

SITE INFORMATION

Report Type: Work Plan 1RP-5045

General Site Information:

Site:	Battle 1H				
Company:	Marathon Oil Permian, LLC.				
Section, Township and Range	Unit A	Sec. 34	T 21S	R 33E	
Lease Number:	API No. 30-025-41364				
County:	Lea County				
GPS:	32.442006° N			103.552481° W	
Surface Owner:	fee				
Mineral Owner:	fee				
Directions:	From the intersection of Hwy 62/180 and Hwy 176 turn Southeast and go approx. 14.15 miles turn left south and go approx. 3.6 miles, turn right West 3.5miles turn left south and approx. 0.6miles turn right West and head .10miles and arrive on location.				

Release Data:

Date Released:	4/21/2018
Type Release:	oil
Source of Contamination:	Free Water Knock out
Fluid Released:	6.77 bbls
Fluids Recovered:	3 bbls

Official Communication:

Name:	Callie Karrigan	Ike Tavaréz
Company:	Marathon Oil	Tetra Tech
Address:	5555 San Felipe Street	4000 N. Big Spring Ste 401
City:	Carlsbad, NM 88220	Midland, Texas
Phone number:	(575)457-2621	(432) 687-8110
Fax:		
Email:	cnkarrigan@marathonoil.com	Ike.Tavaréz@tetrattech.com

Ranking Criteria

Depth to Groundwater:	Ranking Score	Site Data
<50 ft	20	
50-99 ft	10	
>100 ft.	0	250'-275'
WellHead Protection:	Ranking Score	Site Data
Water Source <1,000 ft., Private <200 ft.	20	
Water Source >1,000 ft., Private >200 ft.	0	0
Surface Body of Water:	Ranking Score	Site Data
<200 ft.	20	
200 ft - 1,000 ft.	10	
>1,000 ft.	0	0
Total Ranking Score:		0

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

APPROVED

By CHernandez at 3:29 pm, Jul 26, 2018

Please note that completion of delineation, while remediating, is considered conducted at-risk. NMOCD approves the proposed remediation for 1RP-5045 with these clarifications: Both bottom and sidewall confirmation samples are required for each of the proposed depths of excavation at no greater than 50 ft. intervals. At least one confirmation sidewall/edge sample location must be at the border between each different depth of excavation. Marked confirmation sample locations in relation to delineation sample locations on a scaled map. Dated photo documentation of the remediation process.



July 20, 2018

Ms. Olivia Yu
Environmental Engineer Specialist
Oil Conservation Division, District 1
1625 North French Drive
Hobbs, New Mexico 88240

Re: Work Plan for the Marathon Oil Company, Battle #1H, Unit A, Section 34, Township 21 South, Range 33 East, Lea County, New Mexico. 1RP-5045.

Ms. Yu:

Tetra Tech, Inc. (Tetra Tech) was contacted by Marathon Oil Company (Marathon) to investigate and assess a release that occurred at the Battle #1H, Unit A, Section 34, Township 21 South, Range 33 East, Lea County, New Mexico (Site). The spill site coordinates are N 32.442006°, W 103.552481°. The site location is shown in Figures 1 and 2.

Background

According to the State of New Mexico C-141 Initial Report, the release was discovered on April 21, 2018 and released approximately 6.77 barrels of crude oil due to failure of the free water knockout being closed, releasing fluids down the flare line and out of the flare. The impacted area on the pad and lease road measures approximately 210' x 165' with possible overspray that migrated into the pasture measuring approximately 500' x 500'. Marathon performed a surficial scrape to recover the saturated soils located on the pad. All of the excavated material was hauled to proper disposal. The initial C-141 form is included in Appendix A.

Groundwater

No wells are listed within Section 34 in the New Mexico Office of the State Engineers database or the Geology and Groundwater Conditions in Southern Lea County, NM (Report 6). The USGS National Water Information System does list one well in Section 28 with depth to groundwater of 179' below surface. The New Mexico Office of the State Engineers database list one well in Section 33 with depth to groundwater of 180' below surface. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in the area is between 250' and 275' below surface. The groundwater data is shown in Appendix B.

Tetra Tech

4000 North Big Spring, Suite 401, Midland, TX 79705

Tel 432.682.4559 Fax 432.682.3946 www.tetrattech.com

Regulatory

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 5,000 mg/kg.

Soil Assessment and Analytical Results

On May 14, 2018, Tetra Tech personnel were onsite to evaluate and sample the release area. A total of eleven (11) auger holes (AH-1 through AH-11) were installed in the spill footprint. Auger holes (AH-1, AH-2, AH-3, AH4, and AH-5) were installed to total depths ranging from 0.5' to 1.5' below surface on the pad area and adjacent to the flare stack. Auger holes (AH-6, AH-7, AH-8, AH-9, AH-10, and AH-11) were installed in the pasture with total sampling depths ranging from 1.0' to 2.0' below surface. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, chloride by EPA method 300.0, and BTEX by EPA Method 8021B. Copies of the laboratory analysis and chain-of-custody documentation are included in Appendix C. The sampling results are summarized in Table 1. The auger hole locations are shown on Figure 3.

Referring to Table 1, the areas of auger holes (AH-1, AH-2, AH-3, AH-6, AH-7, AH-8, AH-9, AH-10, and AH-11) did not show benzene, total BTEX, or TPH concentrations above the RRALs. Additionally, the areas of auger holes (AH-1, AH-2, AH-4, AH-5, AH-6, AH-7, AH-8, AH-9, AH-10, and AH-11) showed chloride concentrations below the 600 mg/kg threshold.

The area of (AH-3) showed a chloride high of 10,600 mg/kg at a depth of 0-1' below surface. Additionally, the area of auger holes (AH-4, and AH-5) showed high TPH concentrations of 7,540 mg/kg and 5,290 mg/kg both at 0-0.5' below surface. No benzene or total BTEX concentrations above the RRALs was detected in these areas.

Work Plan

Based on the laboratory results, Marathon proposes to remove the chloride and TPH impacted soils as shown on Figure 4 and highlighted (green) on Table 1. Due to access issues and safety concerns, the proposed excavation will be performed to remove the impacted soil to the maximum extent practicable. The areas of auger hole (AH-3, AH-4, and AH-5) will be excavated to approximately 0.5' to 3.0' below surface. During the excavation activities, deeper samples will be collected using a backhoe in the areas of auger holes (AH-3, AH-4, and AH-5) in order to vertically define the extents. Based on the results those areas will be excavated to the appropriate depths. The excavated areas will then be backfilled with clean material to surface grade. All of the excavated material will be transported offsite for proper disposal.



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The proposed excavation depths may not be reached due to wall cave-ins and safety concerns for onsite personnel. Also, impacted soil around oil and gas equipment, structures or lines may not be viable or practicable to be removed due to safety concerns for onsite personnel. As such, Marathon Oil Company (Marathon) will excavate the impacted soils to the maximum extent practicable.

Conclusion

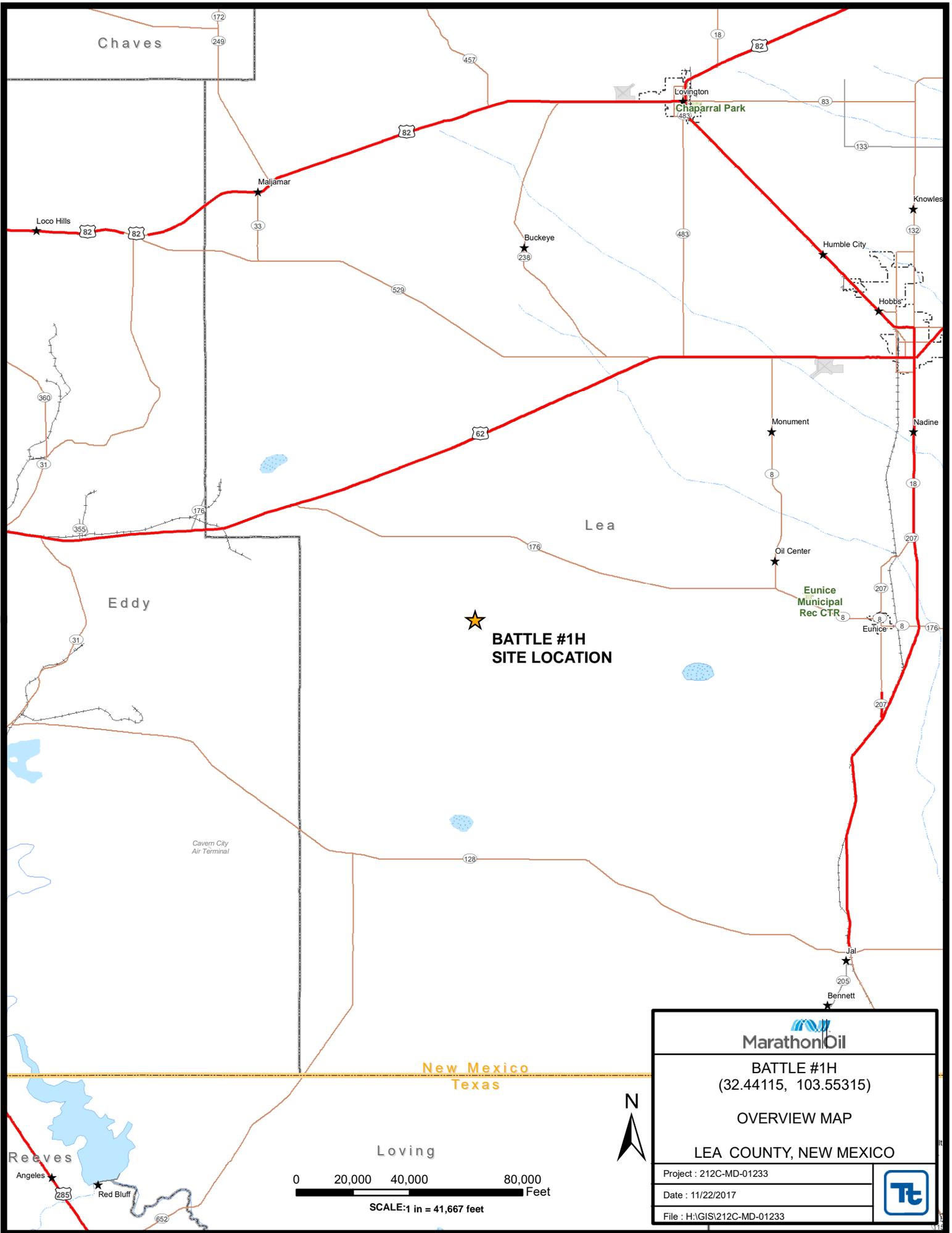
Upon completion, a final report detailing the remediation activities will be submitted to the NMOCD. If you have any questions or comments concerning the assessment or the proposed remediation activities for this site, please call at (432) 682-4559.

Respectfully submitted,
TETRA TECH

Mike Carmona,
Geologist

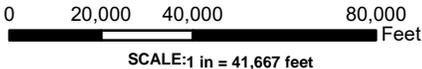
cc: Shelly Tucker – BLM
Henryetta Price – BLM
Callie Karrigan - Marathon

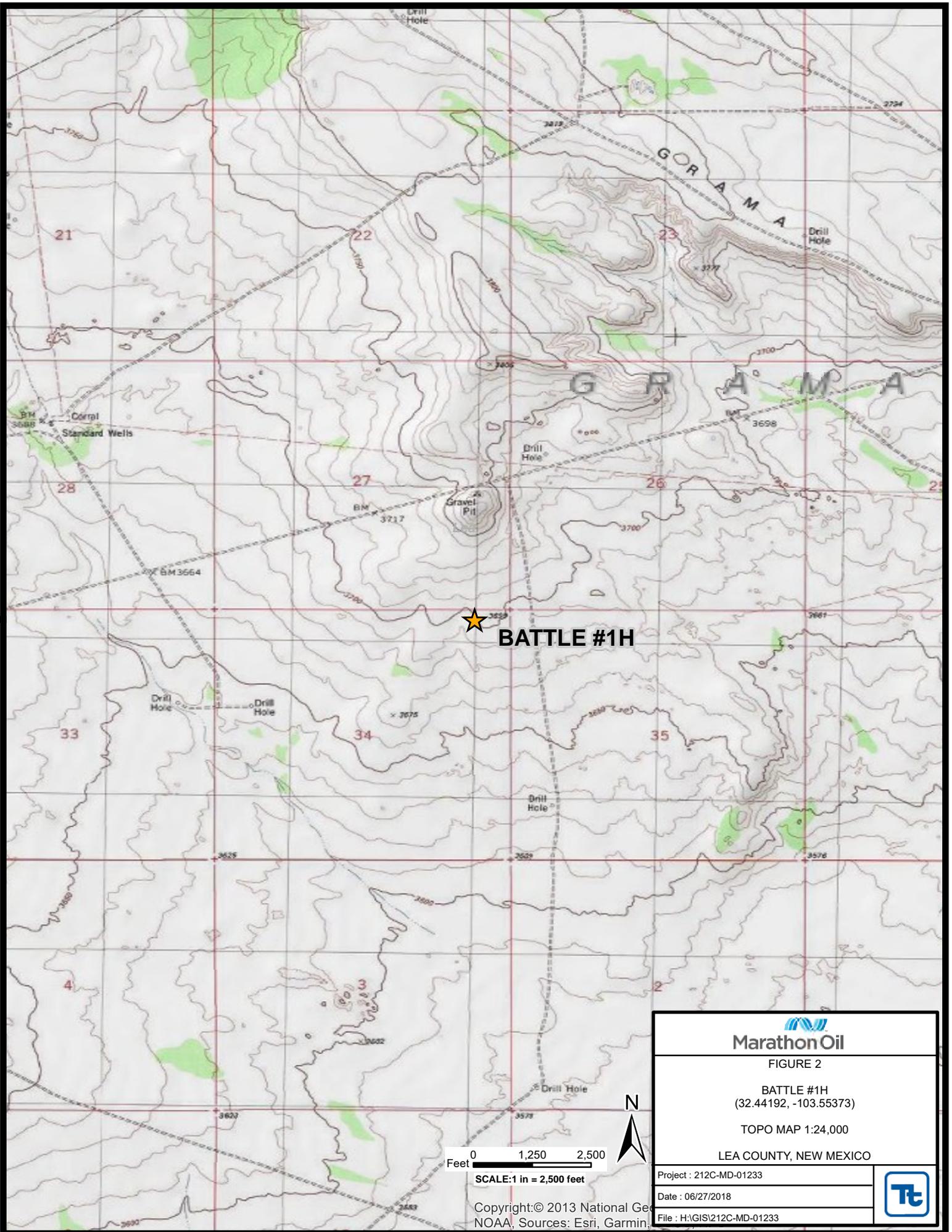
Figures



★
**BATTLE #1H
 SITE LOCATION**

 Marathon Oil	
BATTLE #1H (32.44115, 103.55315)	
OVERVIEW MAP	
LEA COUNTY, NEW MEXICO	
Project : 212C-MD-01233	
Date : 11/22/2017	
File : H:\GIS\212C-MD-01233	
	



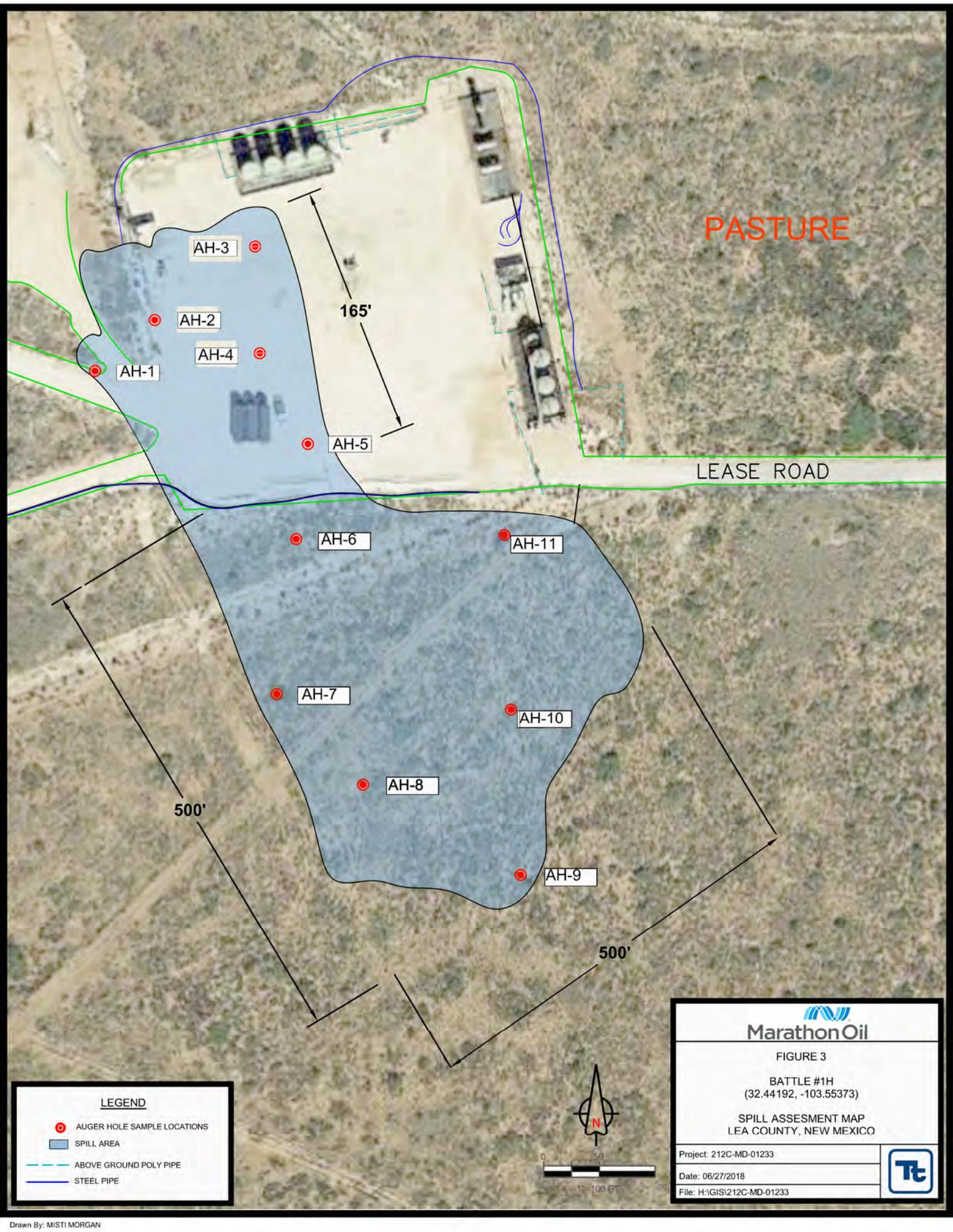


BATTLE #1H

 Marathon Oil	
FIGURE 2 BATTLE #1H (32.44192, -103.55373) TOPO MAP 1:24,000 LEA COUNTY, NEW MEXICO	
Project : 212C-MD-01233	
Date : 06/27/2018	
File : H:\GIS\212C-MD-01233	

0 1,250 2,500
Feet
SCALE: 1 in = 2,500 feet





PASTURE

LEASE ROAD

AH-3

AH-2

AH-4

AH-1

165'

AH-5

AH-6

AH-11

AH-7

AH-10

AH-8

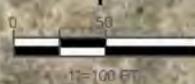
AH-9

500'

500'

LEGEND

- AUGER HOLE SAMPLE LOCATIONS
- SPILL AREA
- ABOVE GROUND POLY PIPE
- STEEL PIPE



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FIGURE 3

BATTLE #1H
(32.44192, -103.55373)

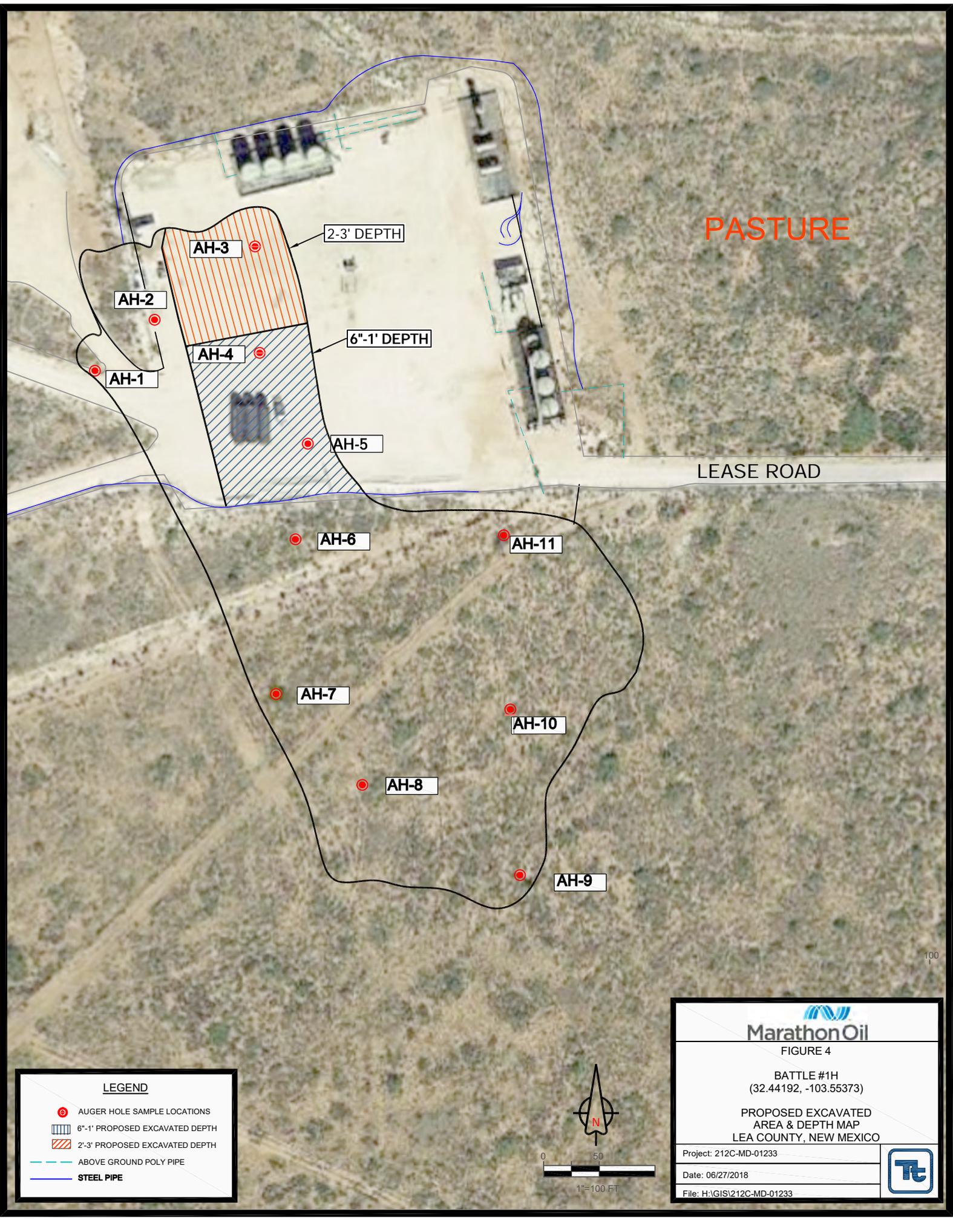
SPILL ASSESMENT MAP
LEA COUNTY, NEW MEXICO

Project: 212C-MD-01233

Date: 06/27/2018

File: H:\GIS\212C-MD-01233





PASTURE

LEASE ROAD

2'-3' DEPTH

6'-1' DEPTH

AH-2

AH-3

AH-1

AH-4

AH-5

AH-6

AH-11

AH-7

AH-10

AH-8

AH-9

LEGEND

- AUGER HOLE SAMPLE LOCATIONS
- 6'-1' PROPOSED EXCAVATED DEPTH
- 2'-3' PROPOSED EXCAVATED DEPTH
- ABOVE GROUND POLY PIPE
- STEEL PIPE



MarathonOil

FIGURE 4

BATTLE #1H
(32.44192, -103.55373)

PROPOSED EXCAVATED
AREA & DEPTH MAP
LEA COUNTY, NEW MEXICO

Project: 212C-MD-01233

Date: 06/27/2018

File: H:\GIS\212C-MD-01233



Tables

**Table 1
Marathon Oil Company
Battle #1H
Lea County, New Mexico**

Sample ID	Sample Date	Sample Depth (ft)	Soil Status		TPH (mg/kg)				Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	GRO	DRO	ORO	Total						
AH-1	5/14/2018	0-1	X		<14.9	665	88.2	753	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	<4.98
	"	1-1.5	X		<15.0	172	23.9	196	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<4.95
AH-2	5/14/2018	0-6"	X		<15.0	827	157	984	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	86.8
AH-3	5/14/2018	0-1	X		<15.0	124	46.6	171	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	10,600
AH-4	5/14/2018	0-6"	X		126	6,620	790	7,540	<0.00199	<0.00199	<0.00199	0.0164	0.0164	150
AH-5	5/14/2018	0-6"	X		<74.9	4,600	688	5,290	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	355
AH-6	5/14/2018	0-1	X		<15.0	220	54.1	274	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	<4.97
	"	1-1.5	X		<15.0	37.4	25.6	63.0	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	<5.00
AH-7	5/14/2018	0-1	X		<14.9	18.8	<14.9	18.8	<0.00198	<0.00198	<0.00198	<0.00198	<0.00198	<5.00
	"	1-1.5	X		<15.0	19.3	<15.0	19.3	<0.00199	<0.00199	<0.00199	<0.00199	<0.00199	<4.90
AH-8	5/14/2018	0-1	X		15.4	35.5	<15.0	50.9	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	<4.95
	"	1-1.5	X		<15.0	17.0	<15.0	17.0	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	<4.91
AH-9	5/14/2018	0-1	X		<15.0	15.7	<15.0	15.7	<0.00201	<0.00201	<0.00201	<0.00201	<0.00201	<4.96
	"	1-1.5	X		<15.0	16.9	<15.0	16.9	<0.00198	<0.00198	<0.00198	<0.00198	<0.00198	<4.97
	"	1.5-2.0	X		<15.0	15.7	<15.0	15.7	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<5.00
AH-10	5/14/2018	0-1	X		<15.0	21.4	<15.0	21.4	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<5.00
	"	1-1.5	X		<15.0	15.6	<15.0	15.6	<0.00202	<0.00202	<0.00202	<0.00202	<0.00202	<4.90
AH-11	5/14/2018	0-1	X		<15.0	<15.0	<15.0	<15.0	<0.00199	<0.00199	<0.00199	0.00479	0.00479	270
	"	1-1.5	X		<14.9	<14.9	<14.9	<14.9	<0.00198	<0.00198	<0.00198	<0.00198	<0.00198	109
	"	1.5-2.0	X		<15.0	<15.0	<15.0	<15.0	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	118

(-) Not Analyzed

BEB Below Excavation Bottom

Proposed Excavation

Photos

**Marathon Oil Company
Battle #1H
Lea County, New Mexico**



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View East-Area of AH-1



View Southwest- Area of AH-2

**Marathon Oil Company
Battle #1H
Lea County, New Mexico**



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View West-Area of AH-3



View Northwest- Area of AH-4

**Marathon Oil Company
Battle #1H
Lea County, New Mexico**



TETRA TECH



View West-Area of AH-3



View Northwest- Area of AH-4

**Marathon Oil Company
Battle #1H
Lea County, New Mexico**



TETRA TECH



View Southeast-Area of AH-5



View North— Overspray Area of AH-6

**Marathon Oil Company
Battle #1H
Lea County, New Mexico**



**TETRA
TECH**



View Southeast-Area of AH-7



View East- Overspray Area of AH-7

**Marathon Oil Company
Battle #1H
Lea County, New Mexico**



**TETRA
TECH**



View North-Overspray Area of AH-8



View West-Overspray Area of AH-9

**Marathon Oil Company
Battle #1H
Lea County, New Mexico**



**TETRA
TECH**



View Northwest-Area of AH-10



View West- Overspray Area of AH-11

Appendix A

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

State of New Mexico
Energy Minerals and Natural Resources

Form C-141
Revised April 3, 2017

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

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

Release Notification and Corrective Action

OPERATOR

Initial Report Final Report

Name of Company Marathon Oil Company	Contact Callie Karrigan
Address 5555 San Felipe Street, Houston, Texas 77056	Telephone No. 405-202-1028(cell) 575-297-0956 (office)
Facility Name Battle 1H	Facility Type Oil well

Surface Owner: fee	Mineral Owner: fee	API No. 30-025-41364
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LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
A	34	21S	33E	160	North	360	East	Lea

Latitude 32.442006 Longitude -103.552481 NAD83

NATURE OF RELEASE

Type of Release: oil	Volume of Release 6.77 bbls	Volume Recovered 3 bbls
Source of Release: Free water knock out	Date and Hour of Occurrence 04/21/2018 9:30 am	Date and Hour of Discovery 04/21/2018 9:30 am
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? Olivia Yu, Lea County	
By Whom? Callie Karrigan	Date and Hour 04/21/018 2:23 pm	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*
Not applicable.

RECEIVED
By Olivia Yu at 10:24 am, May 07, 2018

Describe Cause of Problem and Remedial Action Taken.*

The Operator reported that the oil dump on the Battle 1H free water knock out (FWKO) was stuck closed, releasing fluids down the flare line and out the flare. Approximately 6.77 barrels of oil was released out the flare. No fire was reported. The released remained on location.

Describe Area Affected and Cleanup Action Taken.*

Standing fluids were recovered via vac truck and light scraping was performed to recover saturated soil. Tetrtech will be assessing the release and affected area.

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

Signature: <i>Callie Karrigan</i>	OIL CONSERVATION DIVISION	
Printed Name: Callie Karrigan	Approved by Environmental Specialist: 	
Title: HES Professional	Approval Date: 5/7/2018	Expiration Date:
E-mail Address: cnkarrigan@marathonoil.com	Conditions of Approval:	Attached <input checked="" type="checkbox"/>
Date: 05/6/2018 Phone: 405-202-1028 (cell) 575-297-0956 (office)	see attached directive	

* Attach Additional Sheets If Necessary

1RP-5045 **nOY1812737111**

pOY1812737505

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
Battle 1H
Lea County, New Mexico

20 South 33 East

6	5 325	4	3	2	1
7	8 278	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36
					+300

Artesia

20 South 34 East

6	5	4 125	3	2	1
7	8	9	10	11	12
18	17 128	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34 82	35	36
				150	270

20 South 35 East

6 56	5 64	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31 65	32	33 89	34	35	36
					49

21 South 32 East

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

21 South 33 East

6	5	4	3	2 79	1
7	8	9	10	11 100	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33 180	34 572	35	36
			143		
				107	
				150	
					Site

21 South 34 East

6	5	4 95	3	2	1
7	8 120	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28 140	27	26	25
31	32	33	34	35	36

22 South 32 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14 382	13
19 (S)	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36
				350	
					280

22 South 33 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36
				391	

22 South 34 East

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

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

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

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

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

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

(NAD83 UTM in meters)

(In feet)

POD Number	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	DepthWell	DepthWater	Water Column	
CP 00578		CP	LE	4	3	11	21S	33E		636674	3595445*	<input type="checkbox"/>	165	150	15
CP 00579		CP	LE	2	2	02	21S	33E		637438	3598269*	<input type="checkbox"/>	125	100	25
CP 00600 POD1		CP	LE	2	4	25	21S	33E		639152	3591054*	<input type="checkbox"/>	65		
CP 00601 POD1		CP	LE	2	1	28	21S	33E		633502	3591791*	<input type="checkbox"/>	223		
CP 00765 POD1		CP	LE	3	2	13	21S	33E		638698	3594668*	<input type="checkbox"/>	508		
CP 00766 POD1		CP	LE	3	2	13	21S	33E		638698	3594668*	<input type="checkbox"/>	510		
CP 00794 POD1		CP	LE	4	1	18	21S	33E		629976	3594865*	<input type="checkbox"/>	160		
CP 00795 POD1		CP	LE	4	1	18	21S	33E		629976	3594865*	<input type="checkbox"/>	170		
CP 00796 POD1		CP	LE	2	2	4	02	21S	33E	637548	3597564*	<input type="checkbox"/>	102		
CP 00797 POD1		CP	LE	1	2	4	02	21S	33E	637348	3597564*	<input type="checkbox"/>	110		
CP 00801 POD1		CP	LE	3	2	1	11	21S	33E	636555	3596549*	<input type="checkbox"/>	200		
CP 00802 POD1		CP	LE	3	3	2	02	21S	33E	637001	3598672	<input type="checkbox"/>	1154		
CP 00803 POD1		CP	LE	3	2	2	02	21S	33E	637337	3598168*	<input type="checkbox"/>	1100		
CP 00804 POD1		CP	LE	3	2	2	02	21S	33E	637337	3598168*	<input type="checkbox"/>	170		
CP 00854 POD1		CP	LE	1	1	2	33	21S	33E	633879	3590223	<input type="checkbox"/>	950	600	350
CP 01290 POD1		CP	LE	3	1	02	21S	33E		637114	3598855	<input type="checkbox"/>	1250	725	525
CP 01316 POD1		CP	LE	3	2	4	02	21S	33E	637432	3597709	<input type="checkbox"/>	1370		
CP 01317 POD1		CP	LE	1	3	2	02	21S	33E	636884	3598450	<input type="checkbox"/>	1250	1025	225
CP 01349 POD1		CP	LE	2	3	1	27	21S	33E	635304	3591576	<input type="checkbox"/>	1188	572	616
CP 01355 POD1		CP	LE	2	1	3	27	21S	33E	634773	3591061	<input type="checkbox"/>	1192	582	610
CP 01356 POD1		CP	LE	4	2	2	33	21S	33E	634560	3590014	<input type="checkbox"/>	1098	555	543
CP 01357 POD1		CP	LE	4	3	1	27	21S	33E	634782	3591347	<input type="checkbox"/>	1286	578	708
CP 01411 POD1		CP	LE	2	2	34	21S	33E		635968	3590386	<input type="checkbox"/>	1149		
CP 01411 POD2		CP	LE	1	2	34	21S	33E		635534	3590380	<input type="checkbox"/>	1125		

Average Depth to Water: **543 feet**
 Minimum Depth: **100 feet**
 Maximum Depth: **1025 feet**

Record Count: 24

PLSS Search:

Township: 21S **Range:** 33E

*UTM location was derived from PLSS - see Help

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



National Water Information System: Web Interface

USGS Water Resources

Data Category:

Groundwater

Geographic Area:

New Mexico

GO

Click to hide News Bulletins

- Please see news on new formats
- Full News

Groundwater levels for New Mexico

Click to hide state-specific text

Search Results -- 1 sites found

Agency code = usgs

site_no list =

- 322702103344001

Minimum number of levels = 1

[Save file of selected sites](#) to local disk for future upload

USGS 322702103344001 21S.33E.28.12443

Available data for this site

Groundwater: Field measurements

GO

Lea County, New Mexico
Hydrologic Unit Code 13070007
Latitude 32°27'13", Longitude 103°34'42" NAD27
Land-surface elevation 3,688.00 feet above NGVD29
The depth of the well is 224 feet below land surface.
This well is completed in the Chinle Formation (231CHNL) local aquifer.

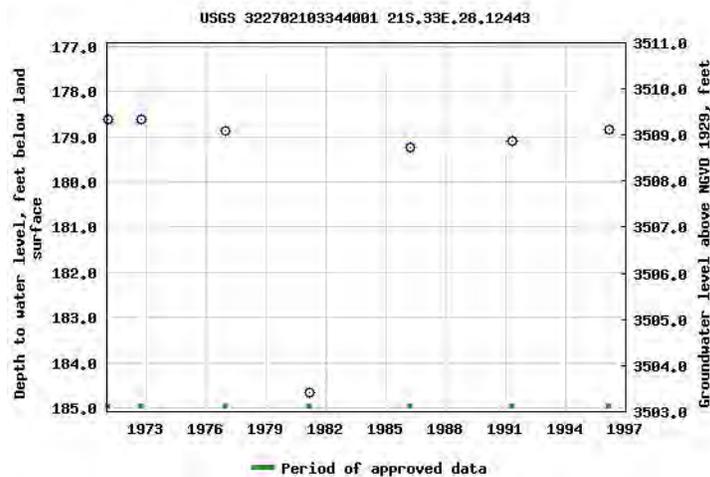
Output formats

[Table of data](#)

[Tab-separated data](#)

[Graph of data](#)

[Reselect period](#)



Breaks in the plot represent a gap of at least one year between field measurements.

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U.S. Department of the Interior | U.S. Geological Survey

Title: Groundwater for New Mexico: Water Levels

URL: <https://nwis.waterdata.usgs.gov/nm/nwis/gwlevels?>



Appendix C

Analytical Report 586572

for
Tetra Tech- Midland

Project Manager: Ike Tavaréz

Marathon-Battle 1H

212C-MD-01233

25-MAY-18

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-18-25), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-17-16), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-17-12)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-17-16)
Xenco-Odessa (EPA Lab Code: TX00158): Texas (T104704400-18-14)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-17-3)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab Code: AZ00901): Arizona (AZM757)
Xenco-Atlanta (LELAP Lab ID #04176)
Xenco-Tampa: Florida (E87429)
Xenco-Lakeland: Florida (E84098)



25-MAY-18

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

Reference: XENCO Report No(s): **586572**
Marathon-Battle 1H
Project Address: Lea County, New Mexico

Ike Tavaréz:

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) 586572. 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. 586572 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Kelsey Brooks

Project Manager

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

Certified and approved by numerous States and Agencies.

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

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

Tetra Tech- Midland, Midland, TX

Marathon-Battle 1H

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
AH #1 (0-1')	S	05-14-18 00:00		586572-001
AH #1 (0-1.5')	S	05-14-18 00:00		586572-002
AH #2 (0-6')	S	05-14-18 00:00		586572-003
AH #3 (0-1')	S	05-14-18 00:00		586572-004
AH #4 (0-6")	S	05-14-18 00:00		586572-005
AH #5 (0-6")	S	05-14-18 00:00		586572-006
AH #6 (0-1')	S	05-14-18 00:00		586572-007
AH #6 (1-1.5')	S	05-14-18 00:00		586572-008
AH #7 (0-1')	S	05-14-18 00:00		586572-009
AH #7 (1-1.5')	S	05-14-18 00:00		586572-010
AH #8 (0-1')	S	05-14-18 00:00		586572-011
AH #8 (1-1.5')	S	05-14-18 00:00		586572-012
AH #9 (0-1')	S	05-14-18 00:00		586572-013
AH #9 (1-1.5')	S	05-14-18 00:00		586572-014
AH #9 (1.5-2')	S	05-14-18 00:00		586572-015
AH #10 (0-1')	S	05-14-18 00:00		586572-016
AH #10 (1-1.5')	S	05-14-18 00:00		586572-017
AH #11 (0-1')	S	05-14-18 00:00		586572-018
AH #11 (1-1.5')	S	05-14-18 00:00		586572-019
AH #11 (1.5-2')	S	05-14-18 00:00		586572-020



CASE NARRATIVE

Client Name: Tetra Tech- Midland

Project Name: Marathon-Battle 1H

Project ID: 212C-MD-01233
Work Order Number(s): 586572

Report Date: 25-MAY-18
Date Received: 05/18/2018

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3051413 BTEX by EPA 8021B

Lab Sample ID 586572-002 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Benzene, Ethylbenzene, Toluene, 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: 586572-001, -002, -004, -005, -006, -007, -008, -009, -010, -011, -013, -014, -015, -016, -017, -018, -019.

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-3051424 BTEX by EPA 8021B

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

Lab Sample ID 586572-003 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Ethylbenzene, Toluene, 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: 586572-003, -012, -020.

The Laboratory Control Sample for Toluene, m,p-Xylenes, Ethylbenzene, o-Xylene is within laboratory Control Limits, therefore the data was accepted.



Certificate of Analysis Summary 586572



Tetra Tech- Midland, Midland, TX

Project Name: Marathon-Battle 1H

Project Id: 212C-MD-01233
 Contact: Ike Tavarez
 Project Location: Lea County, New Mexico

Date Received in Lab: Fri May-18-18 01:30 pm
 Report Date: 25-MAY-18
 Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	586572-001	586572-002	586572-003	586572-004	586572-005	586572-006
	Field Id:	AH #1 (0-1')	AH #1 (0-1.5')	AH #2 (0-6')	AH #3 (0-1')	AH #4 (0-6")	AH #5 (0-6")
	Depth:						
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	May-14-18 00:00					
BTEX by EPA 8021B	Extracted:	May-24-18 12:00	May-24-18 12:00	May-24-18 17:15	May-24-18 12:00	May-24-18 12:00	May-24-18 12:00
	Analyzed:	May-24-18 15:09	May-24-18 12:45	May-25-18 06:32	May-24-18 13:03	May-24-18 13:22	May-24-18 13:40
	Units/RL:	mg/kg RL					
	Benzene	<0.00199 0.00199	<0.00200 0.00200	<0.00202 0.00202	<0.00202 0.00202	<0.00199 0.00199	<0.00200 0.00200
Toluene	<0.00199 0.00199	<0.00200 0.00200	<0.00202 0.00202	<0.00202 0.00202	<0.00199 0.00199	<0.00200 0.00200	
Ethylbenzene	<0.00199 0.00199	<0.00200 0.00200	<0.00202 0.00202	<0.00202 0.00202	<0.00199 0.00199	<0.00200 0.00200	
m,p-Xylenes	<0.00398 0.00398	<0.00401 0.00401	<0.00403 0.00403	<0.00403 0.00403	0.00917 0.00398	<0.00399 0.00399	
o-Xylene	<0.00199 0.00199	<0.00200 0.00200	<0.00202 0.00202	<0.00202 0.00202	0.00724 0.00199	<0.00200 0.00200	
Total Xylenes	<0.00199 0.00199	<0.00200 0.00200	<0.00202 0.00202	<0.00202 0.00202	0.0164 0.00199	<0.00200 0.00200	
Total BTEX	<0.00199 0.00199	<0.00200 0.00200	<0.00202 0.00202	<0.00202 0.00202	0.0164 0.00199	<0.00200 0.00200	
Inorganic Anions by EPA 300/300.1	Extracted:	May-22-18 16:30					
	Analyzed:	May-22-18 19:09	May-22-18 19:27	May-22-18 19:33	May-22-18 19:39	May-22-18 19:45	May-22-18 20:03
	Units/RL:	mg/kg RL					
	Chloride	<4.98 4.98	<4.95 4.95	86.8 4.97	10600 99.6	150 4.91	355 4.97
TPH By SW8015 Mod	Extracted:	May-24-18 07:00					
	Analyzed:	May-24-18 10:07	May-24-18 10:26	May-24-18 11:19	May-24-18 11:37	May-24-18 11:55	May-24-18 12:13
	Units/RL:	mg/kg RL					
	Gasoline Range Hydrocarbons (GRO)	<14.9 14.9	<15.0 15.0	<15.0 15.0	<15.0 15.0	126 74.7	<74.9 74.9
Diesel Range Organics (DRO)	665 14.9	172 15.0	827 15.0	124 15.0	6620 74.7	4600 74.9	
Oil Range Hydrocarbons (ORO)	88.2 14.9	23.9 15.0	157 15.0	46.6 15.0	790 74.7	688 74.9	
Total TPH	753 14.9	196 15.0	984 15.0	171 15.0	7540 74.7	5290 74.9	

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

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Kelsey Brooks
Project Manager



Certificate of Analysis Summary 586572



Tetra Tech- Midland, Midland, TX

Project Name: Marathon-Battle 1H

Project Id: 212C-MD-01233
 Contact: Ike Tavarez
 Project Location: Lea County, New Mexico

Date Received in Lab: Fri May-18-18 01:30 pm
 Report Date: 25-MAY-18
 Project Manager: Kelsey Brooks

Analysis Requested	Lab Id:	586572-007	586572-008	586572-009	586572-010	586572-011	586572-012
	Field Id:	AH #6 (0-1')	AH #6 (1-1.5')	AH #7 (0-1')	AH #7 (1-1.5')	AH #8 (0-1')	AH #8 (1-1.5')
	Depth:						
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	May-14-18 00:00					
BTEX by EPA 8021B	Extracted:	May-24-18 12:00	May-24-18 17:15				
	Analyzed:	May-24-18 13:58	May-24-18 14:14	May-24-18 14:32	May-24-18 14:51	May-24-18 16:07	May-25-18 10:28
	Units/RL:	mg/kg RL					
Benzene		<0.00201 0.00201	<0.00201 0.00201	<0.00198 0.00198	<0.00199 0.00199	<0.00201 0.00201	<0.00202 0.00202
Toluene		<0.00201 0.00201	<0.00201 0.00201	<0.00198 0.00198	<0.00199 0.00199	<0.00201 0.00201	<0.00202 0.00202
Ethylbenzene		<0.00201 0.00201	<0.00201 0.00201	<0.00198 0.00198	<0.00199 0.00199	<0.00201 0.00201	<0.00202 0.00202
m,p-Xylenes		<0.00402 0.00402	<0.00402 0.00402	<0.00397 0.00397	<0.00398 0.00398	<0.00402 0.00402	<0.00404 0.00404
o-Xylene		<0.00201 0.00201	<0.00201 0.00201	<0.00198 0.00198	<0.00199 0.00199	<0.00201 0.00201	<0.00202 0.00202
Total Xylenes		<0.00201 0.00201	<0.00201 0.00201	<0.00198 0.00198	<0.00199 0.00199	<0.00201 0.00201	<0.00202 0.00202
Total BTEX		<0.00201 0.00201	<0.00201 0.00201	<0.00198 0.00198	<0.00199 0.00199	<0.00201 0.00201	<0.00202 0.00202
Inorganic Anions by EPA 300/300.1	Extracted:	May-22-18 16:30					
	Analyzed:	May-22-18 20:09	May-22-18 20:15	May-22-18 20:21	May-22-18 20:27	May-22-18 20:33	May-22-18 20:51
	Units/RL:	mg/kg RL					
Chloride		<4.97 4.97	<5.00 5.00	<5.00 5.00	<4.90 4.90	<4.95 4.95	<4.91 4.91
TPH By SW8015 Mod	Extracted:	May-24-18 07:00					
	Analyzed:	May-24-18 12:31	May-24-18 12:50	May-24-18 13:08	May-24-18 13:26	May-24-18 14:20	May-24-18 14:38
	Units/RL:	mg/kg RL					
Gasoline Range Hydrocarbons (GRO)		<15.0 15.0	<15.0 15.0	<14.9 14.9	<15.0 15.0	15.4 15.0	<15.0 15.0
Diesel Range Organics (DRO)		220 15.0	37.4 15.0	18.8 14.9	19.3 15.0	35.5 15.0	17.0 15.0
Oil Range Hydrocarbons (ORO)		54.1 15.0	25.6 15.0	<14.9 14.9	<15.0 15.0	<15.0 15.0	<15.0 15.0
Total TPH		274 15.0	63.0 15.0	18.8 14.9	19.3 15.0	50.9 15.0	17.0 15.0

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Kelsey Brooks
Project Manager



Certificate of Analysis Summary 586572



Tetra Tech- Midland, Midland, TX

Project Name: Marathon-Battle 1H

Project Id: 212C-MD-01233
Contact: Ike Tavarez
Project Location: Lea County, New Mexico

Date Received in Lab: Fri May-18-18 01:30 pm
Report Date: 25-MAY-18
Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	586572-013	586572-014	586572-015	586572-016	586572-017	586572-018
	<i>Field Id:</i>	AH #9 (0-1')	AH #9 (1-1.5')	AH #9 (1.5-2')	AH #10 (0-1')	AH #10 (1-1.5')	AH #11 (0-1')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	May-14-18 00:00					
BTEX by EPA 8021B	<i>Extracted:</i>	May-24-18 12:00					
	<i>Analyzed:</i>	May-24-18 16:44	May-24-18 17:15	May-24-18 17:33	May-24-18 17:51	May-24-18 18:10	May-24-18 18:28
	<i>Units/RL:</i>	mg/kg RL					
Benzene		<0.00201 0.00201	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200	<0.00202 0.00202	<0.00199 0.00199
Toluene		<0.00201 0.00201	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200	<0.00202 0.00202	<0.00199 0.00199
Ethylbenzene		<0.00201 0.00201	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200	<0.00202 0.00202	<0.00199 0.00199
m,p-Xylenes		<0.00402 0.00402	<0.00397 0.00397	<0.00399 0.00399	<0.00401 0.00401	<0.00403 0.00403	0.00479 0.00398
o-Xylene		<0.00201 0.00201	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200	<0.00202 0.00202	<0.00199 0.00199
Total Xylenes		<0.00201 0.00201	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200	<0.00202 0.00202	0.00479 0.00199
Total BTEX		<0.00201 0.00201	<0.00198 0.00198	<0.00200 0.00200	<0.00200 0.00200	<0.00202 0.00202	0.00479 0.00199
Inorganic Anions by EPA 300/300.1	<i>Extracted:</i>	May-22-18 16:30					
	<i>Analyzed:</i>	May-22-18 20:57	May-22-18 21:15	May-22-18 21:21	May-22-18 21:26	May-22-18 21:32	May-22-18 21:38
	<i>Units/RL:</i>	mg/kg RL					
Chloride		<4.96 4.96	<4.97 4.97	<5.00 5.00	<5.00 5.00	<4.90 4.90	270 4.99
TPH By SW8015 Mod	<i>Extracted:</i>	May-24-18 07:00					
	<i>Analyzed:</i>	May-24-18 14:56	May-24-18 15:14	May-24-18 15:33	May-24-18 15:51	May-24-18 16:09	May-24-18 16:27
	<i>Units/RL:</i>	mg/kg RL					
Gasoline Range Hydrocarbons (GRO)		<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0
Diesel Range Organics (DRO)		15.7 15.0	16.9 15.0	15.7 15.0	21.4 15.0	15.6 15.0	<15.0 15.0
Oil Range Hydrocarbons (ORO)		<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0	<15.0 15.0
Total TPH		15.7 15.0	16.9 15.0	15.7 15.0	21.4 15.0	15.6 15.0	<15.0 15.0

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

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

Kelsey Brooks
Project Manager



Certificate of Analysis Summary 586572



Tetra Tech- Midland, Midland, TX

Project Name: Marathon-Battle 1H

Project Id: 212C-MD-01233
 Contact: Ike Tavarez
 Project Location: Lea County, New Mexico

Date Received in Lab: Fri May-18-18 01:30 pm
 Report Date: 25-MAY-18
 Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	586572-019	586572-020				
	<i>Field Id:</i>	AH #11 (1-1.5')	AH #11 (1.5-2')				
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL				
	<i>Sampled:</i>	May-14-18 00:00	May-14-18 00:00				
BTEX by EPA 8021B	<i>Extracted:</i>	May-24-18 12:00	May-24-18 17:15				
	<i>Analyzed:</i>	May-24-18 18:46	May-25-18 06:50				
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				
Benzene		<0.00198 0.00198	<0.00200 0.00200				
Toluene		<0.00198 0.00198	<0.00200 0.00200				
Ethylbenzene		<0.00198 0.00198	<0.00200 0.00200				
m,p-Xylenes		<0.00397 0.00397	<0.00401 0.00401				
o-Xylene		<0.00198 0.00198	<0.00200 0.00200				
Total Xylenes		<0.00198 0.00198	<0.00200 0.00200				
Total BTEX		<0.00198 0.00198	<0.00200 0.00200				
Inorganic Anions by EPA 300/300.1	<i>Extracted:</i>	May-22-18 16:30	May-22-18 16:30				
	<i>Analyzed:</i>	May-22-18 21:44	May-22-18 21:50				
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				
Chloride		109 4.90	118 4.95				
TPH By SW8015 Mod	<i>Extracted:</i>	May-24-18 07:00	May-24-18 07:00				
	<i>Analyzed:</i>	May-24-18 16:45	May-24-18 17:03				
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL				
Gasoline Range Hydrocarbons (GRO)		<14.9 14.9	<15.0 15.0				
Diesel Range Organics (DRO)		<14.9 14.9	<15.0 15.0				
Oil Range Hydrocarbons (ORO)		<14.9 14.9	<15.0 15.0				
Total TPH		<14.9 14.9	<15.0 15.0				

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

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

Kelsey Brooks
Project Manager



Form 2 - Surrogate Recoveries

Project Name: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051427

Sample: 586572-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 10:07

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	95.4	99.6	96	70-135	
o-Terphenyl	51.9	49.8	104	70-135	

Lab Batch #: 3051427

Sample: 586572-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 10:26

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.0	99.8	93	70-135	
o-Terphenyl	48.1	49.9	96	70-135	

Lab Batch #: 3051427

Sample: 586572-003 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 11:19

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	100	99.7	100	70-135	
o-Terphenyl	61.3	49.9	123	70-135	

Lab Batch #: 3051427

Sample: 586572-004 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 11:37

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	104	99.7	104	70-135	
o-Terphenyl	54.2	49.9	109	70-135	

Lab Batch #: 3051427

Sample: 586572-005 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 11:55

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	121	99.6	121	70-135	
o-Terphenyl	53.1	49.8	107	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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



Form 2 - Surrogate Recoveries

Project Name: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051427

Sample: 586572-006 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 12:13

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	101	99.9	101	70-135	
o-Terphenyl	51.8	50.0	104	70-135	

Lab Batch #: 3051427

Sample: 586572-007 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 12:31

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	98.6	99.8	99	70-135	
o-Terphenyl	51.3	49.9	103	70-135	

Lab Batch #: 3051413

Sample: 586572-002 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 12:45

SURROGATE RECOVERY STUDY					
BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0243	0.0300	81	70-130	
4-Bromofluorobenzene	0.0257	0.0300	86	70-130	

Lab Batch #: 3051427

Sample: 586572-008 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 12:50

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	112	100	112	70-135	
o-Terphenyl	56.2	50.0	112	70-135	

Lab Batch #: 3051413

Sample: 586572-004 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 13:03

SURROGATE RECOVERY STUDY					
BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0280	0.0300	93	70-130	
4-Bromofluorobenzene	0.0349	0.0300	116	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: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051427

Sample: 586572-009 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 13:08

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	99.3	99.6	100	70-135	
o-Terphenyl	47.5	49.8	95	70-135	

Lab Batch #: 3051413

Sample: 586572-005 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 13:22

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0300	0.0300	100	70-130	
4-Bromofluorobenzene	0.0308	0.0300	103	70-130	

Lab Batch #: 3051427

Sample: 586572-010 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 13:26

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	106	99.7	106	70-135	
o-Terphenyl	52.0	49.9	104	70-135	

Lab Batch #: 3051413

Sample: 586572-006 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 13:40

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0273	0.0300	91	70-130	
4-Bromofluorobenzene	0.0296	0.0300	99	70-130	

Lab Batch #: 3051413

Sample: 586572-007 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 13:58

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0279	0.0300	93	70-130	
4-Bromofluorobenzene	0.0316	0.0300	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: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051413

Sample: 586572-008 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 14:14

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0347	0.0300	116	70-130	
4-Bromofluorobenzene	0.0285	0.0300	95	70-130	

Lab Batch #: 3051427

Sample: 586572-011 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 14:20

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	110	99.8	110	70-135	
o-Terphenyl	52.0	49.9	104	70-135	

Lab Batch #: 3051413

Sample: 586572-009 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 14:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0290	0.0300	97	70-130	
4-Bromofluorobenzene	0.0352	0.0300	117	70-130	

Lab Batch #: 3051427

Sample: 586572-012 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 14:38

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	109	99.7	109	70-135	
o-Terphenyl	52.7	49.9	106	70-135	

Lab Batch #: 3051413

Sample: 586572-010 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 14:51

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0261	0.0300	87	70-130	
4-Bromofluorobenzene	0.0305	0.0300	102	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: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051427

Sample: 586572-013 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 14:56

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	107	99.9	107	70-135	
o-Terphenyl	51.7	50.0	103	70-135	

Lab Batch #: 3051413

Sample: 586572-001 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 15:09

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0305	0.0300	102	70-130	
4-Bromofluorobenzene	0.0280	0.0300	93	70-130	

Lab Batch #: 3051427

Sample: 586572-014 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 15:14

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	105	100	105	70-135	
o-Terphenyl	53.4	50.0	107	70-135	

Lab Batch #: 3051427

Sample: 586572-015 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 15:33

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	100	99.8	100	70-135	
o-Terphenyl	51.3	49.9	103	70-135	

Lab Batch #: 3051427

Sample: 586572-016 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 15:51

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	103	99.8	103	70-135	
o-Terphenyl	49.4	49.9	99	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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



Form 2 - Surrogate Recoveries

Project Name: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051413

Sample: 586572-011 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 16:07

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0259	0.0300	86	70-130	
4-Bromofluorobenzene	0.0304	0.0300	101	70-130	

Lab Batch #: 3051427

Sample: 586572-017 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 16:09

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	108	99.7	108	70-135	
o-Terphenyl	53.4	49.9	107	70-135	

Lab Batch #: 3051427

Sample: 586572-018 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 16:27

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	111	99.9	111	70-135	
o-Terphenyl	54.2	50.0	108	70-135	

Lab Batch #: 3051413

Sample: 586572-013 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 16:44

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0307	0.0300	102	70-130	
4-Bromofluorobenzene	0.0337	0.0300	112	70-130	

Lab Batch #: 3051427

Sample: 586572-019 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 16:45

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	108	99.6	108	70-135	
o-Terphenyl	54.0	49.8	108	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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



Form 2 - Surrogate Recoveries

Project Name: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051427

Sample: 586572-020 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 17:03

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	99.9	99.7	100	70-135	
o-Terphenyl	49.4	49.9	99	70-135	

Lab Batch #: 3051413

Sample: 586572-014 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 17:15

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0303	0.0300	101	70-130	
4-Bromofluorobenzene	0.0244	0.0300	81	70-130	

Lab Batch #: 3051413

Sample: 586572-015 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 17:33

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0271	0.0300	90	70-130	
4-Bromofluorobenzene	0.0317	0.0300	106	70-130	

Lab Batch #: 3051413

Sample: 586572-016 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 17:51

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0261	0.0300	87	70-130	
4-Bromofluorobenzene	0.0235	0.0300	78	70-130	

Lab Batch #: 3051413

Sample: 586572-017 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 18:10

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0329	0.0300	110	70-130	
4-Bromofluorobenzene	0.0331	0.0300	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: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051413

Sample: 586572-018 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 18:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0281	0.0300	94	70-130	
4-Bromofluorobenzene	0.0278	0.0300	93	70-130	

Lab Batch #: 3051413

Sample: 586572-019 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 18:46

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0259	0.0300	86	70-130	
4-Bromofluorobenzene	0.0296	0.0300	99	70-130	

Lab Batch #: 3051424

Sample: 586572-003 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/25/18 06:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0248	0.0300	83	70-130	
4-Bromofluorobenzene	0.0295	0.0300	98	70-130	

Lab Batch #: 3051424

Sample: 586572-020 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/25/18 06:50

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0293	0.0300	98	70-130	
4-Bromofluorobenzene	0.0318	0.0300	106	70-130	

Lab Batch #: 3051424

Sample: 586572-012 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/25/18 10:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0244	0.0300	81	70-130	
4-Bromofluorobenzene	0.0326	0.0300	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: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051427

Sample: 7655477-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 05/24/18 09:13

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	114	100	114	70-135	
o-Terphenyl	59.6	50.0	119	70-135	

Lab Batch #: 3051413

Sample: 7655456-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 05/24/18 12:27

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0263	0.0300	88	70-130	
4-Bromofluorobenzene	0.0218	0.0300	73	70-130	

Lab Batch #: 3051424

Sample: 7655460-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 05/25/18 06:14

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0250	0.0300	83	70-130	
4-Bromofluorobenzene	0.0241	0.0300	80	70-130	

Lab Batch #: 3051427

Sample: 7655477-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 05/24/18 09:31

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	122	100	122	70-135	
o-Terphenyl	55.0	50.0	110	70-135	

Lab Batch #: 3051413

Sample: 7655456-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 05/24/18 10:52

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0282	0.0300	94	70-130	
4-Bromofluorobenzene	0.0291	0.0300	97	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: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051424

Sample: 7655460-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 05/25/18 04:43

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0285	0.0300	95	70-130	
4-Bromofluorobenzene	0.0316	0.0300	105	70-130	

Lab Batch #: 3051427

Sample: 7655477-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 05/24/18 09:49

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	130	100	130	70-135	
o-Terphenyl	63.8	50.0	128	70-135	

Lab Batch #: 3051413

Sample: 7655456-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 05/24/18 11:11

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0258	0.0300	86	70-130	
4-Bromofluorobenzene	0.0353	0.0300	118	70-130	

Lab Batch #: 3051424

Sample: 7655460-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

Date Analyzed: 05/25/18 05:01

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	70-130	
4-Bromofluorobenzene	0.0281	0.0300	94	70-130	

Lab Batch #: 3051427

Sample: 586572-002 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 10:44

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	126	99.9	126	70-135	
o-Terphenyl	57.3	50.0	115	70-135	

* Surrogate outside of Laboratory QC limits

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

*** Poor recoveries due to dilution

Surrogate Recovery [D] = 100 * A / B

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



Form 2 - Surrogate Recoveries

Project Name: Marathon-Battle 1H

Work Orders : 586572,

Project ID: 212C-MD-01233

Lab Batch #: 3051413

Sample: 586572-002 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 11:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0291	0.0300	97	70-130	
4-Bromofluorobenzene	0.0337	0.0300	112	70-130	

Lab Batch #: 3051424

Sample: 586572-003 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/25/18 05:19

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	70-130	
4-Bromofluorobenzene	0.0306	0.0300	102	70-130	

Lab Batch #: 3051427

Sample: 586572-002 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 11:02

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	127	99.8	127	70-135	
o-Terphenyl	55.0	49.9	110	70-135	

Lab Batch #: 3051413

Sample: 586572-002 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/24/18 11:50

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0226	0.0300	75	70-130	
4-Bromofluorobenzene	0.0244	0.0300	81	70-130	

Lab Batch #: 3051424

Sample: 586572-003 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

Date Analyzed: 05/25/18 05:37

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0286	0.0300	95	70-130	
4-Bromofluorobenzene	0.0323	0.0300	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.



BS / BSD Recoveries



Project Name: Marathon-Battle 1H

Work Order #: 586572

Project ID: 212C-MD-01233

Analyst: ALJ

Date Prepared: 05/24/2018

Date Analyzed: 05/24/2018

Lab Batch ID: 3051413

Sample: 7655456-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.00202	0.101	0.106	105	0.100	0.0937	94	12	70-130	35	
Toluene	<0.00202	0.101	0.108	107	0.100	0.0922	92	16	70-130	35	
Ethylbenzene	<0.00202	0.101	0.106	105	0.100	0.0948	95	11	70-130	35	
m,p-Xylenes	<0.00403	0.202	0.225	111	0.201	0.203	101	10	70-130	35	
o-Xylene	<0.00202	0.101	0.113	112	0.100	0.103	103	9	70-130	35	

Analyst: ALJ

Date Prepared: 05/24/2018

Date Analyzed: 05/25/2018

Lab Batch ID: 3051424

Sample: 7655460-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Benzene	<0.00199	0.0994	0.0945	95	0.0996	0.0856	86	10	70-130	35	
Toluene	<0.00199	0.0994	0.0928	93	0.0996	0.0826	83	12	70-130	35	
Ethylbenzene	<0.00199	0.0994	0.0933	94	0.0996	0.0843	85	10	70-130	35	
m,p-Xylenes	<0.00398	0.199	0.197	99	0.199	0.179	90	10	70-130	35	
o-Xylene	<0.00199	0.0994	0.101	102	0.0996	0.0946	95	7	70-130	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: Marathon-Battle 1H

Work Order #: 586572

Project ID: 212C-MD-01233

Analyst: SCM

Date Prepared: 05/22/2018

Date Analyzed: 05/22/2018

Lab Batch ID: 3051035

Sample: 7645262-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	250	232	93	250	232	93	0	90-110	20	

Analyst: ARM

Date Prepared: 05/24/2018

Date Analyzed: 05/24/2018

Lab Batch ID: 3051427

Sample: 7655477-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	909	91	1000	1060	106	15	70-135	20	
Diesel Range Organics (DRO)	<15.0	1000	1010	101	1000	1200	120	17	70-135	20	

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

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

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

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: Marathon-Battle 1H

Work Order # : 586572

Project ID: 212C-MD-01233

Lab Batch ID: 3051413

QC- Sample ID: 586572-002 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 05/24/2018

Date Prepared: 05/24/2018

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	0.0501	50	0.100	0.0593	59	17	70-130	35	X
Toluene	<0.00200	0.0998	0.0442	44	0.100	0.0577	58	26	70-130	35	X
Ethylbenzene	<0.00200	0.0998	0.0446	45	0.100	0.0545	55	20	70-130	35	X
m,p-Xylenes	<0.00399	0.200	0.0878	44	0.200	0.116	58	28	70-130	35	X
o-Xylene	<0.00200	0.0998	0.0438	44	0.100	0.0599	60	31	70-130	35	X

Lab Batch ID: 3051424

QC- Sample ID: 586572-003 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 05/25/2018

Date Prepared: 05/24/2018

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	0.0778	78	0.101	0.0787	78	1	70-130	35	
Toluene	<0.00201	0.100	0.0672	67	0.101	0.0679	67	1	70-130	35	X
Ethylbenzene	<0.00201	0.100	0.0581	58	0.101	0.0566	56	3	70-130	35	X
m,p-Xylenes	<0.00402	0.201	0.119	59	0.202	0.118	58	1	70-130	35	X
o-Xylene	<0.00201	0.100	0.0582	58	0.101	0.0585	58	1	70-130	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: Marathon-Battle 1H

Work Order # : 586572

Project ID: 212C-MD-01233

Lab Batch ID: 3051035

QC- Sample ID: 586572-001 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 05/22/2018

Date Prepared: 05/22/2018

Analyst: SCM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<4.98	249	250	100	249	249	100	0	90-110	20	

Lab Batch ID: 3051035

QC- Sample ID: 586572-011 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 05/22/2018

Date Prepared: 05/22/2018

Analyst: SCM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<4.95	248	232	94	248	235	95	1	90-110	20	

Lab Batch ID: 3051427

QC- Sample ID: 586572-002 S

Batch #: 1 **Matrix:** Soil

Date Analyzed: 05/24/2018

Date Prepared: 05/24/2018

Analyst: ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	999	967	97	998	923	92	5	70-135	20	
Diesel Range Organics (DRO)	172	999	1270	110	998	1140	97	11	70-135	20	

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

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

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

5810572



Tetra Tech, Inc.

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

Client Name: **Marathon** Site Manager: **Ike TAVAREZ**

Project Name: **Battle 1H**

Project Location: (county, state) **Lea County, New Mexico** Project #: **212C-MD-01233**

Invoice to: **Tetra Tech, Inc.**

Receiving Laboratory: **Xenco Lab** Sampler Signature: **Mike Carrmona**

Comments:

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING		MATRIX		PRESERVATIVE METHOD			# CONTAINERS	FILTERED (Y/N)		
		YEAR-2018	DATE	TIME	WATER	SOIL	HCL	HNO ₃			ICE	None
	AH #1 (0-1')		5/14/2018		X				X		1	N
	AH #1 (1-1.5')		5/14/2018		X				X		1	N
	AH #2 (0-6")		5/14/2018		X				X		1	N
	AH #3 (0-1')		5/14/2018		X				X		1	N
	AH #4 (0-6")		5/14/2018		X				X		1	N
	AH #5 (0-6")		5/14/2018		X				X		1	N
	AH #6 (0-1')		5/14/2018		X				X		1	N
	AH #6 (1-1.5')		5/14/2018		X				X		1	N
	AH #7 (0-1')		5/14/2018		X				X		1	N
	AH #7 (1-1.5')		5/14/2018		X				X		1	N

Relinquished by: *[Signature]* Date: **5/14/16** Time: **1:30**

Received by: *[Signature]* Date: **5/14/16** Time: **1:30**

Relinquished by: _____ Date: _____ Time: _____

Received by: _____ Date: _____ Time: _____

ORIGINAL COPY

ANALYSIS REQUEST
(Circle or Specify Method No.)

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

REMARKS:

STANDARD

RUSH: Same Day 24 hr 48 hr 72 hr

Rush Charges Authorized

Special Report Limits or TRRP Report

LAB USE ONLY

Sample Temperature: *[Signature]*

(Circle) HAND DELIVERED FEDEX UPS Tracking #: _____



Tetra Tech, Inc.

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

5806572

Client Name: Marathon
 Project Name: Battle 1H
 Project Location: (county, state) Lea County, New Mexico
 Invoice to: Tetra Tech, Inc.
 Receiving Laboratory: Xenco Lab
 Project #: 212C-MD-01233
 Project #:
 Sampler Signature: Mike Carrmona
 Comments: *Bill Tetra Tech -*

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION		SAMPLING		MATRIX		PRESERVATIVE METHOD			# CONTAINERS	FILTERED (Y/N)
	YEAR-2018	DATE	TIME	WATER	SOIL	HCL	HNO ₃	ICE	None		
	AH #8 (0-1')	5/14/2018		X				X		1	N
	AH #8 (1-1.5')	5/14/2018		X				X		1	N
	AH #9 (0-1')	5/14/2018		X				X		1	N
	AH #9 (1-1.5')	5/14/2018		X				X		1	N
	AH #9 (1.5-2')	5/14/2018		X				X		1	N
	AH #10 (0-1')	5/14/2018		X				X		1	N
	AH #10 (1-1.5')	5/14/2018		X				X		1	N
	AH #11 (0-1')	5/14/2018		X				X		1	N
	AH #11 (1-1.5')	5/14/2018		X				X		1	N
	AH #11 (1.5-2')	5/14/2018		X				X		1	N

Retinquired by: [Signature] Date: 5/14/18 Time: 1:30
 Received by: [Signature] Date: 5/14/18 Time: 1:30

ANALYSIS REQUEST
 (Circle or Specify Method No.)

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

LAB USE ONLY
 REMARKS:
 STANDARD
 RUSH: Same Day 24 hr 48 hr 72 hr
 Push Charges Authorized
 Special Report Limits or TRRP Report

Sample Temperature: 2/10 18

(Circle) HAND DELIVERED FEDEX UPS Tracking #:

ORIGINAL COPY

Client: Tetra Tech- Midland

Date/ Time Received: 05/18/2018 01:30:00 PM

Work Order #: 586572

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	2.6
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seals intact on shipping container/ cooler?	N/A
#5 Custody Seals intact on sample bottles?	N/A
#6*Custody Seals Signed and dated?	N/A
#7 *Chain of Custody present?	Yes
#8 Any missing/extra samples?	No
#9 Chain of Custody signed when relinquished/ received?	Yes
#10 Chain of Custody agrees with sample labels/matrix?	Yes
#11 Container label(s) legible and intact?	Yes
#12 Samples in proper container/ bottle?	Yes
#13 Samples properly preserved?	Yes
#14 Sample container(s) intact?	Yes
#15 Sufficient sample amount for indicated test(s)?	Yes
#16 All samples received within hold time?	Yes
#17 Subcontract of sample(s)?	N/A
#18 Water VOC samples have zero headspace?	N/A

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

Analyst:

PH Device/Lot#:

Checklist completed by: Brianna Teel Date: 05/18/2018
 Brianna Teel

Checklist reviewed by: Kelsey Brooks Date: 05/21/2018
 Kelsey Brooks

Appendix D