

SITE INFORMATION

Report Type: Work Plan 2RP-4954

General Site Information:

Site:	Graham Cracker 2 State #1H					
Company:	COG Operating LLC					
Section, Township and Range	Unit P	Unit 02	T 26S	R 28E		
Lease Number:	API No. 30-015-42282					
County:	Eddy County					
GPS:	32.06543			-104.050695		
Surface Owner:	State					
Mineral Owner:						
Directions:	From the intersection of HWY 285 and Longhorn Rd, travel north on HWY 285 and continue for 1.5 mi, turn east on lease road and continue for 1.27 mi to location.					

Release Data:

Date Released:	8/22/2018
Type Release:	Oil
Source of Contamination:	Truck
Fluid Released:	5 bbls
Fluids Recovered:	0 bbls

Official Communication:

Name:	Ike Tavaréz		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@tetrattech.com

Site Characterization

Depth to Groundwater:	120' below surface
Karst Potential:	Medium

Recommended Remedial Action Levels (RRALs)

Benzene	Total BTEX	TPH (GRO+DRO+MRO)	Chlorides
10 mg/kg	50 mg/kg	100 mg/kg	600 mg/kg



December 20, 2018

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

Re: Work Plan for the COG Operating, LLC, Graham Cracker 2 State #1H, Unit P, Section 02, Township 26 South, Range 28 East, Eddy County, New Mexico. 2RP-4954

Mr. Bratcher:

Tetra Tech, Inc. (Tetra Tech) was contacted by COG Operating, LLC (COG) to assess a release that occurred at the Graham Cracker 2 State #1H, Unit P, Section 02, Township 26 South, Range 28 East, Eddy County, New Mexico (Site). The spill site coordinates are 32.6543°, -104.050695°. 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 August 22, 2018, and released approximately 5 barrels of oil due to a third party truck overfilling. None of the fluids were recovered. The release impacted an area on the pad measuring approximately 55' x 75'. The C-141 Form is 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. However, the site is located in a medium karst potential area. The nearest well listed is in Section 02 on the New Mexico Office of the State Engineer's (NMOSE) database, approximately 0.5 miles northwest of the site, and has a reported depth to groundwater of 120 feet below surface. The site characterization data is shown in Appendix B.

Tetra Tech

901 West Wall St, Suite 100, Midland, TX 79701

Tel 432.682.4559 Fax 432.682.3946 www.tetrattech.com

Regulatory

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, 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 December 13, 2018, Tetra Tech personnel were onsite to evaluate and sample the release area. A total of two (2) backhoe trenches (T-1 and T-2) were installed in the release footprint to total depths of 10' below surface. Additionally, due to the gypsum formation encountered during sampling activities, a background trench (Background 1) was installed in the adjacent pasture to a total depth of 6' below surface evaluate the native soils. Selected 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, none of the samples analyzed showed benzene, total BTEX, or TPH concentrations above the RRALs. However, the areas of trenches (T-1 and T-2) showed chloride concentrations above the 600 mg/kg threshold. The area of trench (T-1) showed a chloride high of 1,340 mg/kg at 4.0', which declined with depth to 890 mg/kg at 10' below surface. The area of trench (T-2) showed a chloride high of 4,070 mg/kg at 1.0', which declined with depth to 573 mg/kg at 4.0' and showed a bottom trench concentration of 519 mg/kg at 10' below surface.

The samples collected at the background trench (Background 1) showed a chloride high of 539 mg/kg at 3.0' below surface.

Work Plan

Based on the laboratory results and the background chloride concentrations detected, COG proposes to excavate the areas as shown on Figure 4 and highlighted (green) on Table 1. The areas of trenches (T-1 and T-2) and will be excavated to approximately 3.0'-4.0' below surface. Due to the onsite equipment (LACT unit, load lines, etc.), electrical lines, production line, and heavy traffic in the area, the deeper chloride concentrations cannot be safely removed.



Variance

Per rule 19.15.29.14, COG requests a variance to install a 20-mil liner at 3.0'-4.0' below surface, to prevent vertical migration of the deeper chloride concentrations detected. If accessible, during the excavation activities, deeper samples will be collected in the area of trench (T-1) for vertical delineation. Prior to the liner installation, composite bottom hole samples will be collected every 400 square feet, to be representative of the release area, for documentation purposes.

Once the excavation is complete, the areas will be backfilled with clean material to surface grade. COG estimates approximately 800 cubic yards will be excavated, and the remediation to be implemented 90 days after the work plan is approved.

Conclusion

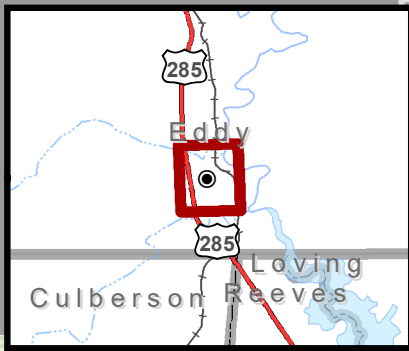
Once the remediation activities have been completed, a final report will be submitted. If you have any questions or comments concerning the assessment or remediation activities for this site, please call at (432) 682-4559.

Respectfully submitted,
TETRA TECH

Clair Gonzales,
Project Manager

cc: Ryan Mann - NMSLO
Ike Tavarez - COG

Figures



OVERALL VIEW 1:731,732

GRAHAM CRACKER 2 STATE 1H

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



FIGURE 2

GRAHAM CRACKER 2 STATE 1H
(32.06543°, -104.050695°)

TOPOGRAPHIC MAP

EDDY COUNTY, NEW MEXICO

Project : 212C-MD-01501

Date : 12/20/2018

File : H:\GIS\212C-MD-01501

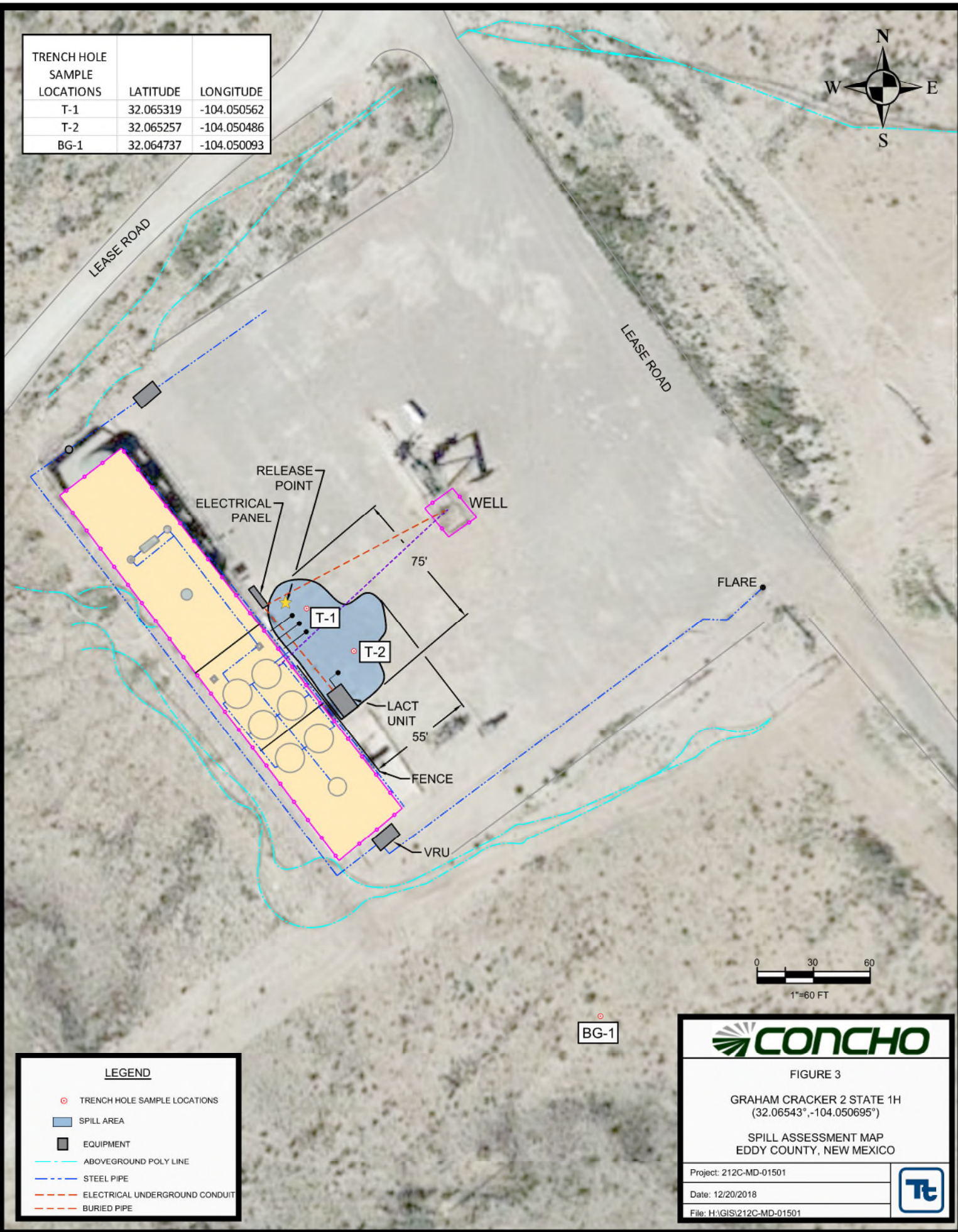
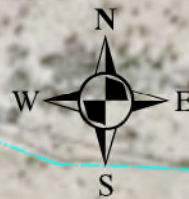


LEGEND

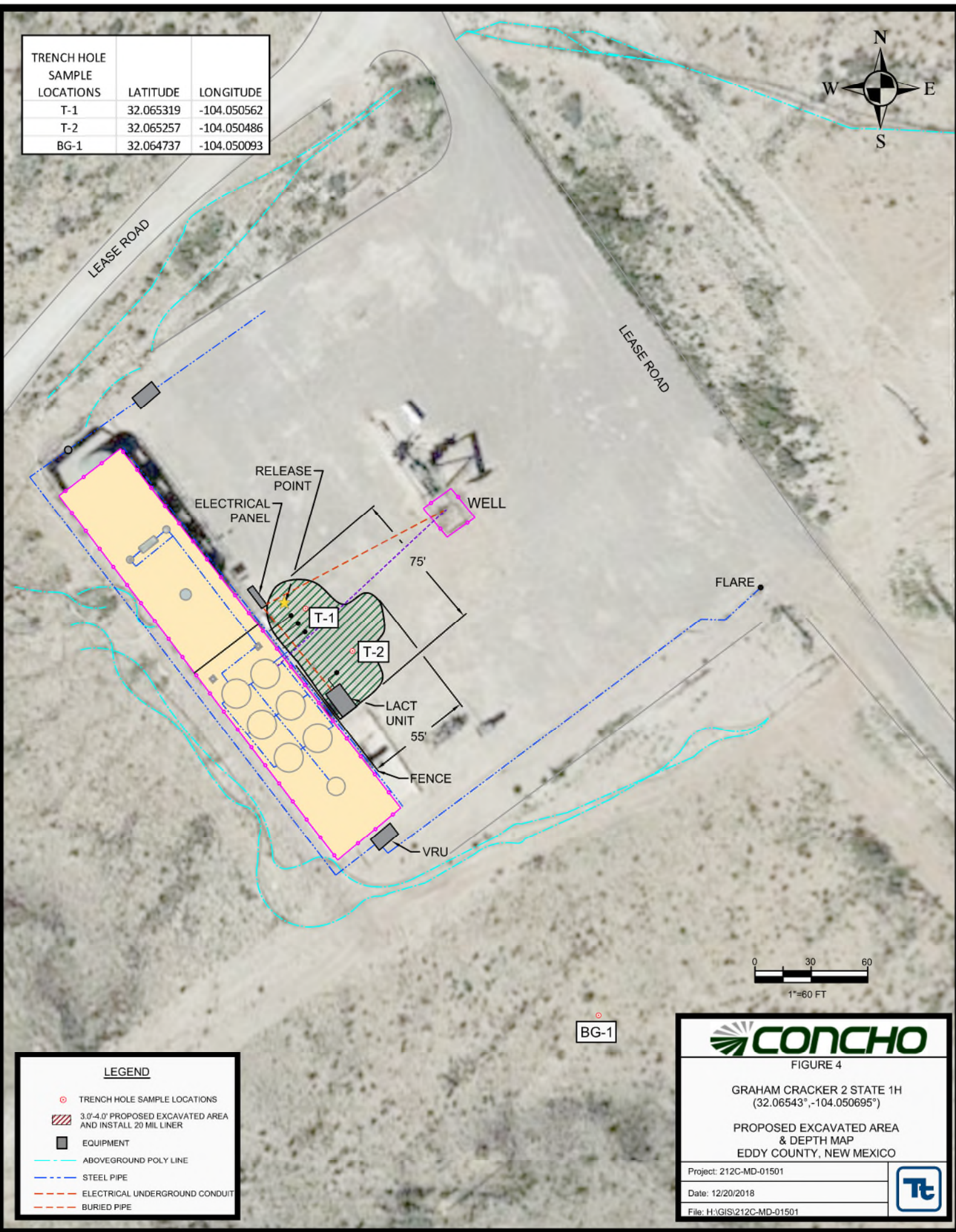
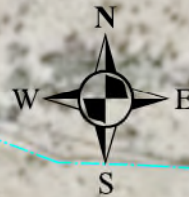
● SITE LOCATION



TRENCH HOLE SAMPLE LOCATIONS	LATITUDE	LONGITUDE
T-1	32.065319	-104.050562
T-2	32.065257	-104.050486
BG-1	32.064737	-104.050093



TRENCH HOLE SAMPLE LOCATIONS	LATITUDE	LONGITUDE
T-1	32.065319	-104.050562
T-2	32.065257	-104.050486
BG-1	32.064737	-104.050093



Tables

Table 1
COG
Graham Cracker 2 State #1H
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	GRO+DRO	ORO	Total						
T-1	12/13/2018	1	X		<14.9	<14.9	<14.9	<14.9	<14.9	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	1,300
	"	2	X		<15.0	<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	473
	"	3	X		-	-	-	-	-	-	-	-	-	-	1,190
	"	4	X		-	-	-	-	-	-	-	-	-	-	1,340
	"	6	X		-	-	-	-	-	-	-	-	-	-	1,310
	"	8	X		-	-	-	-	-	-	-	-	-	-	1,150
	"	10	X		-	-	-	-	-	-	-	-	-	-	890
T-2	12/13/2018	1	X		<15.0	39.2	39.2	<15.0	39.2	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	4,070
	"	2	X		<15.0	<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	2,240
	"	3	X		-	-	-	-	-	-	-	-	-	-	1,840
	"	4	X		-	-	-	-	-	-	-	-	-	-	573
	"	6	X		-	-	-	-	-	-	-	-	-	-	314
	"	8	X		-	-	-	-	-	-	-	-	-	-	334
	"	10	X		-	-	-	-	-	-	-	-	-	-	519
Background 1	12/13/2018	1	X		-	-	-	-	-	-	-	-	-	-	<4.98
	"	2	X		-	-	-	-	-	-	-	-	-	-	25.9
	"	3	X		-	-	-	-	-	-	-	-	-	-	539
	"	4	X		-	-	-	-	-	-	-	-	-	-	97.0
	"	6	X		-	-	-	-	-	-	-	-	-	-	500

(-) Not Analyzed

 Proposed Excavation Depth

 Proposed Liner Placement

Photos

COG Operating LLC
Graham Cracker 2 State #1H
Eddy County, New Mexico



View Northwest – Area of T-1



View West – Area of T-2

COG Operating LLC
Graham Cracker 2 State #1H
Eddy County, New Mexico



TETRA TECH



View Northeast – Area of Background 1

Appendix A

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

State of New Mexico
Energy Minerals and Natural
Resources 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	
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party	OGRID
Contact Name	Contact Telephone
Contact email	Incident # (assigned by OCD)
Contact mailing address	

Location of Release Source

Latitude _____ Longitude _____
(NAD 83 in decimal degrees to 5 decimal places)

Site Name	Site Type
Date Release Discovered	API# (if applicable)

Unit Letter	Section	Township	Range	County

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)

<input type="checkbox"/> Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Produced Water	Volume Released (bbls)	Volume Recovered (bbls)
	Is the concentration of total dissolved solids (TDS) in the produced water >10,000 mg/l?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Condensate	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
<input type="checkbox"/> Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

Incident ID	
District RP	
Facility ID	
Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC? <input type="checkbox"/> Yes <input type="checkbox"/> No	If YES, for what reason(s) does the responsible party consider this a major release?
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?	

Initial Response

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

<input type="checkbox"/> The source of the release has been stopped. <input type="checkbox"/> The impacted area has been secured to protect human health and the environment. <input type="checkbox"/> Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices. <input type="checkbox"/> All free liquids and recoverable materials have been removed and managed appropriately.	
If all the actions described above have <u>not</u> 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: _____	Title: _____
Signature: <u>Delann Grant</u>	Date: _____
email: _____	Telephone: _____
<u>OCD Only</u> Received by: _____ Date: _____	

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?	_____ (ft bgs)
Did this release impact groundwater or surface water?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	<input type="checkbox"/> Yes <input type="checkbox"/> 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)?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	<input type="checkbox"/> Yes <input type="checkbox"/> 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?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a wetland?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release overlying a subsurface mine?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release overlying an unstable area such as karst geology?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the lateral extents of the release within a 100-year floodplain?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Did the release impact areas not on an exploration, development, production, or storage site?	<input type="checkbox"/> Yes <input type="checkbox"/> 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.

<p>Characterization Report Checklist: <i>Each of the following items must be included in the report.</i></p> <div><input type="checkbox"/> Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.<input type="checkbox"/> Field data<input type="checkbox"/> Data table of soil contaminant concentration data<input type="checkbox"/> Depth to water determination<input type="checkbox"/> Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release<input type="checkbox"/> Boring or excavation logs<input type="checkbox"/> Photographs including date and GIS information<input type="checkbox"/> Topographic/Aerial maps<input type="checkbox"/> Laboratory data including chain of custody</div>

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.

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: _____ Title: _____

Signature:  _____ Date: _____

email: _____ Telephone: _____

OCD Only

Received by: _____ Date: _____

Incident ID	
District RP	
Facility ID	
Application ID	

Remediation Plan

Remediation Plan Checklist: *Each of the following items must be included in the plan.*


- ☐ Detailed description of proposed remediation technique
- ☐ Scaled sitemap with GPS coordinates showing delineation points
- ☐ Estimated volume of material to be remediated
- ☐ Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
- ☐ Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)

Deferral Requests Only: *Each of the following items must be confirmed as part of any request for deferral of remediation.*

- ☐ Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.
- ☐ Extents of contamination must be fully delineated.
- ☐ Contamination does not cause an imminent risk to human health, the environment, or groundwater.

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: _____ Title: _____

Signature:  _____ Date: _____

email: _____ Telephone: _____

OCD Only

Received by: _____ Date: _____

☐ Approved ☐ Approved with Attached Conditions of Approval ☐ Denied ☐ Deferral Approved

Signature: _____ Date: _____

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
COG - Graham Cracker 2 State #1H

24 South			27 East		
6	5	4	3	2	1
7	8 36	9 50	10	11	12
18 30	17 26	16 43	15	14	13 27
19 34	20	21	22 70	23	24 31
30	29	28	27	26	25
31	32	33	34	35	36

24 South			28 East		
6 70	5 30	4 30	3	2 55	1 60
7	8 50	9	10 17	11 20	12 73
18	17 42	16 29	15 18	14 52	13 34
19	20 48	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

24 South			29 East		
6	5	4	3	2	1
7	8	9	10	11	12
18 160	17 4	16	15	14	13
19	20	21 18	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

25 South			27 East		
6	5	4	3	2 27	1
7	8	9	10	11	12 92
18	17	16	15	14	13
19	20 24	21	22 26	23 67	24
30	29	28	27 16	26 12	25
31	32	33 19	34	35	36

25 South			28 East		
6	5 59	4 35	3 32	2	1 Site
7	8	9	10	11	12
18	17	16	15 48	14	13
19 67	20	21	22 49	23	24
30	29 96	28	27	26 40	25
31	32 15	33 90	34	35 55	36 40

25 South			29 East		
6	5	4	3	2 98	1
7 40	8	9	10	11	12
18	17	16	15 40	14	13
19	20	21 165	22 140	23	24
30	29	28	27	26	25
31 30	32 115	33	34	35	36

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

26 South			28 East		
6	5	4	3	2 120	1 21
7	8	9	10	11	12 100
18	17	16	15	14 93	13 56
19	20	21	22 120	23	24
30	29	28	27 145	26	25
31	32	33	34	35	36

26 South			29 East		
6	5 78	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21 125	22 57	23	24
30	29	28	27 69	26	25
31	32	33	34	35	36

88 New Mexico State Engineers Well Reports

105 USGS Well Reports

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

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

34 NMOCD - Groundwater Data

121 Abandoned Waterwell (recently measured)



New Mexico Office of the State Engineer

Water Column/Average Depth to Water

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

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

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

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	DepthWell	DepthWater	Water Column
C 01668		CUB	ED	3	3	12	26S	28E		589957	3546554*	250	100	150
C 02160		CUB	ED	4	1	2	14	26S	28E	589243	3546044*	300	120	180
C 02160 S		CUB	ED	1	1	2	14	26S	28E	589043	3546244*	300	120	180
C 02160 S2		CUB	ED	1	1	2	14	26S	28E	589043	3546244*	300	120	180
C 02160 S3		CUB	ED	2	2	1	14	26S	28E	588834	3546241*	300	120	180
C 02160 S4		CUB	ED	2	2	1	14	26S	28E	588834	3546241*	300	120	180
C 02160 S5		CUB	ED	1	1	1	14	26S	28E	588225	3546237*	300	120	180
C 02160 S6		CUB	ED	3	3	1	14	26S	28E	588232	3545635*	300	120	180
C 02160 S7		CUB	ED	3	3	1	22	26S	28E	586638	3543998*	300	120	180
C 02160 S8		CUB	ED	2	3	3	12	26S	28E	590056	3546653*	200	120	80
C 02160 S9		CUB	ED	3	3	2	02	26S	28E	589020	3548868*	300	120	180
C 02477		CUB	ED	1	1	03	26S	28E		586687	3549347*	150		
C 02478		CUB	ED	2	1	05	26S	28E		583848	3549325*	100		
C 02479		CUB	ED	4	4	10	26S	28E		587909	3546534*	200		
C 02480		CUB	ED	4	4	10	26S	28E		587909	3546534*	150		
C 02481		CUB	ED	1	1	14	26S	28E		588326	3546138*	200		
C 02894		C	ED	2	2	3	12	26S	28E	590458	3547061*	240		
C 02924		C	ED	1	3	2	11	26S	28E	589032	3547451*			
C 04022 POD1		CUB	ED	4	4	2	15	26S	28E	588082	3545647	220	175	45
C 04022 POD2		CUB	ED	2	2	2	27	26S	28E	588106	3543082	250	145	105

Average Depth to Water: **124 feet**

Minimum Depth: **100 feet**

Maximum Depth: **175 feet**

Record Count: 20

PLSS Search:

Township: 26S **Range:** 28E

*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.

11/14/18 10:24 AM

WATER COLUMN/ AVERAGE DEPTH TO WATER

COG Graham Cracker 2 State #1H

Karst Potential Map

Legend

- CRIT
- HIGH
- LOW
- MEDIUM

Site

285

Pease Hwy

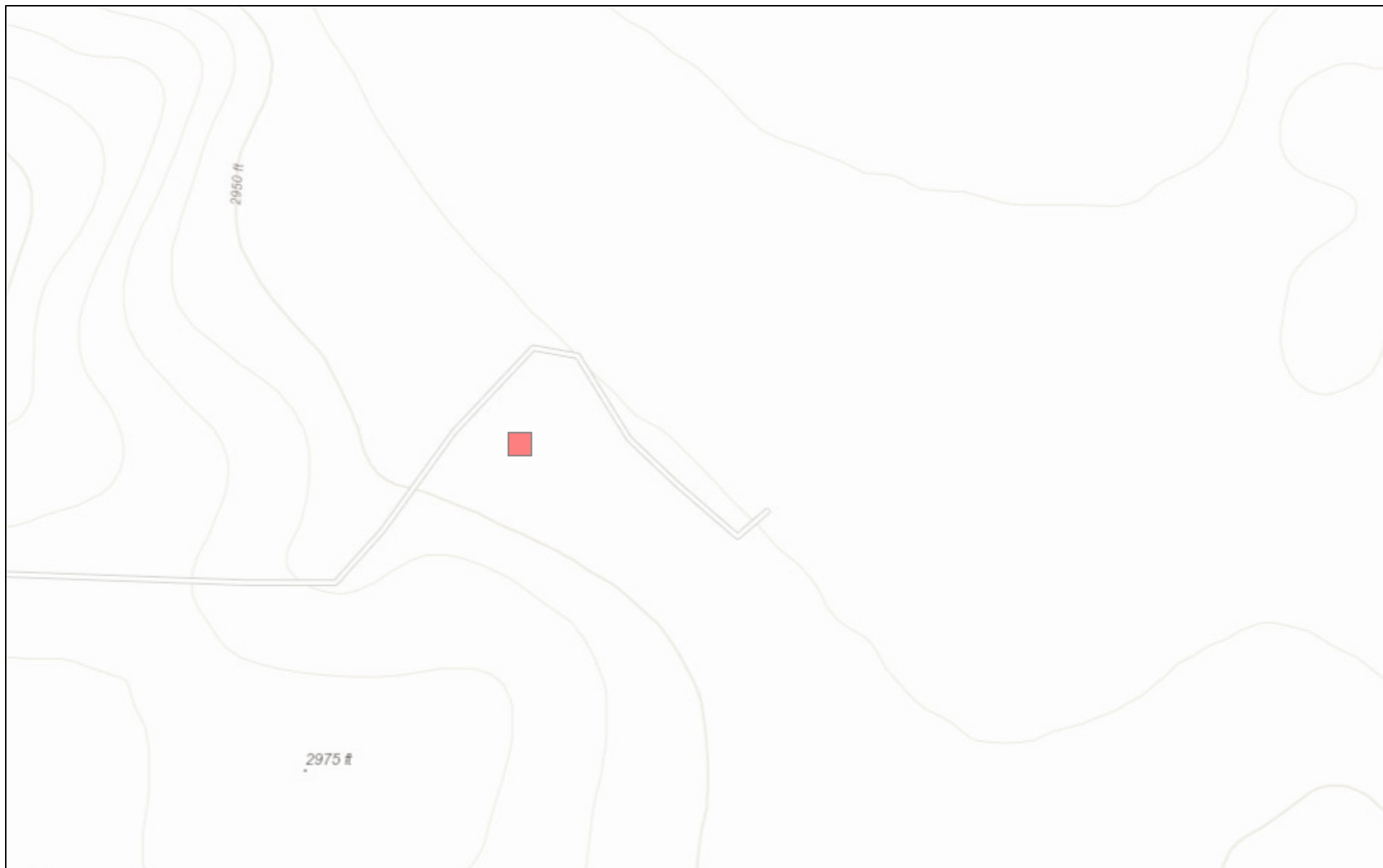
Google earth

© 2018 Google

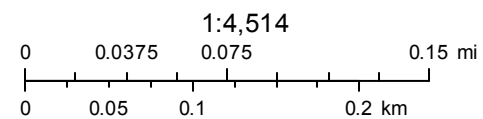
N

2 mi

New Mexico NFHL Data



December 20, 2018



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

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Appendix C

Analytical Report 608911

for Tetra Tech- Midland

Project Manager: Clair Gonzales

Graham Cracker 2 State #1H (08/22/18)

212C-MD-01501

20-DEC-18

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)



20-DEC-18

Project Manager: **Clair Gonzales**

Tetra Tech- Midland

901 West Wall ST

Midland, TX 79701

Reference: XENCO Report No(s): **608911**

Graham Cracker 2 State #1H (08/22/18)

Project Address: Eddy County, NM

Clair Gonzales:

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) 608911. 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. 608911 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,

Kelsey Brooks

Project Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

Certified and approved by numerous States and Agencies.

A Small Business and Minority Status Company that delivers SERVICE and QUALITY

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



Sample Cross Reference 608911



Tetra Tech- Midland, Midland, TX

Graham Cracker 2 State #1H (08/22/18)

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
T-1 1'	S	12-13-18 00:00		608911-001
T-1 2'	S	12-13-18 00:00		608911-002
T-1 3'	S	12-13-18 00:00		608911-003
T-1 4'	S	12-13-18 00:00		608911-004
T-1 6'	S	12-13-18 00:00		608911-005
T-1 8'	S	12-13-18 00:00		608911-006
T-1 10'	S	12-13-18 00:00		608911-007
T-2 1'	S	12-13-18 00:00		608911-008
T-2 2'	S	12-13-18 00:00		608911-009
T-2 3'	S	12-13-18 00:00		608911-010
Background 1'	S	12-13-18 00:00		608911-011
Background 2'	S	12-13-18 00:00		608911-012
Background 3'	S	12-13-18 00:00		608911-013
Background 4'	S	12-13-18 00:00		608911-014
Background 6'	S	12-13-18 00:00		608911-015
T-2 4'	S	12-13-18 00:00		608911-016
T-2 6'	S	12-13-18 00:00		608911-017
T-2 8'	S	12-13-18 00:00		608911-018
T-2 10'	S	12-13-18 00:00		608911-019



CASE NARRATIVE

Client Name: Tetra Tech- Midland

Project Name: Graham Cracker 2 State #1H (08/22/18)

Project ID: 212C-MD-01501
Work Order Number(s): 608911

Report Date: 20-DEC-18
Date Received: 12/17/2018

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3073441 BTEX by EPA 8021B

Surrogate 4-Bromofluorobenzene recovered above QC limits. Matrix interferences is suspected; data confirmed by re-analysis.

Samples affected are: 608911-001.

Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3073512 Chloride by EPA 300

Lab Sample ID 608911-015 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Chloride recovered below QC limits in the Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 608911-005, -006, -007, -008, -009, -010, -011, -012, -013, -014, -015, -016, -017, -018, -019.

The Laboratory Control Sample for Chloride is within laboratory Control Limits, therefore the data was accepted.



Certificate of Analysis Summary 608911

Tetra Tech- Midland, Midland, TX

Project Name: Graham Cracker 2 State #1H (08/22/18)



Project Id: 212C-MD-01501
Contact: Clair Gonzales
Project Location: Eddy County, NM

Date Received in Lab: Mon Dec-17-18 02:18 pm
Report Date: 20-DEC-18
Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	608911-001	608911-002	608911-003	608911-004	608911-005	608911-006
	<i>Field Id:</i>	T-1 1'	T-1 2'	T-1 3'	T-1 4'	T-1 6'	T-1 8'
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Dec-13-18 00:00	Dec-13-18 00:00	Dec-13-18 00:00	Dec-13-18 00:00	Dec-13-18 00:00	Dec-13-18 00:00
BTEX by EPA 8021B	<i>Extracted:</i>	Dec-17-18 16:45	Dec-17-18 16:45				
	<i>Analyzed:</i>	Dec-18-18 01:25	Dec-18-18 01:44				
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				
Benzene		<0.00199 0.00199	<0.00200 0.00200				
Toluene		<0.00199 0.00199	<0.00200 0.00200				
Ethylbenzene		<0.00199 0.00199	<0.00200 0.00200				
m,p-Xylenes		<0.00398 0.00398	<0.00400 0.00400				
o-Xylene		<0.00199 0.00199	<0.00200 0.00200				
Total Xylenes		<0.00199 0.00199	<0.00200 0.00200				
Total BTEX		<0.00199 0.00199	<0.00200 0.00200				
Chloride by EPA 300	<i>Extracted:</i>	Dec-18-18 16:00	Dec-18-18 16:00	Dec-18-18 16:00	Dec-18-18 16:00	Dec-19-18 09:30	Dec-19-18 09:30
	<i>Analyzed:</i>	Dec-19-18 01:12	Dec-19-18 01:18	Dec-19-18 01:24	Dec-19-18 01:31	Dec-19-18 11:08	Dec-19-18 11:14
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		1300 24.9	473 4.95	1190 25.0	1340 25.0	1310 25.0	1150 24.8
TPH by SW8015 Mod	<i>Extracted:</i>	Dec-18-18 17:00	Dec-18-18 17:00				
	<i>Analyzed:</i>	Dec-19-18 12:41	Dec-19-18 13:00				
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				
Gasoline Range Hydrocarbons (GRO)		<14.9 14.9	<15.0 15.0				
Diesel Range Organics (DRO)		<14.9 14.9	<15.0 15.0				
Motor Oil Range Hydrocarbons (MRO)		<14.9 14.9	<15.0 15.0				
Total TPH		<14.9 14.9	<15.0 15.0				

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Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

Kelsey Brooks
Project Manager



Certificate of Analysis Summary 608911

Tetra Tech- Midland, Midland, TX

Project Name: Graham Cracker 2 State #1H (08/22/18)



Project Id: 212C-MD-01501
Contact: Clair Gonzales
Project Location: Eddy County, NM

Date Received in Lab: Mon Dec-17-18 02:18 pm
Report Date: 20-DEC-18
Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	608911-007	608911-008	608911-009	608911-010	608911-011	608911-012
	<i>Field Id:</i>	T-1 10'	T-2 1'	T-2 2'	T-2 3'	Background 1'	Background 2'
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Dec-13-18 00:00	Dec-13-18 00:00	Dec-13-18 00:00	Dec-13-18 00:00	Dec-13-18 00:00	Dec-13-18 00:00
BTEX by EPA 8021B	<i>Extracted:</i>		Dec-17-18 16:45	Dec-17-18 16:45			
	<i>Analyzed:</i>		Dec-18-18 02:03	Dec-18-18 02:22			
	<i>Units/RL:</i>		mg/kg RL	mg/kg RL			
Benzene			<0.00201 0.00201	<0.00200 0.00200			
Toluene			<0.00201 0.00201	<0.00200 0.00200			
Ethylbenzene			<0.00201 0.00201	<0.00200 0.00200			
m,p-Xylenes			<0.00402 0.00402	<0.00401 0.00401			
o-Xylene			<0.00201 0.00201	<0.00200 0.00200			
Total Xylenes			<0.00201 0.00201	<0.00200 0.00200			
Total BTEX			<0.00201 0.00201	<0.00200 0.00200			
Chloride by EPA 300	<i>Extracted:</i>	Dec-19-18 09:30	Dec-19-18 09:30	Dec-19-18 09:30	Dec-19-18 09:30	Dec-19-18 09:30	Dec-19-18 09:30
	<i>Analyzed:</i>	Dec-19-18 10:50	Dec-19-18 11:21	Dec-19-18 11:27	Dec-19-18 11:50	Dec-19-18 11:56	Dec-19-18 12:03
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		890 4.97	4070 50.0	2240 25.0	1840 25.0	<4.98 4.98	25.9 4.99
TPH by SW8015 Mod	<i>Extracted:</i>		Dec-18-18 17:00	Dec-18-18 17:00			
	<i>Analyzed:</i>		Dec-19-18 14:00	Dec-19-18 14:20			
	<i>Units/RL:</i>		mg/kg RL	mg/kg RL			
Gasoline Range Hydrocarbons (GRO)			<15.0 15.0	<15.0 15.0			
Diesel Range Organics (DRO)			39.2 15.0	<15.0 15.0			
Motor Oil Range Hydrocarbons (MRO)			<15.0 15.0	<15.0 15.0			
Total TPH			39.2 15.0	<15.0 15.0			

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Kelsey Brooks
Project Manager



Certificate of Analysis Summary 608911

Tetra Tech- Midland, Midland, TX

Project Name: Graham Cracker 2 State #1H (08/22/18)



Project Id: 212C-MD-01501
Contact: Clair Gonzales
Project Location: Eddy County, NM

Date Received in Lab: Mon Dec-17-18 02:18 pm
Report Date: 20-DEC-18
Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	608911-013	608911-014	608911-015	608911-016	608911-017	608911-018
	<i>Field Id:</i>	Background 3'	Background 4'	Background 6'	T-2 4'	T-2 6'	T-2 8'
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Dec-13-18 00:00	Dec-13-18 00:00	Dec-13-18 00:00	Dec-13-18 00:00	Dec-13-18 00:00	Dec-13-18 00:00
Chloride by EPA 300	<i>Extracted:</i>	Dec-19-18 09:30	Dec-19-18 09:30	Dec-19-18 09:30	Dec-19-18 09:30	Dec-19-18 09:30	Dec-19-18 09:30
	<i>Analyzed:</i>	Dec-19-18 12:09	Dec-19-18 12:15	Dec-19-18 12:21	Dec-19-18 12:40	Dec-19-18 12:46	Dec-19-18 13:09
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		539 5.00	97.0 4.96	500 4.95	573 25.0	314 24.8	334 25.0

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Kelsey Brooks
Project Manager



Certificate of Analysis Summary 608911

Tetra Tech- Midland, Midland, TX

Project Name: Graham Cracker 2 State #1H (08/22/18)



Project Id: 212C-MD-01501
Contact: Clair Gonzales
Project Location: Eddy County, NM

Date Received in Lab: Mon Dec-17-18 02:18 pm
Report Date: 20-DEC-18
Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	608911-019					
	Field Id:	T-2 10'					
	Depth:						
	Matrix:	SOIL					
	Sampled:	Dec-13-18 00:00					
Chloride by EPA 300	Extracted:	Dec-19-18 09:30					
	Analyzed:	Dec-19-18 13:16					
	Units/RL:	mg/kg RL					
Chloride		519 24.8					

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Kelsey Brooks
Project Manager

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit

SDL Sample Detection Limit

LOD Limit of Detection

PQL Practical Quantitation Limit

MQL Method Quantitation Limit

LOQ Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

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



Form 2 - Surrogate Recoveries

Project Name: Graham Cracker 2 State #1H (08/22/18)

Work Orders : 608911,

Lab Batch #: 3073441

Sample: 608911-001 / SMP

Project ID: 212C-MD-01501

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/18/18 01:25

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0247	0.0300	82	70-130	
4-Bromofluorobenzene	0.0400	0.0300	133	70-130	**

Lab Batch #: 3073441

Sample: 608911-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/18/18 01:44

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0305	0.0300	102	70-130	
4-Bromofluorobenzene	0.0300	0.0300	100	70-130	

Lab Batch #: 3073441

Sample: 608911-008 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/18/18 02:03

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0309	0.0300	103	70-130	
4-Bromofluorobenzene	0.0286	0.0300	95	70-130	

Lab Batch #: 3073441

Sample: 608911-009 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/18/18 02:22

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0315	0.0300	105	70-130	
4-Bromofluorobenzene	0.0295	0.0300	98	70-130	

Lab Batch #: 3073492

Sample: 608911-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/19/18 12:41

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	90.9	99.6	91	70-135	
o-Terphenyl	45.3	49.8	91	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: Graham Cracker 2 State #1H (08/22/18)

Work Orders : 608911,

Lab Batch #: 3073492

Sample: 608911-002 / SMP

Project ID: 212C-MD-01501

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/19/18 13:00

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	99.0	99.8	99	70-135	
o-Terphenyl	48.9	49.9	98	70-135	

Lab Batch #: 3073492

Sample: 608911-008 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/19/18 14:00

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	95.4	99.7	96	70-135	
o-Terphenyl	47.3	49.9	95	70-135	

Lab Batch #: 3073492

Sample: 608911-009 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/19/18 14:20

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	88.5	99.9	89	70-135	
o-Terphenyl	44.0	50.0	88	70-135	

Lab Batch #: 3073441

Sample: 7668269-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/17/18 21:02

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0299	0.0300	100	70-130	
4-Bromofluorobenzene	0.0241	0.0300	80	70-130	

Lab Batch #: 3073492

Sample: 7668387-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/19/18 08:21

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	108	100	108	70-135	
o-Terphenyl	55.1	50.0	110	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: Graham Cracker 2 State #1H (08/22/18)

Work Orders : 608911,

Lab Batch #: 3073441

Sample: 7668269-1-BKS / BKS

Project ID: 212C-MD-01501

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/17/18 19:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0305	0.0300	102	70-130	
4-Bromofluorobenzene	0.0257	0.0300	86	70-130	

Lab Batch #: 3073492

Sample: 7668387-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/19/18 08:41

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	123	100	123	70-135	
o-Terphenyl	64.4	50.0	129	70-135	

Lab Batch #: 3073441

Sample: 7668269-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/17/18 19:47

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0305	0.0300	102	70-130	
4-Bromofluorobenzene	0.0259	0.0300	86	70-130	

Lab Batch #: 3073492

Sample: 7668387-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 12/19/18 09:01

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	119	100	119	70-135	
o-Terphenyl	59.7	50.0	119	70-135	

Lab Batch #: 3073441

Sample: 608945-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/17/18 20:06

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1,4-Difluorobenzene	0.0254	0.0300	85	70-130	
4-Bromofluorobenzene	0.0380	0.0300	127	70-130	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries

Project Name: Graham Cracker 2 State #1H (08/22/18)

Work Orders : 608911,

Lab Batch #: 3073492

Sample: 608795-001 S / MS

Project ID: 212C-MD-01501

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/19/18 09:42

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	121	99.8	121	70-135	
o-Terphenyl	50.9	49.9	102	70-135	

Lab Batch #: 3073441

Sample: 608945-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/17/18 20:25

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0303	0.0300	101	70-130	
4-Bromofluorobenzene	0.0262	0.0300	87	70-130	

Lab Batch #: 3073492

Sample: 608795-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 12/19/18 10:02

SURROGATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	122	99.7	122	70-135	
o-Terphenyl	51.4	49.9	103	70-135	

* Surrogate outside of Laboratory QC limits

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



BS / BSD Recoveries



Project Name: Graham Cracker 2 State #1H (08/22/18)

Work Order #: 608911

Project ID: 212C-MD-01501

Analyst: SCM

Date Prepared: 12/17/2018

Date Analyzed: 12/17/2018

Lab Batch ID: 3073441

Sample: 7668269-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.000384	0.0998	0.0965	97	0.101	0.0956	95	1	70-130	35	
Toluene	<0.000455	0.0998	0.0892	89	0.101	0.0887	88	1	70-130	35	
Ethylbenzene	<0.000564	0.0998	0.0971	97	0.101	0.0962	95	1	70-130	35	
m,p-Xylenes	<0.00101	0.200	0.176	88	0.201	0.175	87	1	70-130	35	
o-Xylene	<0.000344	0.0998	0.0856	86	0.101	0.0851	84	1	70-130	35	

Analyst: CHE

Date Prepared: 12/18/2018

Date Analyzed: 12/18/2018

Lab Batch ID: 3073354

Sample: 7668303-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	250	256	102	250	273	109	6	90-110	20	

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

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

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

All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries



Project Name: Graham Cracker 2 State #1H (08/22/18)

Work Order #: 608911

Project ID: 212C-MD-01501

Analyst: CHE

Date Prepared: 12/19/2018

Date Analyzed: 12/19/2018

Lab Batch ID: 3073512

Sample: 7668352-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	250	266	106	250	264	106	1	90-110	20	

Analyst: ARM

Date Prepared: 12/18/2018

Date Analyzed: 12/19/2018

Lab Batch ID: 3073492

Sample: 7668387-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Gasoline Range Hydrocarbons (GRO)	<8.00	1000	1070	107	1000	1050	105	2	70-135	20	
Diesel Range Organics (DRO)	<8.13	1000	1180	118	1000	1140	114	3	70-135	20	

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

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

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

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: Graham Cracker 2 State #1H (08/22/18)

Work Order #: 608911

Project ID: 212C-MD-01501

Lab Batch ID: 3073441

QC- Sample ID: 608945-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/17/2018

Date Prepared: 12/17/2018

Analyst: SCM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.000387	0.101	0.0678	67	0.0996	0.0850	85	23	70-130	35	X
Toluene	<0.000458	0.101	0.0759	75	0.0996	0.0789	79	4	70-130	35	
Ethylbenzene	<0.000568	0.101	0.0886	88	0.0996	0.0836	84	6	70-130	35	
m,p-Xylenes	<0.00102	0.201	0.173	86	0.199	0.151	76	14	70-130	35	
o-Xylene	<0.000346	0.101	0.0869	86	0.0996	0.0736	74	17	70-130	35	

Lab Batch ID: 3073354

QC- Sample ID: 608910-017 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/18/2018

Date Prepared: 12/18/2018

Analyst: CHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	1090	248	1320	93	248	1320	93	0	90-110	20	

Lab Batch ID: 3073354

QC- Sample ID: 608910-023 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/19/2018

Date Prepared: 12/18/2018

Analyst: CHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	65.7	250	312	99	250	307	97	2	90-110	20	

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

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

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



Form 3 - MS / MSD Recoveries



Project Name: Graham Cracker 2 State #1H (08/22/18)

Work Order #: 608911

Project ID: 212C-MD-01501

Lab Batch ID: 3073512

QC- Sample ID: 608911-007 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/19/2018

Date Prepared: 12/19/2018

Analyst: CHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	890	249	1140	100	249	1120	92	2	90-110	20	

Lab Batch ID: 3073512

QC- Sample ID: 608911-015 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/19/2018

Date Prepared: 12/19/2018

Analyst: CHE

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	500	248	733	94	248	720	89	2	90-110	20	X

Lab Batch ID: 3073492

QC- Sample ID: 608795-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 12/19/2018

Date Prepared: 12/18/2018

Analyst: ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<7.99	998	975	98	997	987	99	1	70-135	20	
Diesel Range Organics (DRO)	<8.11	998	1050	105	997	1060	106	1	70-135	20	

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

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

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

Analysis Request of Chain of Custody Record



Tetra Tech, Inc.

4000 N. Big Spring Street, Ste
401 Midland, Texas 79705
Tel (432) 682-4559
Fax (432) 682-3946

Page

2 of 2

Client Name:		COG		Site Manager:		Clair Gonzales	
Project Name:		Graham Cracker 2 State #1H		Project #:		212C-MD-01501	
Project Location: (county, state)		Eddy County, NM		Invoice to:		COG - Attn: Ike Tavaréz	
Receiving Laboratory:		Xenco		Sampler Signature:		John Kell	
Comments:							

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING		MATRIX		PRESERVATIVE METHOD				# CONTAINERS	FILTERED (Y/N)	
		YEAR	DATE	TIME	WATER	SOIL	HCL	HNO ₃	ICE			
	Background 1'		12/13/2018		X			X			1	
	Background 2'		12/13/2018		X			X			1	
	Background 3'		12/13/2018		X			X			1	
	Background 4'		12/13/2018		X			X			1	
	Background 6'		12/13/2018		X			X			1	
	T-2 4'		12/13/18					X			1	
	T-2 6'		12/13/18					X			1	
	T-2 8'		12/13/18					X			1	
	T-2 10'		12/13/18					X			1	

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
<i>Clair Gonzales</i>	12/17/18	1414	<i>John Kell</i>	12/17/18	1418
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

ORIGINAL COPY

LAB USE ONLY	REMARKS:	Sample Temperature	
		34.3	34.3
<input checked="" type="checkbox"/> RUSH: Same Day 24 hr 48 hr <u>72 hr</u> <input type="checkbox"/> Rush Charges Authorized <input type="checkbox"/> Special Report Limits or TRRP Report			

ANALYSIS REQUEST (Circle or Specify Method No.)	
BTEX 8021B	BTEX 8260B
TPH TX1005 (Ext to C35)	
TPH 8015M (GRO - DRO - ORO)	
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	
Asbestos	
Hold	

Analysis Request of Chain of Custody Record



Tetra Tech, Inc.

4000 N. Big Spring Street, Ste 401
Midland, Texas 79705
Tel (432) 682-4559
Fax (432) 682-3946

Client Name: COG		Site Manager: Clair Gonzales	
Project Name: Graham Cracker 2 State #1H (08/22/18)			
Project Location: Eddy County, NM		Project #: 212C-MD-01501	
Invoice to: COG - Attn: Ike Tavaréz			
Receiving Laboratory: Xenco		Sampler Signature: John Kell	
Comments: Run deeper samples if benzene exceeds 10 mg/kg or total BTEX exceeds 50 mg/kg. Run deeper samples if TPH exceeds 100 mg/kg.			

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING		MATRIX				PRESERVATIVE METHOD	# CONTAINERS	FILTERED (Y/N)
		DATE	TIME	WATER	SOIL	HCL	HNO ₃			
T-1 1'		12/13/2018		X				X		1
T-1 2'		12/13/2018		X				X		1
T-1 3'		12/13/2018		X				X		1
T-1 4'		12/13/2018		X				X		1
T-1 6'		12/13/2018		X				X		1
T-1 8'		12/13/2018		X				X		1
T-1 10'		12/13/2018		X				X		1
T-2 1		12/13/2018		X				X		1
T-2 2		12/13/2018		X				X		1
T-2 3		12/13/2018		X				X		1

Relinquished by: <i>Donna M. Jolley</i> Date: 12/17/18 Time: 1418	Received by: <i>[Signature]</i> Date: 12/17/18 Time: 1418	Relinquished by: _____ Date: _____ Time: _____	Received by: _____ Date: _____ Time: _____	LAB USE ONLY		REMARKS:
				Sample Temperature	3.2/3.1	
<input checked="" type="checkbox"/> RUSH: Same Day 24 hr 48 hr <u>2 hr</u> <input type="checkbox"/> Rush Charges Authorized <input type="checkbox"/> Special Report Limits or TRRP Report				ANALYSIS REQUEST (Circle or Specify Method No.) BTEX 8021B BTEX 8260B TPH TX1005 (Ext to C35) TPH 8015M (GRO - DRO - ORO) 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 Asbestos Hold		

ORIGINAL COPY



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: Tetra Tech- Midland

Date/ Time Received: 12/17/2018 02:18:00 PM

Work Order #: 608911

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist

Comments

#1 *Temperature of cooler(s)?	3.1
#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

Brianna Teel

Date: 12/17/2018

Checklist reviewed by:

Kelsey Brooks

Kelsey Brooks

Date: 12/18/2018