SITE INFORMATION

Report Type: Deferment Report 2RP-3939

General Site Information:						
Site:	**Gadwall 18 Fed Com #1**					
Company:	**Cimarex Energy**					
Section, Township and Range	**Unit C**	**Sec. 18**	**T 25S**	**R 27E**		
Lease Number:	**API No. 30-015-33496**					
County:	**Eddy County**					
GPS:	**32.13486º N**			**104.23313º W**		
Surface Owner:	**Federal**					
Mineral Owner:						
Directions:	From intersection of Whites City Rd & John D Forehand Rd travel north on John D Forehand for approximately 4.9 mi to location on east side of lease road.					

Release Data:	
Date Released:	10/12/2016
Type Release:	Oil
Source of Contamination:	Tank
Fluid Released:	200 bbls
Fluids Recovered:	70 bbls

Official Communication:			
Name:	Christine Alderman		Ike Tavarez
Company:	Cimarex Energy		Tetra Tech
Address:	600 N. Marienfield St.		4000 N. Big Spring
	Ste 600		Ste 401
City:	Midland Texas, 79701		Midland, Texas
Phone number:	(432) 853-7059		(432) 682-4559
Fax:			
Email:	calderman@cimarex.com		Ike.Tavarez@tetratech.com

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

Acceptable Soil RRAL (mg/kg)		
Benzene	***Total BTEX***	***TPH***
10	50	100

TETRA TECH

April 25, 2018

Christine Alderman
ESH Supervisor – Permian Basin
Cimarex Energy
600 N. Marienfeld St.
Midland, Texas 79701

Re: Deferment Report for the Cimarex Energy, Gadwall 18 Fed Com #1, Unit C, Section 18, Township 25 South, Range 27 East, Eddy County, New Mexico. 2RP-3939.

Ms. Alderman:

Tetra Tech, Inc. (Tetra Tech) was contacted by Cimarex Energy (Cimarex) to assess a spill that occurred at the Gadwall 18 Fed Com #1, Unit C, Section 18, Township 25 South, Range 27 East, Eddy County, New Mexico (Site). The spill site coordinates are N 32.13486º, W 104.23313°. The site location is shown on Figures 1 and 2.

Background

According to the State of New Mexico C-141 Initial Report, the leak was discovered on October 12, 2016, and released approximately two hundred (200) barrels of oil due to corrosion causing a hole to develop in an oil tank. Approximately seventy (70) barrels of oil was recovered with a vacuum truck. The release was contained inside the lined facility and measured approximately 60' x 150'. However, Cimarex inspected the liner and discovered a hole in the liner located southwest of the facility. The initial C-141 form is included in Appendix A. The release area is shown on Figure 3.

Groundwater

No water wells were listed within Section 18 on the New Mexico Office of the State Engineer's website or the USGS National Water Information database. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in the area is less than 50' below surface. However, one well is listed in Section 20 on the USGS National Water Information database, approximately 1.6 miles southeast of the site, with a reported depth to groundwater of 24' below surface. The well listed in Section 20 has a reported surface elevation of 3,125 feet above sea level. The estimated surface elevation of the site is 3,196 feet above sea level. Based on relative elevation, the estimated depth to groundwater is approximately 95' below surface. The groundwater data is shown in Appendix B.

Regulatory

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 100 mg/kg.

Spill Inspection

Initial Sampling

On November 14, 2016, Tetra Tech was onsite to collect soil samples from the release area to evaluate the soils. One auger hole (AH-1) was installed in the area of the torn liner, and two additional auger holes (AH-2 and AH-3) were installed approximately 20' apart to the east and west of auger hole (AH-1) in order to evaluate the horizontal extents. The auger holes were installed to a depth of 0.5' below surface, deeper samples were not collected due to a dense caliche formation in the area. Selected samples were analyzed for TPH analysis by EPA method 8015 modified and BTEX by EPA Method 8021B. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 1. The sample locations are shown on Figure 3.

Referring to Table 1, all samples showed elevated TPH concentrations at 0-0.5' below surface of 1,180 mg/kg (AH-1), 2,300 mg/kg (AH-2), and 1,790 mg/kg (AH-3). However, the samples showed benzene and total BTEX concentrations below the RRALs.

Additional Sampling

Based on the laboratory results, Tetra Tech returned to the site on September 5, 2017, in order to vertically define the impact. Two (2) boreholes (BH-1 and BH-2) were installed using an air rotary rig. The boreholes (BH-1 and BH-2) were installed inside the bermed facility to total depths of 16'-17' and 19'-20' below surface, respectively. Due to access and safety issues, BH-1 was installed in between auger holes (AH-1 and AH-2) and BH-2 was installed in the southeast corner of the facility. Groundwater was not encountered during the drilling activities. Selected samples were analyzed for TPH analysis by EPA method 8015 modified and BTEX by EPA Method 8021B. 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 borehole (BH-1) showed elevated TPH concentrations above the RRAL in the shallow soils. The area of borehole (BH-1) showed a TPH high of 3,390 mg/kg at 2'-3' below surface. The TPH impact then declined with depth to below the laboratory reporting limits at 4'-5' and showed a bottom hole concentration of <25.0 mg/kg at 16'-17' below surface. The area of borehole (BH-2) showed a TPH concentration of 3,460 mg/kg at 0'-1' below surface, which steadily declined with depth to 120 mg/kg at 14'-15' and showed a bottom hole concentration of 95.0 mg/kg at 19'-20' below surface.

None of the samples collected showed benzene concentrations above the RRALs. Additionally, all of the samples collected at borehole (BH-2) showed total BTEX concentrations below the 50 mg/kg threshold, with concentrations ranging from 1.21 mg/kg (4-5') and 0.0120 mg/kg (19-20'). The area of borehole (BH-1) showed an elevated total BTEX concentration of 275 mg/kg at 2-3', which declined with depth to 0.177 mg/kg at 4-5', and showed a bottom hole concentration below the laboratory reporting limit at 16-17' below surface.

Conclusion

The release area is inside a lined facility with access issues. Due to the equipment and tanks inside the facility, the impacted areas are not accessible. Cimarex will make an attempt to pull the liner in the areas of boreholes (BH-1 and BH-2) in order to remove 2.0'-3.0' of the impacted material. Once the area is excavated to the maximum extent possible and backfilled with clean material, the liner will be replaced and repaired. The removed soil will either be remediated onsite or hauled for proper disposal.

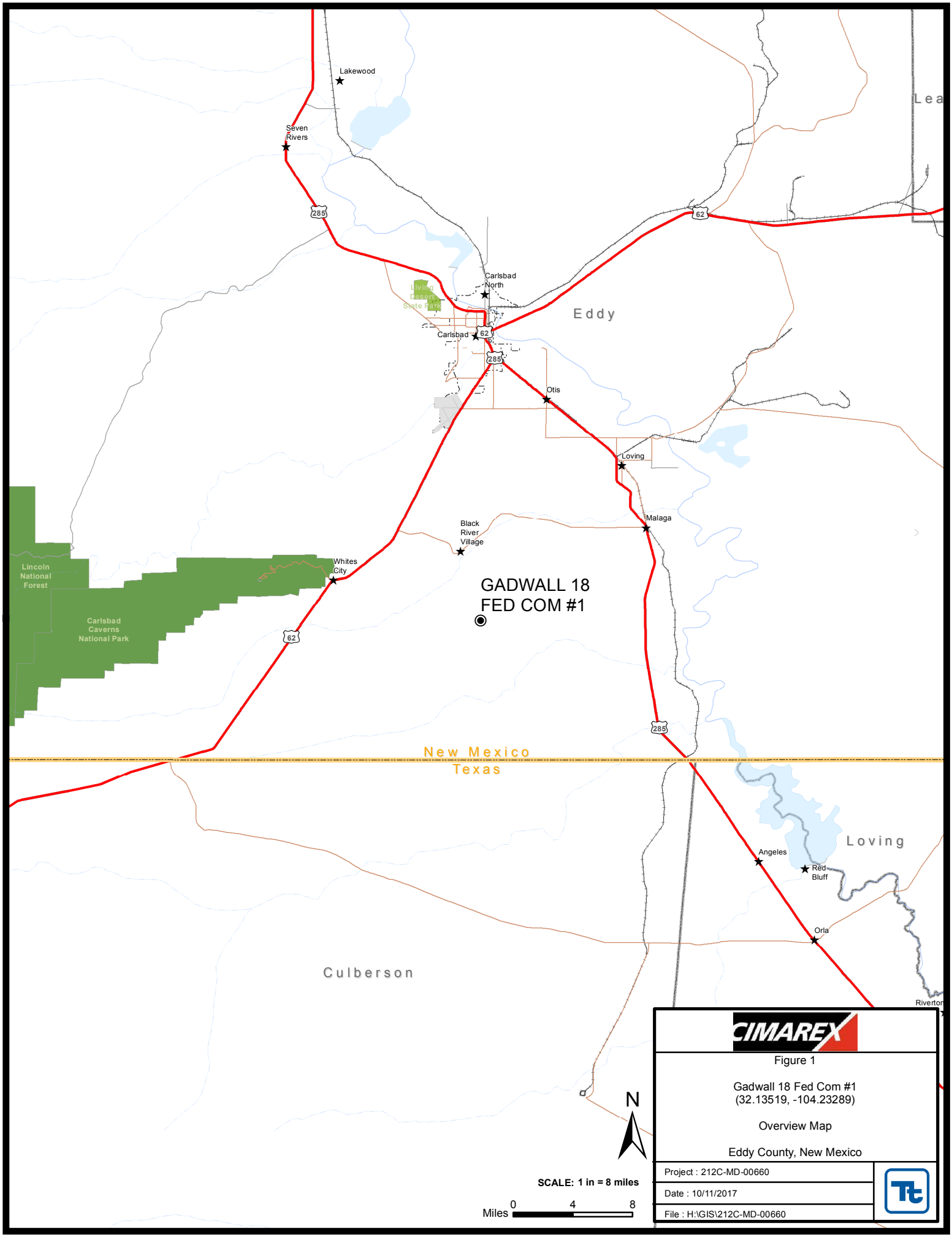
Due to the safety issues, Cimarex proposes to defer the remaining impacted areas until abandonment. The liner will be inspected for integrity and any tears will be repaired. If you have any questions or comments concerning the assessment activities for this site, please call me at (432) 682-4559.

Respectfully submitted,
TETRA TECH

Ike Tavarez, PG
Senior Project Manager

Clair Gonzales,
Geologist I

Figures



CIMAREX

Figure 1

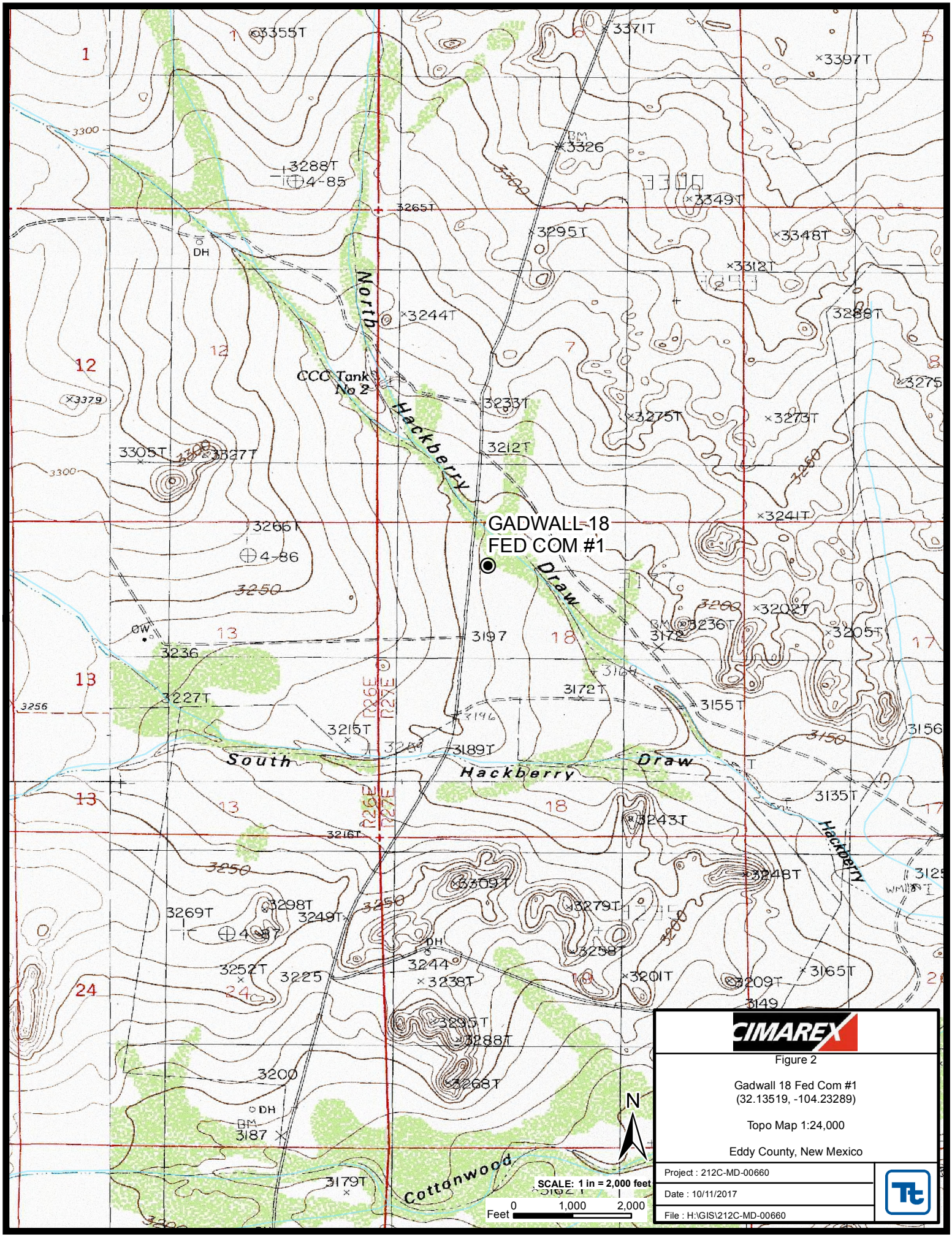
Gadwall 18 Fed Com #1
(32.13519, -104.23289)

Overview Map

Eddy County, New Mexico

Project : 212C-MD-00660	
Date : 10/11/2017	
File : H:\GIS\212C-MD-00660	

Mapped By: Isabel Marmolejo



CIMAREX

Figure 2

Gadwall 18 Fed Com #1
(32.13519, -104.23289)

Topo Map 1:24,000

Eddy County, New Mexico

Project : 212C-MD-00660

Date : 10/11/2017

File : H:\GIS\212C-MD-00660

Mapped By: Isabel Marmolejo

CIMAREX

Figure 3

Gadwall 18 Fed Com #1
(32.13519, -104.23289)

Spill Assessment Map

Eddy County, New Mexico

Project : 212C-MD-00660	
Date : 10/11/2017	
File : H:\GIS\212C-MD-00660	

Mapped By: Isabel Marmolejo

Mapped By: Isabel Marmolejo

Tables

Table 1
Cimarex
Gadwall 18 Fed Com #1
Eddy County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Soil Status		TPH (mg/kg)			Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)
			In-Situ	Removed	GRO	DRO	Total					
AH-1	11/14/2016	0-0.5	X		**562**	**614**	**1,180**	<0.106	3.30	0.302	14.5	18.1
AH-2	11/14/2016	0-0.5	X		**928**	**1,370**	**2,300**	0.128	3.79	2.69	21.9	28.5
BH-1	9/5/2017	0-1	X		**242**	**562**	**804**	<0.00201	0.0264	<0.00201	0.248	0.275
	"	2-3	X		**1,530**	**1,830**	**3,390**	<0.500	35.0	24.1	216	**275**
	"	4-5	X		<24.9	<24.9	<24.9	<0.00200	0.0259	<0.00200	0.151	0.177
	"	16-17	X		<25.0	<25.0	<25.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
AH-3	11/14/2016	0-0.5	X		**1,130**	**658**	**1,790**	0.326	8.55	0.714	30.9	40.5
BH-2	9/5/2017	0-1	X		**220**	**3,240**	**3,460**	0.00954	0.0855	0.0308	0.278	0.404
	"	2-3	X		**110**	**1,390**	**1,500**	0.00517	0.0114	0.0381	0.3920	0.549
	"	4-5	X		**92.8**	**345**	**438**	<0.00364	0.213	0.0431	0.958	1.21
	"	6-7	X		**32.7**	**404**	**437**	<0.00394	0.0297	0.0105	0.163	0.203
	"	9-10	X		**<25.0**	**157**	**157**	-	-	-	-	-
	"	14-15	X		**<24.9**	**120**	**120**	-	-	-	-	-
	"	19-20	X		<24.9	95.0	95.0	<0.00200	<0.00200	<0.00200	0.0120	0.0120

Photos

Cimarex Energy
Gadwall 18 Fed Com #1
Eddy County, New Mexico

View East – Areas of AH-1 and AH-2

View West – Area of AH-3

Cimarex Energy
Gadwall 18 Fed Com #1
Eddy County, New Mexico

View North – Area of BH-1

View North – Area of BH-2

Appendix A

NM OIL CONSERVATION
ARTESIA DISTRICT
OCT 13 2016
RECEIVED

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

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised August 8, 2011

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

Release Notification and Corrective Action

nAB1628854271

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company Cimarex Energy 162683	Contact Christine Alderman
Address 600 N Marienfeld Ste 600 Midland TX	Telephone No. 432-853-7059
Facility Name Gadwall 18 Fed Com 1	Facility Type production

Surface Owner Fed	Mineral Owner	API No. 30-015-33496

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
C	18	25S	27E	850	N	1490	W	Eddy

Latitude_32.13486_**Longitude** -104.23313

NATURE OF RELEASE

Type of Release crude oil	Volume of Release 200 bbls	Volume Recovered 70 bbls
Source of Release tank	Date and Hour of Occurrence 10/12/2016	Date and Hour of Discovery 10/12/2016
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Shelly Tucker/Heather Patterson	
By Whom? Christine Alderman	Date and Hour 10/13/2016	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.

Describe Cause of Problem and Remedial Action Taken.
Tank developed corrosion hole. Fluid released into a lined, gravel filled containment.

Describe Area Affected and Cleanup Action Taken.
Once fluids were recovered it was noted that there was a hole in the liner, therefore 130 bbls were lost to the soils. We will delineate to determine depth of contamination.

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

Signature:

Printed Name: Christine Alderman

Title: ESH Supervisor

E-mail Address: calderman@cimarex.com

Date: 10/13/2016 Phone: 432-853-7059

OIL CONSERVATION DIVISION

Approved by Environmental Specialist: Signed By Mike Bratcher

Approval Date: 10/14/16 Expiration Date: N/A

Conditions of Approval: Attached ☐
Remediation per O.C.D. Rules & Guidelines
SUBMIT REMEDIATION PROPOSAL NO
LATER THAN: 11/14/16

2RP-3939

* Attach Additional Sheets If Necessary

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
Cimarex - Gadwall 18 Fed Com #1
Eddy County, New Mexico

24 South 26 East

6 63	5	4	3	2	1
7 250	8 450	9	10	11	12
18 650	17	16	15	14 30	13
19	20	21	22	23 38 37	24 28 30
30 70	29 46	28	27 30	26	25
31	32 111 109	33	34	35	36

24 South 27 East

6	5	4	3	2	1
7	8 17 26	9 43	10	11	12 27
18 30 34	17	16	15	14	13 30 31
19	20	21	22 70	23	24
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

25 South 26 East

6	5	4	3 45	2	1
7 60	8	9 45	10	11	12
18	17	16	15	14	13
19	20	21	22 118	23	24
30	29	28	27	26	25
31	32	33	34	35	36

25 South 27 East

6	5	4	3	2	1
7	8	9	10	11	12 92
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	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 67	17	16	15 48 49	14	13
19	20 96	21	22	23	24
30	29 15	28 90	27	26 40	25
31	32	33	34	35	36 40

26 South 26 East

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

88 New Mexico State Engineers Well Reports

105 USGS Well Reports

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

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

34 NMOCD - Groundwater Data

123 Tetra Tech installed temporary wells and field water level

143 NMOCD Groundwater map well location

New Mexico Office of the State Engineer

Water Column/Average Depth to Water

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

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

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

(NAD83 UTM in meters)

(In feet)

POD Number	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
C 02588		C	ED	3	4	3	33	25S	27E	575645	3549575*	81	19	62
C 03261 POD1			ED	3	2	1	20	25S	27E	574007	3554006*	351		
C 03262 POD1		C	ED	2	1	2	22	25S	27E	577837	3554244*	75		
C 03264 POD1		C	ED	2	1	2	02	25S	27E	579391	3559099*			
C 03938 POD1		CUB	ED	2	2	2	25	25S	27E	581482	3552616	21	12	9

Average Depth to Water: **15 feet**

Minimum Depth: **12 feet**

Maximum Depth: **19 feet**

Record Count: 5

PLSS Search:

Township: 25S **Range:** 27E

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

10/5/17 9:33 AM

WATER COLUMN/ AVERAGE DEPTH TO WATER

Appendix C

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
200 East Sunset Road, Suite E El Paso, Texas 79922 915•585•3443 FAX 915•585•4944
5002 Basin Street, Suite A1 Midland, Texas 79703 432•689•6301 FAX 432•689•6313
(BioAquatic) 2501 Mayes Rd., Suite 100 Carrollton, Texas 75006 972•242•7750
E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

Certifications

WBE HUB NCTRCA DBE NELAP Kansas Oklahoma

Analytical and Quality Control Report

(Corrected Report)

Ike Tavarez
Tetra Tech
4000 N. Big Spring
Ste. 401
Midland, TX, 79705

Report Date: November 23, 2016

Work Order: 16111603

Project Location: Eddy Co, NM
Project Name: Cimarex-Gadwall 18
Project Number: 212C-MD-00660

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
432040	AH-1 (0-6")	soil	2016-11-14	00:00	2016-11-15
432041	AH-2 (0-6")	soil	2016-11-14	00:00	2016-11-15
432042	AH-3 (0-6")	soil	2016-11-14	00:00	2016-11-15

Report Corrections (Work Order 16111603)

- 11/23/16: Added Project Number to report.

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TraceAnalysis, Inc. uses the attached chain of custody (COC) as the laboratory check-in documentation which includes sample receipt, temperature, sample preservation method and condition, collection date and time, testing requested, company, sampler, contacts and any special remarks.

This report consists of a total of 21 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director
James Taylor, Assistant Director
Johnny Grindstaff, Operations Manager

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QC Batch 133916 - Method Blank (1) . . . 9
QC Batch 133927 - Method Blank (1) . . . 9
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QC Batch 133927 - LCS (1) . . . 12
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Case Narrative

Samples for project Cimarex-Gadwall 18 were received by TraceAnalysis, Inc. on 2016-11-15 and assigned to work order 16111603. Samples for work order 16111603 were received intact at a temperature of 4.4 C.

Samples were analyzed for the following tests using their respective methods.

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
BTEX	S 8021B	113525	2016-11-16 at 08:09	133915	2016-11-18 at 08:09
TPH DRO	S 8015 D	113536	2016-11-17 at 16:00	133927	2016-11-18 at 11:21
TPH GRO	S 8015 D	113525	2016-11-16 at 08:09	133916	2016-11-18 at 08:12
TPH GRO	S 8015 D	113566	2016-11-19 at 15:00	133964	2016-11-21 at 12:48

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 16111603 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Sample: 432040 - AH-1 (0-6")

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	133915	Date Analyzed:	2016-11-18	Analyzed By:	AK
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Benzene [1]		3	<0.106	mg/Kg	5.3	0.0200
Toluene		3	**3.30**	mg/Kg	5.3	0.0200
Ethylbenzene		3	**0.302**	mg/Kg	5.3	0.0200
Xylene		3	**14.5**	mg/Kg	5.3	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			9.48	mg/Kg	5.3	10.0	95	70 - 130
4-Bromofluorobenzene (4-BFB)			13.0	mg/Kg	5.3	10.0	130	70 - 130

Sample: 432040 - AH-1 (0-6")

Laboratory:	Lubbock				
Analysis:	TPH DRO	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	133927	Date Analyzed:	2016-11-18	Analyzed By:	HJ
Prep Batch:	113536	Sample Preparation:	2016-11-17	Prepared By:	HJ

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
DRO		1,2	**614**	mg/Kg	10	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	Qsr	Qsr	65.8	mg/Kg	10	20.0	329	70 - 130

Sample: 432040 - AH-1 (0-6")

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	133916	Date Analyzed:	2016-11-18	Analyzed By:	AK
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO	Qr	3	**562**	mg/Kg	5.3	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			9.58	mg/Kg	5.3	10.0	96	70 - 130
4-Bromofluorobenzene (4-BFB)	Qsr	Qsr	15.9	mg/Kg	5.3	10.0	159	70 - 130

Sample: 432041 - AH-2 (0-6")

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	133915	Date Analyzed:	2016-11-18	Analyzed By:	AK
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Benzene		3	**0.128**	mg/Kg	5.3	0.0200
Toluene		3	**3.79**	mg/Kg	5.3	0.0200
Ethylbenzene		3	**2.69**	mg/Kg	5.3	0.0200
Xylene		3	**21.9**	mg/Kg	5.3	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			9.43	mg/Kg	5.3	10.0	94	70 - 130
4-Bromofluorobenzene (4-BFB)			17.0	mg/Kg	5.3	10.0	170	70 - 130

Sample: 432041 - AH-2 (0-6")

Laboratory:	Lubbock				
Analysis:	TPH DRO	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	133927	Date Analyzed:	2016-11-18	Analyzed By:	HJ
Prep Batch:	113536	Sample Preparation:	2016-11-17	Prepared By:	HJ

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO		1,2	**1370**	mg/Kg	10	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane	Qsr	Qsr	116	mg/Kg	10	20.0	580	70 - 130

Sample: 432041 - AH-2 (0-6")

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	133964	Date Analyzed:	2016-11-21	Analyzed By:	AK
Prep Batch:	113566	Sample Preparation:	2016-11-19	Prepared By:	AK

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
GRO		3	**928**	mg/Kg	53	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			98.6	mg/Kg	53	100	99	70 - 130
4-Bromofluorobenzene (4-BFB)			107	mg/Kg	53	100	107	70 - 130

Sample: 432042 - AH-3 (0-6")

Laboratory:	Midland				
Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	133915	Date Analyzed:	2016-11-18	Analyzed By:	AK
Prep Batch:	113525	Sample Preparation:	2016-11-16	Prepared By:	AK

Parameter	Flag	Cert	Result	RL Units	Dilution	RL
Benzene		3	**0.326**	mg/Kg	5.3	0.0200
Toluene		3	**8.55**	mg/Kg	5.3	0.0200
Ethylbenzene		3	**0.714**	mg/Kg	5.3	0.0200
Xylene		3	**30.9**	mg/Kg	5.3	0.0200

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			9.04	mg/Kg	5.3	10.0	90	70 - 130
4-Bromofluorobenzene (4-BFB)			15.0	mg/Kg	5.3	10.0	150	70 - 130

Sample: 432042 - AH-3 (0-6")

Laboratory:	Lubbock				
Analysis:	TPH DRO	Analytical Method:	S 8015 D	Prep Method:	N/A
QC Batch:	133927	Date Analyzed:	2016-11-18	Analyzed By:	HJ
Prep Batch:	113536	Sample Preparation:	2016-11-17	Prepared By:	HJ

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
DRO		1,2	**658**	mg/Kg	10	50.0

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane Qsr	Qsr		62.2	mg/Kg	10	20.0	311	70 - 130

Sample: 432042 - AH-3 (0-6")

Laboratory:	Midland				
Analysis:	TPH GRO	Analytical Method:	S 8015 D	Prep Method:	S 5035
QC Batch:	133964	Date Analyzed:	2016-11-21	Analyzed By:	AK
Prep Batch:	113566	Sample Preparation:	2016-11-19	Prepared By:	AK

Parameter	Flag	Cert	RL Result	Units	Dilution	RL
GRO		3	**1130**	mg/Kg	53	4.00

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			97.8	mg/Kg	53	100	98	70 - 130
4-Bromofluorobenzene (4-BFB)			105	mg/Kg	53	100	105	70 - 130

Method Blanks

Method Blank (1) QC Batch: 133915

QC Batch: 133915 | Date Analyzed: 2016-11-18 | Analyzed By: AK
Prep Batch: 113525 | QC Preparation: 2016-11-16 | Prepared By: AK

Parameter	Flag	Cert	MDL Result	Units	RL
Benzene		3	<0.0106	mg/Kg	0.02
Toluene		3	<0.0165	mg/Kg	0.02
Ethylbenzene		3	<0.0160	mg/Kg	0.02
Xylene		3	<0.00456	mg/Kg	0.02

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.04	mg/Kg	1.06	2.00	102	70 - 130
4-Bromofluorobenzene (4-BFB)			1.89	mg/Kg	1.06	2.00	94	70 - 130

Method Blank (1) QC Batch: 133916

QC Batch: 133916 | Date Analyzed: 2016-11-18 | Analyzed By: AK
Prep Batch: 113525 | QC Preparation: 2016-11-16 | Prepared By: AK

Parameter	Flag	Cert	MDL Result	Units	RL
GRO		3	<1.86	mg/Kg	4

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.17	mg/Kg	1.06	2.00	108	70 - 130
4-Bromofluorobenzene (4-BFB)			1.79	mg/Kg	1.06	2.00	90	70 - 130

Method Blank (1) QC Batch: 133927

QC Batch: 133927 | Date Analyzed: 2016-11-18 | Analyzed By: HJ
Prep Batch: 113536 | QC Preparation: 2016-11-17 | Prepared By: HJ

Parameter	Flag	Cert	MDL Result	Units	RL
DRO		1,2	<8.47	mg/Kg	50

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane			16.6	mg/Kg	1	20.0	83	70 - 130

Method Blank (1) QC Batch: 133964

QC Batch:	133964	Date Analyzed:	2016-11-21	Analyzed By:	AK
Prep Batch:	113566	QC Preparation:	2016-11-19	Prepared By:	AK

Parameter	Flag	Cert	MDL Result	Units	RL
GRO		3	<1.86	mg/Kg	4

Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)			2.05	mg/Kg	1.06	2.00	102	70 - 130
4-Bromofluorobenzene (4-BFB)			1.79	mg/Kg	1.06	2.00	90	70 - 130

Laboratory Control Spikes

Laboratory Control Spike (LCS-1)

QC Batch: 133915 | Date Analyzed: 2016-11-18 | Analyzed By: AK
Prep Batch: 113525 | QC Preparation: 2016-11-16 | Prepared By: AK

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		3	1.86	mg/Kg	1.06	2.00	<0.0106	93	70 - 130
Toluene		3	1.95	mg/Kg	1.06	2.00	<0.0165	98	70 - 130
Ethylbenzene		3	1.99	mg/Kg	1.06	2.00	<0.0160	100	70 - 130
Xylene		3	6.00	mg/Kg	1.06	6.00	<0.00456	100	70 - 130

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		3	1.98	mg/Kg	1.06	2.00	<0.0106	99	70 - 130	6	20
Toluene		3	1.86	mg/Kg	1.06	2.00	<0.0165	93	70 - 130	5	20
Ethylbenzene		3	1.85	mg/Kg	1.06	2.00	<0.0160	92	70 - 130	7	20
Xylene		3	5.57	mg/Kg	1.06	6.00	<0.00456	93	70 - 130	7	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.02	1.92	mg/Kg	1.06	2.00	101	96	70 - 130
4-Bromofluorobenzene (4-BFB)	2.05	1.96	mg/Kg	1.06	2.00	102	98	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 133916 | Date Analyzed: 2016-11-18 | Analyzed By: AK
Prep Batch: 113525 | QC Preparation: 2016-11-16 | Prepared By: AK

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		3	20.7	mg/Kg	1	20.0	<1.76	104	70 - 130

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

continued . . .

control spikes continued ...

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		[3]	22.0	mg/Kg	1	20.0	<1.76	110	70 - 130	6	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.05	2.03	mg/Kg	1	2.00	102	102	70 - 130
4-Bromofluorobenzene (4-BFB)	1.86	1.88	mg/Kg	1	2.00	93	94	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 133927 | Date Analyzed: 2016-11-18 | Analyzed By: HJ
Prep Batch: 113536 | QC Preparation: 2016-11-17 | Prepared By: HJ

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		[1,2]	116	mg/Kg	1	100	<8.47	116	68.5 - 136

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO		[1,2]	109	mg/Kg	1	100	<8.47	109	68.5 - 136	6	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Tricosane	20.9	20.0	mg/Kg	1	20.0	104	100	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 133964 | Date Analyzed: 2016-11-21 | Analyzed By: AK
Prep Batch: 113566 | QC Preparation: 2016-11-19 | Prepared By: AK

Param	F	C	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		[3]	18.8	mg/Kg	1.06	20.0	<1.86	94	70 - 130

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

Param	F	C	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		[3]	19.5	mg/Kg	1.06	20.0	<1.86	98	70 - 130	4	20

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

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.01	1.99	mg/Kg	1.06	2.00	100	100	70 - 130
4-Bromofluorobenzene (4-BFB)	1.80	1.82	mg/Kg	1.06	2.00	90	91	70 - 130

Matrix Spikes

Matrix Spike (MS-1) Spiked Sample: 432013

QC Batch: 133915 | Date Analyzed: 2016-11-18 | Analyzed By: AK
Prep Batch: 113525 | QC Preparation: 2016-11-16 | Prepared By: AK

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene		3	1.81	mg/Kg	1.06	2.00	<0.0106	90	70 - 130
Toluene		3	1.80	mg/Kg	1.06	2.00	<0.0165	90	70 - 130
Ethylbenzene		3	1.88	mg/Kg	1.06	2.00	<0.0160	94	70 - 130
Xylene		3	5.63	mg/Kg	1.06	6.00	<0.00456	94	70 - 130

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene		3	1.75	mg/Kg	1.06	2.00	<0.0106	88	70 - 130	3	20
Toluene		3	1.76	mg/Kg	1.06	2.00	<0.0165	88	70 - 130	2	20
Ethylbenzene		3	1.91	mg/Kg	1.06	2.00	<0.0160	96	70 - 130	2	20
Xylene		3	5.84	mg/Kg	1.06	6.00	<0.00456	97	70 - 130	4	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	2.09	1.99	mg/Kg	1.06	2	104	100	70 - 130
4-Bromofluorobenzene (4-BFB)	2.01	2.08	mg/Kg	1.06	2	100	104	70 - 130

Matrix Spike (MS-1) Spiked Sample: 432013

QC Batch: 133916 | Date Analyzed: 2016-11-18 | Analyzed By: AK
Prep Batch: 113525 | QC Preparation: 2016-11-16 | Prepared By: AK

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		3	17.0	mg/Kg	1	20.0	<1.76	85	70 - 130

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

continued ...

matrix spikes continued ...

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO	Qr	Qr [3]	20.8	mg/Kg	1	20.0	<1.76	104	70 - 130	20	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.97	2.02	mg/Kg	1	2	98	101	70 - 130
4-Bromofluorobenzene (4-BFB)	1.85	1.88	mg/Kg	1	2	92	94	70 - 130

Matrix Spike (MS-1) Spiked Sample: 432013

QC Batch: 133927 | Date Analyzed: 2016-11-18 | Analyzed By: HJ
Prep Batch: 113536 | QC Preparation: 2016-11-17 | Prepared By: HJ

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO		[1,2]	125	mg/Kg	1	100	<8.47	125	49.3 - 138

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO		[1,2]	125	mg/Kg	1	100	<8.47	125	49.3 - 138	0	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Tricosane	23.0	23.2	mg/Kg	1	20	115	116	70 - 130

Matrix Spike (xMS-1) Spiked Sample: 432013

QC Batch: 133964 | Date Analyzed: 2016-11-21 | Analyzed By: AK
Prep Batch: 113566 | QC Preparation: 2016-11-19 | Prepared By: AK

Param	F	C	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO		[3]	15.0	mg/Kg	1	20.0	<1.76	75	70 - 130

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

Param	F	C	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO		[3]	13.9	mg/Kg	1	20.0	<1.76	70	70 - 130	8	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.94	1.88	mg/Kg	1	2	97	94	70 - 130
4-Bromofluorobenzene (4-BFB)	1.83	1.82	mg/Kg	1	2	92	91	70 - 130

Calibration Standards

Standard (CCV-2)

QC Batch: 133915 Date Analyzed: 2016-11-18 Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		3	mg/kg	0.100	0.105	105	80 - 120	2016-11-18
Toluene		3	mg/kg	0.100	0.0991	99	80 - 120	2016-11-18
Ethylbenzene		3	mg/kg	0.100	0.0982	98	80 - 120	2016-11-18
Xylene		3	mg/kg	0.300	0.295	98	80 - 120	2016-11-18

Standard (CCV-3)

QC Batch: 133915 Date Analyzed: 2016-11-18 Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		3	mg/kg	0.100	0.103	103	80 - 120	2016-11-18
Toluene		3	mg/kg	0.100	0.104	104	80 - 120	2016-11-18
Ethylbenzene		3	mg/kg	0.100	0.0994	99	80 - 120	2016-11-18
Xylene		3	mg/kg	0.300	0.296	99	80 - 120	2016-11-18

Standard (CCV-2)

QC Batch: 133916 Date Analyzed: 2016-11-18 Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		3	mg/Kg	1.00	0.990	99	80 - 120	2016-11-18

Standard (CCV-3)

QC Batch: 133916 Date Analyzed: 2016-11-18 Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		3	mg/Kg	1.00	1.17	117	80 - 120	2016-11-18

Standard (CCV-1)

QC Batch: 133927 Date Analyzed: 2016-11-18 Analyzed By: HJ

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1,2	mg/Kg	100	84.4	84	80 - 120	2016-11-18

Standard (CCV-2)

QC Batch: 133927 Date Analyzed: 2016-11-18 Analyzed By: HJ

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		1,2	mg/Kg	100	95.3	95	80 - 120	2016-11-18

Standard (CCV-1)

QC Batch: 133964 Date Analyzed: 2016-11-21 Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		3	mg/Kg	1.00	0.970	97	80 - 120	2016-11-21

Standard (CCV-2)

QC Batch: 133964 Date Analyzed: 2016-11-21 Analyzed By: AK

Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		3	mg/Kg	1.00	1.09	109	80 - 120	2016-11-21

Appendix

Report Definitions

Name	Definition
MDL	Method Detection Limit
MQL	Minimum Quantitation Limit
SDL	Sample Detection Limit

Laboratory Certifications

C	Certifying Authority	Certification Number	Laboratory Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	Kansas	Kansas E-10317	Lubbock
2	NELAP	T104704219-16-13	Lubbock
3	NELAP	T104704392-14-8	Midland

Standard Flags

F	Description
B	Analyte detected in the corresponding method blank above the method detection limit
H	Analyzed out of hold time
J	Estimated concentration
Jb	The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
Je	Estimated concentration exceeding calibration range.
MI1	Split peak or shoulder peak
MI2	Instrument software did not integrate
MI3	Instrument software misidentified the peak
MI4	Instrument software integrated improperly
MI5	Baseline correction
Qc	Calibration check outside of laboratory limits.
Qr	RPD outside of laboratory limits
Qs	Spike recovery outside of laboratory limits.
Qsr	Surrogate recovery outside of laboratory limits.
U	The analyte is not detected above the SDL

Result Comments

1 Dilution due to excessive hydrocarbons.

Attachments

The scanned attachments will follow this page.
Please note, each attachment may consist of more than one page.

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Analysis Request of Chain of Custody Record

PAGE: 1 OF: 1

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

CLIENT NAME: Cimarex

SITE MANAGER: Ike Tavarez

PROJECT NO.:

PROJECT NAME: Cimarex - Gadwall 18 Eddy Co NM

LAB I.D. NUMBER	DATE 2016	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	FILTERED (Y/N)	PRESERVATIVE METHOD: HCL	HNO3	ICE	NONE	BTEX 8021B	TPH 8015 MOD. TX1005 (Ext. to C35)	PAH 8270	RCRA Metals Ag As Ba Cd Cr Pb Hg Se	TCLP Metals Ag As Ba Cd Vr Pd Hg Se	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC.MS Vol. 8240/8260/624	GC.MS Semi. Vol. 8270/625	PCB's 8080/608	Pest. 808/608	Chloride	Gamma Spec.	Alpha Beta (Air)	PLM (Asbestos)	Major Anions/Cations, pH, TDS
432040	11.14		S		X	AH-1 (0-6")	1	N			X	X	X	X														
041	11.14		S		X	AH-2 (0-6")	1	N			X	X	X	X														
042	11.14		S		X	AH-3 (0-6")	1	N			X	X	X	X														

RELINQUISHED BY: (Signature) Clint Wright Date: 11.15 Time:

RECEIVED BY: (Signature) Tracy Beckwith Date: 11/15/16 Time: 16:53

SAMPLED BY: (Print & Initial) Clair Gonzales Date: 11.14 Time:

RELINQUISHED BY: (Signature) Date: Time:

RECEIVED BY: (Signature) Date: Time:

SAMPLE SHIPPED BY: (Circle) FEDEX BUS HAND DELIVERED UPS

AIRBILL #:

OTHER:

RELINQUISHED BY: (Signature) Date: Time:

RECEIVED BY: (Signature) Date: Time:

RECEIVING LABORATORY: Trace

ADDRESS:

CITY: Midland STATE: Tx ZIP:

CONTACT: PHONE:

RECEIVED BY: (Signature) Tracy Beckwith

DATE: 11/15/16 TIME: 16:53

TETRA TECH CONTACT PERSON: Ike Tavarez

Results by:

RUSH Charges Authorized: Yes No

SAMPLE CONDITION WHEN RECEIVED:

REMARKS: Temp 2.4

Brenda Ward 11/17/16

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

9:40 25 24 39 08E 28/29

Analytical Report 562130

for

Tetra Tech- Midland

Project Manager: Ike Tavarez

Cimarex- Gadwall 18 Federal com #1

212C-MD-00660

28-SEP-17

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

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

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

28-SEP-17

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

Reference: XENCO Report No(s): **562130**
Cimarex- Gadwall 18 Federal com #1
Project Address: Eddy County, New Mexico

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) 562130. 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. 562130 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

Sample Cross Reference 562130

Tetra Tech- Midland, Midland, TX

Cimarex- Gadwall 18 Federal com #1

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
BH #1 (0-1')	S	09-05-17 00:00		562130-001
BH #1 (2-3')	S	09-05-17 00:00		562130-002
BH #1 (4-5')	S	09-05-17 00:00		562130-003
BH #1 (16-17')	S	09-05-17 00:00		562130-006
BH #2 (0-1')	S	09-05-17 00:00		562130-007
BH #2 (2-3')	S	09-05-17 00:00		562130-008
BH #2 (4-5')	S	09-05-17 00:00		562130-009
BH #2 (6-7')	S	09-05-17 00:00		562130-010
BH #2 (9-10)	S	09-05-17 00:00		562130-011
BH #2 (14-15')	S	09-05-17 00:00		562130-012
BH #2 (19-20')	S	09-05-17 00:00		562130-013
BH #1 (6-7')	S	09-05-17 00:00		Not Analyzed
BH #1 (11-12')	S	09-05-17 00:00		Not Analyzed

Sample receipt non conformances and comments:

562130-002, -008 released from hold for TPH 09/12 per COC instructions-- KB

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3027189 BTEX by EPA 8021B
Lab Sample ID 562130-006 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Benzene, Ethylbenzene, Toluene recovered below QC limits in the Matrix Spike. m,p-Xylenes, o-Xylene recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 562130-001, -006, -007, -013.
The Laboratory Control Sample for Toluene, Benzene, m,p-Xylenes, Ethylbenzene, o-Xylene is within laboratory Control Limits, therefore the data was accepted.
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3027465 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3027595 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3028038 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3028130 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Certificate of Analysis Summary 562130

Tetra Tech- Midland, Midland, TX

Project Name: Cimarex- Gadwall 18 Federal com #1

Project Id: 212C-MD-00660
Contact: Ike Tavarez
Project Location: Eddy County, New Mexico

Date Received in Lab: Wed Sep-06-17 01:51 pm
Report Date: 28-SEP-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	562130-001		562130-002		562130-003		562130-006		562130-007		562130-008	
	Field Id:	BH #1 (0-1')		BH #1 (2-3')		BH #1 (4-5')		BH #1 (16-17')		BH #2 (0-1')		BH #2 (2-3')	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Sep-05-17 00:00		Sep-05-17 00:00		Sep-05-17 00:00		Sep-05-17 00:00		Sep-05-17 00:00		Sep-05-17 00:00	
BTEX by EPA 8021B	***Extracted:***	Sep-08-17 08:30		Sep-13-17 08:00		Sep-13-17 13:00		Sep-08-17 08:30		Sep-08-17 08:30		Sep-13-17 08:00	
	Analyzed:	Sep-08-17 12:21		Sep-13-17 19:02		Sep-14-17 01:18		Sep-08-17 09:50		Sep-08-17 11:43		Sep-13-17 18:43	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		<0.00201	0.00201	<0.500	0.500	<0.00200	0.00200	<0.00200	0.00200	0.00954	0.00202	0.00517	0.00345
Toluene		0.0264	0.00201	35.0	0.500	0.0259	0.00200	<0.00200	0.00200	0.0855	0.00202	0.114	0.00345
Ethylbenzene		<0.00201	0.00201	24.1	0.500	<0.00200	0.00200	<0.00200	0.00200	0.0308	0.00202	0.0381	0.00345
m,p-Xylenes		0.193	0.00402	189	1.00	0.103	0.00399	<0.00399	0.00399	0.241	0.00403	0.347	0.00690
o-Xylene		0.0552	0.00201	26.8	0.500	0.0484	0.00200	<0.00200	0.00200	0.0371	0.00202	0.0452	0.00345
Total Xylenes		0.248	0.00201	216	0.500	0.151	0.00200	<0.00200	0.00200	0.278	0.00202	0.392	0.00345
Total BTEX		0.275	0.00201	275	0.500	0.177	0.00200	<0.00200	0.00200	0.404	0.00202	0.549	0.00345
TPH by Texas1005	***Extracted:***	Sep-07-17 15:00		Sep-14-17 14:00		Sep-16-17 15:00		Sep-07-17 15:00		Sep-07-17 15:00		Sep-14-17 14:00	
	Analyzed:	Sep-08-17 03:22		Sep-15-17 03:10		Sep-16-17 21:38		Sep-08-17 03:45		Sep-08-17 04:07		Sep-15-17 03:33	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
C6-C12 Range Hydrocarbons		242	25.0	1530	24.9	<24.9	24.9	<25.0	25.0	220	24.9	110	25.0
C12-C28 Range Hydrocarbons		562	25.0	1830	24.9	<24.9	24.9	<25.0	25.0	3240	24.9	1390	25.0
C28-C35 Range Hydrocarbons		<25.0	25.0	29.4	24.9	<24.9	24.9	<25.0	25.0	<24.9	24.9	<25.0	25.0
Total TPH		804	25.0	3390	24.9	<24.9	24.9	<25.0	25.0	3460	24.9	1500	25.0

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 562130

Tetra Tech- Midland, Midland, TX

Project Name: Cimarex- Gadwall 18 Federal com #1

Project Id: 212C-MD-00660
Contact: Ike Tavarez
Project Location: Eddy County, New Mexico

Date Received in Lab: Wed Sep-06-17 01:51 pm
Report Date: 28-SEP-17
Project Manager: Kelsey Brooks

Analysis Requested																	
	Lab Id:	562130-009		562130-010		562130-011		562130-012		562130-013							
	Field Id:	BH #2 (4-5')		BH #2 (6-7')		BH #2 (9-10)		BH #2 (14-15')		BH #2 (19-20')							
	Depth:																
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL							
	Sampled:	Sep-05-17 00:00		Sep-05-17 00:00		Sep-05-17 00:00		Sep-05-17 00:00		Sep-05-17 00:00							
BTEX by EPA 8021B	***Extracted:***	Sep-18-17 14:16		Sep-19-17 15:00						Sep-08-17 08:30							
	Analyzed:	Sep-19-17 03:32		Sep-20-17 10:49						Sep-08-17 12:02							
	Units/RL:	mg/kg	RL	mg/kg	RL					mg/kg	RL						
Benzene		<0.00364	0.00364	<0.00394	0.00394					<0.00200	0.00200						
Toluene		0.213	0.00364	0.0297 K	0.00394					<0.00200	0.00200						
Ethylbenzene		0.0431	0.00364	0.0105 K	0.00394					<0.00200	0.00200						
m,p-Xylenes		0.694	0.00727	0.122 K	0.00787					0.00661	0.00401						
o-Xylene		0.264	0.00364	0.0408 K	0.00394					0.00542	0.00200						
Total Xylenes		0.958	0.00364	0.163 K	0.00394					0.0120	0.00200						
Total BTEX		1.21	0.00364	0.203 K	0.00394					0.0120	0.00200						
TPH by Texas1005	***Extracted:***	Sep-16-17 15:00		Sep-20-17 17:00		Sep-21-17 17:00		Sep-21-17 17:00		Sep-07-17 15:00							
	Analyzed:	Sep-16-17 22:01		Sep-21-17 04:35		Sep-22-17 13:05		Sep-22-17 13:30		Sep-08-17 04:31							
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL						
C6-C12 Range Hydrocarbons		92.8	24.9	32.7 K	25.0	<25.0	25.0	<24.9	24.9	<24.9	24.9						
C12-C28 Range Hydrocarbons		345	24.9	404 K	25.0	157 K	25.0	120 K	24.9	95.0	24.9						
C28-C35 Range Hydrocarbons		<24.9	24.9	<25.0	25.0	<25.0	25.0	<24.9	24.9	<24.9	24.9						
Total TPH		438	24.9	437 K	25.0	157 K	25.0	120 K	24.9	95.0	24.9						

Kelsey Brooks
Project Manager

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

+ 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: Cimarex- Gadwall 18 Federal com #1

Work Orders : 562130,

Project ID: 212C-MD-00660

Lab Batch #: 3027213 **Sample:** 562130-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/08/17 03:22

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	56.1	50.0	112	70-130	
1-Chlorooctane	102	100	102	70-130	

Lab Batch #: 3027213 **Sample:** 562130-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/08/17 03:45

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	50.7	50.0	101	70-130	
1-Chlorooctane	95.1	99.9	95	70-130	

Lab Batch #: 3027213 **Sample:** 562130-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/08/17 04:07

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	62.8	49.9	126	70-130	
1-Chlorooctane	95.7	99.7	96	70-130	

Lab Batch #: 3027213 **Sample:** 562130-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/08/17 04:31

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	52.6	49.9	105	70-130	
1-Chlorooctane	97.4	99.7	98	70-130	

Lab Batch #: 3027189 **Sample:** 562130-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/08/17 09:50

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	80-120	
4-Bromofluorobenzene	0.0255	0.0300	85	80-120	

* 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: Cimarex- Gadwall 18 Federal com #1

Work Orders : 562130,

Project ID: 212C-MD-00660

Lab Batch #: 3027189 **Sample:** 562130-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/08/17 11:43

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	80-120	
4-Bromofluorobenzene	0.0332	0.0300	111	80-120	

Lab Batch #: 3027189 **Sample:** 562130-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/08/17 12:02

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0277	0.0300	92	80-120	
4-Bromofluorobenzene	0.0262	0.0300	87	80-120	

Lab Batch #: 3027189 **Sample:** 562130-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/08/17 12:21

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0260	0.0300	87	80-120	
4-Bromofluorobenzene	0.0338	0.0300	113	80-120	

Lab Batch #: 3027465 **Sample:** 562130-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/13/17 18:43

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0253	0.0300	84	80-120	
4-Bromofluorobenzene	0.0301	0.0300	100	80-120	

Lab Batch #: 3027465 **Sample:** 562130-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/13/17 19:02

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0245	0.0300	82	80-120	
4-Bromofluorobenzene	0.0289	0.0300	96	80-120	

* 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: Cimarex- Gadwall 18 Federal com #1

Work Orders : 562130,

Project ID: 212C-MD-00660

Lab Batch #: 3027595 **Sample:** 562130-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/14/17 01:18

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	80-120	
4-Bromofluorobenzene	0.0248	0.0300	83	80-120	

Lab Batch #: 3027741 **Sample:** 562130-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/15/17 03:10

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	63.5	49.9	127	70-130	
1-Chlorooctane	129	99.7	129	70-130	

Lab Batch #: 3027741 **Sample:** 562130-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/15/17 03:33

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	64.8	50.0	130	70-130	
1-Chlorooctane	103	99.9	103	70-130	

Lab Batch #: 3027920 **Sample:** 562130-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/16/17 21:38

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	51.9	49.9	104	70-130	
1-Chlorooctane	93.8	99.7	94	70-130	

Lab Batch #: 3027920 **Sample:** 562130-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/16/17 22:01

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	53.6	49.9	107	70-130	
1-Chlorooctane	95.2	99.7	95	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: Cimarex- Gadwall 18 Federal com #1

Work Orders : 562130,

Project ID: 212C-MD-00660

Lab Batch #: 3028038 **Sample:** 562130-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/19/17 03:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0288	0.0300	96	80-120	
4-Bromofluorobenzene	0.0352	0.0300	117	80-120	

Lab Batch #: 3028130 **Sample:** 562130-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/20/17 10:49

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0266	0.0300	89	80-120	
4-Bromofluorobenzene	0.0254	0.0300	85	80-120	

Lab Batch #: 3028282 **Sample:** 562130-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/21/17 04:35

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	56.3	50.0	113	70-130	
1-Chlorooctane	97.0	100	97	70-130	

Lab Batch #: 3028552 **Sample:** 562130-011 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/22/17 13:05

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	55.6	49.9	111	70-130	
1-Chlorooctane	96.0	99.8	96	70-130	

Lab Batch #: 3028552 **Sample:** 562130-012 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/22/17 13:30

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	52.3	49.9	105	70-130	
1-Chlorooctane	94.5	99.7	95	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: Cimarex- Gadwall 18 Federal com #1

Work Orders : 562130,

Project ID: 212C-MD-00660

Lab Batch #: 3027213 **Sample:** 730676-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/07/17 20:36

SURROGATE RECOVERY STUDY

TPH by Texas1005

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	52.9	50.0	106	70-130	
1-Chlorooctane	98.4	100	98	70-130	

Lab Batch #: 3027189 **Sample:** 730642-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/08/17 09:26

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0281	0.0300	94	80-120	
4-Bromofluorobenzene	0.0241	0.0300	80	80-120	

Lab Batch #: 3027465 **Sample:** 730828-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/13/17 09:42

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0290	0.0300	97	80-120	
4-Bromofluorobenzene	0.0242	0.0300	81	80-120	

Lab Batch #: 3027595 **Sample:** 730911-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/13/17 21:13

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0274	0.0300	91	80-120	
4-Bromofluorobenzene	0.0246	0.0300	82	80-120	

Lab Batch #: 3027741 **Sample:** 730997-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/14/17 18:56

SURROGATE RECOVERY STUDY

TPH by Texas1005

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	59.8	50.0	120	70-130	
1-Chlorooctane	107	100	107	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: Cimarex- Gadwall 18 Federal com #1

Work Orders : 562130,

Project ID: 212C-MD-00660

Lab Batch #: 3027920 **Sample:** 731086-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/16/17 18:26

SURROGATE RECOVERY STUDY

TPH by Texas1005

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	50.0	50.0	100	70-130	
1-Chlorooctane	89.7	100	90	70-130	

Lab Batch #: 3028038 **Sample:** 731191-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/19/17 01:54

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0277	0.0300	92	80-120	
4-Bromofluorobenzene	0.0288	0.0300	96	80-120	

Lab Batch #: 3028282 **Sample:** 731327-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/20/17 23:38

SURROGATE RECOVERY STUDY

TPH by Texas1005

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	56.3	50.0	113	70-130	
1-Chlorooctane	101	100	101	70-130	

Lab Batch #: 3028552 **Sample:** 731371-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/22/17 02:47

SURROGATE RECOVERY STUDY

TPH by Texas1005

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	54.9	50.0	110	70-130	
1-Chlorooctane	98.6	100	99	70-130	

Lab Batch #: 3027213 **Sample:** 730676-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/07/17 21:00

SURROGATE RECOVERY STUDY

TPH by Texas1005

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	56.9	50.0	114	70-130	
1-Chlorooctane	106	100	106	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: Cimarex- Gadwall 18 Federal com #1

Work Orders : 562130,

Project ID: 212C-MD-00660

Lab Batch #: 3027189 **Sample:** 730642-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/08/17 07:50

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0281	0.0300	94	80-120	
4-Bromofluorobenzene	0.0249	0.0300	83	80-120	

Lab Batch #: 3027465 **Sample:** 730828-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/13/17 07:46

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0288	0.0300	96	80-120	
4-Bromofluorobenzene	0.0266	0.0300	89	80-120	

Lab Batch #: 3027595 **Sample:** 730911-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/13/17 19:40

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0270	0.0300	90	80-120	
4-Bromofluorobenzene	0.0259	0.0300	86	80-120	

Lab Batch #: 3027741 **Sample:** 730997-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/14/17 19:20

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	64.1	50.0	128	70-130	
1-Chlorooctane	124	100	124	70-130	

Lab Batch #: 3027920 **Sample:** 731086-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/16/17 18:49

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	59.1	50.0	118	70-130	
1-Chlorooctane	107	100	107	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: Cimarex- Gadwall 18 Federal com #1

Work Orders : 562130,

Project ID: 212C-MD-00660

Lab Batch #: 3028038 **Sample:** 731191-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/19/17 00:14

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0314	0.0300	105	80-120	
4-Bromofluorobenzene	0.0315	0.0300	105	80-120	

Lab Batch #: 3028130 **Sample:** 731230-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/19/17 22:51

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0268	0.0300	89	80-120	
4-Bromofluorobenzene	0.0268	0.0300	89	80-120	

Lab Batch #: 3028282 **Sample:** 731327-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/21/17 00:03

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	57.9	50.0	116	70-130	
1-Chlorooctane	110	100	110	70-130	

Lab Batch #: 3028552 **Sample:** 731371-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/22/17 03:12

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	58.7	50.0	117	70-130	
1-Chlorooctane	110	100	110	70-130	

Lab Batch #: 3027213 **Sample:** 730676-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/07/17 21:25

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	57.9	50.0	116	70-130	
1-Chlorooctane	110	100	110	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: Cimarex- Gadwall 18 Federal com #1

Work Orders : 562130,

Project ID: 212C-MD-00660

Lab Batch #: 3027189 **Sample:** 730642-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/08/17 08:09

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0295	0.0300	98	80-120	
4-Bromofluorobenzene	0.0263	0.0300	88	80-120	

Lab Batch #: 3027465 **Sample:** 730828-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/13/17 08:05

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0292	0.0300	97	80-120	
4-Bromofluorobenzene	0.0269	0.0300	90	80-120	

Lab Batch #: 3027595 **Sample:** 730911-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/13/17 19:58

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0275	0.0300	92	80-120	
4-Bromofluorobenzene	0.0259	0.0300	86	80-120	

Lab Batch #: 3027741 **Sample:** 730997-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/14/17 19:44

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	59.7	50.0	119	70-130	
1-Chlorooctane	112	100	112	70-130	

Lab Batch #: 3027920 **Sample:** 731086-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/16/17 19:15

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	58.3	50.0	117	70-130	
1-Chlorooctane	108	100	108	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: Cimarex- Gadwall 18 Federal com #1

Work Orders : 562130,

Project ID: 212C-MD-00660

Lab Batch #: 3028038 **Sample:** 731191-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/19/17 00:35

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0318	0.0300	106	80-120	
4-Bromofluorobenzene	0.0297	0.0300	99	80-120	

Lab Batch #: 3028130 **Sample:** 731230-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/19/17 23:10

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0267	0.0300	89	80-120	
4-Bromofluorobenzene	0.0261	0.0300	87	80-120	

Lab Batch #: 3028282 **Sample:** 731327-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/21/17 00:28

SURROGATE RECOVERY STUDY

TPH by Texas1005

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	58.0	50.0	116	70-130	
1-Chlorooctane	108	100	108	70-130	

Lab Batch #: 3028552 **Sample:** 731371-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 09/22/17 03:35

SURROGATE RECOVERY STUDY

TPH by Texas1005

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	59.0	50.0	118	70-130	
1-Chlorooctane	110	100	110	70-130	

Lab Batch #: 3027213 **Sample:** 561981-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/07/17 22:12

SURROGATE RECOVERY STUDY

TPH by Texas1005

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	54.7	50.0	109	70-130	
1-Chlorooctane	105	100	105	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: Cimarex- Gadwall 18 Federal com #1

Work Orders : 562130,

Project ID: 212C-MD-00660

Lab Batch #: 3027189 **Sample:** 562130-006 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/08/17 08:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0292	0.0300	97	80-120	
4-Bromofluorobenzene	0.0265	0.0300	88	80-120	

Lab Batch #: 3027465 **Sample:** 562479-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/13/17 08:24

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0347	0.0300	116	80-120	
4-Bromofluorobenzene	0.0251	0.0300	84	80-120	

Lab Batch #: 3027595 **Sample:** 562531-004 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/13/17 20:16

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0285	0.0300	95	80-120	
4-Bromofluorobenzene	0.0268	0.0300	89	80-120	

Lab Batch #: 3027741 **Sample:** 562537-006 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/15/17 01:14

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	61.8	50.0	124	70-130	
1-Chlorooctane	114	100	114	70-130	

Lab Batch #: 3027920 **Sample:** 562930-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/16/17 20:01

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	61.1	49.9	122	70-130	
1-Chlorooctane	113	99.8	113	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: Cimarex- Gadwall 18 Federal com #1

Work Orders : 562130,

Project ID: 212C-MD-00660

Lab Batch #: 3028038 **Sample:** 562914-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/19/17 00:56

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0358	0.0300	119	80-120	
4-Bromofluorobenzene	0.0320	0.0300	107	80-120	

Lab Batch #: 3028130 **Sample:** 563090-005 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/19/17 23:29

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0277	0.0300	92	80-120	
4-Bromofluorobenzene	0.0275	0.0300	92	80-120	

Lab Batch #: 3028282 **Sample:** 563148-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/21/17 01:17

SURROGATE RECOVERY STUDY

TPH by Texas1005

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	52.7	50.0	105	70-130	
1-Chlorooctane	103	99.9	103	70-130	

Lab Batch #: 3028552 **Sample:** 563550-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/22/17 06:50

SURROGATE RECOVERY STUDY

TPH by Texas1005

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	58.1	49.9	116	70-130	
1-Chlorooctane	108	99.8	108	70-130	

Lab Batch #: 3027213 **Sample:** 561981-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/07/17 22:37

SURROGATE RECOVERY STUDY

TPH by Texas1005

Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	55.0	50.0	110	70-130	
1-Chlorooctane	109	99.9	109	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: Cimarex- Gadwall 18 Federal com #1

Work Orders : 562130,

Project ID: 212C-MD-00660

Lab Batch #: 3027189 **Sample:** 562130-006 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/08/17 08:47

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0288	0.0300	96	80-120	
4-Bromofluorobenzene	0.0265	0.0300	88	80-120	

Lab Batch #: 3027465 **Sample:** 562479-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/13/17 09:05

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	80-120	
4-Bromofluorobenzene	0.0276	0.0300	92	80-120	

Lab Batch #: 3027595 **Sample:** 562531-004 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/13/17 20:35

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0308	0.0300	103	80-120	
4-Bromofluorobenzene	0.0255	0.0300	85	80-120	

Lab Batch #: 3027741 **Sample:** 562537-006 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/15/17 01:37

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	62.9	50.0	126	70-130	
1-Chlorooctane	118	99.9	118	70-130	

Lab Batch #: 3027920 **Sample:** 562930-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/16/17 20:26

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	58.5	50.0	117	70-130	
1-Chlorooctane	108	100	108	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: Cimarex- Gadwall 18 Federal com #1

Work Orders : 562130,

Project ID: 212C-MD-00660

Lab Batch #: 3028038 **Sample:** 562914-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/19/17 01:16

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	80-120	
4-Bromofluorobenzene	0.0344	0.0300	115	80-120	

Lab Batch #: 3028130 **Sample:** 563090-005 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/19/17 23:47

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0306	0.0300	102	80-120	
4-Bromofluorobenzene	0.0252	0.0300	84	80-120	

Lab Batch #: 3028282 **Sample:** 563148-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/21/17 01:42

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	53.0	50.0	106	70-130	
1-Chlorooctane	103	99.9	103	70-130	

Lab Batch #: 3028552 **Sample:** 563550-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 09/22/17 07:14

SURROGATE RECOVERY STUDY

TPH by Texas1005 Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
o-Terphenyl	56.5	50.0	113	70-130	
1-Chlorooctane	104	100	104	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.

BS / BSD Recoveries

Project Name: Cimarex- Gadwall 18 Federal com #1

Work Order #: 562130 **Project ID:** 212C-MD-00660

Analyst: ALJ **Date Prepared:** 09/08/2017 **Date Analyzed:** 09/08/2017

Lab Batch ID: 3027189 **Sample:** 730642-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	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
Benzene	<0.00200	0.100	0.119	119	0.101	0.108	107	10	70-130	35	
Toluene	<0.00200	0.100	0.110	110	0.101	0.101	100	9	70-130	35	
Ethylbenzene	<0.00200	0.100	0.107	107	0.101	0.0984	97	8	71-129	35	
m,p-Xylenes	<0.00401	0.200	0.208	104	0.202	0.191	95	9	70-135	35	
o-Xylene	<0.00200	0.100	0.0995	100	0.101	0.0920	91	8	71-133	35	

Analyst: ALJ **Date Prepared:** 09/13/2017 **Date Analyzed:** 09/13/2017

Lab Batch ID: 3027465 **Sample:** 730828-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	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
Benzene	<0.00199	0.0996	0.106	106	0.100	0.106	106	0	70-130	35	
Toluene	<0.00199	0.0996	0.0996	100	0.100	0.0991	99	1	70-130	35	
Ethylbenzene	<0.00199	0.0996	0.0972	98	0.100	0.0972	97	0	71-129	35	
m,p-Xylenes	<0.00398	0.199	0.188	94	0.200	0.189	95	1	70-135	35	
o-Xylene	<0.00199	0.0996	0.0908	91	0.100	0.0913	91	1	71-133	35	

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: Cimarex- Gadwall 18 Federal com #1

Work Order #: 562130 **Project ID:** 212C-MD-00660

Analyst: ALJ **Date Prepared:** 09/13/2017 **Date Analyzed:** 09/13/2017

Lab Batch ID: 3027595 **Sample:** 730911-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	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
Benzene	<0.00202	0.101	0.104	103	0.100	0.100	100	4	70-130	35	
Toluene	<0.00202	0.101	0.0996	99	0.100	0.0952	95	5	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0994	98	0.100	0.0948	95	5	71-129	35	
m,p-Xylenes	<0.00403	0.202	0.194	96	0.201	0.184	92	5	70-135	35	
o-Xylene	<0.00202	0.101	0.0938	93	0.100	0.0890	89	5	71-133	35	

Analyst: ALJ **Date Prepared:** 09/18/2017 **Date Analyzed:** 09/19/2017

Lab Batch ID: 3028038 **Sample:** 731191-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	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
Benzene	<0.00201	0.100	0.0796	80	0.101	0.0830	82	4	70-130	35	
Toluene	<0.00201	0.100	0.0918	92	0.101	0.0867	86	6	70-130	35	
Ethylbenzene	<0.00201	0.100	0.0933	93	0.101	0.0882	87	6	71-129	35	
m,p-Xylenes	<0.00402	0.201	0.180	90	0.202	0.170	84	6	70-135	35	
o-Xylene	<0.00201	0.100	0.0888	89	0.101	0.0835	83	6	71-133	35	

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: Cimarex- Gadwall 18 Federal com #1

Work Order #: 562130 **Project ID:** 212C-MD-00660

Analyst: ALJ **Date Prepared:** 09/19/2017 **Date Analyzed:** 09/19/2017

Lab Batch ID: 3028130 **Sample:** 731230-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	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
Benzene	0.0998	0.101	0.0998	99	0.100	0.100	100	0	70-130	35	
Toluene	0.102	0.101	0.102	101	0.100	0.0977	98	4	70-130	35	
Ethylbenzene	0.0969	0.101	0.0969	96	0.100	0.0960	96	1	71-129	35	
m,p-Xylenes	0.196	0.202	0.196	97	0.200	0.191	96	3	70-135	35	
o-Xylene	0.0944	0.101	0.0944	93	0.100	0.0919	92	3	71-133	35	

Analyst: ARM **Date Prepared:** 09/07/2017 **Date Analyzed:** 09/07/2017

Lab Batch ID: 3027213 **Sample:** 730676-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 Analytes	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
C6-C12 Range Hydrocarbons	<25.0	1000	979	98	1000	966	97	1	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	1000	957	96	1000	976	98	2	75-125	25	

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: Cimarex- Gadwall 18 Federal com #1

Work Order #: 562130 **Project ID:** 212C-MD-00660

Analyst: ARM **Date Prepared:** 09/14/2017 **Date Analyzed:** 09/14/2017

Lab Batch ID: 3027741 **Sample:** 730997-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 Analytes	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
C6-C12 Range Hydrocarbons	<25.0	1000	995	100	1000	938	94	6	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	1000	1030	103	1000	945	95	9	75-125	25	

Analyst: ARM **Date Prepared:** 09/16/2017 **Date Analyzed:** 09/16/2017

Lab Batch ID: 3027920 **Sample:** 731086-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 Analytes	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
C6-C12 Range Hydrocarbons	<25.0	1000	956	96	1000	943	94	1	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	1000	971	97	1000	989	99	2	75-125	25	

Analyst: ARM **Date Prepared:** 09/20/2017 **Date Analyzed:** 09/21/2017

Lab Batch ID: 3028282 **Sample:** 731327-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 Analytes	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
C6-C12 Range Hydrocarbons	<25.0	1000	986	99	1000	967	97	2	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	1000	1010	101	1000	1010	101	0	75-125	25	

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: Cimarex- Gadwall 18 Federal com #1

Work Order #: 562130 **Project ID:** 212C-MD-00660

Analyst: ARM **Date Prepared:** 09/21/2017 **Date Analyzed:** 09/22/2017

Lab Batch ID: 3028552 **Sample:** 731371-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 Analytes	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
C6-C12 Range Hydrocarbons	<25.0	1000	1010	101	1000	1000	100	1	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	1000	1010	101	1000	1010	101	0	75-125	25	

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: Cimarex- Gadwall 18 Federal com #1

Work Order # : 562130 **Project ID:** 212C-MD-00660

Lab Batch ID: 3027189 **QC- Sample ID:** 562130-006 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/08/2017 **Date Prepared:** 09/08/2017 **Analyst:** ALJ

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	<0.00200	0.0998	0.0668	67	0.0994	0.0830	84	22	70-130	35	X
Toluene	<0.00200	0.0998	0.0614	62	0.0994	0.0756	76	21	70-130	35	X
Ethylbenzene	<0.00200	0.0998	0.0581	58	0.0994	0.0702	71	19	71-129	35	X
m,p-Xylenes	<0.00399	0.200	0.114	57	0.199	0.137	69	18	70-135	35	X
o-Xylene	<0.00200	0.0998	0.0559	56	0.0994	0.0669	67	18	71-133	35	X

Lab Batch ID: 3027465 **QC- Sample ID:** 562479-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/13/2017 **Date Prepared:** 09/13/2017 **Analyst:** ALJ

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	<0.00202	0.101	0.124	123	0.100	0.107	107	15	70-130	35	
Toluene	<0.00202	0.101	0.0959	95	0.100	0.0983	98	2	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0771	76	0.100	0.0910	91	17	71-129	35	
m,p-Xylenes	<0.00404	0.202	0.124	61	0.200	0.165	83	28	70-135	35	X
o-Xylene	<0.00202	0.101	0.0734	73	0.100	0.0848	85	14	71-133	35	

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.

Form 3 - MS / MSD Recoveries

Project Name: Cimarex- Gadwall 18 Federal com #1

Work Order # : 562130 **Project ID:** 212C-MD-00660

Lab Batch ID: 3027595 **QC- Sample ID:** 562531-004 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/13/2017 **Date Prepared:** 09/13/2017 **Analyst:** ALJ

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	<0.00201	0.100	0.0756	76	0.0998	0.0806	81	6	70-130	35	
Toluene	<0.00201	0.100	0.0705	71	0.0998	0.0675	68	4	70-130	35	X
Ethylbenzene	<0.00201	0.100	0.0680	68	0.0998	0.0617	62	10	71-129	35	X
m,p-Xylenes	<0.00402	0.201	0.131	65	0.200	0.114	57	14	70-135	35	X
o-Xylene	<0.00201	0.100	0.0675	68	0.0998	0.0569	57	17	71-133	35	X

Lab Batch ID: 3028038 **QC- Sample ID:** 562914-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/19/2017 **Date Prepared:** 09/18/2017 **Analyst:** ALJ

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	<0.00201	0.100	0.0671	67	0.0998	0.0566	57	17	70-130	35	X
Toluene	<0.00201	0.100	0.0650	65	0.0998	0.0605	61	7	70-130	35	X
Ethylbenzene	<0.00201	0.100	0.0657	66	0.0998	0.0612	61	7	71-129	35	X
m,p-Xylenes	<0.00402	0.201	0.128	64	0.200	0.0964	48	28	70-135	35	X
o-Xylene	<0.00201	0.100	0.0644	64	0.0998	0.0560	56	14	71-133	35	X

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.

Form 3 - MS / MSD Recoveries

Project Name: Cimarex- Gadwall 18 Federal com #1

Work Order # : 562130 **Project ID:** 212C-MD-00660

Lab Batch ID: 3028130 **QC- Sample ID:** 563090-005 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/19/2017 **Date Prepared:** 09/19/2017 **Analyst:** ALJ

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	<0.00348	0.174	0.122	70	0.177	0.0907	51	29	70-130	35	X
Toluene	<0.00348	0.174	0.108	62	0.177	0.144	81	29	70-130	35	X
Ethylbenzene	<0.00348	0.174	0.0930	53	0.177	0.0825	47	12	71-129	35	X
m,p-Xylenes	<0.00697	0.348	0.198	57	0.353	0.255	72	25	70-135	35	X
o-Xylene	<0.00348	0.174	0.102	59	0.177	0.0736	42	32	71-133	35	X

Lab Batch ID: 3027213 **QC- Sample ID:** 561981-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/07/2017 **Date Prepared:** 09/07/2017 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 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
C6-C12 Range Hydrocarbons	<25.0	1000	925	93	999	929	93	0	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	1000	901	90	999	931	93	3	75-125	25	

Lab Batch ID: 3027741 **QC- Sample ID:** 562537-006 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/15/2017 **Date Prepared:** 09/14/2017 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 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
C6-C12 Range Hydrocarbons	<25.0	1000	986	99	999	991	99	1	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	1000	997	100	999	971	97	3	75-125	25	

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.

Form 3 - MS / MSD Recoveries

Project Name: Cimarex- Gadwall 18 Federal com #1

Work Order # : 562130 **Project ID:** 212C-MD-00660

Lab Batch ID: 3027920 **QC- Sample ID:** 562930-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/16/2017 **Date Prepared:** 09/16/2017 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 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
C6-C12 Range Hydrocarbons	41.7	998	995	96	1000	967	93	3	75-125	25	
C12-C28 Range Hydrocarbons	79.9	998	1050	97	1000	1040	96	1	75-125	25	

Lab Batch ID: 3028282 **QC- Sample ID:** 563148-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/21/2017 **Date Prepared:** 09/20/2017 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 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
C6-C12 Range Hydrocarbons	<25.0	999	918	92	999	927	93	1	75-125	25	
C12-C28 Range Hydrocarbons	<25.0	999	947	95	999	977	98	3	75-125	25	

Lab Batch ID: 3028552 **QC- Sample ID:** 563550-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/22/2017 **Date Prepared:** 09/21/2017 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH by Texas1005 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
C6-C12 Range Hydrocarbons	<25.0	998	988	99	1000	997	100	1	75-125	25	
C12-C28 Range Hydrocarbons	200	998	1150	95	1000	1180	98	3	75-125	25	

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

562130

Client Name: Cimarex	**Site Manager:** Ike Tavarez
Project Name: Gadwall 18 Federal Com #1	
Project Location: (county, state) Eddy County, New Mexico	**Project #:** 212C-MD-00660
Invoice to: Cimarex	
Receiving Laboratory: Xenco Midland Tx	**Sampler Signature:** Mike Carmona

Comments:

Run deeper samples if TPH exceeds 100 mg/kg, if Benzene exceeds 10 mg/kg, BTEX exceeds 50 mg/kg

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE	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
	BH #1 (0-1')	9/5/2017			X				X			1	N	X		X																				
	BH #1 (2-3')	9/5/2017			X				X			1	N																							
	BH #1 (4-5')	9/5/2017			X				X			1	N																							
	BH #1 (6-7')	9/5/2017			X				X			1	N																							
	BH #1 (11-12')	9/5/2017			X				X			1	N																							
	BH #1 (16-17')	9/5/2017			X				X			1	N	X		X																				
	BH #2 (0-1')	9/5/2017			X				X			1	N	X		X																				
	BH #2 (2-3')	9/5/2017			X				X			1	N																							
	BH #2 (4-5')	9/5/2017			X				X			1	N																							
	BH #2 (6-7')	9/5/2017			X				X			1	N																							

ANALYSIS REQUEST
(Circle or Specify Method No.)

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Mike Carmona	9-6-17	1350	Corrie Herring	9/6/17	13:51
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

LAB USE ONLY

Sample Temperature

REMARKS:

- [X] 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 #: _____

Temp: 3.6 IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 3.4

ORIGINAL COPY

Final 1.004

Analysis Request of Chain of Custody Record

Page 2 of 2

Tetra Tech, Inc.

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

562130

Client Name: Cimarex
Site Manager: Ike Tavarez
Project Name: Gadwall 18 Federal Com #1
Project Location: (county, state) Eddy County, New Mexico
Project #: 212C-MD-00660
Invoice to: Cimarex
Receiving Laboratory: Xenco Midland Tx
Sampler Signature: Mike Carmona
Comments: Run deeper samples if TPH exceeds 100 mg/kg, if Benzene exceeds 10 mg/kg, BTEX exceeds 50 mg/kg

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE (YEAR: 2017)	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	PRESERVATIVE METHOD HCL	HNO_3	ICE	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	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Anion/Cation Balance	Hold
	BH #2 (9-10')	9/5/2017			X			X		1	N																			
	BH#2 (14-15')	9/5/2017			X			X		1	N																			
	BH #2 (19-20')	9/5/2017			X			X		1	N	X		X																

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Mike Carmona	9-6-17	1350	Connie Fleming	9/6/17	13:51

LAB USE ONLY
Sample Temperature

REMARKS:
- [X] 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 #: ____________

Temp: 3.6 IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 3.4

ORIGINAL COPY

XENCO Laboratories
Prelogin/Nonconformance Report- Sample Log-In

Client: Tetra Tech- Midland

Date/ Time Received: 09/06/2017 01:51:00 PM

Work Order #: 562130

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)?	3.4
#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)?	**No**
#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: Shawnee Smith Date: 09/07/2017
Shawnee Smith

Checklist reviewed by: Kelsey Brooks Date: 09/07/2017
Kelsey Brooks