Burton Flats Rd (238) and Buckeye Rd. head east on Buckeye Rd for 1.25 miles, turn north onto unnamed lease rd and go 0.84 miles, turn west and go 0.3 miles and arrive at location					

Release Data:	
Date Released:	12/8/2018
Type Release:	Produced Water & Crude Oil
Source of Contamination:	Gasket failure on FWKO
Fluid Released:	30 bbl water 5 bbl oil
Fluids Recovered:	28 bbls water 3 bbl oil

Official Communication:			
Name:	Ike Tavarez		Clair Gonzales
Company:	COG Operating, LLC		Tetra Tech
Address:	One Concho Center		901 West Wall Street
	600 W. Illinois Ave.		Suite 100
City:	Midland Texas, 79701		Midland, Texas
Phone number:	(432) 686-3023		(432) 687-8110
Fax:	(432) 684-7137		
Email:	itavarez@concho.com		Clair.Gonzales@tetratech.com

Site Characterization	
Depth to Groundwater:	*102' below surface*
Karst Potential:	*High*

Recommended Remedial Action Levels (RRALs)				
Benzene	***Total BTEX***	***TPH (GRO+DRO)***	***TPH (GRO+DRO+MRO)***	***Chlorides***
10 mg/kg	*50 mg/kg*	*100 mg/kg*	*100 mg/kg*	*600 mg/kg*

TETRA TECH

April 8, 2019

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

Re: Closure Report for the COG Operating, LLC, Crapshoot 13 Federal #1H, Unit A, Section 24, Township 20 South, Range 29 East, Eddy County, New Mexico. 2RP-5134

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating, LLC (COG) to remediate a release that occurred at the Crapshoot 13 Federal #1H, Unit A, Section 24, Township 20 South, Range 29 East, Eddy County, New Mexico (Site). The spill site coordinates are 32.56562°, -104.02292°. The site location is shown on Figures 1 and 2.

Background

According to the State of New Mexico C-141 Initial Report the release was discovered on December 8, 2018. Approximately 30 barrels of produced water and 5 barrels of crude oil were released due to a gasket failure on the free water knockout. The release occurred in the lined facility, with some overspray in the pasture. A vacuum truck was dispatched to remove all free-standing fluids, recovering 28 barrels of produced water and 3 barrels of crude oil. The release impacted an area in the adjacent pasture, east of the lined facility, measuring approximately 40' X 12'. The initial C-141 Forms are included in Appendix A.

Site Characterization

A site characterization was performed for the site and no watercourses, lakebeds, sinkholes, playa lakes, residences, schools, hospitals, institutions, churches, springs, private domestic water wells, springs, wetlands, incorporated municipal boundaries, subsurface mines, or floodplains are located within the specified distances and the site is in a high karst potential area. The nearest well is listed in the New Mexico Office of the State Engineers website website in Section 19, Township 20 South, Range 30 East, approximately 0.96 miles southeast of the site, and has a reported depth to groundwater of 102 feet below ground 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.tetratech.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, updated August 14, 2018. 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 site characterization, the proposed RRAL for TPH is 100 mg/kg (GRO + DRO + MRO). Additionally, based on the site characterization, the proposed RRAL for chlorides is 600 mg/kg.

Soil Assessment and Analytical Results

On January 15, 2019, COG personnel were onsite to sample the release area. A total of three (3) auger holes (AH-1, AH-2, and AH-3) were installed to total depths of 0.5' to 2.5' below surface. Soil samples were collected and submitted to the laboratory for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B, and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The results of the sampling are summarized in Table 1. The sample locations are shown on Figure 3.

Referring to Table 1, the area of auger holes (AH-2 and AH-3) showed benzene and total BTEX below the laboratory reporting limits. Additionally, the area of auger hole (AH-3) showed total TPH and chloride concentrations below the RRAL's. The areas of auger holes (AH-1 and AH-2) showed total TPH above the RRAL, with TPH highs of 282 mg/kg to 3,080 mg/kg. Auger holes (AH-1 and AH-2) also showed chloride concentrations above the RRAL, which declined with depth to below the RRAL at 1'-1.5' . The area of auger hole (AH-1) showed a total BTEX high of 77.2 mg/kg in the shallow soil (0-1') that declined with depth to below the RRAL at 1'-1.5'.

Remediation Activities

Tetra Tech personnel were onsite from February 28 through March 1, 2019 to supervise the remediation activities. The areas of auger holes (AH-1 and AH-2) were excavated to total depths between 4.0' to 4.5' below surface. Three (3) bottom hole composite samples and five (5) sidewall composite samples were collected every 200 square feet to ensure proper removal of the impacted soils. The samples were submitted to the laboratory to be analyzed for TPH method 8015 extended, BTEX method 8021B, and Chloride by EPA Method 300.0. The sampling results are summarized in Table 2. The excavation depths and sample locations are shown in Figure 4.

Referring to Table 1, all collected confirmation samples showed benzene, total BTEX, TPH, and chloride concentrations below the RRAL's.

Approximately 85 cubic yards of material was excavated and transported offsite for proper disposal. The area was then backfilled with clean material to surface grade.

TETRA TECH

Revegetation Plan

The area will be seeded with a Bureau of Land Management (BLM) seed mixture for shallow sites in June 2019 in order to coincide with the rainy season in Southeastern New Mexico to aid in revegetation. Based on the soils at the site, the Bureau of Land Management (BLM) Seed Mixture 4 will be used for seeding and will be planted in the amount specified in the pounds pure live seed (PLS) per acre. The seed mixture will be spread by a drill equipped with a depth regulator or a hand-held broadcaster and raked. If a hand-held broadcaster is used for dispersal, the pounds pure live seed per acre will be doubled.

Site inspections will be performed to assess the revegetation progress and evaluate the site for the presence of primary or secondary noxious weeds. If noxious weeds are identified, the BLM will be contacted to determine an effective method for eradication. If the site does not show revegetation after one growing season, the area will be reseeded as appropriate. The BLM seed mixture details and corresponding pounds pure live seed per acre are included in Appendix D.

Conclusion

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

Respectfully submitted,
TETRA TECH

Clair Gonzales,
Project Manager

Johnathon Kell,
Geologist

cc: Ike Tavarez – COG
Dakota Neel - COG
Rebecca Haskell - COG
Sheldon Hitchcock - COG
DeAnn Grant - COG

Figures

CONCHO

FIGURE 1

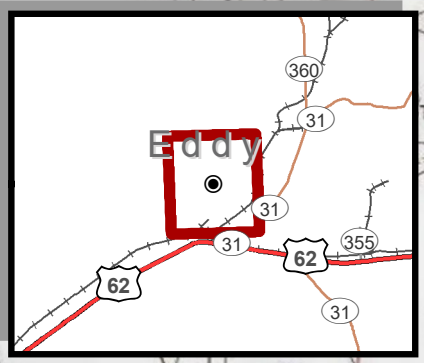
CRAPSHOOT 13 FEDERAL 1H
(32.565620°, -104.022920°)

OVERVIEW MAP

EDDY COUNTY, NEW MEXICO

Project : 212C-MD-01627	
Date : 03/06/2019	
File : H:\GIS\212C-MD-01627	

MAPPED BY: MISTI MORGAN



OVERALL VIEW
1:500,000

CRAPSHOOT 13 FEDERAL 1H

N
W
E
S

0
2,000
4,000
Feet
1 inch = 2,000 feet

LEGEND

◉ SITE LOCATION

CONCHO

FIGURE 2

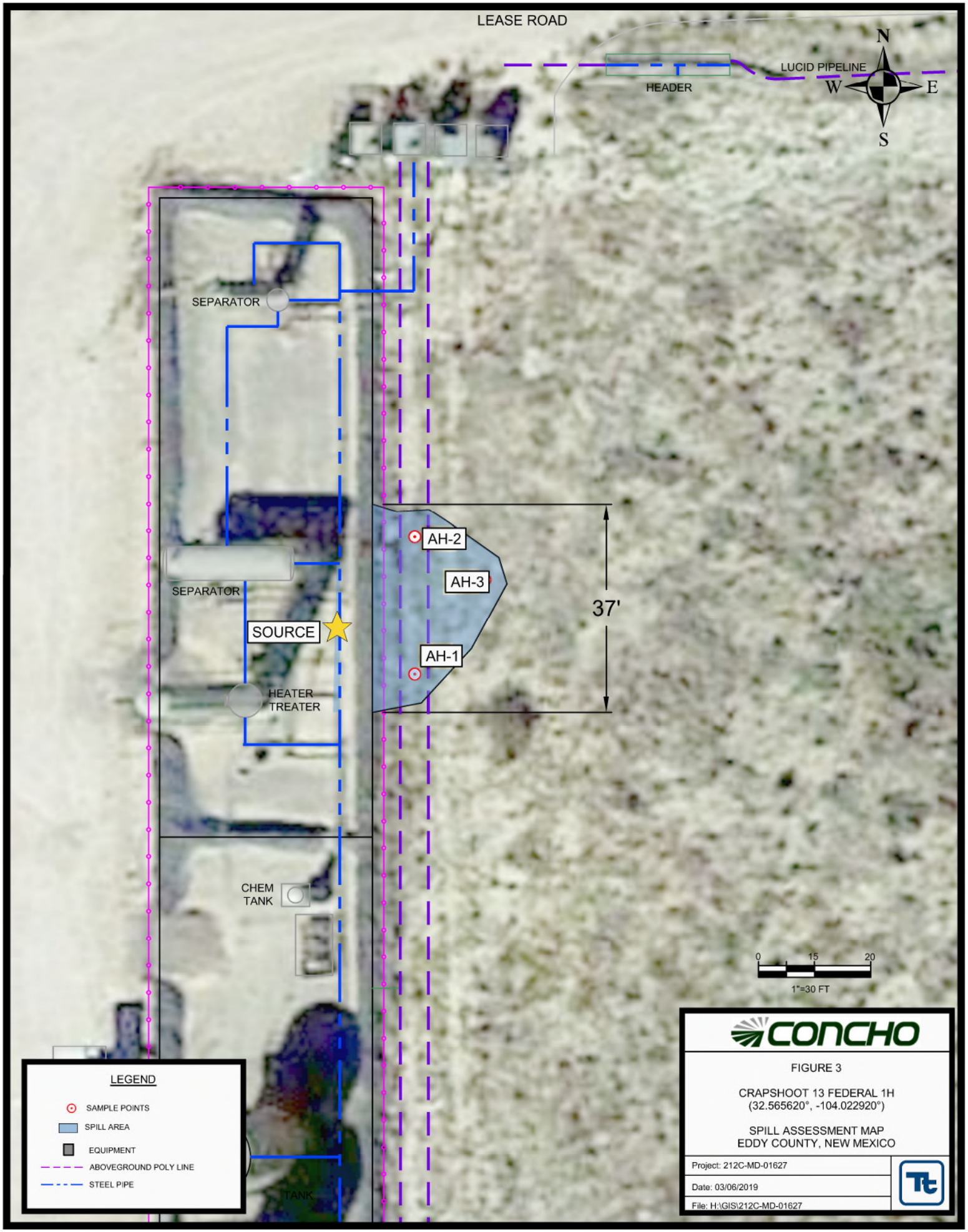
CRAPSHOOT 13 FEDERAL 1H
(32.565620°,-104.022920°)

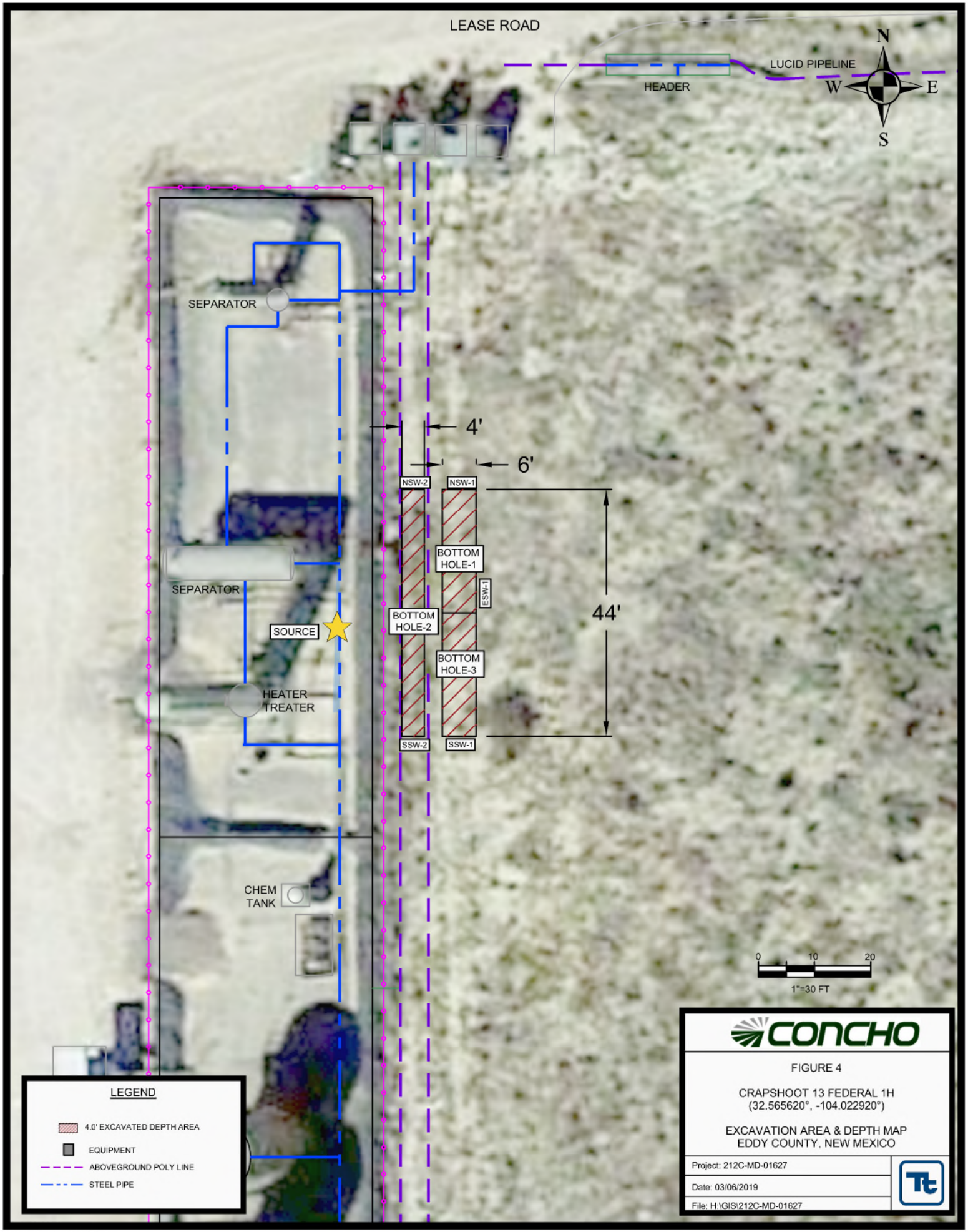
TOPOGRAPHIC MAP

EDDY COUNTY, NEW MEXICO

Project : 212C-MD-01627
Date : 03/06/2019
File : H:\GIS\212C-MD-01627

MAPPED BY: MISTI MORGAN


LEASE ROAD
LUCID PIPELINE
HEADER
N
W
E
S
SEPARATOR
SEPARATOR
SOURCE
HEATER
TREATER
AH-2
AH-3
AH-1
37'
CHEM
TANK
TANK
0
15
20
1"=30 FT
LEGEND
SAMPLE POINTS
SPILL AREA
EQUIPMENT
ABOVEGROUND POLY LINE
STEEL PIPE
CONCHO
FIGURE 3
CRAPSHOOT 13 FEDERAL 1H
(32.565620°, -104.022920°)
SPILL ASSESSMENT MAP
EDDY COUNTY, NEW MEXICO
Project: 212C-MD-01627
Date: 03/06/2019
File: H:\GIS\212C-MD-01627
Drawn By: MISTI MORGAN


LEASE ROAD
LUCID PIPELINE
HEADER
N
W
E
S
SEPARATOR
SEPARATOR
SOURCE
HEATER
TREATER
CHEM
TANK
4'
6'
44'
NSW-2
NSW-1
BOTTOM
HOLE-1
ESW-1
BOTTOM
HOLE-2
BOTTOM
HOLE-3
SSW-2
SSW-1
0
10
20
1"=30 FT
LEGEND
4.0' EXCAVATED DEPTH AREA
EQUIPMENT
ABOVEGROUND POLY LINE
STEEL PIPE
CONCHO
FIGURE 4
CRAPSHOOT 13 FEDERAL 1H
(32.565620°, -104.022920°)
EXCAVATION AREA & DEPTH MAP
EDDY COUNTY, NEW MEXICO
Project: 212C-MD-01627
Date: 03/06/2019
File: H:\GIS\212C-MD-01627
Drawn By: MISTI MORGAN

Photos

COG
Crapshoot 13 Federal #1H
Eddy County, New Mexico

Area of Excavation – View South

Area of Excavation – View North

Tables

Table 1
COG
Crapshoot 13 Federal #1H
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	BEB 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	ORO	Total						
AH-1	1/15/2019	0-1	-		X	**877**	**2,100**	98	**3,080**	0.325	19.7	11.7	45.5	**77.2**	**1,270**
	"	1-1.5	-		X	<15.0	23.5	<15.0	23.5	<0.00199	<0.00199	<0.00199	0.0181	0.0181	**820**
	"	2-2.5	-		X	16.3	16.1	<15.0	32.4	0.00340	<0.00200	<0.00200	0.00737	0.0	**957**
AH-2	1/15/2019	0-1	-		X	<15.0	**282**	<15.0	**282**	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	**1,170**
	"	1-1.5	-		X	<15.0	19.3	<15.0	19.3	<0.00199	0.00219	<0.00200	<0.00200	0.00219	**1,370**
AH-3	1/15/2019	0-0.5	-	X		23.8	60.2	<15.0	84.0	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	82.7
Bottom Hole #1	3/1/2019	-	4	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	336
Bottom Hole #2	3/1/2019	-	4	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	464
Bottom Hole #3	3/1/2019	-	4.5	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	128
North 1 Sidewall	3/1/2019	-	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	592
North 2 Sidewall	3/1/2019	-	-	X		<10.0	76.7	<10.0	76.7	<0.050	<0.050	<0.050	<0.150	<0.300	288
South 1 Sidewall	3/1/2019	-	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	176
South 2 Sidewall	3/1/2019	-	-	X		<10.0	12.1	<10.0	12.1	<0.050	<0.050	<0.050	<0.150	<0.300	256
East 1 Sidewall	3/1/2019	-	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	560
Background	3/1/2019	1	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	64.0
	"	2	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	128.0
	"	3	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	64.0
	"	4	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	64.0
	"	5	-	X		<10.0	<10.0	<10.0	<10.0	<0.050	<0.050	<0.050	<0.150	<0.300	64.0

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 Department

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

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	NAB1836130754
District RP	2RP-5134
Facility ID	
Application ID	pAB1836130499

Release Notification

Responsible Party

Responsible Party	COG Operating, LLC	OGRID	229137
Contact Name	Robert McNeill	Contact Telephone	(432) 683-7443
Contact email	RMcNeill@concho.com	Incident # *(assigned by OCD)*	NAB1836130754
Contact mailing address	600 West Illinois Avenue, Midland, Texas 79701		

Location of Release Source

Latitude 32.56562 Longitude -104.02292

(NAD 83 in decimal degrees to 5 decimal places)

Site Name	Crapshoot 13 Federal #001H	Site Type	Tank Battery
Date Release Discovered	December 8, 2018	API# *(if applicable)*	30-015-42323

Unit Letter	Section	Township	Range	County
A	24	20S	29E	Eddy

Surface Owner: ☐ State ■ Federal ☐ Tribal ☐ Private (*Name:* _____)

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

■ Crude Oil	Volume Released (bbls) 5	Volume Recovered (bbls) 3
■ Produced Water	Volume Released (bbls) 30	Volume Recovered (bbls) 28
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	■ Yes ☐ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

The release was caused by a gasket failure on the FWKO. The gasket is being replaced.
The release was in the lined facility and in the pasture. A vacuum truck was dispatched to remove all freestanding fluids. Concho will evaluate the site to determine if we may commence remediation immediately or 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.

State of New Mexico
Oil Conservation Division

Incident ID	NAB1836130754
District RP	2RP-5134
Facility ID	
Application ID	pAB1836130499

Was this a major release as defined by 19.15.29.7(A) NMAC? ☒ Yes ☐ No	If YES, for what reason(s) does the responsible party consider this a major release? The volume released was greater than 25 barrels.

If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?

Immediate notice was given by Ike Tavarez via e-mail December 9, 2018 at 8:51 am to Mike Bratcher and Shelly Tucker.

Initial Response

The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury

- ☒ The source of the release has been stopped.
- ☒ The impacted area has been secured to protect human health and the environment.
- ☒ Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.
- ☒ All free liquids and recoverable materials have been removed and managed appropriately.

If all the actions described above have not been undertaken, explain why:

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD 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 OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD 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.

Printed Name: DeAnn Grant Title: HSE Administrative Assistant

Signature: _____ Date: 12/10/2018

email: agrant@concho.com Telephone: (432) 253-4513

OCD Only

Received by: Amalia Bustamante Date: 12/27/2018

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	102 (ft bgs)
Did this release impact groundwater or surface water?	☐ Yes ☑ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ☑ No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	☐ Yes ☑ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ☑ No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	☐ Yes ☑ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ☑ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ☑ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ☑ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ☑ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	☑ Yes ☐ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ☑ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	☑ Yes ☐ No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

Characterization Report Checklist: ***Each of the following items must be included in the report.***

- ☑ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- ☐ Field data
- ☑ Data table of soil contaminant concentration data
- ☑ Depth to water determination
- ☑ Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
- ☐ Boring or excavation logs
- ☑ Photographs including date and GIS information
- ☑ Topographic/Aerial maps
- ☑ Laboratory data including chain of custody

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD 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 OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD 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.

Printed Name: Ike Tavarez Title: Senior HSE Supervisor

Signature: Date: 4/8/19

email: itavarez@concho.com Telephone: 432-685-2573

OCD Only

Received by: Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Closure

The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

Closure Report Attachment Checklist: *Each of the following items must be included in the closure report.*

☑ A scaled site and sampling diagram as described in 19.15.29.11 NMAC

☑ Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)

☑ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)

☑ Description of 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 OCD 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 OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD 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. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: Ike Tavarez Title: Senior HSE Supervisor

Signature: _____ Date: 4/8/19

email: itavarez@concho.com Telephone: 432-685-2573

OCD Only

Received by: _____ Date: _____

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

Closure Approved by: _____ Date: _____

Printed Name: _____ Title: _____

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG-Crapshoot 13 Federal #1H

19 South 28 East

6	5	4	3	2	1
7	8	9 246 265	10	11	12
18 91	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36 75

19 South 29 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13 123 101
19	20 62.9	21	22	23	24
30	29	28	27	26	25
31	32	33	34 62' 60	35 121 110	36 115

19 South 30 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15 92	14	13
19	20	21	22	23	24
30 90	29	28	27	26	25 65
31 115	32	33	34	35	36

20 South 28 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 30	27 35	26	25
31 115	32	33 25 29	34	35	36 19

20 South 29 East

6	5	4	3 91	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20 62	21	22	23	24
30 52	29	28	27	26	25
31	32	33	34	35	36

20 South 30 East

6	5 3.5	4	3 6	2	1
7	8	9	10	11	12
18	17	16 29	15	14	13
19 102	20 29	21 150	22	23	24
30	29	28	27	26	25
31	32 170	33 191	34	35	36

21 South 27 East

6 34 175	5 350	4	3	2	1 12 186
7	8	9 81 78	10	11	12
18	17	16	15	14	13
19 30 3627	20	21 Site 75	22	23	24
30 15 16	29 11 31 30	28 40 46	27	26 70 32	25 12
31 15 17	32 15 15	33	34	35 30	36

21 South 28 East

6	5	4 80	3	2	1
7	8	9	10	11	12
18 9 19	17 37	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

21 South 29 East

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

88 New Mexico State Engineers Well Reports

105 USGS Well Reports

34 NMOCD - Groundwater Data

90 Geology and Groundwater Conditions in Southern Lea, County, NM (Report 6)

Geology and Groundwater Resources of Eddy County, NM (Report 3)

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	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
CP 00419		CP	ED		4	3	32	20S	30E	594250	3599003*	262	170	92
CP 00431		CP	ED		2	3	33	20S	30E	595857	3599419*	235	195	40
CP 00532		CP	ED	4	3	4	21	20S	30E	596328	3602138*	335	150	185
CP 00551		CP	ED	1	1	1	33	20S	30E	595343	3600320*	286	187	99
CP 00648 POD2		CP	ED	4	3	3	04	20S	30E	595488	3606960*	330	75	255
CP 00775		CP	ED	2	1	4	11	20S	30E	599515	3605981*	350	40	310
CP 00781 POD1		CP	ED	2	3	1	36	20S	30E	600381	3599959*	700	332	368
CP 01629 POD1		CP	ED	4	3	2	19	20S	30E	593060	3602968	141	102	39

Average Depth to Water: **156 feet**

Minimum Depth: **40 feet**

Maximum Depth: **332 feet**

Record Count: 8

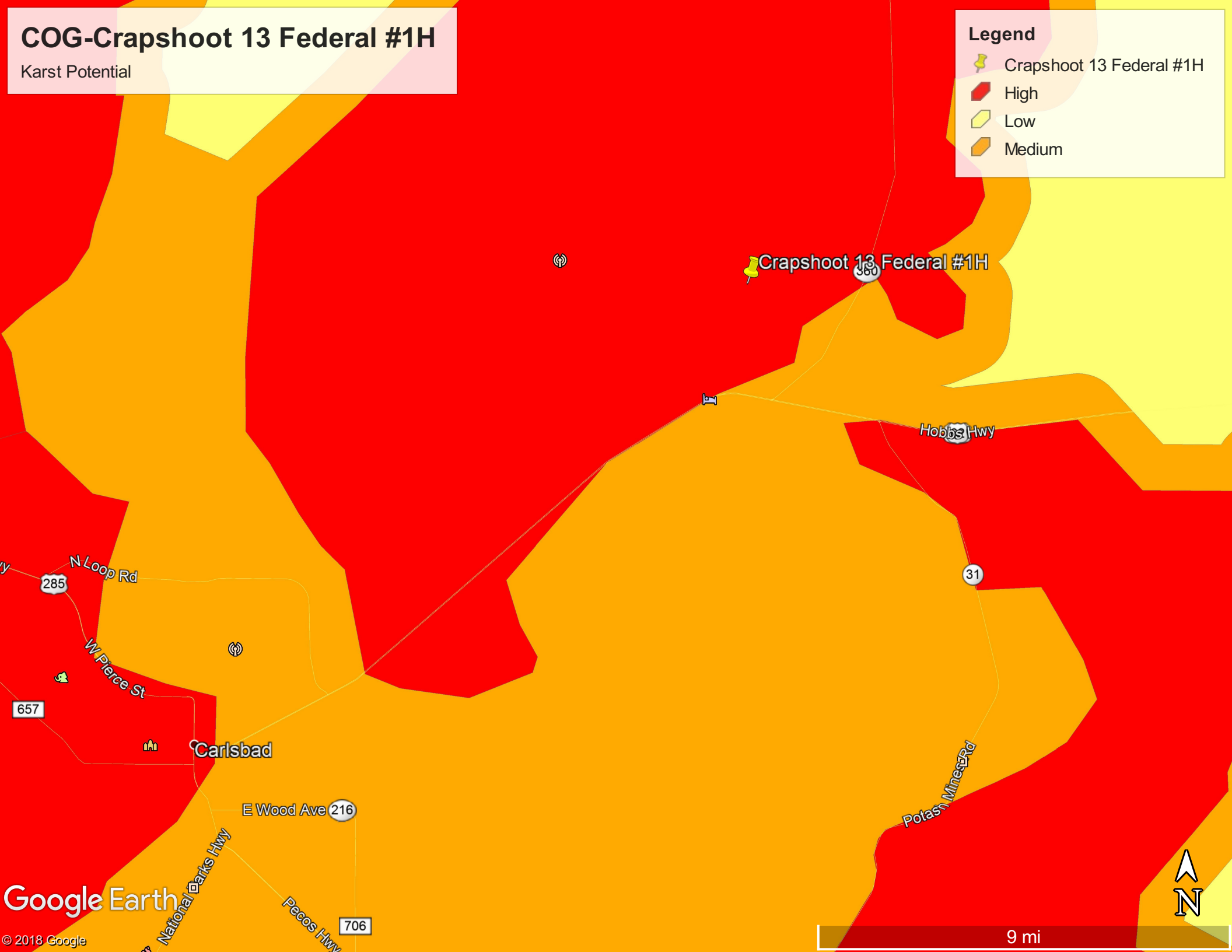
Basin/County Search:

County: Eddy

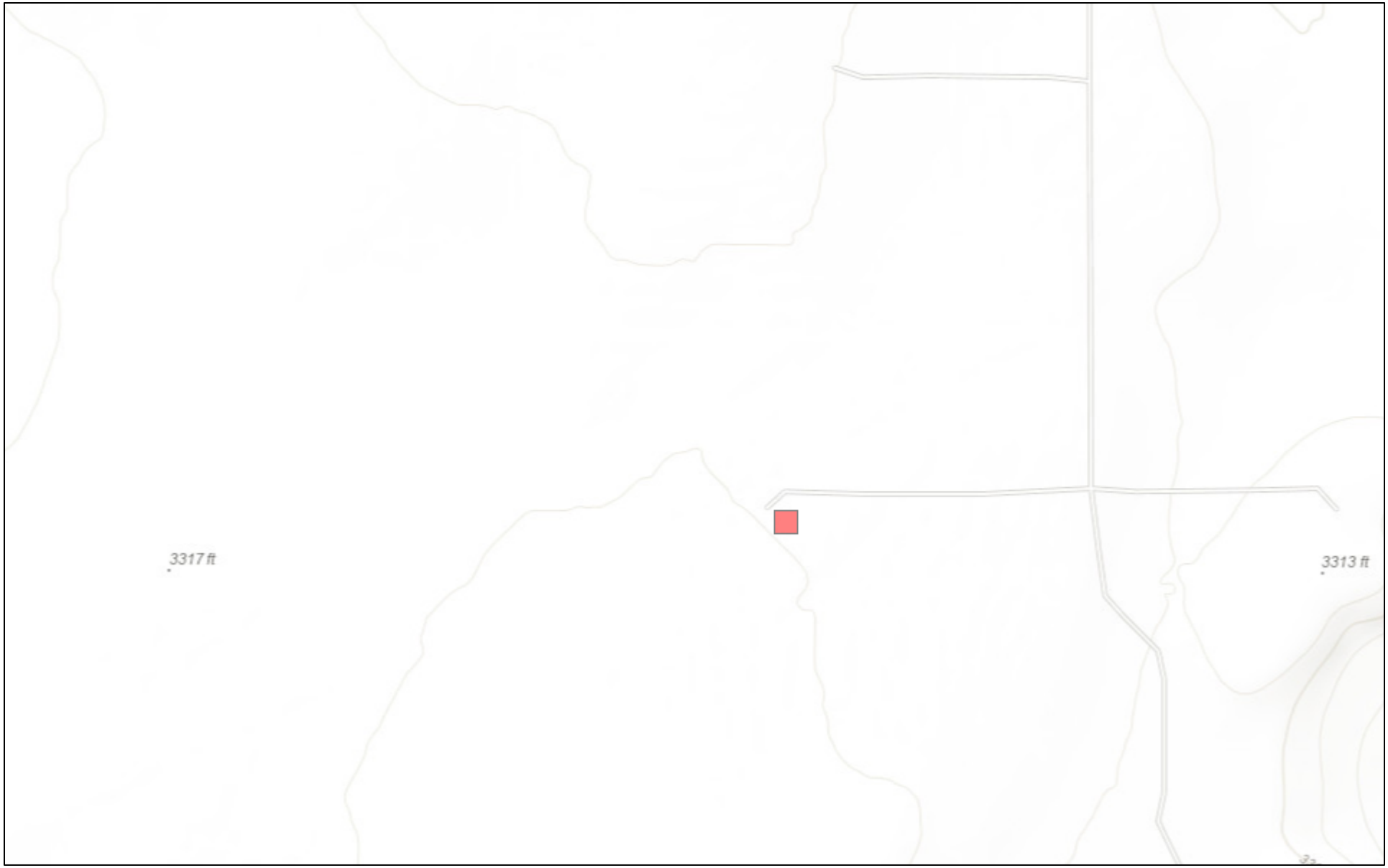
PLSS Search:

Township: 20S **Range:** 30E

***UTM location was derived from PLSS - see Help**


COG-Crapshoot 13 Federal #1H
Karst Potential
Legend
Crapshoot 13 Federal #1H
High
Low
Medium
Crapshoot 13 Federal #1H
360
Hobbs Hwy
31
N Loop Rd
285
W Pierce St
657
Carlsbad
E Wood Ave
216
Potash Mines Rd
National Parks Hwy
Pecos Hwy
706
Google Earth
© 2018 Google
9 mi
N

New Mexico NFHL Data



March 4, 2019

1:9,028

0 0.075 0.15 0.3 mi

0 0.1 0.2 0.4 km

FEMA
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS,

Appendix C

Certificate of Analysis Summary 611433

COG Operating LLC, Artesia, NM

Project Name: Crapshoot 13 Federal 1H TB (12-8-18)

Project Id:
Contact: Ike Tavarez
Project Location: Lea Co.NM

Date Received in Lab: Wed Jan-16-19 09:56 am
Report Date: 22-JAN-19
Project Manager: Jessica Kramer

Analysis Requested													
	Lab Id:	611433-001		611433-002		611433-003		611433-004		611433-005		611433-006	
	Field Id:	AH-1 (0-1)		AH-1 (1-1.5')		AH-1 (2-2.5')		AH-2 (0-1)		AH-2 (1-1.5')		AH-3 (0-0.5')	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Jan-15-19 00:00		Jan-15-19 00:00		Jan-15-19 00:00		Jan-15-19 00:00		Jan-15-19 00:00		Jan-15-19 00:00	
BTEX by EPA 8021B	***Extracted:***	Jan-17-19 17:00		Jan-17-19 17:00		Jan-17-19 17:00		Jan-17-19 17:00		Jan-17-19 17:00		Jan-17-19 17:00	
	Analyzed:	Jan-20-19 13:30		Jan-18-19 16:47		Jan-18-19 17:06		Jan-18-19 17:25		Jan-18-19 11:34		Jan-18-19 11:53	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		0.325	0.201	<0.00199	0.00199	0.00340	0.00200	<0.00199	0.00199	<0.00200	0.00200	<0.00201	0.00201
Toluene		19.7	0.201	<0.00199	0.00199	<0.00200	0.00200	<0.00199	0.00199	0.00219	0.00200	<0.00201	0.00201
Ethylbenzene		11.7	0.201	<0.00199	0.00199	<0.00200	0.00200	<0.00199	0.00199	<0.00200	0.00200	<0.00201	0.00201
m,p-Xylenes		33.4	0.402	<0.00398	0.00398	<0.00401	0.00401	<0.00398	0.00398	<0.00399	0.00399	<0.00402	0.00402
o-Xylene		12.1	0.201	0.0181	0.00199	0.00737	0.00200	<0.00199	0.00199	<0.00200	0.00200	<0.00201	0.00201
Total Xylenes		45.5	0.201	0.0181	0.00199	0.00737	0.00200	<0.00199	0.00199	<0.00200	0.00200	<0.00201	0.00201
Total BTEX		77.2	0.201	0.0181	0.00199	0.0108	0.00200	<0.00199	0.00199	0.00219	0.00200	<0.00201	0.00201
Chloride by EPA 300	***Extracted:***	Jan-17-19 11:00		Jan-17-19 11:00		Jan-17-19 11:00		Jan-17-19 11:00		Jan-17-19 11:00		Jan-17-19 11:00	
	Analyzed:	Jan-17-19 15:17		Jan-17-19 15:48		Jan-17-19 15:58		Jan-17-19 16:08		Jan-17-19 16:19		Jan-17-19 16:29	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		1270	25.0	820	4.97	957	4.96	1170	49.6	1370	24.9	82.7	5.00
TPH By SW8015 Mod	***Extracted:***	Jan-19-19 09:00		Jan-19-19 09:00		Jan-19-19 09:00		Jan-19-19 09:00		Jan-19-19 09:00		Jan-19-19 09:00	
	Analyzed:	Jan-19-19 19:23		Jan-19-19 15:03		Jan-19-19 14:43		Jan-19-19 14:23		Jan-19-19 14:03		Jan-19-19 13:43	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Gasoline Range Hydrocarbons		877	15.0	<15.0	15.0	16.3	15.0	<15.0	15.0	<15.0	15.0	23.8	15.0
Diesel Range Organics		2100	15.0	23.5	15.0	16.1	15.0	282	15.0	19.3	15.0	60.2	15.0
Motor Oil Range Hydrocarbons (MRO)		98.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0	<15.0	15.0
Total TPH		3080	15.0	23.5	15.0	32.4	15.0	282	15.0	19.3	15.0	84.0	15.0

Analytical Report 611433

for

COG Operating LLC

Project Manager: Ike Tavarez

Crapshoot 13 Federal 1H TB (12-8-18)

22-JAN-19

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-18-28), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-18-17), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-18-14)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-18-18)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-18-18)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-18-4)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab Code: AZ00901): Arizona (AZM757)
Xenco-Atlanta (LELAP Lab ID #04176)
Xenco-Tampa: Florida (E87429)
Xenco-Lakeland: Florida (E84098)

22-JAN-19

Project Manager: **Ike Tavarez**
COG Operating LLC
2407 Pecos Avenue
Artesia, NM 88210

Reference: XENCO Report No(s): **611433**
Crapshoot 13 Federal 1H TB (12-8-18)
Project Address: Lea 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) 611433. 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. 611433 will be filed for 45 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,

Jessica Kramer
Project Assistant

Sample Cross Reference 611433

COG Operating LLC, Artesia, NM

Crapshoot 13 Federal 1H TB (12-8-18)

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
AH-1 (0-1)	S	01-15-19 00:00		611433-001
AH-1 (1-1.5')	S	01-15-19 00:00		611433-002
AH-1 (2-2.5')	S	01-15-19 00:00		611433-003
AH-2 (0-1)	S	01-15-19 00:00		611433-004
AH-2 (1-1.5')	S	01-15-19 00:00		611433-005
AH-3 (0-0.5')	S	01-15-19 00:00		611433-006

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3076351 BTEX by EPA 8021B
Surrogate 4-Bromofluorobenzene recovered above QC limits. Matrix interferences is suspected.
Samples affected are: 611433-001.
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.
Lab Sample ID 611433-005 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD).
o-Xylene recovered below QC limits in the Matrix Spike. Outlier/s are due to possible matrix interference.
Samples in the analytical batch are: 611433-001, -002, -003, -004, -005, -006.
The Laboratory Control Sample for o-Xylene is within laboratory Control Limits, therefore the data was accepted.

Batch: LBA-3076405 TPH By SW8015 Mod
Surrogate 1-Chlorooctane recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.
Samples affected are: 611433-001.
Surrogate o-Terphenyl recovered above QC limits Data confirmed by re-analysis. Samples affected are: 7670058-1-BSD,611433-001.

Certificate of Analytical Results 611433

COG Operating LLC, Artesia, NM

Crapshoot 13 Federal 1H TB (12-8-18)

Sample Id:	**AH-1 (0-1)**	Matrix:	Soil	Date Received:	01.16.19 09.56
Lab Sample Id:	611433-001	Date Collected:	01.15.19 00.00		

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	01.17.19 11.00	Basis:	Wet Weight
Seq Number:	3076271				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1270**	25.0	mg/kg	01.17.19 15.17		5

Analytical Method:	TPH By SW8015 Mod			Prep Method:	TX1005P
Tech:	ALJ			% Moisture:	
Analyst:	ALJ	Date Prep:	01.19.19 09.00	Basis:	Wet Weight
Seq Number:	3076405				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons	PHC610	**877**	15.0	mg/kg	01.19.19 19.23		1
Diesel Range Organics	C10C28DRO	**2100**	15.0	mg/kg	01.19.19 19.23		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	**98.0**	15.0	mg/kg	01.19.19 19.23		1
Total TPH	PHC635	**3080**	15.0	mg/kg	01.19.19 19.23		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	139	%	70-135	01.19.19 19.23	**
o-Terphenyl	84-15-1	136	%	70-135	01.19.19 19.23	**

Final 1.000

Certificate of Analytical Results 611433

COG Operating LLC, Artesia, NM

Crapshoot 13 Federal 1H TB (12-8-18)

Sample Id:	**AH-1 (0-1)**	Matrix:	Soil	Date Received:	01.16.19 09.56
Lab Sample Id:	611433-001	Date Collected:	01.15.19 00.00		
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	SCM			% Moisture:	
Analyst:	SCM	Date Prep:	01.17.19 17.00	Basis:	Wet Weight
Seq Number:	3076351				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	**0.325**	0.201	mg/kg	01.20.19 13.30		100
Toluene	108-88-3	**19.7**	0.201	mg/kg	01.20.19 13.30		100
Ethylbenzene	100-41-4	**11.7**	0.201	mg/kg	01.20.19 13.30		100
m,p-Xylenes	179601-23-1	**33.4**	0.402	mg/kg	01.20.19 13.30		100
o-Xylene	95-47-6	**12.1**	0.201	mg/kg	01.20.19 13.30		100
Total Xylenes	1330-20-7	**45.5**	0.201	mg/kg	01.20.19 13.30		100
Total BTEX		**77.2**	0.201	mg/kg	01.20.19 13.30		100

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	114	%	70-130	01.20.19 13.30	
4-Bromofluorobenzene	460-00-4	174	%	70-130	01.20.19 13.30	**

Certificate of Analytical Results 611433

COG Operating LLC, Artesia, NM

Crapshoot 13 Federal 1H TB (12-8-18)

Sample Id:	**AH-1 (1-1.5')**	Matrix:	Soil	Date Received:	01.16.19 09.56
Lab Sample Id:	611433-002	Date Collected:	01.15.19 00.00		

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	01.17.19 11.00	Basis:	Wet Weight
Seq Number:	3076271				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**820**	4.97	mg/kg	01.17.19 15.48		1

Analytical Method:	TPH By SW8015 Mod			Prep Method:	TX1005P
Tech:	ALJ			% Moisture:	
Analyst:	ALJ	Date Prep:	01.19.19 09.00	Basis:	Wet Weight
Seq Number:	3076405				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons	PHC610	<15.0	15.0	mg/kg	01.19.19 15.03	U	1
Diesel Range Organics	C10C28DRO	**23.5**	15.0	mg/kg	01.19.19 15.03		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	01.19.19 15.03	U	1
Total TPH	PHC635	**23.5**	15.0	mg/kg	01.19.19 15.03		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	101	%	70-135	01.19.19 15.03	
o-Terphenyl	84-15-1	102	%	70-135	01.19.19 15.03	

Certificate of Analytical Results 611433

COG Operating LLC, Artesia, NM

Crapshoot 13 Federal 1H TB (12-8-18)

Sample Id:	**AH-1 (1-1.5')**	Matrix:	Soil	Date Received:	01.16.19 09.56
Lab Sample Id:	611433-002	Date Collected:	01.15.19 00.00		
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	SCM			% Moisture:	
Analyst:	SCM	Date Prep:	01.17.19 17.00	Basis:	Wet Weight
Seq Number:	3076351				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	01.18.19 16.47	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	01.18.19 16.47	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	01.18.19 16.47	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	01.18.19 16.47	U	1
o-Xylene	95-47-6	**0.0181**	0.00199	mg/kg	01.18.19 16.47		1
Total Xylenes	1330-20-7	**0.0181**	0.00199	mg/kg	01.18.19 16.47		1
Total BTEX		**0.0181**	0.00199	mg/kg	01.18.19 16.47		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	121	%	70-130	01.18.19 16.47	
1,4-Difluorobenzene	540-36-3	114	%	70-130	01.18.19 16.47	

Certificate of Analytical Results 611433

COG Operating LLC, Artesia, NM

Crapshoot 13 Federal 1H TB (12-8-18)

Sample Id:	**AH-1 (2-2.5')**	Matrix:	Soil	Date Received:	01.16.19 09.56
Lab Sample Id:	611433-003	Date Collected:	01.15.19 00.00		

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	01.17.19 11.00	Basis:	Wet Weight
Seq Number:	3076271				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**957**	4.96	mg/kg	01.17.19 15.58		1

Analytical Method:	TPH By SW8015 Mod			Prep Method:	TX1005P
Tech:	ALJ			% Moisture:	
Analyst:	ALJ	Date Prep:	01.19.19 09.00	Basis:	Wet Weight
Seq Number:	3076405				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons	PHC610	**16.3**	15.0	mg/kg	01.19.19 14.43		1
Diesel Range Organics	C10C28DRO	**16.1**	15.0	mg/kg	01.19.19 14.43		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	01.19.19 14.43	U	1
Total TPH	PHC635	**32.4**	15.0	mg/kg	01.19.19 14.43		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	122	%	70-135	01.19.19 14.43	
o-Terphenyl	84-15-1	124	%	70-135	01.19.19 14.43	

Certificate of Analytical Results 611433

COG Operating LLC, Artesia, NM

Crapshoot 13 Federal 1H TB (12-8-18)

Sample Id:	**AH-1 (2-2.5')**	Matrix:	Soil	Date Received:	01.16.19 09.56
Lab Sample Id:	611433-003	Date Collected:	01.15.19 00.00		
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	SCM			% Moisture:	
Analyst:	SCM	Date Prep:	01.17.19 17.00	Basis:	Wet Weight
Seq Number:	3076351				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	**0.00340**	0.00200	mg/kg	01.18.19 17.06		1
Toluene	108-88-3	<0.00200	0.00200	mg/kg	01.18.19 17.06	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	01.18.19 17.06	U	1
m,p-Xylenes	179601-23-1	<0.00401	0.00401	mg/kg	01.18.19 17.06	U	1
o-Xylene	95-47-6	**0.00737**	0.00200	mg/kg	01.18.19 17.06		1
Total Xylenes	1330-20-7	**0.00737**	0.00200	mg/kg	01.18.19 17.06		1
Total BTEX		**0.0108**	0.00200	mg/kg	01.18.19 17.06		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	118	%	70-130	01.18.19 17.06	
1,4-Difluorobenzene	540-36-3	117	%	70-130	01.18.19 17.06	

COG Operating LLC, Artesia, NM

Crapshoot 13 Federal 1H TB (12-8-18)

Sample Id:	**AH-2 (0-1)**	Matrix:	Soil	Date Received:	01.16.19 09.56
Lab Sample Id:	611433-004	Date Collected:	01.15.19 00.00		

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	01.17.19 11.00	Basis:	Wet Weight
Seq Number:	3076271				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1170**	49.6	mg/kg	01.17.19 16.08		10

Analytical Method:	TPH By SW8015 Mod			Prep Method:	TX1005P
Tech:	ALJ			% Moisture:	
Analyst:	ALJ	Date Prep:	01.19.19 09.00	Basis:	Wet Weight
Seq Number:	3076405				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons	PHC610	<15.0	15.0	mg/kg	01.19.19 14.23	U	1
Diesel Range Organics	C10C28DRO	**282**	15.0	mg/kg	01.19.19 14.23		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	01.19.19 14.23	U	1
Total TPH	PHC635	**282**	15.0	mg/kg	01.19.19 14.23		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	99	%	70-135	01.19.19 14.23	
o-Terphenyl	84-15-1	106	%	70-135	01.19.19 14.23	

Certificate of Analytical Results 611433

COG Operating LLC, Artesia, NM

Crapshoot 13 Federal 1H TB (12-8-18)

Sample Id:	**AH-2 (0-1)**	Matrix:	Soil	Date Received:	01.16.19 09.56
Lab Sample Id:	611433-004	Date Collected:	01.15.19 00.00		
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	SCM			% Moisture:	
Analyst:	SCM	Date Prep:	01.17.19 17.00	Basis:	Wet Weight
Seq Number:	3076351				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00199	0.00199	mg/kg	01.18.19 17.25	U	1
Toluene	108-88-3	<0.00199	0.00199	mg/kg	01.18.19 17.25	U	1
Ethylbenzene	100-41-4	<0.00199	0.00199	mg/kg	01.18.19 17.25	U	1
m,p-Xylenes	179601-23-1	<0.00398	0.00398	mg/kg	01.18.19 17.25	U	1
o-Xylene	95-47-6	<0.00199	0.00199	mg/kg	01.18.19 17.25	U	1
Total Xylenes	1330-20-7	<0.00199	0.00199	mg/kg	01.18.19 17.25	U	1
Total BTEX		<0.00199	0.00199	mg/kg	01.18.19 17.25	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	123	%	70-130	01.18.19 17.25	
1,4-Difluorobenzene	540-36-3	115	%	70-130	01.18.19 17.25	

Certificate of Analytical Results 611433

COG Operating LLC, Artesia, NM

Crapshoot 13 Federal 1H TB (12-8-18)

Sample Id:	**AH-2 (1-1.5')**	Matrix:	Soil	Date Received:	01.16.19 09.56
Lab Sample Id:	611433-005	Date Collected:	01.15.19 00.00		

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	01.17.19 11.00	Basis:	Wet Weight
Seq Number:	3076271				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1370**	24.9	mg/kg	01.17.19 16.19		5

Analytical Method:	TPH By SW8015 Mod			Prep Method:	TX1005P
Tech:	ALJ			% Moisture:	
Analyst:	ALJ	Date Prep:	01.19.19 09.00	Basis:	Wet Weight
Seq Number:	3076405				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons	PHC610	<15.0	15.0	mg/kg	01.19.19 14.03	U	1
Diesel Range Organics	C10C28DRO	**19.3**	15.0	mg/kg	01.19.19 14.03		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	01.19.19 14.03	U	1
Total TPH	PHC635	**19.3**	15.0	mg/kg	01.19.19 14.03		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	119	%	70-135	01.19.19 14.03	
o-Terphenyl	84-15-1	120	%	70-135	01.19.19 14.03	

Certificate of Analytical Results 611433

COG Operating LLC, Artesia, NM

Crapshoot 13 Federal 1H TB (12-8-18)

Sample Id:	**AH-2 (1-1.5')**	Matrix:	Soil	Date Received:	01.16.19 09.56
Lab Sample Id:	611433-005	Date Collected:	01.15.19 00.00		
Analytical Method:	BTEX by EPA 8021B			Prep Method:	SW5030B
Tech:	SCM			% Moisture:	
Analyst:	SCM	Date Prep:	01.17.19 17.00	Basis:	Wet Weight
Seq Number:	3076351				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/kg	01.18.19 11.34	U	1
Toluene	108-88-3	**0.00219**	0.00200	mg/kg	01.18.19 11.34		1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/kg	01.18.19 11.34	U	1
m,p-Xylenes	179601-23-1	<0.00399	0.00399	mg/kg	01.18.19 11.34	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/kg	01.18.19 11.34	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/kg	01.18.19 11.34	U	1
Total BTEX		**0.00219**	0.00200	mg/kg	01.18.19 11.34		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
4-Bromofluorobenzene	460-00-4	111	%	70-130	01.18.19 11.34	
1,4-Difluorobenzene	540-36-3	114	%	70-130	01.18.19 11.34	

Certificate of Analytical Results 611433

COG Operating LLC, Artesia, NM

Crapshoot 13 Federal 1H TB (12-8-18)

Sample Id:	**AH-3 (0-0.5')**	Matrix:	Soil	Date Received:	01.16.19 09.56
Lab Sample Id:	611433-006	Date Collected:	01.15.19 00.00		

Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	01.17.19 11.00	Basis:	Wet Weight
Seq Number:	3076271				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**82.7**	5.00	mg/kg	01.17.19 16.29		1

Analytical Method:	TPH By SW8015 Mod			Prep Method:	TX1005P
Tech:	ALJ			% Moisture:	
Analyst:	ALJ	Date Prep:	01.19.19 09.00	Basis:	Wet Weight
Seq Number:	3076405				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Gasoline Range Hydrocarbons	PHC610	**23.8**	15.0	mg/kg	01.19.19 13.43		1
Diesel Range Organics	C10C28DRO	**60.2**	15.0	mg/kg	01.19.19 13.43		1
Motor Oil Range Hydrocarbons (MRO)	PHCG2835	<15.0	15.0	mg/kg	01.19.19 13.43	U	1
Total TPH	PHC635	**84.0**	15.0	mg/kg	01.19.19 13.43		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1-Chlorooctane	111-85-3	102	%	70-135	01.19.19 13.43	
o-Terphenyl	84-15-1	105	%	70-135	01.19.19 13.43	

Certificate of Analytical Results 611433

COG Operating LLC, Artesia, NM

Crapshoot 13 Federal 1H TB (12-8-18)

Sample Id:	**AH-3 (0-0.5')**	Matrix: Soil	Date Received:01.16.19 09.56
Lab Sample Id:	611433-006	Date Collected: 01.15.19 00.00	
Analytical Method:	BTEX by EPA 8021B		Prep Method: SW5030B
Tech:	SCM		% Moisture:
Analyst:	SCM	Date Prep: 01.17.19 17.00	Basis: Wet Weight
Seq Number:	3076351		

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00201	0.00201	mg/kg	01.18.19 11.53	U	1
Toluene	108-88-3	<0.00201	0.00201	mg/kg	01.18.19 11.53	U	1
Ethylbenzene	100-41-4	<0.00201	0.00201	mg/kg	01.18.19 11.53	U	1
m,p-Xylenes	179601-23-1	<0.00402	0.00402	mg/kg	01.18.19 11.53	U	1
o-Xylene	95-47-6	<0.00201	0.00201	mg/kg	01.18.19 11.53	U	1
Total Xylenes	1330-20-7	<0.00201	0.00201	mg/kg	01.18.19 11.53	U	1
Total BTEX		<0.00201	0.00201	mg/kg	01.18.19 11.53	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	115	%	70-130	01.18.19 11.53	
4-Bromofluorobenzene	460-00-4	114	%	70-130	01.18.19 11.53	

Flagging Criteria

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

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

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

QC Summary 611433

COG Operating LLC

Crapshoot 13 Federal 1H TB (12-8-18)

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3076271 Matrix: Solid Date Prep: 01.17.19
MB Sample Id: 7669894-1-BLK LCS Sample Id: 7669894-1-BKS LCSD Sample Id: 7669894-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	237	95	243	97	90-110	3	20	mg/kg	01.17.19 11:50	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3076271 Matrix: Soil Date Prep: 01.17.19
Parent Sample Id: 611434-001 MS Sample Id: 611434-001 S MSD Sample Id: 611434-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	521	249	748	91	751	92	90-110	0	20	mg/kg	01.17.19 12:21	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3076271 Matrix: Soil Date Prep: 01.17.19
Parent Sample Id: 611434-004 MS Sample Id: 611434-004 S MSD Sample Id: 611434-004 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	935	249	1150	86	1150	86	90-110	0	20	mg/kg	01.17.19 14:46	X

Analytical Method: **TPH By SW8015 Mod** Prep Method: TX1005P
Seq Number: 3076405 Matrix: Solid Date Prep: 01.19.19
MB Sample Id: 7670058-1-BLK LCS Sample Id: 7670058-1-BKS LCSD Sample Id: 7670058-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons	<8.00	1000	798	80	797	80	70-135	0	20	mg/kg	01.19.19 10:27	
Diesel Range Organics	<8.13	1000	878	88	863	86	70-135	2	20	mg/kg	01.19.19 10:27	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	88		123		122		70-135	%	01.19.19 10:27
o-Terphenyl	88		117		139	**	70-135	%	01.19.19 10:27

MS/MSD Percent Recovery [D] = 100*(C-A) / B LCS = Laboratory Control Sample MS = Matrix Spike
Relative Percent Difference RPD = 200* | (C-E) / (C+E) | A = Parent Result B = Spike Added
LCS/LCSD Recovery [D] = 100 * (C) / [B] C = MS/LCS Result D = MSD/LCSD % Rec
Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample) E = MSD/LCSD Result

QC Summary 611433

COG Operating LLC

Crapshoot 13 Federal 1H TB (12-8-18)

Analytical Method: **TPH By SW8015 Mod** Prep Method: TX1005P
Seq Number: 3076405 Matrix: Soil Date Prep: 01.19.19
Parent Sample Id: 611429-006 MS Sample Id: 611429-006 S MSD Sample Id: 611429-006 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Gasoline Range Hydrocarbons	<8.00	1000	909	91	931	93	70-135	2	20	mg/kg	01.19.19 11:41	
Diesel Range Organics	8.74	1000	998	99	1040	103	70-135	4	20	mg/kg	01.19.19 11:41	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1-Chlorooctane	135		132		70-135	%	01.19.19 11:41
o-Terphenyl	132		116		70-135	%	01.19.19 11:41

Analytical Method: **BTEX by EPA 8021B** Prep Method: SW5030B
Seq Number: 3076351 Matrix: Solid Date Prep: 01.17.19
MB Sample Id: 7670053-1-BLK LCS Sample Id: 7670053-1-BKS LCSD Sample Id: 7670053-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.000386	0.100	0.114	114	0.115	115	70-130	1	35	mg/kg	01.18.19 09:42	
Toluene	<0.000457	0.100	0.0992	99	0.0983	98	70-130	1	35	mg/kg	01.18.19 09:42	
Ethylbenzene	<0.000566	0.100	0.0903	90	0.0893	89	70-130	1	35	mg/kg	01.18.19 09:42	
m,p-Xylenes	<0.00102	0.200	0.180	90	0.177	89	70-130	2	35	mg/kg	01.18.19 09:42	
o-Xylene	<0.000345	0.100	0.0909	91	0.0899	90	70-130	1	35	mg/kg	01.18.19 09:42	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	107		108		110		70-130	%	01.18.19 09:42
4-Bromofluorobenzene	95		108		108		70-130	%	01.18.19 09:42

Analytical Method: **BTEX by EPA 8021B** Prep Method: SW5030B
Seq Number: 3076351 Matrix: Soil Date Prep: 01.17.19
Parent Sample Id: 611433-005 MS Sample Id: 611433-005 S MSD Sample Id: 611433-005 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	0.000719	0.101	0.104	102	0.101	101	70-130	3	35	mg/kg	01.18.19 10:20	
Toluene	0.00219	0.101	0.0909	88	0.0881	86	70-130	3	35	mg/kg	01.18.19 10:20	
Ethylbenzene	0.000579	0.101	0.0734	72	0.0727	73	70-130	1	35	mg/kg	01.18.19 10:20	
m,p-Xylenes	<0.00102	0.202	0.143	71	0.142	71	70-130	1	35	mg/kg	01.18.19 10:20	
o-Xylene	0.00110	0.101	0.0710	69	0.0707	70	70-130	0	35	mg/kg	01.18.19 10:20	X

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	112		110		70-130	%	01.18.19 10:20
4-Bromofluorobenzene	109		111		70-130	%	01.18.19 10:20

MS/MSD Percent Recovery [D] = 100*(C-A) / B LCS = Laboratory Control Sample MS = Matrix Spike
Relative Percent Difference RPD = 200* | (C-E) / (C+E) | A = Parent Result B = Spike Added
LCS/LCSD Recovery [D] = 100 * (C) / [B] C = MS/LCS Result D = MSD/LCSD % Rec
Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample) E = MSD/LCSD Result

Analysis Request of Chain of Custody Record

611433

Page 1 of 1

CONCHO

One Concho Center/600/Illinois Avenue/Midland, Texas Tel (432) 683-7443

Client Name: COG	**Site Manager:** Ike Tavarez
Project Name: Crapshoot 13 Federal 1H TB (12-8-18)	
Project Location: (county, state) Eddy Co. NM.	**Project #:**
Invoice to: COG - Ike Tavarez	
Receiving Laboratory: Xenco	**Sampler Signature:**
Comments:	

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING YEAR: DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE	# CONTAINERS	FILTERED (Y/N)
	AH-1 (0-1')	1-15-19			S			✓		
	(1-1.5')				S			✓		
	(2-2.5')				S			✓		
	AH-2 (0-1')				S			✓		
	(1-1.5')				S			✓		
	AH-3 (0-0.5')				S			✓		

ANALYSIS REQUEST (Circle or Specify Method No.)

BTEX 8021B / BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride	Sulfate	TDS	General Water Chemistry (see attached list)	Anion/Cation Balance				Hold
X	X	X												X	X								
X	X	X												X	X								
X	X	X												X	X								
X	X	X												X	X								
X	X	X												X	X								
X	X	X												X	X								

Final 1.000

Page 21 of 22

Relinquished by:	**Date:** 1-16-19	**Time:**	**Received by:**
Relinquished by:	**Date:**	**Time:**	**Received by:**
Relinquished by:	**Date:**	**Time:**	**Received by:**

LAB USE ONLY

Sample Temperature

C. 3/0.2

-0.1/28

REMARKS:

☑ RUSH: Same Day 24 hr 48 hr (72 hr)

☐ Rush Charges Authorized

☐ Special Report Limits or TRRP Report

(Circle) HAND DELIVERED FEDEX UPS Tracking #: _____

ORIGINAL COPY

XENCO Laboratories
Prelogin/Nonconformance Report- Sample Log-In

Client: COG Operating LLC

Date/ Time Received: 01/16/2019 09:56:00 AM

Work Order #: 611433

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)?	.2
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**
#5 Custody Seals intact on sample bottles?	**N/A**
#6*Custody Seals Signed and dated?	**N/A**
#7 *Chain of Custody present?	**Yes**
#8 Any missing/extra samples?	**No**
#9 Chain of Custody signed when relinquished/ received?	**Yes**
#10 Chain of Custody agrees with sample labels/matrix?	**Yes**
#11 Container label(s) legible and intact?	**Yes**
#12 Samples in proper container/ bottle?	**Yes**
#13 Samples properly preserved?	**Yes**
#14 Sample container(s) intact?	**Yes**
#15 Sufficient sample amount for indicated test(s)?	**Yes**
#16 All samples received within hold time?	**Yes**
#17 Subcontract of sample(s)?	**N/A**
#18 Water 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: Brianna Teel Date: 01/16/2019
Brianna Teel

Checklist reviewed by: Jessica Kramer Date: 01/16/2019
Jessica Kramer

CARDINAL Laboratories

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

March 04, 2019

CLAIR GONZALES

TETRA TECH

901 WEST WALL STREET , STE 100

MIDLAND, TX 79701

RE: CRAPSHOOT 13 FED 1H

Enclosed are the results of analyses for samples received by the laboratory on 03/01/19 14:15.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-18-11. 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 accreditated 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

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
CLAIR GONZALES
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	03/01/2019	Sampling Date:	03/01/2019
Reported:	03/04/2019	Sampling Type:	Soil
Project Name:	CRAPSHOOT 13 FED 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01627 (12/8/18)	Sample Received By:	Jodi Henson
Project Location:	COG - EDDY CO NM		

Sample ID: BACKGROUND (0-1') (H900823-01)

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	03/02/2019	ND	2.19	109	2.00	1.47	
Toluene*	<0.050	0.050	03/02/2019	ND	2.05	102	2.00	2.22	
Ethylbenzene*	<0.050	0.050	03/02/2019	ND	2.14	107	2.00	1.98	
Total Xylenes*	<0.150	0.150	03/02/2019	ND	6.43	107	6.00	1.48	
Total BTEX	<0.300	0.300	03/02/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *96.6 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**64.0**	16.0	03/02/2019	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	03/02/2019	ND	204	102	200	0.396	
DRO >C10-C28*	<10.0	10.0	03/02/2019	ND	225	113	200	0.801	
EXT DRO >C28-C36	<10.0	10.0	03/02/2019	ND					

Surrogate: 1-Chlorooctane *69.8 %* *41-142*

Surrogate: 1-Chlorooctadecane *71.9 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
CLAIR GONZALES
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	03/01/2019	Sampling Date:	03/01/2019
Reported:	03/04/2019	Sampling Type:	Soil
Project Name:	CRAPSHOOT 13 FED 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01627 (12/8/18)	Sample Received By:	Jodi Henson
Project Location:	COG - EDDY CO NM		

Sample ID: BACKGROUND (2') (H900823-02)

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	03/01/2019	ND	2.19	110	2.00	1.72	
Toluene*	<0.050	0.050	03/01/2019	ND	2.01	101	2.00	1.88	
Ethylbenzene*	<0.050	0.050	03/01/2019	ND	2.10	105	2.00	0.961	
Total Xylenes*	<0.150	0.150	03/01/2019	ND	6.35	106	6.00	0.649	
Total BTEX	<0.300	0.300	03/01/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *96.2 %* *73.3-129*

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	03/02/2019	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	03/02/2019	ND	204	102	200	0.396	
DRO >C10-C28*	<10.0	10.0	03/02/2019	ND	225	113	200	0.801	
EXT DRO >C28-C36	<10.0	10.0	03/02/2019	ND					

Surrogate: 1-Chlorooctane *90.3 %* *41-142*

Surrogate: 1-Chlorooctadecane *91.8 %* *37.6-147*

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CARDINAL Laboratories

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Analytical Results For:

TETRA TECH
CLAIR GONZALES
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	03/01/2019	Sampling Date:	03/01/2019
Reported:	03/04/2019	Sampling Type:	Soil
Project Name:	CRAPSHOOT 13 FED 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01627 (12/8/18)	Sample Received By:	Jodi Henson
Project Location:	COG - EDDY CO NM		

Sample ID: BACKGROUND (3') (H900823-03)

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	03/01/2019	ND	2.19	110	2.00	1.72	
Toluene*	<0.050	0.050	03/01/2019	ND	2.01	101	2.00	1.88	
Ethylbenzene*	<0.050	0.050	03/01/2019	ND	2.10	105	2.00	0.961	
Total Xylenes*	<0.150	0.150	03/01/2019	ND	6.35	106	6.00	0.649	
Total BTEX	<0.300	0.300	03/01/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *96.1 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**64.0**	16.0	03/02/2019	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	03/02/2019	ND	204	102	200	0.396	
DRO >C10-C28*	<10.0	10.0	03/02/2019	ND	225	113	200	0.801	
EXT DRO >C28-C36	<10.0	10.0	03/02/2019	ND					

Surrogate: 1-Chlorooctane *95.5 %* *41-142*

Surrogate: 1-Chlorooctadecane *99.0 %* *37.6-147*

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Analytical Results For:

TETRA TECH
CLAIR GONZALES
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	03/01/2019	Sampling Date:	03/01/2019
Reported:	03/04/2019	Sampling Type:	Soil
Project Name:	CRAPSHOOT 13 FED 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01627 (12/8/18)	Sample Received By:	Jodi Henson
Project Location:	COG - EDDY CO NM		

Sample ID: BACKGROUND (4') (H900823-04)

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	03/01/2019	ND	2.19	110	2.00	1.72	
Toluene*	<0.050	0.050	03/01/2019	ND	2.01	101	2.00	1.88	
Ethylbenzene*	<0.050	0.050	03/01/2019	ND	2.10	105	2.00	0.961	
Total Xylenes*	<0.150	0.150	03/01/2019	ND	6.35	106	6.00	0.649	
Total BTEX	<0.300	0.300	03/01/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *95.8 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**64.0**	16.0	03/02/2019	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	03/02/2019	ND	204	102	200	0.396	
DRO >C10-C28*	<10.0	10.0	03/02/2019	ND	225	113	200	0.801	
EXT DRO >C28-C36	<10.0	10.0	03/02/2019	ND					

Surrogate: 1-Chlorooctane *87.7 %* *41-142*

Surrogate: 1-Chlorooctadecane *90.6 %* *37.6-147*

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Analytical Results For:

TETRA TECH
CLAIR GONZALES
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	03/01/2019	Sampling Date:	03/01/2019
Reported:	03/04/2019	Sampling Type:	Soil
Project Name:	CRAPSHOOT 13 FED 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01627 (12/8/18)	Sample Received By:	Jodi Henson
Project Location:	COG - EDDY CO NM		

Sample ID: BACKGROUND (5') (H900823-05)

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	03/01/2019	ND	2.19	110	2.00	1.72	
Toluene*	<0.050	0.050	03/01/2019	ND	2.01	101	2.00	1.88	
Ethylbenzene*	<0.050	0.050	03/01/2019	ND	2.10	105	2.00	0.961	
Total Xylenes*	<0.150	0.150	03/01/2019	ND	6.35	106	6.00	0.649	
Total BTEX	<0.300	0.300	03/01/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *95.0 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**64.0**	16.0	03/02/2019	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	03/02/2019	ND	204	102	200	0.396	
DRO >C10-C28*	<10.0	10.0	03/02/2019	ND	225	113	200	0.801	
EXT DRO >C28-C36	<10.0	10.0	03/02/2019	ND					

Surrogate: 1-Chlorooctane *79.8 %* *41-142*

Surrogate: 1-Chlorooctadecane *81.2 %* *37.6-147*

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Analytical Results For:

TETRA TECH
CLAIR GONZALES
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	03/01/2019	Sampling Date:	03/01/2019
Reported:	03/04/2019	Sampling Type:	Soil
Project Name:	CRAPSHOOT 13 FED 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01627 (12/8/18)	Sample Received By:	Jodi Henson
Project Location:	COG - EDDY CO NM		

Sample ID: NORTH 1 SIDEWALL (H900823-06)

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	03/01/2019	ND	2.19	110	2.00	1.72	
Toluene*	<0.050	0.050	03/01/2019	ND	2.01	101	2.00	1.88	
Ethylbenzene*	<0.050	0.050	03/01/2019	ND	2.10	105	2.00	0.961	
Total Xylenes*	<0.150	0.150	03/01/2019	ND	6.35	106	6.00	0.649	
Total BTEX	<0.300	0.300	03/01/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *96.0 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**592**	16.0	03/02/2019	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	03/02/2019	ND	204	102	200	0.396	
DRO >C10-C28*	<10.0	10.0	03/02/2019	ND	225	113	200	0.801	
EXT DRO >C28-C36	<10.0	10.0	03/02/2019	ND					

Surrogate: 1-Chlorooctane *80.4 %* *41-142*

Surrogate: 1-Chlorooctadecane *82.1 %* *37.6-147*

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Analytical Results For:

TETRA TECH
CLAIR GONZALES
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	03/01/2019	Sampling Date:	03/01/2019
Reported:	03/04/2019	Sampling Type:	Soil
Project Name:	CRAPSHOOT 13 FED 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01627 (12/8/18)	Sample Received By:	Jodi Henson
Project Location:	COG - EDDY CO NM		

Sample ID: NORTH 2 SIDEWALL (H900823-07)

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	03/01/2019	ND	2.19	110	2.00	1.72	
Toluene*	<0.050	0.050	03/01/2019	ND	2.01	101	2.00	1.88	
Ethylbenzene*	<0.050	0.050	03/01/2019	ND	2.10	105	2.00	0.961	
Total Xylenes*	<0.150	0.150	03/01/2019	ND	6.35	106	6.00	0.649	
Total BTEX	<0.300	0.300	03/01/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *96.6 %* *73.3-129*

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	03/02/2019	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	03/02/2019	ND	204	102	200	0.396	
DRO >C10-C28*	**76.7**	10.0	03/02/2019	ND	225	113	200	0.801	
EXT DRO >C28-C36	<10.0	10.0	03/02/2019	ND					

Surrogate: 1-Chlorooctane *75.7 %* *41-142*

Surrogate: 1-Chlorooctadecane *83.8 %* *37.6-147*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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Analytical Results For:

TETRA TECH
CLAIR GONZALES
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	03/01/2019	Sampling Date:	03/01/2019
Reported:	03/04/2019	Sampling Type:	Soil
Project Name:	CRAPSHOOT 13 FED 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01627 (12/8/18)	Sample Received By:	Jodi Henson
Project Location:	COG - EDDY CO NM		

Sample ID: EAST 1 SIDEWALL (H900823-08)

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	03/01/2019	ND	2.19	110	2.00	1.72	
Toluene*	<0.050	0.050	03/01/2019	ND	2.01	101	2.00	1.88	
Ethylbenzene*	<0.050	0.050	03/01/2019	ND	2.10	105	2.00	0.961	
Total Xylenes*	<0.150	0.150	03/01/2019	ND	6.35	106	6.00	0.649	
Total BTEX	<0.300	0.300	03/01/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *97.7 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**560**	16.0	03/02/2019	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	03/02/2019	ND	204	102	200	0.396	
DRO >C10-C28*	<10.0	10.0	03/02/2019	ND	225	113	200	0.801	
EXT DRO >C28-C36	<10.0	10.0	03/02/2019	ND					

Surrogate: 1-Chlorooctane *80.2 %* *41-142*

Surrogate: 1-Chlorooctadecane *83.5 %* *37.6-147*

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CARDINAL Laboratories

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Analytical Results For:

TETRA TECH
CLAIR GONZALES
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	03/01/2019	Sampling Date:	03/01/2019
Reported:	03/04/2019	Sampling Type:	Soil
Project Name:	CRAPSHOOT 13 FED 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01627 (12/8/18)	Sample Received By:	Jodi Henson
Project Location:	COG - EDDY CO NM		

Sample ID: SOUTH 1 SIDEWALL (H900823-09)

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	03/01/2019	ND	2.19	110	2.00	1.72	
Toluene*	<0.050	0.050	03/01/2019	ND	2.01	101	2.00	1.88	
Ethylbenzene*	<0.050	0.050	03/01/2019	ND	2.10	105	2.00	0.961	
Total Xylenes*	<0.150	0.150	03/01/2019	ND	6.35	106	6.00	0.649	
Total BTEX	<0.300	0.300	03/01/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *96.8 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**176**	16.0	03/02/2019	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	03/02/2019	ND	204	102	200	0.396	
DRO >C10-C28*	<10.0	10.0	03/02/2019	ND	225	113	200	0.801	
EXT DRO >C28-C36	<10.0	10.0	03/02/2019	ND					

Surrogate: 1-Chlorooctane *87.5 %* *41-142*

Surrogate: 1-Chlorooctadecane *91.7 %* *37.6-147*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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Analytical Results For:

TETRA TECH
CLAIR GONZALES
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	03/01/2019	Sampling Date:	03/01/2019
Reported:	03/04/2019	Sampling Type:	Soil
Project Name:	CRAPSHOOT 13 FED 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01627 (12/8/18)	Sample Received By:	Jodi Henson
Project Location:	COG - EDDY CO NM		

Sample ID: SOUTH 2 SIDEWALL (H900823-10)

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	03/02/2019	ND	2.19	110	2.00	1.72	
Toluene*	<0.050	0.050	03/02/2019	ND	2.01	101	2.00	1.88	
Ethylbenzene*	<0.050	0.050	03/02/2019	ND	2.10	105	2.00	0.961	
Total Xylenes*	<0.150	0.150	03/02/2019	ND	6.35	106	6.00	0.649	
Total BTEX	<0.300	0.300	03/02/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *96.0 %* *73.3-129*

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	03/02/2019	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	03/02/2019	ND	204	102	200	0.396	
DRO >C10-C28*	**12.1**	10.0	03/02/2019	ND	225	113	200	0.801	
EXT DRO >C28-C36	<10.0	10.0	03/02/2019	ND					

Surrogate: 1-Chlorooctane *89.1 %* *41-142*

Surrogate: 1-Chlorooctadecane *93.6 %* *37.6-147*

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Analytical Results For:

TETRA TECH
CLAIR GONZALES
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	03/01/2019	Sampling Date:	03/01/2019
Reported:	03/04/2019	Sampling Type:	Soil
Project Name:	CRAPSHOOT 13 FED 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01627 (12/8/18)	Sample Received By:	Jodi Henson
Project Location:	COG - EDDY CO NM		

Sample ID: BOTTOM HOLE 1 (4' BEB) (H900823-11)

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	03/02/2019	ND	2.19	109	2.00	1.47	
Toluene*	<0.050	0.050	03/02/2019	ND	2.05	102	2.00	2.22	
Ethylbenzene*	<0.050	0.050	03/02/2019	ND	2.14	107	2.00	1.98	
Total Xylenes*	<0.150	0.150	03/02/2019	ND	6.43	107	6.00	1.48	
Total BTEX	<0.300	0.300	03/02/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *95.2 %* *73.3-129*

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	03/02/2019	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	03/02/2019	ND	204	102	200	0.396	
DRO >C10-C28*	<10.0	10.0	03/02/2019	ND	225	113	200	0.801	
EXT DRO >C28-C36	<10.0	10.0	03/02/2019	ND					

Surrogate: 1-Chlorooctane *77.8 %* *41-142*

Surrogate: 1-Chlorooctadecane *84.5 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
CLAIR GONZALES
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	03/01/2019	Sampling Date:	03/01/2019
Reported:	03/04/2019	Sampling Type:	Soil
Project Name:	CRAPSHOOT 13 FED 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01627 (12/8/18)	Sample Received By:	Jodi Henson
Project Location:	COG - EDDY CO NM		

Sample ID: BOTTOM HOLE 2 (4' BEB) (H900823-12)

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	03/02/2019	ND	2.19	109	2.00	1.47	
Toluene*	<0.050	0.050	03/02/2019	ND	2.05	102	2.00	2.22	
Ethylbenzene*	<0.050	0.050	03/02/2019	ND	2.14	107	2.00	1.98	
Total Xylenes*	<0.150	0.150	03/02/2019	ND	6.43	107	6.00	1.48	
Total BTEX	<0.300	0.300	03/02/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *94.5 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**464**	16.0	03/02/2019	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	03/02/2019	ND	187	93.6	200	2.00	
DRO >C10-C28*	<10.0	10.0	03/02/2019	ND	208	104	200	0.631	
EXT DRO >C28-C36	<10.0	10.0	03/02/2019	ND					

Surrogate: 1-Chlorooctane *82.6 %* *41-142*

Surrogate: 1-Chlorooctadecane *84.7 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TETRA TECH
CLAIR GONZALES
901 WEST WALL STREET , STE 100
MIDLAND TX, 79701
Fax To: (432) 682-3946

Received:	03/01/2019	Sampling Date:	03/01/2019
Reported:	03/04/2019	Sampling Type:	Soil
Project Name:	CRAPSHOOT 13 FED 1H	Sampling Condition:	Cool & Intact
Project Number:	212C-MD-01627 (12/8/18)	Sample Received By:	Jodi Henson
Project Location:	COG - EDDY CO NM		

Sample ID: BOTTOM HOLE 3 (4.5' BEB) (H900823-13)

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	03/02/2019	ND	2.19	109	2.00	1.47	
Toluene*	<0.050	0.050	03/02/2019	ND	2.05	102	2.00	2.22	
Ethylbenzene*	<0.050	0.050	03/02/2019	ND	2.14	107	2.00	1.98	
Total Xylenes*	<0.150	0.150	03/02/2019	ND	6.43	107	6.00	1.48	
Total BTEX	<0.300	0.300	03/02/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *93.9 %* *73.3-129*

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	03/02/2019	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	03/02/2019	ND	187	93.6	200	2.00	
DRO >C10-C28*	<10.0	10.0	03/02/2019	ND	208	104	200	0.631	
EXT DRO >C28-C36	<10.0	10.0	03/02/2019	ND					

Surrogate: 1-Chlorooctane *87.2 %* *41-142*

Surrogate: 1-Chlorooctadecane *89.6 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Notes and Definitions

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

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

Analysis Request of Chain of Custody Record

Page 1 of 2

Tetra Tech, Inc.

901W Wall Street, Ste 100
Midland,Texas 79705
Tel (432) 682-4559
Fax (432) 682-3946

Client Name: COG

Site Manager: CLAIR GONZALES

Project Name: CRAPSHOOT 13 FED 1H (12.8.18)

Project Location: (county, state) EDDY CO, NM

Project #: 212C-MD-01627

Invoice to: COG - IKE TAVAREZ

Receiving Laboratory: CARDINAL

Sampler Signature: CONNER MOEHRING

Comments:

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE (YEAR: 2019)	SAMPLING TIME	MATRIX: WATER	MATRIX: SOIL	MATRIX:	PRESERVATIVE METHOD: HCL	PRESERVATIVE METHOD: HNO_3	PRESERVATIVE METHOD: ICE	PRESERVATIVE METHOD: None	PRESERVATIVE METHOD:	# CONTAINERS	FILTERED (Y/N)	BTEX 8021B / BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance				Hold
H900823														BTEX	TPH	TPH	PAH	Total Metals	TCLP Metals	TCLP	TCLP	RCI	GC/MS	GC/MS	PCB's	NORM	PLM	Chloride	Chloride Sulfate TDS	General Water Chemistry	Anion/Cation				
1	Background (0-1')	3/1/19			X				X			1	U	X		X												X							
2	Background (2')	3/1/19			X				X			1	N	X		X												X							
3	Background (3')	3/1/19			X				X			1	N	X		X												X							
4	Background (4')	3/1/19			X				X			1	N	X		X												X							
5	Background (5')	3/1/19			X				X			1	N	X		X												X							
6	North 1 sidewall	3/1/19			X				X			1	N	X		X												X							
7	North 2 sidewall	3/1/19			X				X			1	N	X		X												X							
8	East 1 sidewall	3/1/19			X				X			1	N	X		X												X							
9	South 1 sidewall	3/1/19			X				X			1	N	X		X												X							
10	South 2 sidewall	3/1/19			X				X			1	N	X		X												X							

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Conner Moehring	3/1/19	1415	Jodi Henson	3/1/19	14:15
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

LAB USE ONLY

Sample Temperature

4.3°C / #97

REMARKS:

- ☐ STANDARD
- ☒ RUSH: Same Day (24 hr) 48 hr 72 hr
- ☐ Rush Charges Authorized
- ☐ Special Report Limits or TRRP Report

(Circle) HAND DELIVERED FEDEX UPS Tracking #: _____

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Analysis Request of Chain of Custody Record

Page 2 of 2

Tetra Tech, Inc.

901W Wall Street, Ste 100
Midland,Texas 79705
Tel (432) 682-4559
Fax (432) 682-3946

Client Name: COG

Site Manager: CLAIR GONZALES

Project Name: CRAPSHOOT 13 FED 1H (12.8.18)

Project Location: (county, state) Eddy Co, NM

Project #: 212C-MD-01627

Invoice to: COG - IKE TAVAREZ

Receiving Laboratory: CARDINAL

Sampler Signature: CONNER MOEHRING

Comments:

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING YEAR: 2019 DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	MATRIX	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE	PRESERVATIVE METHOD None	# CONTAINERS	FILTERED (Y/N)	BTEX 8021B / BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO - MRO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride / Sulfate / TDS	General Water Chemistry (see attached list)	Anion/Cation Balance	Hold
H900823																														
11	Bottom Hole 1 (4' BEB)	3/1/19			X				X		1	N	X		X											X				
12	Bottom Hole 2 (4' BEB)	3/1/19			X				X		1	N	X		X											X				
13	Bottom Hole 3 (4.5' BEB)	3/1/19			X				X		1	N	X		X											X				

ANALYSIS REQUEST (Circle or Specify Method No.)

Relinquished by: Conner Moehring Date: 3/1/19 Time: 1415

Received by: Jodi Henson Date: 3/1/19 Time: 14:15

Relinquished by: Date: Time:

Received by: Date: Time:

Relinquished by: Date: Time:

Received by: Date: Time:

LAB USE ONLY

Sample Temperature 4.3°C/#97

REMARKS:

- ☐ STANDARD
- ☒ RUSH: Same Day (24 hr) 48 hr 72 hr
- ☐ Rush Charges Authorized
- ☐ Special Report Limits or TRRP Report

(Circle) HAND DELIVERED FEDEX UPS Tracking #: _____

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Appendix D

Eddy Area, New Mexico

RG—Reeves-Gypsum land complex, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 1w5f
Elevation: 1,250 to 5,000 feet
Mean annual precipitation: 10 to 25 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 190 to 235 days
Farmland classification: Not prime farmland

Map Unit Composition

Reeves and similar soils: 55 percent
Gypsum land: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Reeves

Setting

Landform: Ridges, hills, plains
Landform position (two-dimensional): Backslope, footslope, shoulder, toeslope
Landform position (three-dimensional): Side slope, crest, nose slope, head slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Residuum weathered from gypsum

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 32 inches: clay loam
H3 - 32 to 60 inches: gypsiferous material

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 25 percent
Gypsum, maximum in profile: 80 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: Loamy (R042XC007NM)
Hydric soil rating: No

Description of Gypsum Land

Setting

Landform: Ridges, hills, plains
Landform position (two-dimensional): Backslope, footslope, shoulder, toeslope
Landform position (three-dimensional): Side slope, crest, nose slope, head slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Residuum weathered from gypsum

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Minor Components

Reagan

Percent of map unit:
Ecological site: Loamy (R042XC007NM)
Hydric soil rating: No

Largo

Percent of map unit:
Ecological site: Loamy (R042XC007NM)
Hydric soil rating: No

Cottonwood

Percent of map unit:
Ecological site: Salty Bottomland (R042XC033NM)
Hydric soil rating: No

Data Source Information

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 14, Sep 12, 2018

BLM SERIAL #:

COMPANY REFERENCE:

3.5 Seed Mixture 4, for Gypsum Sites

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the authorized officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

Species	lb/acre
Alkali Sacaton (Sporobolus airoides)	1.0
DWS Four-wing saltbush (Atriplex canescens)	5.0
(DWS: DeWinged Seed)	

*Pounds of pure live seed: Pounds of seed x percent purity x percent germination = pounds pure live seed